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February 1, 1977

Volume 955

Number 1

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PATENT NOTICES

Certificates of Correction for the Week of Feb. 1, 1977

Re. 28,995	3,956,659	3,976,979	3,985,872
D. 240,558	3,956,709	3,977,016	3,985,875
D. 241,470	3,956,713	3,977,256	3,986,113
3,713,825	3,961,654	3,977,307	3,986,142
3,729,404	3,962,265	3,977,947	3,986,697
3,743,537	3,962,861	3,977,983	3,986,823
3,798,114	3,963,598	3,978,095	3,987,032
3,799,199	3,963,828	3,978,189	3,987,303
3,833,580	3,964,296	3,978,297	3,987,641
3,833,727	3,964,997	3,978,656	3,987,684
3,836,252	3,965,136	3,978,661	3,988,022
3,839,164	3,965,418	3,979,406	3,988,207
3,847,945	3,966,000	3,979,482	3,988,245
3,865,222	3,966,965	3,979,607	3,988,451
3,869,598	3,967,217	3,979,925	3,988,472
3,890,182	3,967,700	3,980,243	3,989,085
3,893,077	3,969,356	3,980,247	3,989,219
3,896,169	3,970,219	3,980,251	3,989,393
3,905,998	3,970,256	3,980,289	3,989,575
3,918,793	3,970,265	3,980,448	3,989,601
3,919,199	3,970,331	3,980,551	3,989,663
3,920,076	3,970,364	3,980,570	3,989,694
3,920,359	3,970,452	3,980,721	3,989,729
3,920,724	3,970,630	3,980,727	3,989,767
3,925,776	3,970,742	3,980,839	3,989,858
3,925,902	3,971,576	3,980,855	3,989,994
3,928,500	3,971,653	3,981,631	3,990,007
3,932,065	3,971,710	3,981,736	3,990,190
3,933,588	3,971,936	3,981,941	3,990,209
3,933,696	3,972,712	3,982,693	3,990,270
3,933,871	3,973,364	3,983,090	3,990,500
3,938,052	3,973,560	3,983,118	3,990,569
3,939,375	3,973,697	3,983,679	3,990,692
3,943,014	3,973,807	3,984,001	3,991,238
3,943,639	3,973,871	3,984,158	3,991,258
3,943,724	3,973,881	3,984,509	3,991,377
3,946,091	3,974,003	3,984,874	3,991,378
3,950,499	3,975,798	3,984,973	3,991,511
3,952,195	3,975,978	3,985,159	3,991,897
3,953,428	3,976,526	3,985,205	3,991,946
3,953,597	3,976,780	3,985,356	3,993,861
3,954,334	3,976,796	3,985,628	3,993,912
3,956,349	3,976,820	3,985,698	3,995,669
3,956,513	3,976,856	3,985,706	3,995,670
3,956,519	3,976,879	3,985,726	

Dedication

3,653,276.—*Matthew McIntyre and Harry Edwin Goodfellow*, Jackson, Tenn. REMOTE-CONTROL MIRROR SYSTEM. Patent dated Apr. 4, 1972. Dedication filed Oct. 1, 1976, by the assignee, *Harman International Industries, Inc.* Hereby dedicates the entire term of said patent to the Public.

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,462,487, R. W. Kinney, S. L. Neldeman, F. L. Weisenborn and J. S. P. Schwarz, CHEMICAL COMPOUNDS AND METHODS FOR PREPARING THE SAME, Interference No. 98,970, decided Oct. 12, 1976, claim 4.

Patent No. 3,684,683, Isao Ota, ELECTROPHORETIC LIGHT IMAGE REPRODUCTION DEVICE, Interference No. 99,028, decided Oct. 28, 1976, claims 1 and 13.

Patent No. 3,689,399, Isao Ota, PHOTOELECTROPHORETIC IMAGE REPRODUCTION DEVICE, Interference No. 99,027, decided Oct. 28, 1976, claims 1, 5, 7, 9, 14, 15, 16, 17 and 19.

Patent No. 3,697,366, George H. Harlock and Edward A. Barkard, LIGHTWEIGHT GYPSUM PANEL, Interference No. 99,139, decided Oct. 29, 1976, claim 1.

Patent No. 3,700,721, John A. Price and Mary J. Stewart, SULFOPHENOXO MALONATE COMPOUNDS, Interference No. 99,086, decided Sept. 9, 1976, claim 1.

Patent No. 3,712,473, George W. Ellenburg, REVERSE OSMOSIS MODULE, Interference No. 99,054, decided Sept. 14, 1976, claims 1, 2 and 3.

Patent No. 3,786,852, Robert W. Houston, TIRE CHANGER APPARATUS, Interference No. 99,010, decided Sept. 3, 1976, claims 1 and 10.

Patent No. 3,789,060, Harlan L. Goerting, John N. Elkenberry and Gerald S. Koerner, FLUORINATED CAMPHOR DERIVATIVES AND EUROPIUM AND PRASEODYMIUM CHELATES THEREOF, Interference No. 98,924, decided Sept. 16, 1976, claims 1, 2, 3 and 5.

Patent No. 3,835,782, George L. Griffith and Donald W. Edwards, PRODUCT AND METHOD, Interference No. 99,183, decided Oct. 28, 1976, claims 1, 2, 3, 4, 8, 9, 20, 21 and 22.

Patent No. 3,876,421, Yozo Takemura, PROCESS FOR DESULFURIZATION OF MOLTEN PIG IRON, Interference No. 99,220, decided Oct. 12, 1976, claims 1 and 2.

Disclaimers and Dedications

Reissue No. 28,625.—*Robert A. Cunningham*, Bellaire, Tex. ROCK DRILL WITH INCREASED BEARING LIFE. Patent dated Nov. 25, 1975. Disclaimer and dedication filed Dec. 3, 1976, by the assignee, *Hughes Tool Company*.

Hereby disclaims and dedicates claims 1-15 of said patent.

3,027,477.—*Edward Emanuel Sheldon*, New York, N.Y. ENDOSCOPES. Patent dated Mar. 27, 1962. Disclaimer and dedication filed Nov. 1, 1976, by the assignee, *American Optical Corporation*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,265,892.—*Edward Emanuel Sheldon*, New York, N.Y. SCANOGRAPH USING FLEXIBLE FIBER LIGHT CONDUCTORS. Patent dated Aug. 9, 1966. Disclaimer and dedication filed Nov. 11, 1976, by the assignee, *American Optical Corporation*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,423,620.—*Edward Emanuel Sheldon*, New York, N.Y. VACUUM TUBE DEVICE HAVING LIGHT CONDUCTING RODS AND LUMINESCENT SCREEN. Patent dated Jan. 21, 1969. Disclaimer and dedication filed Nov. 11, 1976, by the assignee, *American Optical Corporation*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Disclaimers

3,791,447.—*Arthur W. Smith, Ray A. Plummer, and Charles Wayne Johnson*, Houston, Tex. WELL METHODS FOR SAND BRIDGE REMOVAL USING SMALL DIAMETER TUBING. Patent dated Feb. 12, 1974. Disclaimer filed Jan. 2, 1976, by the assignee, *Big Three Industries, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,839,732.—*Mario E. Bachmann*, Northlake, Ill. MAGNETIC TAPE HEAD INDEXING MEANS FOR MULTITRACT TAPE PLAYERS. Patent dated Oct. 1, 1974. Disclaimer filed Dec. 8, 1976, by the assignee, *Motorola, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5 and 6 of said patent.

3,841,669.—*William George Luke and David Pender Datson*, Cornwall, England. SWIVEL JOINTS FOR PIPES. Patent dated Oct. 15, 1974. Disclaimer filed Nov. 30, 1976, by the assignee *English Clays Lovering Pochin & Company Limited*.

Hereby enters this disclaimer to claims 1-5 of said patent.

3,845,339.—*Alfred Merkle*, St. Georgen, *Fritz Schmitzder*, Hornberg, and *Werner Heinzmann*, St. Georgen, Germany. PERMANENT MAGNET ROTOR ELECTRIC MOTOR. Patent dated Oct. 29, 1974. Disclaimer filed Dec. 6, 1976, by the assignee, *Papst-Motoren KG*.

Hereby enters this disclaimer to claim 14 of said patent.

3,876,447.—*Frank T. Lally*, Willowick, Ohio. METHOD OF APPLYING HARD-FACING MATERIALS. Patent dated Apr. 8, 1975. Disclaimer filed Nov. 22, 1976, by the assignee, *TRW Inc.*

Hereby enters this disclaimer to claims 1 thru 10 of said patent.

3,878,801.—*William R. Conner, Jr.*, Shelbyville, Tenn. LOADER-UNLOADER FOR AUTOMATIC SEWING APPARATUS. Patent dated Apr. 22, 1975. Disclaimer filed Nov. 26, 1976, by the assignee, *Stahl-Urban Company*.

Hereby enters this disclaimer to claims 1, 2 and 24 of said patent.

3,956,662.—*Gerald E. McTeague*, Portland, and *Kenneth R. Stinger*, Hillsboro, Oreg. CATHODE RAY STORAGE TUBE HAVING A TARGET DIELECTRIC PROVIDED WITH PARTICULATE SEGMENTS OF COLLECTOR ELECTRODE EXTENDING THERE THROUGH. Patent dated May 11, 1976. Disclaimer filed Dec. 3, 1976, by the assignee, *Tektronix, Inc.*

Hereby enters this disclaimer to claim 11 of said patent.

3,978,473.—*James J. Pastoriza*, Lincoln, Mass. INTEGRATED-CIRCUIT DIGITAL-TO-ANALOG CONVERTER. Patent dated Aug. 31, 1976. Disclaimer filed Nov. 18, 1976, by the assignee, *Analog Devices, Incorporated*.

Hereby disclaims the term of this patent subsequent to Aug. 15, 1989.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 18, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-11-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-10-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director..... Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-17-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-21-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-22-76
DESIGNS, GROUP 260—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Apparatuses; Brakes; Railways and Railway Equipment.	2-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding; Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders; Woodworking; Tools; Cutlery; Jacks.	5-5-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-20-76

Expiration of patents: The patents within the range of numbers indicated below expire during January 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,919,443 to 2,925,007 inclusive
Plant Patents..... Numbers 1,893 to 1,900, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 1, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T955,001 TELEPHONE SET

Donald Michael Genaro, Haworth, N.J.; John Niel McGarvey, Drexel Hill, Pa.; Stanley Edward Seretny, Indianapolis, Ind.; Alvin Richard Tilley, Red Bank, N.J., and Carl Eugene Webb, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 3, 1975, Ser. No. 637,175

Int. Cl. D14/03

U.S. Cl. D26—14 A

2 Sheets Drawing. 1 Pages Specification



An ornamental design for a telephone is disclosed in which the telephone is arcuate and includes a pushbutton dial that has a planar face and rectangular pushbuttons. The longitudinal walls on each side of the dial vary in height, the walls having a greater height at their ends than in the middle. In addition, the portion of the set between the dial and the mouthpiece end of the set includes a planar inclined ramp that extends at an angle to both the flat surface of the dial and the curved surface of the set.

T955,002

FERTILIZER PROCESSES INCORPORATING SCRUBBED FLUE GAS SLUDGE BYPRODUCT

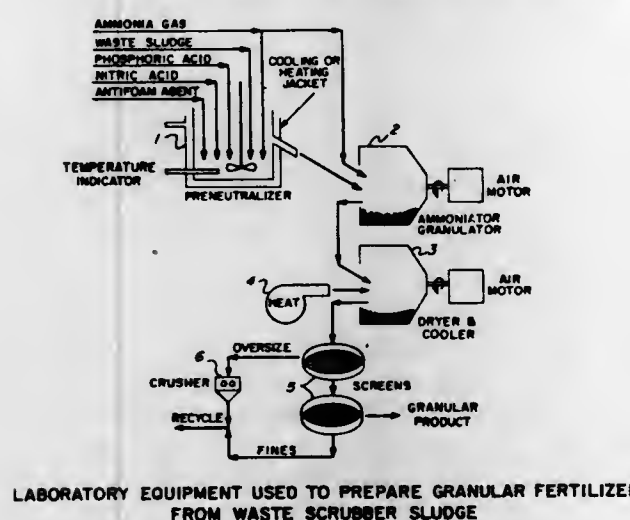
James J. Schultz, and Vincent J. Van Pelt, both of Florence, Ala., assignors to Tennessee Valley Authority

Filed Feb. 23, 1976, Ser. No. 660,054

Int. Cl. C05F 7/00

U.S. Cl. 71—25

3 Sheets Drawing. 15 Pages Specification



A process for the production of a granular fertilizer material from sludge materials discharged from scrubbing processes that remove pollutants from boiler flue gases. Waste sludge discharged from flue gas scrubber systems often contain large amounts of calcium and sulfur as well as lesser amounts of other compounds known to have plant nutrient value. The sludge is treated with an acid such as phosphoric, sulfuric or nitric, or a mixture of these, and ammonia. The resulting

T955,003

PHOTOGRAPHIC FILMS

David Roderick Mann, Colchester; Geoffrey Pickles Irvin, Brantham near Manningtree, and Richard Silverwood, Wivenhoe, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 548,221, Feb. 7, 1975, abandoned.

This application May 4, 1976, Ser. No. 683,240

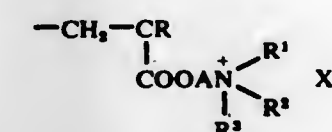
Claims priority, application United Kingdom, Feb. 21, 1974, 7871/74

Int. Cl. G03C 1/78, 1/96

U.S. Cl. 96—87 A

2 Sheets Drawing. 27 Pages Specification

Anti-static photographic films comprise a self-supporting synthetic plastics film base, such as a polyethylene terephthalate film, having superimposed on at least one side a gelatin-containing subbing layer and a radiation-sensitive layer superimposed on the gelatin layer, in which an anti-static material is included in the gelatin-containing subbing layer or being interposed as a layer between the gelatin-containing subbing layer and the radiation-sensitive layer, said anti-static material comprising a polymer or copolymer containing repeating units of the formula:



wherein R represents hydrogen or methyl, R¹ represents methyl or ethyl, R² and R³ each independently represent methyl or ethyl or R² and R³ taken together represent —CH₂CH₂OCH₂CH₂— or —(CH₂)_n— where n represents 4, 5 or 6, A represents an alkylene or substituted alkylene group and X⁻ represents a chloride or acetate ion, said polymer or copolymer having an average molecular weight in the range 5,000 to 2,000,000. Preferred anti-static materials include a copolymer of equimolar amounts of trimethyl-β-methacryloyloxyethyl ammonium chloride and styrene; a copolymer of equimolar amounts of ethyldimethyl-β-methacryloyloxyethyl ammonium bromide and methyl methacrylate; a copolymer formed from equimolar amounts of trimethyl-β-methacryloyloxyethyl ammonium acetate and styrene; a copolymer formed from 15 mole % trimethyl-β-methacryloyloxyethyl ammonium chloride and 85 mole % styrene; a copolymer formed from 50 mole % ethyldimethyl-β-methacryloyloxyethyl ammonium bromide and 50 mole % methyl methacrylate and a homopolymer of trimethyl-β-methacryloyloxyethyl ammonium chloride.

T955,004

METHOD FOR HEAT EXCHANGER LEAK DETECTION IN A LIQUID METAL COOLED NUCLEAR REACTOR

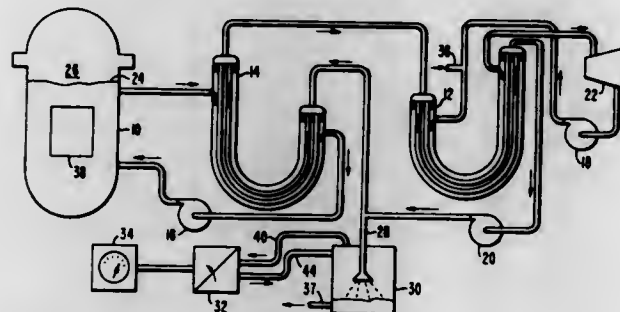
Robert K. Sayre, Mount Lebanon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 5, 1976, Ser. No. 673,563

Int. Cl.² G21C 17/00

U.S. Cl. 176-19 R

2 Sheets Drawing. 20 Pages Specification



An on-line method for early detection of a leak through a tube of a liquid metal-to-water tube type heat exchanger in a liquid metal cooled nuclear reactor system. Introducing helium to the heat exchanger feedwater exposes the helium to any heat exchanger leak locations, and the helium will diffuse or flow through the leak location into the liquid metal. An increase in the helium content of the liquid metal evidences the existence of a leak. The content of helium in the liquid metal can be detected either by direct analysis of the reactor cover gas in a dual cycle reactor plant, or by removing a coolant sample from the reactor system downstream of the heat exchanger in a dual or triple cycle plant, separating the gaseous content of the sample, and analyzing the gaseous content for helium. The properties of helium are such that the invention method may result in identification of a tube leak before any water and liquid metal actually come in contact.

T955,005

PROCESS FOR PURIFICATION OF ALKYL METHACRYLATES

Athey C. Stutler; Max Statman, and Alden E. Blood, all of P.O. Box 2068, Longview, Tex. 75601

Continuation of Ser. No. 693,392, Dec. 26, 1967, abandoned.

This application July 9, 1971, Ser. No. 161,356

Int. Cl. C07c 69/54

U.S. Cl. 260-486 R

2 Sheets Drawing. 18 Pages Specification

Alkyl methacrylates are obtained free of impurities such as alkyl butyrate and assorted alkyl iodides by the partial crystallization of the crude alkyl methacrylate composition and subsequently contacting said crystals of alkyl methacrylate with liquid alkyl methacrylate to thereby free the crystals of occluded impurities.

T955,006

DELAY CIRCUITS USING NEGATIVE RESISTANCE CMOS CIRCUITS

Joseph Richard Cavaliere, Hopewell Junction, and David Barry Eardley, Stanfordsville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 536,080, Dec. 24, 1974, abandoned.

This application June 14, 1976, Ser. No. 695,716

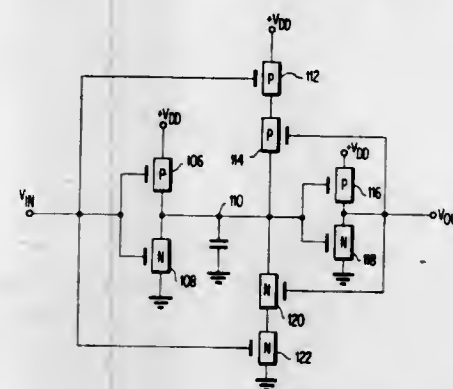
Int. Cl.² H03K 17/04, 17/60, 19/08, 19/20

U.S. Cl. 307-251

3 Sheets Drawing. 19 Pages Specification

A negative resistance circuit constructed of complementary field effect transistors has several applications. A voltage change at an input to the negative resistance circuit alters the

current at the input node in a direction inverse to that normally caused by such a voltage change. The circuit can be



used to speed up the charging or the discharging of a circuit node capacitance.

T955,007

METHOD AND APPARATUS FOR METERING APPARENT ENERGY

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, New York, N.Y.

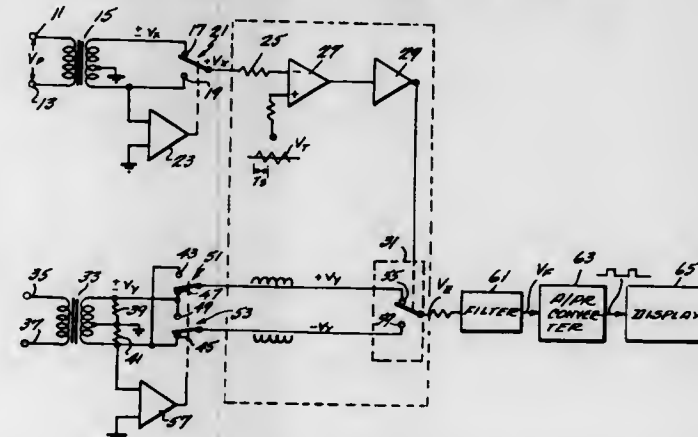
Continuation of Ser. No. 528,041, Nov. 29, 1974. This

application June 21, 1976, Ser. No. 697,892

Int. Cl.² G01R 21/06

U.S. Cl. 324-141

1 Sheets Drawing. 14 Pages Specification



Metering kVA and kVAh in an electrical system is accomplished by generating pairs of analog signals representing current and voltage variables. Each of the analog signals is synchronously rectified to provide a pair of full-wave rectified signals which are multiplied together in a pulse-width amplitude multiplier network to produce a product signal having a DC component which is proportional to the product of the voltage and current variables. In addition, the product signal includes AC components which are filtered out in a low pass filter to thereby provide an output signal which is proportional to the apparent power in the electrical system. The apparent electrical power signal is converted to an apparent electrical energy signal by means of an analog to-pulse converter wherein each output pulse thereof corresponds to a predetermined amount of apparent energy in the electrical system.

T955,008

FLIP CHIP STRUCTURE INCLUDING A SILICON SEMICONDUCTOR ELEMENT BONDED TO AN Si₃N₄ BASE SUBSTRATE

Lawrence V. Gregor, Hopewell Junction, and Robert G. Shephard, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

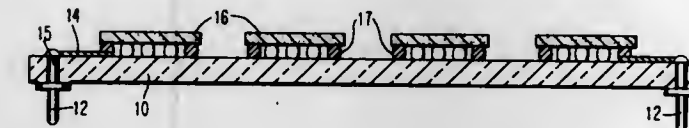
Continuation of Ser. No. 498,487, Aug. 19, 1974, abandoned.

This application June 7, 1976, Ser. No. 693,385

Int. Cl.² H01L 39/02, 29/04, 23/48, 29/40

U.S. Cl. 357-80

2 Sheets Drawing. 13 Pages Specification



A semiconductor device and carrier assembly package having a silicon integrated circuit semiconductor device provided with at least three raised electrical contacts on a first surface, a device support substrate of Si₃N₄ provided with a conductive metallurgy pattern on at least one surface, the conductive pattern including an electrical contact configuration matching the raised electrical contacts on the device, metallurgical bonds between the raised electrical contacts on the device and the electrical contact pattern on the support substrate, and an electrically conductive means for electrically connecting elements of the conductive metallurgy pattern to coating elements off the support substrate.

T955,009

FILM-FORMING COMPOSITION

Robert Clive Lansbury, 1 Tithe Barn Close, St. Albans, Hertfordshire, and Thomas Geoffrey Heggs, 14 Dolesbury Drive, Welwyn, Hertfordshire, both of England

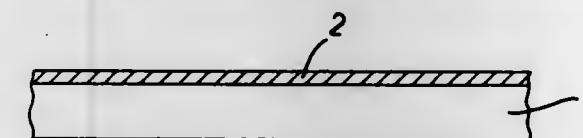
Filed May 24, 1976, Ser. No. 689,545

Claims priority, application United Kingdom, June 11, 1975, 25011/75

Int. Cl.² B32B 27/08; B28B 3/20

U.S. Cl. 428-515

1 Sheets Drawing. 35 Pages Specification



There is disclosed a thermoplastic, film-forming composition comprising a blend of

- a propylene-ethylene copolymer, the propylene content of the copolymer being from 95 to 99.75% by weight of the copolymer, and
 - a polymer of an alpha-olefin of 4 to 10 carbon atoms copolymerized with from 0 to 10% by weight of the copolymer of an alpha-olefin of 2 to 10 carbon atoms, the alpha-olefin polymer constituting from 41 to 90% by weight of the composition.
- The propylene-ethylene copolymer preferably contains from 2 to 4% by weight of ethylene, and preferably, in granular form, exhibits a Melt Flow Index of from 10 to 200 g/10 minutes, measured according to ASTM/D1238-65T (Condition N). The alpha-olefin component of the blend is suitably a polymer, preferably a homo-polymer, of butene-1, and suitably has

a Melt Flow Index, by the aforementioned test, of less than 50 g/10 minutes, preferably between 5 and 40 g/10 minutes. To ensure the production of films having acceptable optical characteristics, the alpha-olefin component preferably comprises from 45 to 65% by weight of the composition. Additives, such as pigments, anti-static agents, and the like, conventionally employed in film production, may be included in the composition, if desired.

The composition is suitably employed for the production of self-supporting films, and is particularly useful as a heat-sealable surface layer of a coextruded, biaxially oriented, multiple-layer film having a substrate layer of a propylene homo- or co-polymer. Such films are heat-sealable at comparatively low temperatures to provide strong heat seals, and are particularly suitable for the packaging of foodstuffs, and the like.

T955,010

HARDWARE/SOFTWARE MONITORING SYSTEM

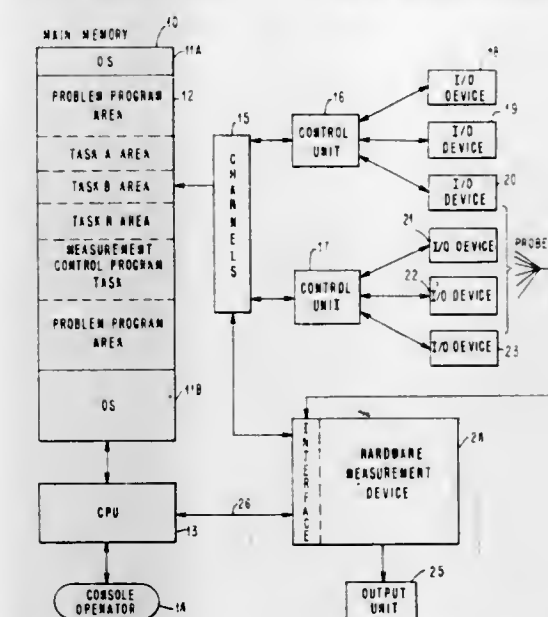
Ronald R. Ragonese, and Franklin D. Schulman, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 557,697, March 12, 1975, which is a continuation of Ser. No. 424,969, Dec. 14, 1973, abandoned, which is a continuation of Ser. No. 302,442, Oct. 31, 1972, abandoned. This application Aug. 12, 1976, Ser. No. 713,772

Int. Cl.² G06F 9/06

U.S. Cl. 444-1

11 Sheets Drawing. 57 Pages Specification



A machine-implemented method of controlling, through software, the collection of data relating to the performance of a data processing system, where the data is gathered by hardware monitoring equipment and/or software monitoring methods whereby a simultaneous or separate hardware/software view of system and application program activity is obtainable. The method provides for immediate feedback of all hardware and software collected data into main memory for automatic, dynamic reconfiguration/modification of the system to improve operating efficiency. Specific examples of dynamic reconfiguration/modification include a method for maximizing the simultaneous utilization of processor/storage, i.e., maximizing CPU/channel overlap, maximizing the transfer of data over a channel, maximizing the number of data requests to a subsystem, and minimizing the time for an I/O request to be stacked in a queue.

REISSUES

FEBRUARY 1, 1977

Matter enclosed in heavy brackets **[]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

NOTE: A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this issue. These entries will be in numerical order by document publication number.

Re. 29,127

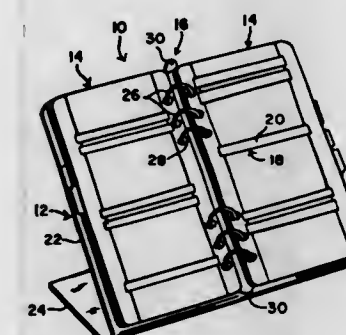
VISIBLE INDEX SYSTEMS

Alexander Patton Janssen, Charlottesville, Va., assignor to Datastrip Corporation, Charlottesville, Va.
Original No. 3,778,914, dated Dec. 18, 1973, Ser. No. 188,743, Oct. 13, 1971. Application for reissue Apr. 4, 1975, Ser. No. 565,006

Int. Cl.² G09F 1/00; B32B 3/10

U.S. Cl. 40—64 R

5 Claims



1. A visible index system comprising: a rectangular insert support means having parallel facing flanges at opposite edges thereof; a plurality of elongated rectangular inserts of a thin, flexible material, each of said inserts being of sufficient length to span the support means, each said insert having recesses at the ends thereof and the flanges on the insert support means having means for selectively engaging said recesses, respectively, so as to removably affix said inserts to said support means with one of the major surfaces of each said insert fully exposed; an adhesive free label having an information receiving surface of generally the same width as the insert, said label being of a material on which the information can be entered by a multiple copy producing type of process; and means for attaching said label to said insert, said last-mentioned means being an adhesive layer on the exposed surface of the insert.

Re. 29,128

VANELESS SUPERSONIC NOZZLE

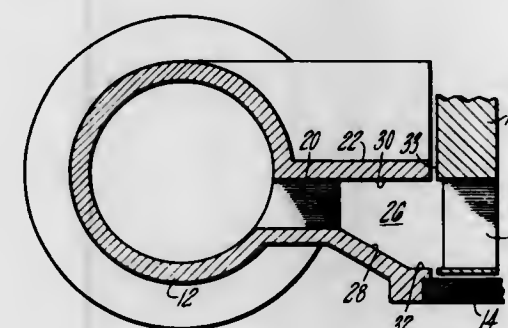
John S. Sohre, One Lake View Circle, Beaver Lake, Ware, Mass. 01082

Original No. 3,804,335, dated Apr. 16, 1974, Ser. No. 3,62,403, May 21, 1973. Application for reissue Jan. 15, 1976, Ser. No. 649,478

Int. Cl.² B05B 1/34; F01D 1/02

U.S. Cl. 239—289

38 Claims



1. A converging-diverging nozzle unit for a supersonic expansion of a motive fluid for delivery to a turbine wheel, the nozzle unit including:

a plurality of nozzles in an array with converging flow passages between adjacent nozzles in the array;
an entrance and a throat in each of said flow passages, the

throat being downstream of the entrance in the direction of flow of motive fluid through the passage; and
a common diverging expansion chamber connected to receive flow from said converging passages, said common diverging chamber extending from the vicinity of the throats of said converging passages downstream toward the turbine wheel.

Re. 29,129

METHOD OF MANUFACTURING ELEMENTS OF CRYSTALLIZED SUGAR

Georges François Duchateau, Tienen, and Paul Joseph Dewulf, Outgaarden, both of Belgium, assignors to Raffinerie Tirlemontoise, Brussels, Belgium

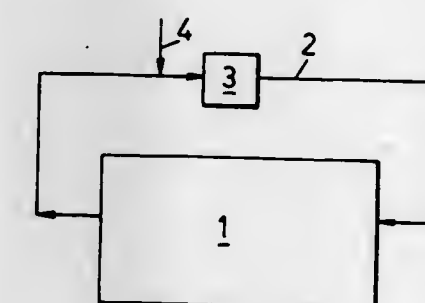
Original No. 3,756,855, dated Sept. 4, 1973, Ser. No. 148,042, May 28, 1971. Application for reissue May 22, 1975, Ser. No. 580,007

Claims priority, application Luxembourg, June 3, 1970, 61049

Int. Cl.² C13F 5/00

U.S. Cl. 127—63

3 Claims



7. A method of manufacturing lumps, slabs and loaves of crystallized sugar, comprising the steps of moistening the crystallized sugar, molding and compressing the sugar into lumps, slabs or loaves and drying said lumps, slabs or loaves at a drying temperature wherein molding and compression of said moistened sugar are carried out at said drying temperature and wherein said molding and compression and drying are carried out in an environment which has a relative humidity less than 100% but more than 85% of the equilibrium relative humidity of the sugar at said drying temperature.

Re. 29,130

ENZYMATIC PROCESS USING IMMOBILIZED MICROBIAL CELLS

Chin K. Lee, and Margaret E. Long, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Original No. 3,821,086, dated June 28, 1974, Ser. No. 161,337, July 9, 1971. Application for reissue Oct. 14, 1975, Ser. No. 621,712

Int. Cl.² C12B 1/00; C12D 13/02

U.S. Cl. 195—31 F

14 Claims

1. A process for effecting an enzyme-catalyzed transformation of a substrate in the presence of flocculated whole microbial cells having associated therewith active quantities of said enzyme which comprises contacting said substrate with an aggregate comprising said cells and a polyelectrolyte flocculating agent under conditions suitable for effecting said enzyme-catalyzed transformation and recovering transformed substrate.

Re. 29,131

**RADIATION-CURABLE ACRYLATE-CAPPED
POLYCAPROLACTONE COMPOSITIONS**

Oliver Wendell Smith, South Charleston, W. Va.; James Edward Weigel, White Plains, N.Y., and David John Trecker, South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

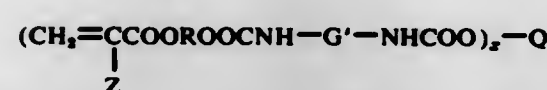
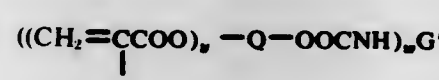
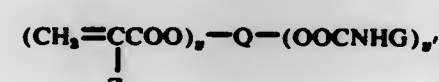
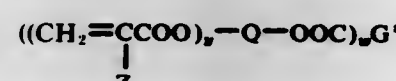
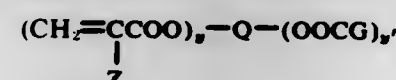
Original No. 3,700,643, dated Oct. 24, 1972, Ser. No. 69,127, Sept. 2, 1970. Continuation-in-part of Ser. No. 6,918, Jan. 29, 1970, abandoned. Application for reissue June 24, 1976, Ser. No. 699,471

Int. Cl.² C08G 22/16, 17/02, 41/04

U.S. Cl. 260-77.5 AN

9 Claims

1. Acrylate-capped polycaprolactones comprising compositions from the group consisting of:



wherein

Z is hydrogen or methyl;

Q is the residue remaining after reaction of the caprolactone polyol with the carboxylic, isocyanato and acrylyl compound;

G is the monovalent residue remaining after reaction of a substituted or unsubstituted monocarboxylic acid or monoisocyanate with the caprolactone polyol and acrylyl compound and is alkyl, aryl, alkenyl, aralkyl, alkaryl or cycloalkyl having up to about 12 carbon atoms;

G' is the polyvalent residue remaining after reaction of a substituted or unsubstituted polycarboxylic acid or polyisocyanate with the caprolactone polyol and acrylyl compound and can be a linkage linear or branched alkylene having from 1 to about 10 carbon atoms, or arylene, alkarylene and aralkylene having from 6 to about 12 carbon atoms, cycloalkylene having from 5 to about 10 carbon atoms, and bicycloalkylene having from 7 to about 15 carbon atoms;

R is a linear or branched divalent alkylene having from 2 to about 5 carbon atoms;

X is alkyl having from 1 to about 3 carbon atoms or phenyl;
x is an integer having a value of from 1 to 4;
y is an integer having a value of 1 to 3;
y' is an integer having a value of 1 to 3;
the sum of y plus y' is from 2 to 4;
w is an integer equal to the valence of G' and can be from 2 to about 4;
n is an integer having a value of from 1 to about 10; and
z is an integer having a value of one.

Re. 29,132

AUTOMATIC DRY COKE WEIGHT SYSTEM

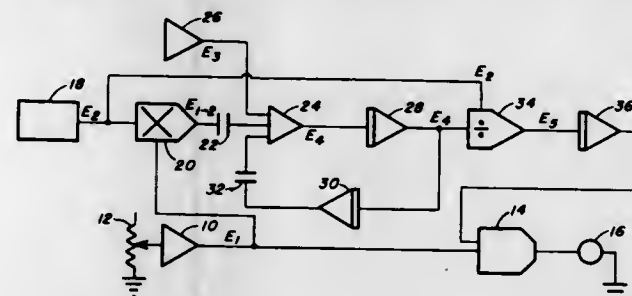
Harold A. List, and Jack H. Baker, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Original No. 3,814,914, dated June 4, 1974, Ser. No. 367,264, June 5, 1973. Application for reissue Jan. 27, 1976, Ser. No. 652,671

Int. Cl.² G06G 7/66; G01G 13/02, 13/28

U.S. Cl. 235-151.1

3 Claims



1. Apparatus for automatically measuring and controlling the net dry weight of discrete quantities of moisture-containing material, comprising:

- (a) means for producing a first signal indicative of the actual weight of each discrete quantity of material;
- (b) means for producing a second signal indicative of the moisture content of said material;
- (c) means for producing a third signal indicative of the target dry weight for each weighing of said material;
- (d) means adapted to receive said first, second and third signals and compute and store a fourth signal indicative of the target dry weight, plus the difference between said target dry weight and the actual dry weight of the instant weighing, plus the error in dry weight existing after the next preceding weighing;
- (e) means adapted to receive said second signal and said fourth signal and compute and store a fifth signal indicative of the actual desired weight for the next weighing;
- (f) timing means for controlling when said fourth and fifth signals are computed and stored; and
- (g) means for shutting off the supply of said material to said next weighing when said first signal equals said fifth signal.

PLANT PATENTS

GRANTED FEBRUARY 1, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,013

ROSE PLANT—MEILIMONA VARIETY

Marie-Louise Meilland; Alain A. Meilland, both of Antibes, and Michele Meilland Richardier, Tassin-la-Demi-Lune, all of France, assignors to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 14, 1975, Ser. No. 622,509

Claims priority, application Morocco, Oct. 23, 1974, 16931

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—15

1 Claim

1. A new and distinct variety of Hybrid Tea rose-plant of vegetative reproduction, characterized by the fact that, from the physical point of view, the plant, with medium green adult wood, is erect, the flower is double, canary yellow; the petals are firm; from the biological point of view, this rose-plant is of vigorous vegetation, blooms continuously, is very good for forcing; good resistance to diseases, its flowers last a long time, either when cut, or on the plant, and its petals drop off cleanly; substantially as shown and described.

4,014

PEACH TREE

Mrs. Alexander B. Hepler, Jr., Long Beach, Calif., assignor to L. E. Cooke Co. Inc., Visalia, Calif.

Filed Apr. 5, 1976, Ser. No. 674,049

Int. Cl.² A01H 5/03

U.S. Cl. Plt.—43

1 Claim

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by a hardy, vigorous, well foliated and productive tree producing fruit of good size, color and eating quality and further characterized by the ability of the tree to grow satisfactorily and produce regular, annual crops with substantially less winter chilling requirement than other similar varieties such as Elberta and Hale type peaches; the variety is further characterized by ease of propagation by usual nursery methods.

PATENTS

GRANTED FEBRUARY 1, 1977

ERRATA

For	See
CLASS	PATENT NO.
141-067	4,005,668
271-161	4,005,794
325-038 R	4,005,818
428-537	4,005,954
429-072	4,006,035
427-123	4,006,036
429-176	4,006,037
106-195	4,006,049
200-061.64	4,006,121
526-017	4,006,126
536-017	4,006,133
536-117	4,006,134
260-309.6	4,006,247
358-196	4,006,290
358-092	4,006,291
358-128	4,006,292
358-128	4,006,293
358-127	4,006,294
358-127	4,006,295
358-106	4,006,296
358-136	4,006,297
358-240	4,006,298
358-293	4,006,299
358-254	4,006,300
358-248	4,006,301
235-068	4,006,344
235-069	4,006,345
324-166	4,006,417

PATENTS

GRANTED FEBRUARY 1, 1977

NOTE: A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

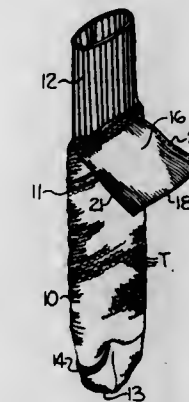
4,005,494
POCKET SOCK AND METHOD OF KNITTING SAME
 William H. Burn, Niot, Tenn., assignor to The Pocket Socks Corporation, Ten Mile, Tenn.

Filed Oct. 20, 1975, Ser. No. 623,982

Int. Cl.² A41B 11/00

U.S. Cl. 2-239

9 Claims



1. A sock including integrally and circularly knit foot, leg and cuff portions with said leg portion being knit throughout at least the major portion thereof of complete seamless courses of body yarn, said cuff portion including elastic yarn incorporated with the body yarn to contract said cuff portion and to aid in supporting said cuff portion on the leg of the wearer, and a pocket having an opening positioned below said cuff portion extending partially around said leg portion, the positioning of said opening below said cuff portion being no greater than the length of said cuff portion so that said cuff portion may be turned down to cover said pocket opening for concealing and maintaining articles in said pocket, said pocket extending downwardly along said leg portion from said opening and comprising first and second layers of knit fabric formed of partial courses, said first and second layers of said pocket each including an upper end integrally knit with said leg portion, the lower ends of said first and second layers of said pocket being integrally knit and joined along a fold line extending across the lower end of said pocket, and stitching means extending along opposite sides of said pocket and joining said first and second layers to each other.

4,005,495
CERAMIC CAP BONE PROSTHESIS AND METHOD OF IMPLANTATION

Helmut Locke, Lauf, Pegnitz, Germany, and Martin Salzer, Vienna, Austria, assignors to Rosenthal Technik AG, Germany

Filed Apr. 16, 1976, Ser. No. 677,799

Claims priority, application Germany, Aug. 9, 1975, 2535649

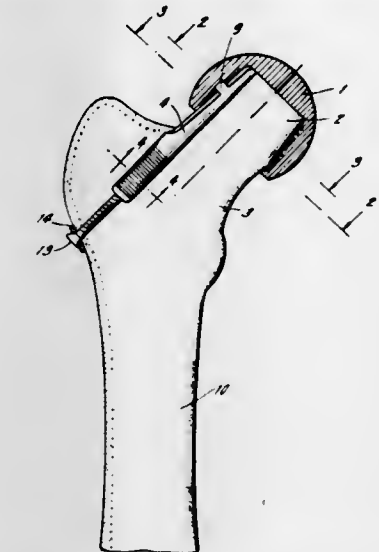
Int. Cl.² A61F 1/24

U.S. Cl. 3-1.91

13 Claims

1. Improved implant for an endoprosthesis comprising:
 a cap to be placed over the end of a bone; said cap being generally spherical in shape on its exterior; said cap having an opening into one side thereof and extending into its interior; said opening being defined by side walls shaped to form said opening into a shape that securely seats and fits on the end of the bone;
 a thrust plate extending into said opening and having engagement means engageable with said side walls and

being in engagement therewith; said thrust plate extending a distance away from said cap to an end of said thrust

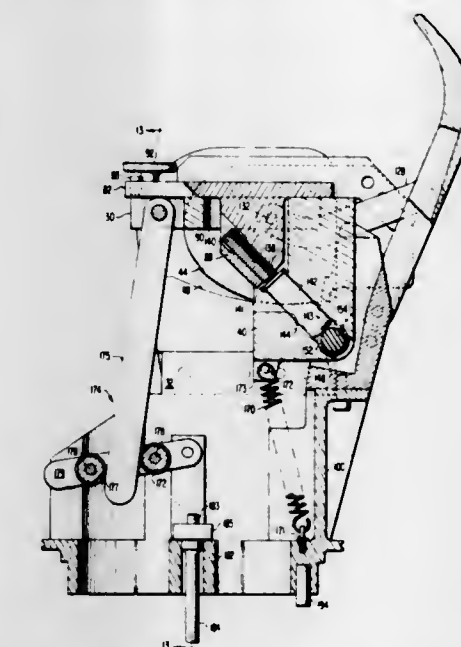


plate; fastening means in engagement with said thrust plate end for holding said thrust plate to the bone.

4,005,496
PROSTHETIC KNEE JOINT
 Donald F. Wilkes, Albuquerque, N. Mex., assignor to Hosmer/Dorrance Corporation, Campbell, Calif.
 Continuation-in-part of Ser. No. 484,627, June 28, 1974, abandoned. This application June 13, 1975, Ser. No. 586,544
 Int. Cl.² A61F 1/04, 1/08

U.S. Cl. 3-27

34 Claims



9. A prosthetic knee joint having a pair of relatively movable members wherein the improvement comprises:
 a brake drum provided for one of said pair of members and having opposed braking surfaces;
 resilient brake shoe means carried by the second of said pair of members and having a longitudinal member with spaced ends positioned adjacent the braking surfaces, the longitudinal member being operable to increase spacing between said ends in response to a transverse squeezing force so that the resilient brake shoe means is operable to frictionally engage said brake drum;
 means for selectively applying a transverse squeezing force to said longitudinal member, said means for applying force carried by the second of said pair of members,

whereby said resilient brake shoe means engages said brake drum to resist relative movement between said pair of relatively movable members.

4,005,497

SUPPORTING PLATE ARRANGEMENT

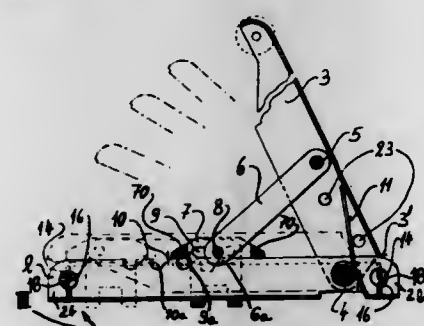
Erhard Sutter, Sursee, Switzerland, assignor to Hermann Lanz AG, Switzerland, Murgenthal, Switzerland
Filed June 27, 1975, Ser. No. 591,116

Claims priority, application Switzerland, July 12, 1974, 9632/74

Int. Cl.³ H61G 7/06

U.S. Cl. 5-68

21 Claims



1. A support plate arrangement for adjusting the inclination of at least one part of a repose surface of reclining furniture, comprising two levers, means for hingedly interconnecting said two levers to form a pair of hinged levers, one of the levers being constituted by a rack member secured to the reclining furniture said rack member having teeth and possessing a substantially U-shaped profile including leg members having leg edges provided with teeth, a slide member displaceable upon the rack member in the lengthwise direction of the rack member during adjustment of the reclining furniture, a support lever member, means for hingedly connecting the support lever member at the other lever defining a second hinged lever, means for permitting an end of the support lever member to be guided between the leg members of the rack member such that the support lever member is movable in the slide member between a work position where it is in engagement with the teeth of the rack member and a rest position which permits the free displacement and pivoting of the levers towards one another into a collapsed position, means provided for spreading the hinged levers from one another, said second hinged lever having a free end possessing a contact surface for the part of the repose surface which is adjustable in inclination.

4,005,498

PATIENT LIFTING DEVICE

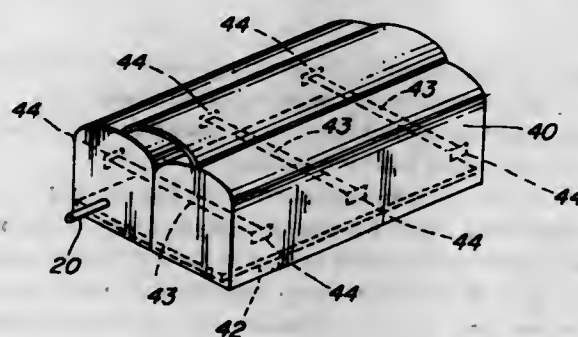
Frank Starr, and Jean Starr, both of N76 W14214 Appleton Ave., Menomonee Falls, Wis. 53051

Filed Jan. 19, 1976, Ser. No. 650,515

Int. Cl.³ A61G 7/08

U.S. Cl. 5-81 R

6 Claims



1. An inflatable device for lifting hospital patients comprising:
a. an elongated inflatable pad having a generally flat bottom

section and a top section having a longitudinal recess; said bottom section and said top section being interconnected by sidewalls;

b. a source of fluid pressure;

c. conduits interconnecting the source of fluid pressure to said inflatable pad; and

d. a control panel affixed to said top section of said pad and covering said longitudinal recess, said control panel and said recess defining a control pocket, said control pocket being open ended on at least one end for receiving an attendant's arm, inflation of said pad applying a lifting force to the attendant's arm and to the patient for facilitating control of a hospital patient during inflation of said pad.

4,005,499

INDIVIDUALIZED BED COVERING

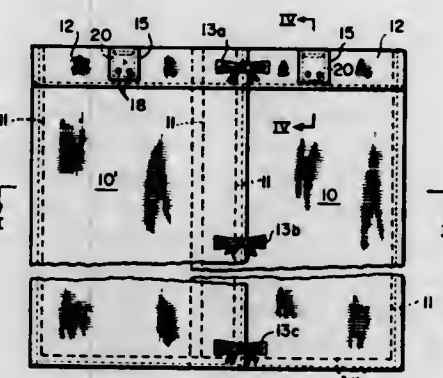
Miriam Travis Klein, 6416 Landview Road, Pittsburgh, Pa. 15217

Filed Mar. 12, 1976, Ser. No. 666,319

Int. Cl.³ H47G 9/00

U.S. Cl. 5-334 R

7 Claims



1. In an improved two-part bed covering, a pair of longitudinally-extending fabric body parts that are adapted to be placed in a side-by-side lengthwise-aligned relation on the bed, each said body part having a relatively narrow hemmed edge along its opposed longitudinal side and transverse bottom portions and a relatively wide transverse selvage edge across its top portion, a pocket provided by said selvage edge, said pocket being adapted to receive and having means to removably retain a small treated pad-like element therein, said body parts having cooperating tie piece means extending therebetween across adjacent lengthwise-extending side portions thereof for removably securing them together in a bed covering assembly, said tie piece means being a ribbon secured at one end to the selvage edge of one of said body parts for extending within and along the selvage edges of both of said body parts, and a treated pad-like element carried by said ribbon within the selvage edge of at least one of said body parts.

4,005,500

FINISHING OF TEXTILES

John Rayment, Nottingham, England, assignor to Samuel Pegg & Son Limited, Leicester, England

Filed Mar. 26, 1974, Ser. No. 454,905

Claims priority, application United Kingdom, Apr. 3, 1973, 15806/73

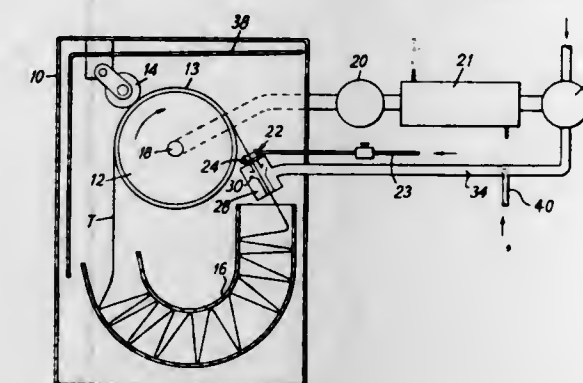
Int. Cl. B05c 5/00, 9/08

U.S. Cl. 8-149.1

9 Claims

1. A process for the treatment of textiles in a finishing stage of manufacture, in which the progress of the textile in a path around a closed circuit within a treatment zone is achieved at least in part firstly by means of an air flow impinging obliquely upon the textile while the textile is being impregnated by a

treatment liquor and then by means of a flow of steam under pressure impinging obliquely upon the impregnated textile



whereby to raise the temperature thereof to the fixing temperature.

4,005,501

MOUNTING MEANS FOR THE ROTATABLE BRUSH ROLL OF A SUCTION CLEANER

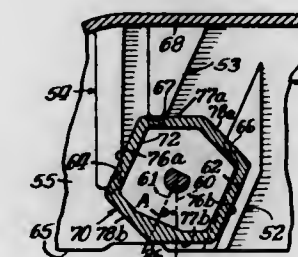
Willis E. Berry, Bloomington, Ill., assignor to National Union Electric Corporation, Greenwich, Conn.

Filed May 27, 1975, Ser. No. 580,559

Int. Cl.³ A47L 5/30

U.S. Cl. 15-339

12 Claims



6. In a suction cleaner including a base having front, rear and laterally spaced side walls, said base having an elongated, laterally extending suction chamber therein, said suction chamber being defined in part by laterally spaced portions of said side walls and a removable sole plate having at least one suction opening therein, the improvement of mounting means for supporting an elongated, rotatable brush roll in said suction chamber and permitting rapid installation in and removal of said brush roll therefrom, said mounting means comprising means defining a seat on the inner surfaces of said suction chamber side wall portions, each seat having a pair of spaced, parallel guide surfaces and stop means for limiting radial inward shifting movement of said brush roll, and engaging means formed on each end of said brush roll for directly engaging said guide surfaces and said stop means, said guide surfaces and said engaging means coacting so that said engaging means is movable between said guide surfaces in one or the other of two diametrically oppositely oriented positions.

4,005,502

ELECTRIC POWER SCRUBBER

Elaine Stevens (Boyer), 2750 Endicott Road, Shaker Heights, Ohio 44120

Filed Sept. 25, 1975, Ser. No. 616,557

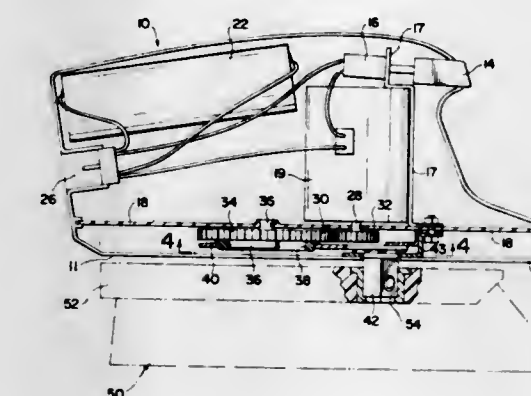
Int. Cl.³ A46B 13/02

U.S. Cl. 15-22 R

7 Claims

1. A power scrubber, which comprises:
a sealed housing;
a motor mounted within the housing having a rotary shaft;
an oscillatory shaft pivotally mounted in the housing, the oscillatory shaft extending from the housing and capable of revolving back and forth in an oscillatory manner;
a generally triangular-shaped brush body mounted on the

oscillatory shaft, the brush body having a periphery of outwardly extending angularly disposed bristles about a generally triangularly shaped center of material extending from one side of said brush body and being capable of oscillating pivotally about the revolving oscillatory shaft axis, the said axis extending through said center material; and



means for oscillating the brush body about the oscillatory shaft axis which includes an eccentric rotatably mounted within the housing and rotated by the rotary shaft and a yoke fitting around the eccentric and producing an oscillatory motion as the eccentric rotates.

4,005,503

WINDSHIELD WIPER BLADE REFILL

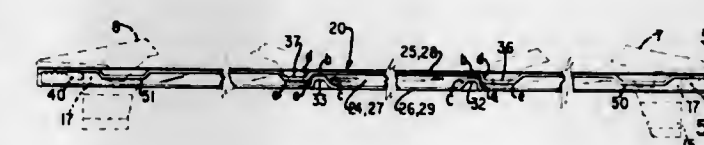
John T. Petrick, Newtown, Conn., assignor to Parker-Hannifin Corporation, Shelton, Conn.

Filed Sept. 26, 1975, Ser. No. 617,013

Int. Cl.³ B60S 1/02

U.S. Cl. 15-250.42

9 Claims



1. In a windshield wiper blade unit for assembly with a pressure distributing wiper structure that includes blade carrying yoke portions at least one of which is detachable, each said portion having fixed thereto at least one set of claws for receiving and holding slidably the backing member of a wiper blade unit, said blade unit including an elastic wiping element comprising longitudinally extending wiping, neck and head portions and a backing member constituted by an extruded, elastically resilient strip having a longitudinally hollow central portion slotted along its bottom to receive slidably said head portion and said neck portion respectively in the hollow and the slot thereof and presenting along opposite sides thereof upper and lower lateral flanges defining therealong laterally open channels to receive slidably, confine and bear pressure from the ends of said claws, the improvement which comprises at least one of said flanges having a deformation thereof protruding into the channel defined thereby and forming in said channel a claw-abutting ridge at a location proximate to but inwardly of the normal working position therein of a claw of the innermost set of claws on one of said yoke portions, there being at least one said ridge forming deformation in at least one of said channels for limiting sliding movement of said strip relative to a claw of the innermost set of claws of each of said yoke portion, each of said ridge forming deformations being a portion of a said lower flange.

4,005,504

METHOD FOR PARTIALLY PEELING SHRIMP

Fernand S. Lapeyre, New Orleans, La., assignor to The Latram Corporation, New Orleans, La.

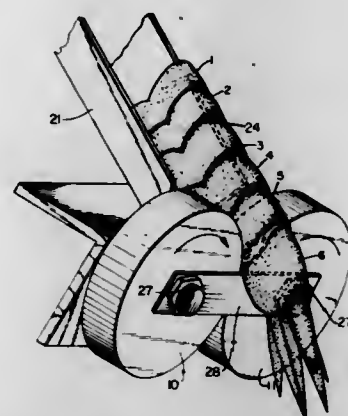
Division of Ser. No. 454,586, March 25, 1974, abandoned.

This application Sept. 5, 1975, Ser. No. 610,676

Int. Cl.² A22C 29/00

U.S. Cl. 17-48

1 Claim



1. The method of peeling only certain desired shell segments from shrimp which have previously had their condyle hinges broken at the 5-6 joint and the backs of their shell segments 1 through 5 cut through comprising:

- subjecting the shrimp for peeling segments 1 through 5 therefrom to the peeling action of a nip formed between a pair of narrow peeling rolls with peeling forces applied to both sides of the shrimp progressively from shell segments 5 through 1 downwardly in a direction essentially from the dorsal to the ventral side of the shrimp, and
- simultaneously moving the shrimp lengthwise down an inclined trough past the peeling nip tail end leading while the shell segments 5 through 1 progressively removed from the shrimp wherein said peeling rolls are thinner than the length of said shrimp and the force imparted by the rolls advances the shrimp past the peeling nip.

4,005,505

METHOD OF PRODUCING A SLIVER-LIKE FIBROUS ELEMENT

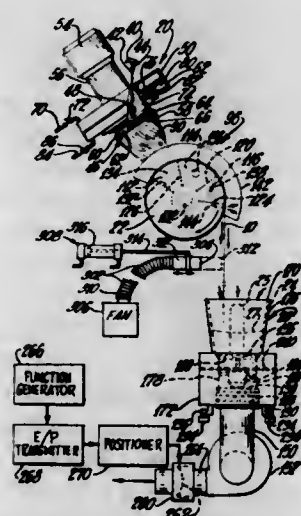
Cletis L. Roberson, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed May 27, 1975, Ser. No. 581,257

Int. Cl.² D01G 27/00

U.S. Cl. 19-150

2 Claims



1. The method of advancing a linear fibrous element for collection comprising:

- advancing a linear fibrous element on the external perforated circumferential surface of a rotating hollow wheel;
- introducing a stream of gaseous fluid having a pressure that

varies between a bias pressure and a pulse pressure into said hollow wheel; and directing the stream of gaseous fluid outwardly through the perforated circumferential surface of said wheel to remove the linear element from such surface and to impart lateral oscillation to said element upon advancement from the rotating wheel.

4,005,506

ADJUSTABLE STRAP ASSEMBLY

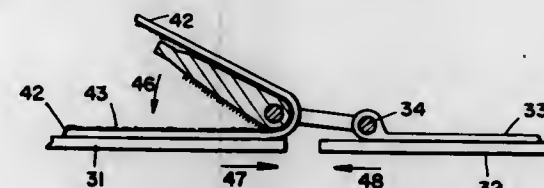
Robert R. Moore, 5401 San Leandro St., Oakland, Calif. 94601

Filed June 9, 1975, Ser. No. 585,181

Int. Cl.² A44B 21/00, 17/00

U.S. Cl. 24-68 E

13 Claims



1. An adjustable strap assembly comprising a buckle, a first strap comprising a length of flexible material adapted to be passed through said buckle, one surface of said strap being provided with a pile fabric having first interlocking elements secured thereto, and a second strap secured at one end to said buckle and including second interlocking element portions secured to both surfaces thereof, one of said interlocking elements comprising hooking elements and the other of said interlocking elements comprising loop elements, said elements releasably interlocking when brought into confronting contiguous relationship, said second strap releasably securing said first strap directly adjacent to said buckle.

4,005,507

SAFETY PUSHPIN

Tadakatsu Yamazaki, No. 802, 1-10-22, Nakameguro, Meguro, Tokyo, Japan

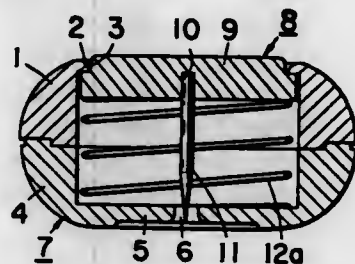
Filed Oct. 23, 1974, Ser. No. 517,432

Claims priority, application Japan, Jan. 16, 1974, 49-7248[U]

Int. Cl.² A44B 9/00; A44C 5/18

U.S. Cl. 24-150 R

9 Claims



1. A safety pushpin that can concurrently serve as a clip, comprising,

- a head and pin extending from the central part of said head, said pushpin being housed within a casing comprising an upper shell having a shell top with a large-diameter hole surrounded by an inwardly extending flange and a lower shell having a bottom wall with a small-diameter hole in the center thereof; said head being larger in diameter than the distance across said flange of said large-diameter hole and said pin being passable through said small-diameter hole in the bottom wall of said lower shell, and further characterized in that an oblique space spread out radially toward both upper and lower ends is provided at a suitable part in the juncture of said upper and lower shells, both of said upper and lower shells being joined

together swingable relative to each other so that said oblique space may be closed, and an elastic material is provided between said upper and lower shells to normally keep said oblique space open.

4,005,508

EASILY RELEASED BELT FASTENER

Daniel B. Merrifield, Fountain Valley, Calif., assignor to Healthways, Los Angeles, Calif.

Filed Sept. 24, 1975, Ser. No. 616,128

Int. Cl.² A44B 11/12, 11/06

U.S. Cl. 24-193

2 Claims



1. An easily released belt fastener which comprises: an elongated body having first and second ends, sides, a top and a bottom, said body also having an opening located therein which extends between said top and said bottom and which is spaced from said sides and said ends, clamping surface means for use in engaging a strap so as to frictionally hold such a strap, said clamping surface means being located on said body so as to extend generally between said sides along the portion of said opening closest adjacent to said first end,

bearing means for movably mounting a clamping bar located on said body adjacent to said opening and to said clamping surface means, said bearing means comprising bearing openings extending through the top of each side and having an enlarged shaped opening portion in each side,

a clamping bar having ends, said ends being shaped for limited rocking movement in said shaped opening portions and being supported within said bearing means so that said bar is capable of being moved between a non-clamping position parallel to and spaced from said clamping surface means and a clamping position in which said clamping bar is parallel to and closer to said clamping surface means than in said non-clamping position, and, said clamping bar and said clamping surface means being located adjacent to said top and to said bottom, respectively, so as to have adjacent edges which are capable of being moved relative to one another as said clamping bar is moved between said clamping and said non-clamping positions,

attachment means located on said second end of said body for use in securing said body in an operative position in which said body can be rotated generally about an axis which is substantially parallel with said clamping surface means,

said opening, said clamping bar and said clamping surface means being shaped so that when said clamping bar is in said non-clamping position a belt may be located so as to extend underneath said first end of said body, beneath said bottom, through said opening to said top, around said clamping bar, between said clamping bar and said clamping surface means and then along itself adjacent to said bottom,

said clamping bar being movable in response to tension applied to a belt which is so located so that as tension is applied to such a belt said clamping bar is moved from

said non-clamping position to said clamping position, said clamping bar engaging a belt which is so located in said clamping position so as to hold said belt against movement relative to said body,

when said body is secured in an operative position by said attachment means said first end of said body being capable of being moved so as to vary the angular relationship between said clamping bar and said body to a sufficient extent so that the tension on the belt will move said clamping bar to said non-clamping position, releasing such a belt so that it can be pulled out of engagement with said body.

4,005,509

JIFFY WASH LINE ADJUSTER

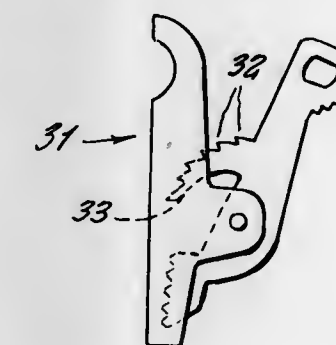
Salvatore Verdina, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Apr. 14, 1975, Ser. No. 567,492

Int. Cl.² F16G 11/10

U.S. Cl. 24-133

1 Claim



1. In a jiffy wash line adjuster, the combination of a pair of levers having means for pivotally attaching them together at their centers, a pair of corresponding jaws formed at one end of said levers for grasping a clothes line therebetween, and an opposite end of said levers forming handle ends each of which has an opening therethrough, said openings being axially disaligned with each other, one of said levers being of channel construction having a longitudinal central line receiving slot and the other said lever being flat and received within said slot of the other said lever wherein said means comprising a pair of ears extending from the lever of channel construction to receive the other lever including a pivot pin extending through aligned holes in said ears and flat lever spaced from said line receiving slot, wherein the jaw on the flat lever is ratcheted and received fully within the slot of the opposing jaw, said flat lever handle end having a transverse opening for tying one end of said line, said handle end of the channel lever including an opening to receive the adjustable end of said line, including further means on said flat lever for engaging and forcing the adjustable line in said slot towards and through the jaws responsive to movement of the handles toward each other, said further means gripping said line against the channelled lever, wherein said further means comprises an arcuate projection extending from the flat lever towards the other said lever, wherein said projection curves convexly towards said slot and terminates in substantial axial alignment within the slot, including teeth on the outer periphery of the projection including portions within the slot and portions external to the slot.

4,005,510

PLASTIC CLIP

Taizo Noda, Nishinomiyu, Japan, assignor to Kohshoh Limited, Kyoto, Japan

Filed Mar. 4, 1976, Ser. No. 663,809

Claims priority, application Japan, Oct. 8, 1975, 50-122228

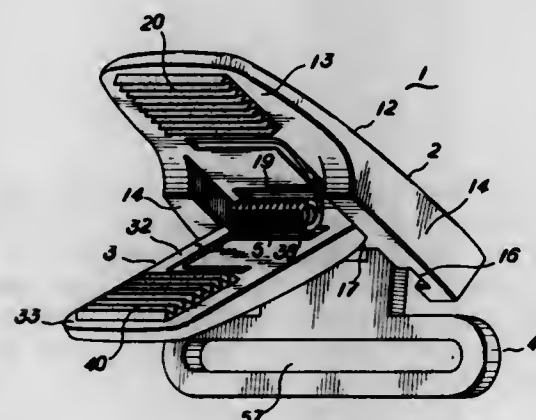
Int. Cl.² A44B 21/00

U.S. Cl. 24-250 R

10 Claims

1. A plastic clip comprising upper and lower plate members

each comprising a base plate provided with a jaw at the front end thereof and being pivotally connected to the other, a spring for holding said jaws in open position and an operating member fitted in said two plate members for holding said jaws in closed position, wherein said upper plate member includes an opening provided at the rear of the corresponding base plate, two opposing side plates each connected to the required portion of each side of the base plate, bearings for the operating member each provided at the rear of the inside surface of said side plate and a shaft having at least an arcuate surface and extending between said side plates, wherein said lower plate member, comprising said base plate at least the front end of which is adapted to be inserted between the front edge of the opening of the upper plate member and said shaft, includes an upwardly-extending expanded portion located at the rear end of the base plate, the lower surface of said expanded portion being formed into a bearing adapted to engage said shaft for the desired arrangement of the upper and lower plate members, a projection located behind said expanded portion and having a smaller width than said expanded portion and being adapted to carry the operating member, and a first protrusion being provided at either side of the rear end of said projection wherein said operating member comprises a holding portion and a box which is open at the front and the bottom thereof, is located in front of said holding portion and is



adapted to be inserted between the rear edge of the opening and the projection from under said opening, each outside surface of the side walls of said box being provided with a shaft for said operating member for loosely engaging the corresponding bearing for the operating member, wherein said operating member is inserted between the rear edge of the opening and the projection of the lower plate member from under the opening of the upper plate member when the jaws are in open position, said box being formed so that it has a thickness in excess of the distance between the rear edge of the opening and the projection to prevent downward slippage, and on the other hand when the jaws are in closed position, each of said side walls of the operating member being located between the side edge of the opening and the projection and a rear wall of the same between the rear edge of the opening and the rear end of the projection, said box also being formed so that its top and bottom are in substantially the same plane with the upper surface of the base plate of the upper plate member and the lower surface of the base plate of the lower plate member respectively, and wherein the jaws are brought to closed position by downwardly pressing the rear end of the lower plate member and further kept in the same position, namely in closed position by force substantially parallel to the plate members exerted to the lower portion of the front end of the side wall of the operating member and the upper portion of the outside surface of the rear wall of the same.

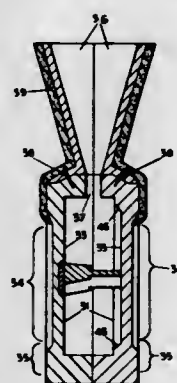
4,005,511 METHOD AND APPARATUS FOR CASTING EXTRUSION DIES

Jay H. Muusse, Spring Lake, Mich., assignor to Tuff-Ten Corporation, Sparta, Mich.

Filed July 3, 1975, Ser. No. 593,025
Int. Cl.² B22C 9/08, 9/06, 9/20

U.S. Cl. 29—33 C

28 Claims



1. A method for casting aluminum extrusion die blanks comprising: providing a mold having spaced side walls joined by a peripheral edge wall to thereby define a disc-like mold cavity, said mold side walls each having a center portion slightly larger in surface area than the area required to form a desired die aperture in the steel disc to be molded, and said mold side walls each including a peripheral portion extending from said center portion to said peripheral edge wall, said mold further including a sprue opening into said cavity at a point spaced from said center portions of said side walls; casting into said mold through said sprue a molten steel of a type suitable for forming aluminum extrusion dies; cooling the mold and the molten steel therein more rapidly at said center portions of both said side walls than at said peripheral portions thereof and more rapidly than at said peripheral edge wall and said sprue of said mold to thereby solidify and steel most rapidly and with the least porosity at the center of the disc being formed in said mold cavity; removing the resulting solid steel disc from said mold and removing the decarburization surface layer of said solid steel disc at least in the center portion of at least one side of said disc.

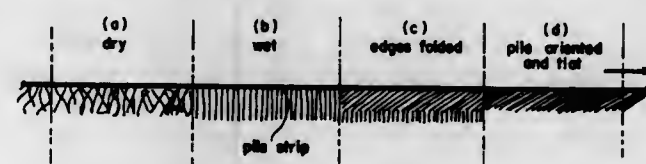
4,005,512 ELECTROPHOTOGRAPHIC TONER REMOVAL BRUSH AND METHOD OF MAKING SAME

Thomas G. Kandel, 100 E. Hartsdale Ave., Hartsdale, N.Y. 10530

Filed Oct. 23, 1975, Ser. No. 625,051
Int. Cl.² A46B 3/00

U.S. Cl. 29—120

46 Claims



1. A method of making an electrophotographic toner removal brush which comprises treating a pile substrate material with a saturated aqueous solution of a first chemical mixture comprising an alkali metal salt and a source of borate ions, withdrawing excess solution therefrom, and simultaneously orienting the pile, allowing the still solution wet pile material to dry, applying the resulting dried pile material to an elongated tubular base core and subjecting said dried pile to further treatment with a saturated aqueous solution of a second chemical mixture comprising two alkali metal salts and a surfactant and finally subjecting said further treated pile material to a centrifugal force sufficient to hurl the pile fibers to an erect condition thereby forming a brush nap wherein the

density of each pile fiber has been increased by rapid centrifugal removal of the solution therefrom and allowing the brush nap to dry.

4,005,513 PINROLL WITH PINSTRIPS

Josef Egerer, Schwabach, Germany, assignor to Firma Staedler & Uhl, Schwabach, Germany

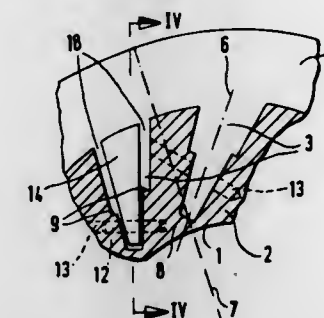
Filed May 17, 1976, Ser. No. 687,415

Claims priority, application Germany, Mar. 27, 1976, 2613210

Int. Cl.² B21B 1/40; D01G 19/04

U.S. Cl. 29—121.5

12 Claims



1. A pin roll comprising a roll body, wedge grooves in said roll body disposed parallel to the axis of said roll body, pinstrips disposed in said wedge grooves, clamping wedges disposed in said wedge grooves and holding said pinstrips in said wedge grooves, at least two parallel pegs in said roll body disposed generally transversely of said wedge grooves, said clamping wedges having means defining oblique slots extending from the bottom thereof, said pegs being disposed in said oblique grooves, and operable means operable in a longitudinal direction and engageable with said wedges means to effect securing and releasing of said pinstrips.

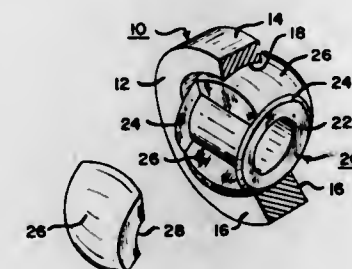
4,005,514 SPHERICAL BEARING ASSEMBLY

Albert R. McCloskey, Fairfield, Conn., assignor to The Helm Universal Company, Fairfield, Conn.

Division of Ser. No. 434,934, Jan. 21, 1974, Pat. No. 3,893,736. This application Feb. 28, 1975, Ser. No. 554,282
Int. Cl.² B21D 53/10

U.S. Cl. 29—149.5 B

1 Claim



1. A method of assembling a spherical bearing assembly having an outer race member with a cylindrical outer surface, a spherical inner surface and lateral surfaces connecting the outer and inner surfaces, and having an inner member fitted within the spherical inner surface of the outer member and the inner member extending laterally beyond the lateral surfaces of the outer member and the inner member having a spool with spherical segments mounted on the spool, comprising the steps of placing a spool member having two annular lips with spherical extremities, one lip at each remote end of said spool member within an area defined by the concave spherical inner surface of an outer member of a spherical bearing, holding the spool member and the outer member misaligned with portions of the spherical extremities of the spool bearing against the

inner spherical surface of the outer member and with respective axes of the spool and outer member aligned at 90°, inserting at least three spherical segments on said spool member in such a manner as to form in continuation of the spherical spool lip extremities a spherical inner member of a spherical bearing assembly having a convex spherical outer surface, rotating the assembled spherical inner member into an operational position with respect to the other member.

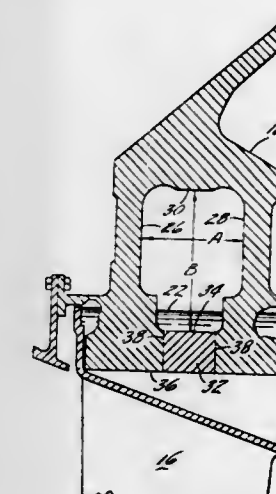
4,005,515 METHOD OF MANUFACTURING A CLOSED CHANNEL DISK FOR A GAS TURBINE ENGINE

Cornelius V. Sundt, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 554,806, March 3, 1975, Pat. No. 3,970,412. This application Mar. 11, 1976, Ser. No. 666,111
Int. Cl.² B23P 15/04, 13/00

U.S. Cl. 29—156.8 R

3 Claims



1. A method for making a fan disk for a turbfan engine comprising the steps of: machining a circumferential channel into the outer periphery of a disk shaped member to form an element having an upstream web and a downstream web; disposing a plurality of arcuate plugs, each of which has an inner circumferential surface, into the channel in end to end relationship to form a toroidal type structure having a substantially rectangular cross section; attaching the arcuate plugs to the upstream and downstream web at the periphery of the disk; and machining a plurality of slots across the periphery of the disk through the upstream and downstream webs and through one or more arcuate plugs disposed therebetween, the most radially inward portion of each slot extending below the inner circumference of the plug.

4,005,516 HAND TOOL HAVING DOUBLE TOGGLE LINKAGE

Johannes Cornelis Wilhelmus Bakermans, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

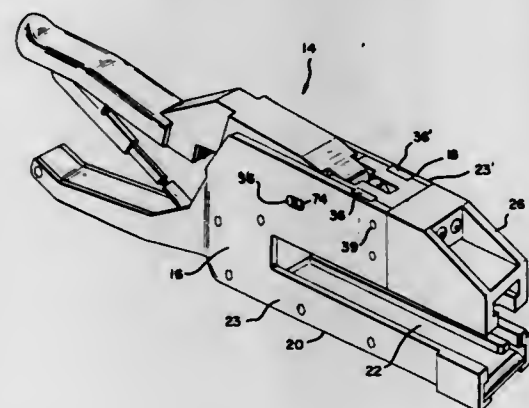
Filed Mar. 15, 1976, Ser. No. 666,553
Int. Cl.² H01R 43/04

U.S. Cl. 29—749

11 Claims

1. A plier-type hand tool comprising: a frame having first and second fixed jaws extending cantilever fashion therefrom and an integral handle extending therefrom, said integral handle being in alignment with said second jaw, said first and second jaws being separated by a gap for reception of a workpiece, a ram slidably mounted in said first jaw for movement towards and away from said second jaw, first and second toggle mechanisms, each of said toggle mechanisms comprising two links connected to each other at a knee joint, said first toggle mechanism being in said first jaw and being pivotally connected at one end

thereof to said ram and at the other end thereof to said first jaw, said first toggle mechanism extending transversely of said first jaw when in a straightened condition, a straightening link, said straightening link being pivotally connected at one end thereof to said knee joint of said first toggle mechanism and extending from said knee joint towards said frame, said second toggle mechanism being pivotally connected at one end thereof to said straightening link and being pivotally connected to said frame at the other end thereof, said second toggle mechanism extending in the direction of said first jaw when in a straightened condition,



a movable handle pivoted to said first jaw at a location proximate to said straightening link and extending from said first jaw past said second toggle mechanism, past said frame portion, and externally of said frame portion beside said integral handle, said knee joint of said second toggle being pivotally connected to said movable handle intermediate the ends thereof whereby upon movement of said movable handle towards said fixed handle when said first and second toggle mechanism are broken, said second toggle mechanism is straightened and said straightening link is driven towards said first toggle whereby said first toggle mechanism is straightened and said ram is moved towards said second jaw.

4,005,517

VACUUM CLEANER HOSE TERMINAL APPLICATOR
Raymond Arthur Coulter, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

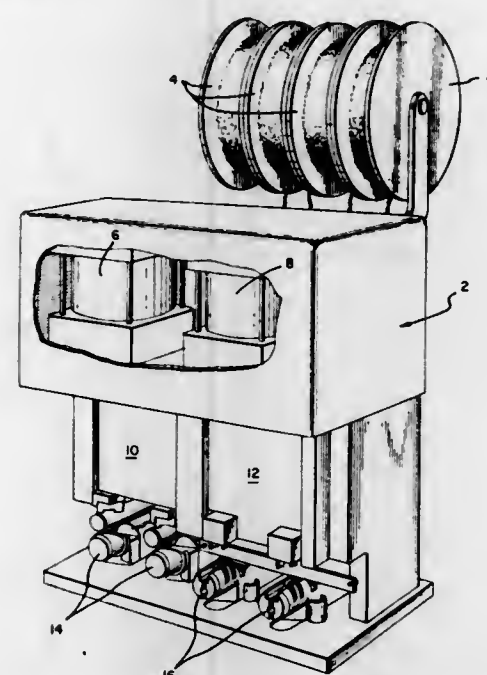
Filed June 23, 1975, Ser. No. 589,238
Int. Cl.² H01R 43/00

U.S. Cl. 29-748

17 Claims

1. Apparatus for attaching a terminal having a wire receiving portion to a helical wire; said apparatus comprising: a generally cylindrical horn for supporting a portion of said wire on the exterior surface of said cylindrical horn with said wire in surrounding relationship to said cylindrical horn, a terminal support surface on said cylindrical horn, said terminal support surface being located radially within said exterior surface, terminal positioning means for positioning one of said terminals on said terminal support surface with said wire receiving portion in alignment with said portion of said wire, and moveable wire insertion means moveable towards and away from said terminal support surface, said wire insertion means moving in a radial direction past said exterior surface of said cylindrical horn to flex said portion of said

wire radially inward into said wire receiving portion, whereby



an electrical and mechanical connection between said terminal and said wire is achieved.

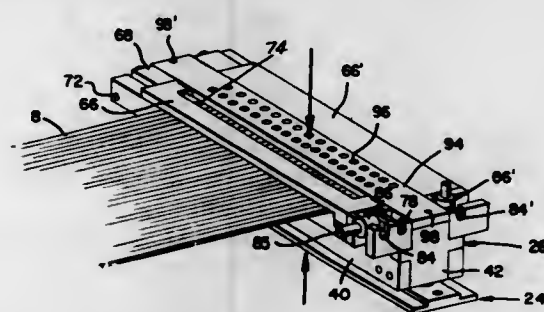
4,005,518

APPARATUS FOR CONNECTING CONDUCTORS IN FLAT CABLE TO TERMINALS IN A CONNECTOR
Johannes Cornelis Wilhelmus Bakermans, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1976, Ser. No. 666,552
Int. Cl.² H01R 43/04

U.S. Cl. 29-752

9 Claims



1. Apparatus for installing a multi-contact connector on a flat multi-conductor cable of the type having a plurality of conductors in side-by-side spaced-apart relationship, said connector being of the type comprising an insulating housing having a cable-receiving face and another face which is on the opposite side of said housing from said cable-receiving face, a plurality of contact terminals in said housing, said terminals having conductor-receiving portions which extend from said cable-receiving face, said apparatus comprising: connector supporting means having a connector supporting surface for supporting said connector on said other face thereof, cable supporting means having a cable supporting surface, said connector supporting means and said cable supporting means being assembled to each other with said connector supporting surface extending parallel to, and beside, said cable supporting surface, said surfaces being offset from each other by a distance such that the free ends of terminals extending from a connector supported on said connector supporting surface are proximate to the plane defined by said cable supporting surface, compressible resilient means interposed between said cable supporting means and said connector supporting means, clamping means for clamping said cable against said cable supporting means with a portion of said cable extending in said plane of said cable supporting surface past a con-

connector supported on said connector supporting means and, removable pressure transmitting plate means disposed beside said cable supporting surface and in alignment with a connector supported on said connector supporting means, said pressure transmitting plate means having terminal-receiving openings extending therethrough which are in alignment with said terminals in said connector whereby,

upon positioning a connector upon said connector supporting surface and clamping said cable against said cable supporting surface by said clamping means, positioning said pressure transmitting plate means beside said cable supporting surface and applying pressure against said pressure transmitting plate means, said cable will be moved relatively towards said cable-receiving face of said connector and said conductor-receiving portions of said terminals will penetrate said cable and establish contact with said conductors, and upon removal of said pressure, and unclamping of said cable, said connector and cable can be removed from said apparatus.

4,005,519

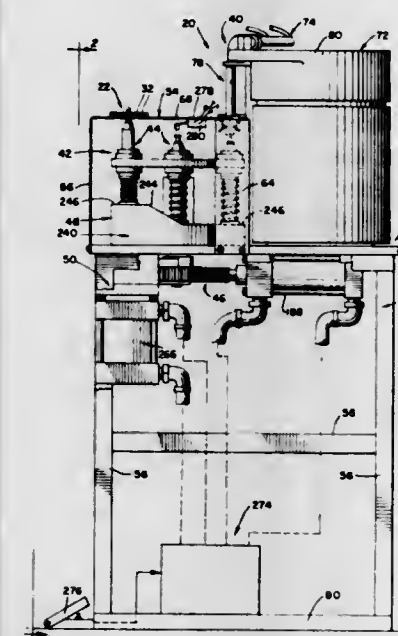
APPARATUS FOR SETTING BLIND RIVETS

Anthony E. Di Maio, and Joseph G. Todisco, both of Georgetown, Mass., assignors to Marson Fastener Corporation, Chelsea, Mass.

Filed May 28, 1975, Ser. No. 581,954
Int. Cl.² B23Q 7/10

U.S. Cl. 29-818

14 Claims



1. An apparatus particularly adapted for use in enabling the continuous setting of blind rivets having rivet mandrels or the like in suitably apertured material comprising support means; feed means operatively connected to the support means for selectively feeding individual rivets to a loading station; carriage means operatively connected to the support means including rivet holding assembly means for receiving respective ones of the rivets and being selectively and incrementally advanced from at least a loading station, to a working station, and back again to the loading station; drive means operatively connected to the carriage means for successively advancing the rivet holding assembly means from at least the loading station to the working station, and back again to the loading station; motion producing means for imparting predetermined generally vertical displacement to each of the riveting holding assembly means in response to movement of the holding assembly means between at least the loading and working stations, and rivet setting means for vertically displacing respective ones of the rivet mandrels operatively held by said holding assembly means for thereby setting the rivet in the material.

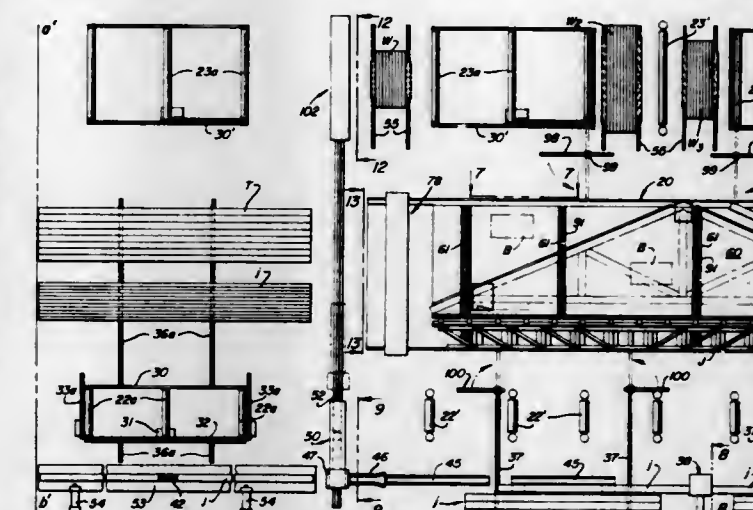
4,005,520

FRAME STRUCTURE FABRICATING SYSTEM
Arthur Carol Sanford, 2308 Bay Drive, Hillsboro Shores, Pompano Beach, Fla. 33062

Filed Mar. 9, 1976, Ser. No. 665,251
Int. Cl.² B23P 11/00

U.S. Cl. 29-432

18 Claims



1. The method of fabricating frame structures having wood chord and web components joined by metal toothed connector plates, comprising providing an elongated rectangular bed on which to assemble and connect the components, conveying bundles of like components forwardly toward the sides of the bed in directions longitudinally thereof, transferring certain components laterally to stacking areas adjacent to the ends of the bed, conveying certain other components to stacking areas adjacent to the sides of the bed, selecting components from said stacking areas and assembling them on the bed to form frame structures with toothed connector plates at the top and bottom of the joints, partly embedding the teeth of said plates by passing a pair of pinch rolls longitudinally over and under said bed, transferring the frame structures laterally off opposite sides of the bed onto longitudinal rows of conveyor rolls, and moving said structures over said rolls rearwardly away from the bed and through stationary pinch rolls to fully embed the teeth of the connector plates.

7. Apparatus for continuously assembling, fabricating and stacking frame structures having wood chord and web components joined by toothed metal connector plates comprising an elongated rectangular jig bed, longitudinal rows of conveyor rolls on opposite sides of said bed and extending beyond the bed to define a storage area therebetween, said conveyor rolls adapted to convey components forwardly to the bed and assembled structures rearwardly from the bed, first transfer means associated with certain of said conveyor rolls for transferring chord components laterally inward adjacent to the ends of the bed, means on the bed to hold the components and connector plates in assembled relation, pinch rolls movably supported for rolling over said bed to partially embed the teeth of the connector plates, second transfer means at opposite sides of the bed to transfer the assembled frame structures onto the rows of conveyor rolls for conveyance rearwardly from the bed, and third transfer means adjacent each row of conveyor rolls at the storage area to transfer the assembled structures laterally and support them in stacked relation in the storage area.

4,005,521

LOCKED-WRAP FUEL ROD

Samuel Kaplan, Los Gatos; Alan J. Chertock, San Francisco, and James R. Panches, San Jose, all of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

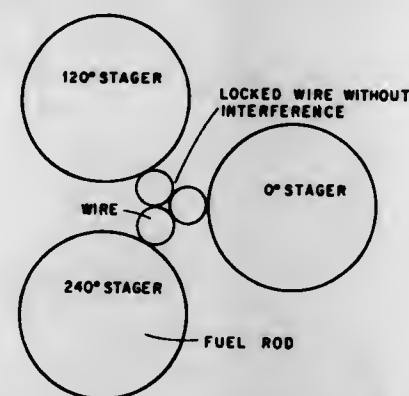
Filed June 17, 1975, Ser. No. 587,800
Int. Cl.² G21C 21/02, 3/12

U.S. Cl. 29-469

1 Claim

1. A method for wire-wrap spacing nuclear fuel rods for a

fuel assembly containing a plurality of fuel rods in a triangular pitch array comprising the steps of: wrapping wire about each of the fuel rods in a helical pattern by using a wire of a diameter ranging from 0.035 to 0.053 inch such that a rod pitch to wire diameter ratio in the range of about 1.15 to about 1.30 can be maintained without wire-to-wire interference caused by overlapping of wires on adjacent fuel rods, and positioning



the thus wrapped rods throughout the fuel assembly such that the groupings of three rods in any triangular pitch array will contain three different start positions of the wire wrapping by placing the groupings of three rods in 0°-120°-240° orientations and such that the wire wrapping of adjacent rods forms a non-overlapping wire-to-wire contact forming a lock-wrap design tending to lock the rods together at each wire-wrap cluster.

4,005,522

METHOD OF CONNECTING TWO OPTICAL FIBRES IN END TO END RELATIONSHIP

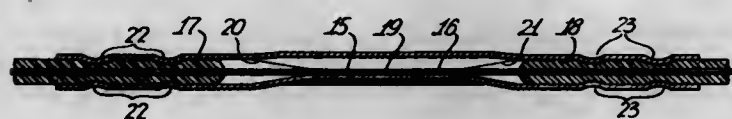
Jack Frank Dalgleish, Ottawa, and Helmut Hans Lukas, Carleton Place, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 549,661, Feb. 13, 1975, Pat. No. 3,972,585. This application Apr. 5, 1976, Ser. No. 673,366

Int. Cl.³ B21D 39/00; B23P 11/00

U.S. Cl. 29-517

4 Claims



1. A method of connecting two coated optical fibres in end to end relationship, comprising:

- preforming a section of a tubular connecting member by radially inwardly deforming said section to form a central bore a close sliding fit on an uncoated fibre;
- inserting a first coated fibre at one end of said tubular connecting member, the uncoated fibre extending into said central bore;
- crimping said tubular connecting member onto said first coated fibre;
- inserting the uncoated fibre of a second coated optical fibre into said central body in end to end relationship with said first fibre.

4. A method as claimed in claim 1, including inserting said second coated fibre into a second tubular member, the uncoated fibre of said second coated fibre extending from one end of said second tubular member;

crimping said second tubular member on said second coated fibre, and holding said first and second tubular members in axial relationship.

4,005,523

SEMICONDUCTOR DEVICES

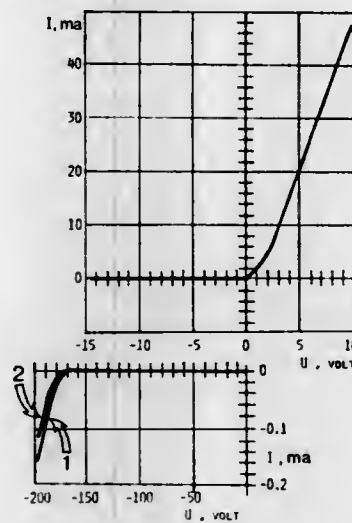
Samson Khaim Milshtein, 84/33 Hanthe St., Jerusalem, Israel
Filed Sept. 9, 1975, Ser. No. 611,801

Claims priority, application Israel, Apr. 9, 1975, 47059

Int. Cl.³ B01J 17/00

U.S. Cl. 29-581

10 Claims



1. A process for the production of p-n junctions which comprises preparing a suitable silicon type-n crystal of 100Ω/cm to several KΩ/cm with the orientation (111), (112) and (110), heating the crystal to a temperature of between 700° and 800 ° C, and applying to the (111) surface a load of from 0.5 to 1.2 kg. during from 5 to 50 seconds by means of a suitable pointed instrument, removing the load and welding the thus produced dislocation region to a suitable conductor.

4,005,524

METHOD OF MAKING AN ANTENNA CONNECTOR

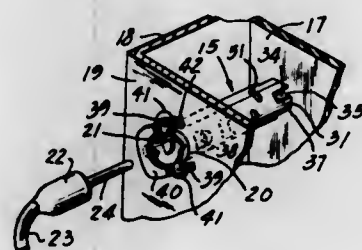
Ronald L. Schultz, Northfield, Ill., assignor to Chromalloy-Alcon, Inc., Chicago, Ill.

Division of Ser. No. 492,242, July 26, 1974, Pat. No. 3,936,120. This application May 8, 1975, Ser. No. 575,729

Int. Cl.³ H02G 15/00

U.S. Cl. 29-629

11 Claims



1. A method of making an electrical connector especially suitable for coupling an antenna leadin with a printed circuit board and a receiver chassis, comprising:

- bending an originally flat sheet metal blank about a cylinder axis into a tubular form body and bringing longitudinal edges of the blank into confronting edge-to-edge relation along a longitudinal joint;
- forming on opposite ends of said body means for mounting it in functioning position;
- assembling within said body a dielectric support carrying an electrical contact in electrically insulated relation at a location within the body spaced from one end of the body and providing an opening into a plug-receiving socket

defined by the body between said one end and said support;

- deforming material of the blank into engagement with the dielectric support and thereby mechanically interlocking the dielectric support to the body; and
- effecting substantial retention of the body against spreading open at said joint contiguous to said support by said deforming material of the blank, but leaving the joint from the support entirely to said one end of the body free to expand when an oversize plug is inserted into the socket.

4,005,525

RETRACTABLE CUTTING IMPLEMENT

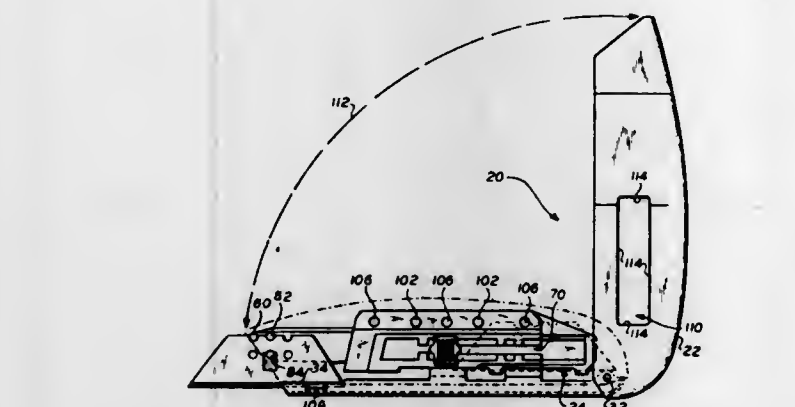
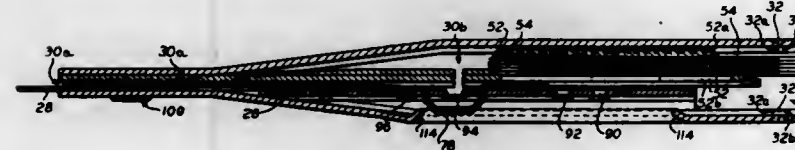
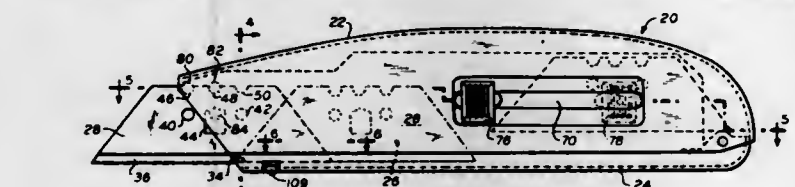
Donald Gringer, Bedford, N.Y., assignor to Allway Tools Inc., Bronx, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,971

Int. Cl.³ B26B 1/08, 5/00

U.S. Cl. 30-125

18 Claims



1. A retractable cutting implement comprising a sleeve-like handle member, said handle member having a cavity portion comprising a first longitudinal slot, said handle member being open on the base thereof through said first slot and at one end of said first slot; a carrier member pivotally mounted to said hollow sleeve-like handle member at the other end thereof opposite from said one end for pivotal movement into and out of said cavity portion between a closed position and an open position for said implement, said carrier member resiliently holding within said cavity portion when said carrier member is pivotally moved into said cavity portion for substantially closing said cavity portion, said carrier member having a longitudinal extent substantially equivalent to said handle member longitudinal extent and comprising a substantially enclosed longitudinally extending chamber with a passage therein in communication with said one end of said first slot in said handle member; and a blade carriage member slidably mountable in said carrier member chamber for slidable movement toward and away from said passage, said blade carriage member having a plurality of studs at the end thereof opposite said pivotally mounted end of said carrier adapted to support a perforated cutting blade having a top edge and a bottom edge for slidable movement of said blade into and out

of said first slot one end through said passage when said implement is in said closed position, at least one of said blade edges comprising a cutting edge, said carrier member opposite end having an inner edge completely pivotally insertable within said handle member cavity portion first longitudinal slot and an outer edge, said outer edge having a guide channel portion and being disposed on said carrier member for protecting a portion of the cutting edge of said cutting blade when said cutting blade is supported on said blade carriage member studs, said studs being disposed on said blade carriage member for supporting said cutting blade in a first cutting position in a first slidable position of said blade carriage member with at least a portion of said cutting edge protruding through said first longitudinal slot one end beyond said handle member cavity portion when said cavity portion is substantially closed by said carrier member pivotal movement into said cavity portion and with the remaining portion of said cutting edge being within said guide channel portion, said handle member first longitudinal slot portion together with said carrier member guide channel portion forming a protective housing for said cutting blade remaining portion to protect said cutting blade top and bottom edges in said first cutting position, said handle member having a second longitudinal slit therein, a button being disposed on said blade carriage member and extending through said chamber and into said second longitudinal slit in said closed position of said implement with said button being movable along said second slit when said blade carriage member slides within said chamber, said movement of said button effectuating said slidable movement of said blade carriage member, said second slit having a longitudinal extent sufficient to enable said slidable movement of said supported cutting blade between said first cutting position and a second retracted position of said cutting blade within said cutting implement, said cutting edge being enclosed with said cutting implement in said retracted position with said implement in said closed position thereof, whereby the remaining portion of said cutting edge of said supported cutting blade is substantially prevented from dulling in said first cutting position and substantially the entire cutting edge of said supported blade is protected in said retracted position.

4,005,526

VACUUM HAIR CUTTER

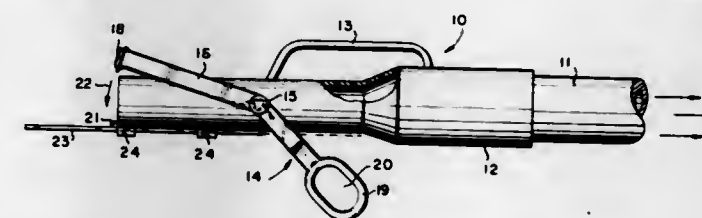
Scott Douglas Clay, P.O. Box 326, Monticello, Miss. 39654

Filed Aug. 27, 1975, Ser. No. 608,100

Int. Cl.³ B26B 19/44

U.S. Cl. 30-133

2 Claims



1. In a vacuum hair cutter, the combination of a scissors-like implement attachable to a hose of a vacuum cleaner or other vacuum source, said scissors-like implement comprising a tube and a frame-like lever pivotally attached together at their approximately longitudinal centers, and said lever carrying a replaceable safety razor blade movable transversely across a first end of said tube, for cutting hair that is vacuum pulled into said tube, said tube being made of a soft, unbreakable polymeric plastic material, and having a diametrical size at a second opposite end thereof, suitable for connection to said vacuum cleaner hose, said first end of said tube being of a smaller diameter than said second opposite end, a ring integral with an outer side of said tube being adaptable for receiving fingers of a person's hand operating said vacuum hair cutter, said lever comprising a pair of parallel, spaced-apart side legs positioned adjacent diametrically opposite sides of said tube, a forward end of said legs being interconnected by a transverse member.

extending portion, said transverse extending portion carrying said replaceable safety razor blade, and opposite, rearward end of said legs each being sidewardly offset toward each other, forming a common handle having a thumb loop there-through.

4,005,527 DEPTH GAUGE

Ralph S. Wilson, 2324 Ada Court, NE., Albuquerque, N. Mex. 87106, and Charles E. Albright, 6629 Henschel NE., Albuquerque, N. Mex. 87109

Filed Dec. 22, 1975, Ser. No. 643,307

Int. Cl.² G01B 3/04, 3/28

U.S. Cl. 33—111

9 Claims



1. A gauge for measuring the depth of a hole, comprising: a plurality of elongated sections of material opaque to X-rays, each of known length dimension, and a plurality of elongated sections of material transparent to X-rays, each of known length dimension, said X-ray transparent sections being alternately carried with respect to said X-ray opaque sections, whereby when the depth gauge is inserted into the hole, the depth of which is to be measured, it can be viewed with X-ray techniques from any angle, the dimensions of the X-ray opaque sections and the X-ray transparent sections presenting an indication of the depth to which it is inserted by said X-ray opaque and transparent sections and further comprising an elongated sleeve into the interior of which said X-ray opaque sections and said X-ray transparent sections are placed.

4,005,528

MEASURING DEVICE FOR GAUGING MECHANICAL PIECES IN PARTICULAR PIECES INCLUDING ROTATION SURFACES

Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marpos-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Continuation of Ser. No. 363,258, May 23, 1973. This application Jan. 14, 1975, Ser. No. 540,888

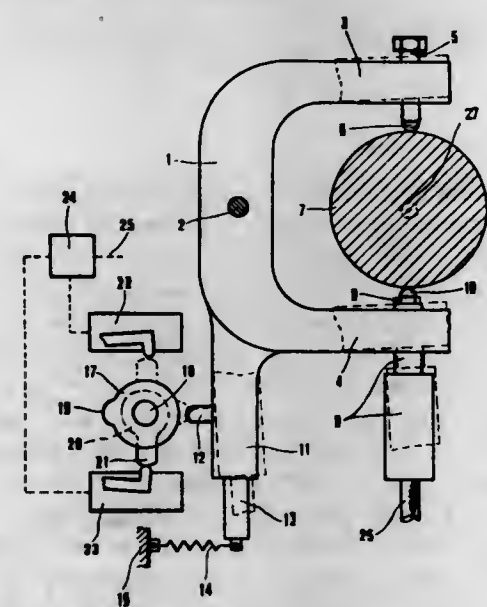
Claims priority, application Italy, May 23, 1972, 3436/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² G01B 5/08, 5/20

U.S. Cl. 33—143 F

6 Claims



5. A measuring device for checking mechanical workpieces supported to rotate about a determined fixed axis, comprising:

mounting means defining a fixed rotational axis parallel to the rotational axis of the workpiece to be checked; a support mounted on said mounting means rotatable about the rotational axis defined by said mounting means, said support comprising a first arm and a second arm arranged at opposite sides of said rotational axis defined by said mounting means; a first feeler fixed on said first arm of said support;

a measuring head fixed on said second arm of said support and comprising a movable second feeler aligned with said first feeler along a line substantially intersecting the rotational axis of the workpiece, said line being substantially perpendicular to the plane defined by said determined fixed axis and fixed rotational axis; resilient means coupled to said support for urging said first feeler against the workpiece; an electrical unit connected to said measuring head for detecting and visualizing the measurements made; and

commutation and reference means comprising first control elements for commutating said support and second control elements for commutating said electrical unit; said first control elements including a mechanical member movable from a first working position, in which said mechanical member contacts said support to maintain it in a position in which said first feeler is apart from the workpiece and said second feeler contacts the workpiece to measure first geometrical features thereof, to a second working position in which said support can oscillate and both said first and second feelers contact the workpiece to measure second geometrical features thereof; said second control elements being movable to commutate said electrical unit from a first operating condition for measuring and visualizing said first geometrical features to a second operation condition for measuring and visualizing said second geometrical features.

4,005,529

CORRUGATING STATION ASSEMBLY GUIDE

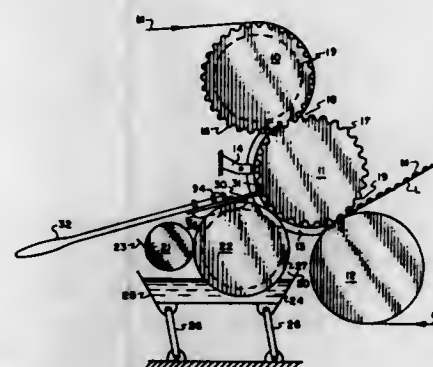
Willem A. Nikkel, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,535

Int. Cl.² B31F 1/22

U.S. Cl. 33—181 R

5 Claims



1. A method of meshing glue application roll relief grooves with corresponding corrugating roll stripper fingers comprising the steps of:

- Providing a structural member having a leading edge and at least one planar surface parallel with said edge;
- Providing slots in said leading edge of sliding fit width relative to a corresponding stripper finger web width, the depth of said slots being normal to said leading edge;
- Providing structural projections from said planar surface of sliding fit width relative to a corresponding relief groove width, said projections being in parallel alignment with the depth of said slots;
- Positioning said structural member tangentially against said applicator roll with said stripper fingers meshed with said slots and said projections meshed with said grooves; and

E. Moving said applicator roll into operative proximity with said corrugating roll.

4,005,530

AUDIO-VISUAL TRAINING DEVICE WITH SELECTIVE BRANCHING

Bunzo Takahashi, Akishima; Hiroshi Tachibana, and Minoru Otake, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

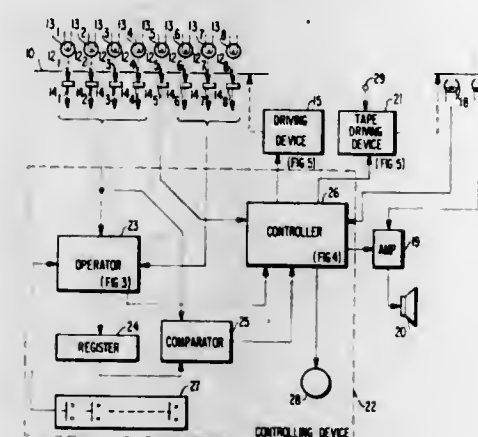
Continuation-in-part of Ser. No. 433,414, Jan. 8, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,487

Claims priority, application Japan, Jan. 8, 1973, 48-4739

Int. Cl.² G09B 7/04

U.S. Cl. 35—8 A

1 Claim



1. An audio-visual training device comprising:

- a visual-record having a plurality of image frames, some of said image frames having a first binary signal groups for instruction purposes and second binary signal groups representing the address of the image frame and others of said image frames having only said binary signal groups representing the address of the image frame, said first and second binary signal groups being in the vicinity of corresponding ones of said image frames,
- an audio-record in which audio information corresponding to each of said image frames of said visual record is recorded in the same sequence as that of said image frames of said visual-record on a first track and image frame feed signals are recorded on a second track at the end of each image frame of said visual record,
- film projector means for presenting each image frame of said visual-record to a student, said film projector means including driving means for feeding the image frames of said visual-record one-by-one, in accordance with a feed signal, and in a forward or reverse direction, in accordance with an image frame drive direction signal, and first and second detecting means provided in said film projector means for reading said first and second binary signal groups, respectively, in the vicinity of each said image frame of said visual record,
- audio-record player means including an audio circuit for presenting said audio information recorded on said first track of said audio-record to the student, and for reproducing said image frame feed signals recorded on said second track of said audio-record, said audio-record reproducing means further including driving means for running said audio-record in the forward direction at the play-back speed of said audio information, for stopping the running of said audio-record and for running said audio-record at a higher speed than said play-back speed in the forward or reverse directions in accordance with a play-back signal, a stop signal, a high speed forward drive signal and a high speed reverse drive signal, respectively, and
- controlling means connected to receive the outputs of said first and second detecting means in said film projector means and the reproduced image frame feed signals from said audio-record player means for generating said

feed signal and image frame drive direction signal supplied to said film projector means and said play-back signal, said stop signal, said high speed forward drive signal, and said high speed reverse signal supplied to said audio-record player means, said controlling means comprising:

- push button means having a plurality of push buttons for entering the reactions or selections of the student from answer choices provided in said image frame of said visual-record presented to the student by said projector means,
- operator means connected to receive the outputs from said push button means, and said first and second binary signal groups from said first and second detector means respectively, and including first computing means for computing from said first binary signal group and the outputs of said push button means level signals corresponding to the level of the entry or selection made by the student and second computing means for computing from said second binary signal group and said level signals the address of the image frame of said visual-record to be accessed next and generating signals corresponding to the feed direction of said image frame to be accessed,
- register means connected to said second computing means for storing the computed address of the image frame to be accessed next,
- comparator means connected to receive the output signals from said second detector means and to receive the computed address stored in said register means for comparing the address stored in said register means and the output signals from said second detector means when said visual-record is fed by said film projector driving means, and generating an output pulse when the outputs of said second detector means agree with said address stored in said register means,
- first control means for causing the first image frame of said visual-record and the corresponding audio information of said audio-record to be presented to the student when power is turned on,
- second control means connected to receive said reproduced image frame signals from said audio-record player means for generating said feed signal to said film projector means to advance said image frames one-by-one in response to the image frame feed signals reproduced from said sound track of said audio-record when no first binary signal group is provided in the vicinity of a presented image frame of said visual-record,
- third control means operative when a first binary signal group is provided in the vicinity of a presented image frame of said visual-record for generating said stop signal to said audio-record player means so as to stop the generating of said feed signals to said film projector means by said second control means,
- fourth control means responsive to the output of said push button means when it is operated by the student, to said feed direction signals from said second computing means, to said output of said comparator means and to said image frame feed signals for first generating from the outputs of said push button means a feed signal to said film projector means to advance said visual-record in a forward direction one image frame in order to regain synchronization between said audio-record and said visual-record and, if there is an output pulse from said comparator means, then generating a reset pulse to said register means and presenting the next image frame and corresponding audio information to the student, but if there is an output pulse from said comparator means when said visual-record is advanced in a forward direction one image to regain synchronization between said audio-record and said visual-record, then generating a feed signal, in response to the reproduced image frame feed signals, and an image frame

drive direction signal to said film projector means and, until an output pulse is received from said comparator means, generating said high speed forward drive signal or said high speed reverse drive signal according to said image frame drive direction signal.

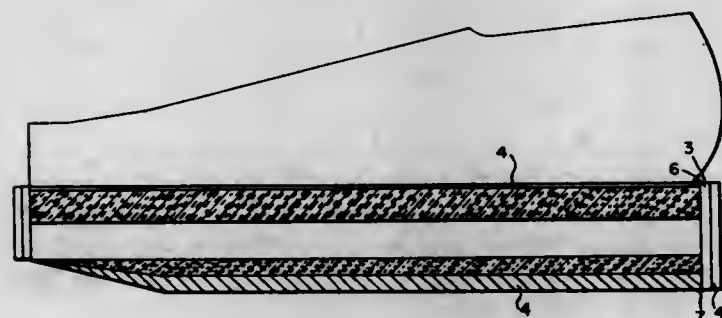
- ix. fifth control means responsive to an output pulse from said comparator means, to said feed direction signals from said second computing means and to said reproduced image frame feed signals for first generating a reset signal to said register means and generating a stop signal to said audio-record player means immediately if the drive is in the forward direction and after receiving an image frame feed signal if the drive is in the reverse direction, and then generating a play-back signal to said audio-record playing means, and
- x. sixth control means responsive to said fourth control means for inhibiting the presenting of said audio information recorded on said first track of said audio-record while either said high speed forward or reverse drive signals are connected.

4,005,531 FOOT COOLER

Morton Weintraub, 1542 47th St., and Bernard Gendelman, 1340 52nd St., both of Brooklyn, N.Y. 11219
Filed Aug. 11, 1975, Ser. No. 603,663
Int. Cl.² A43B 13/18, 13/38

U.S. Cl. 36-28

1 Claim



1. A pair of cool shoes comprising: a high platform outer sole specially insulated within and specially constructed with a vacant chamber, which said chamber houses a durable, lightweight, removable container, which said container contains a chilly refrigerant that absorbs the heat transfer from the user's feet and passes it on down through the insufficiently insulated inner sole separating the user's feet from the cool container, to the chilly refrigerant contained within the said container.

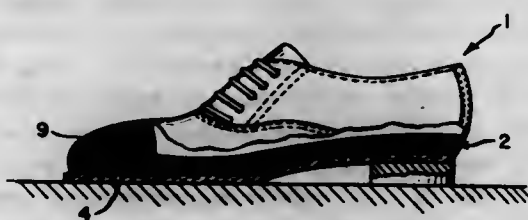
4,005,532 INSULATED INSOLE CONSTRUCTION

Erik O. Giese, Key Biscayne, Fla., and Alexander Louis Gross, Aspen, Colo., assignors to Comfort Products, Inc., Aspen, Colo.

Filed Aug. 20, 1975, Ser. No. 606,223
Int. Cl.² A43B 13/38

U.S. Cl. 36-44

4 Claims



1. An insulated insole construction having a toe, arch and heel area adapted to be included in a shoe comprising: a layer of plastic mesh material shaped to include an insole portion conforming to the inner sole of a shoe where the plastic mesh

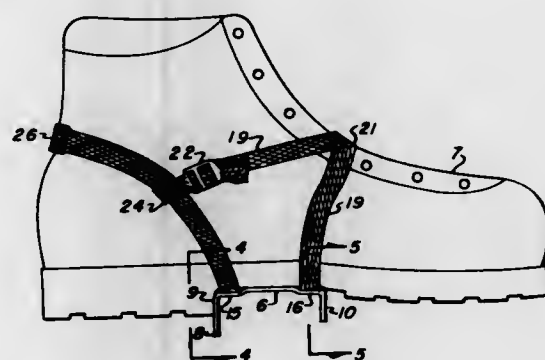
material comprises a mesh-like plastic first fabric, a mesh-like plastic second fabric spaced from said first fabric, a corrugated plastic separating material extending between and joining said first and second fabrics, a first plastic film overlying said first fabric and a second plastic film overlying said second fabric with said first and second plastic films being sealed together around their edges to hermetically encase said first and second fabrics and separating material to form a noncollapsible insulating chamber therebetween.

4,005,533 INSTEP CRAMPONS

Gordon K. Anderson, 14632 Pacific St., and Steven M. Leuck, 14801 Briarcliff Place, both of Tustin, Calif. 92680
Filed Nov. 7, 1975, Ser. No. 629,770
Int. Cl.² A43C 15/00; A43B 3/18

U.S. Cl. 36-62

1 Claim



1. An instep crampon for footwear in general of the kind described, comprising a substantially channel shaped metallic plate, of a width appropriate to the instep of a boot or shoe, stamped and formed to size having a plurality of downward depending spikes of varying height on front and rear legs of the channel, with multiple spaced parallel slots upset from the edge to provide for attachment of a plurality of flexible straps including front and rear straps, slidably connected to the said plate through the parallel slots the front strap attaching to the footwear around the instep over the arch of the foot and fastened releaseably to a slidable attachment connected to the rear strap which is attached to the plate in like manner and embraces the periphery of the heel to provide support for the front strap arrangement.

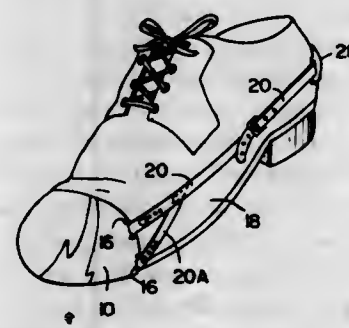
4,005,534 SHOE PROTECTION DEVICE

Harold Crist, and Robert A. Crist, both of Arbovale, W. Va., assignors to The Raymond Lee Organization, Inc., a part interest

Filed Jan. 2, 1976, Ser. No. 646,283
Int. Cl.² A43B 13/22

U.S. Cl. 36-72 R

3 Claims



1. A protection device for a shoe, said device comprising: a hollow metal member having the external shape of a shoe tip and having an internal chamber of like shape communicating with a rear opening in the member, the member having a bottom of a first uniform thickness;

an even plurality of strap receiving loops secured to the outer surface of the two opposite sides of the member and extending outwardly therefrom, half of said plurality of loops being secured to one side, the remaining half of said loops being secured to the opposite side, said loops being located along the periphery of said opening and lying in a common vertical plane located at right angles to the longitudinal axis of said member.

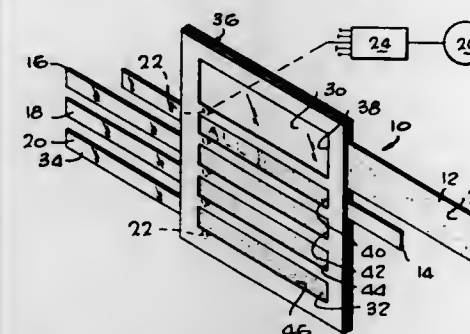
4,005,535

PROGRESSIVELY REVEALED DISPLAY

James F. Davis, 17154 Nordhoff St., Northridge, Calif. 91324
Filed Apr. 11, 1974, Ser. No. 459,928
Int. Cl.² G09F 11/00

U.S. Cl. 40-30

15 Claims



1. A device for progressively revealing a display comprising: a display having a viewable face; a stationary mask defining viewable areas of said face; first and second movable masks, each said movable mask having an opaque area and a clear area selectively positioned in front of the viewable face of said display, each said mask being movable across the face of said display, said masks being positioned adjacent each other and movable to cover and reveal adjacent portions of said display; and means connected to said movable masks for moving each said mask from a position wherein said opaque portion of each said mask is in front of said display, across said face so that said clear portion of said mask is in front of said face of said display so that said display is progressively revealed, said means for moving said mask comprising means for sequentially moving said first mask while said second mask is substantially stationary so that said first mask first progressively reveals a first one of said viewable areas of said display, and then moving said second mask while said first mask is substantially stationary so that said second mask progressively reveals a second one of said viewable areas of said display.

4,005,536

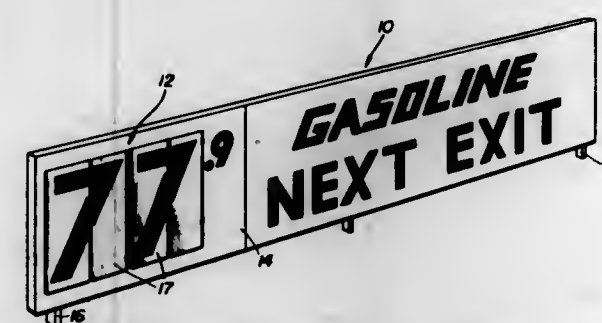
CHANGEABLE DISPLAY APPARATUS

Samuel Plato Fanning, Jr., Jackson, Miss., assignor to National Advertising Company, Bedford Park, Ill.

Filed Aug. 19, 1975, Ser. No. 605,803
Int. Cl.² G09F 11/02

U.S. Cl. 40-104.02

6 Claims



1. Changeable display apparatus comprising: a frame; a plurality of substantially flat display character members;

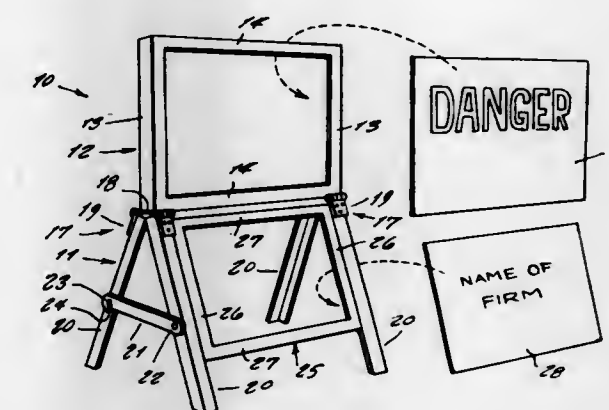
a hinge assembly rigidly mounted to one end of said display character members; means for mounting said hinge assembly to said frame for changeably displaying said display characters thereon; said hinge assembly including, a rod; a plurality of hollow cylindrical members rotatably mounted immediately adjacent each other on said rod; a plurality of flanges having one end extending respectively from the perimeter of each of said cylindrical members; a mounting portion extending outwardly from the other end of each of said flanges; means for mounting a respective one of said display character members to each of said mounting portions; said mounting portions of each of said flanges disposed substantially parallel to each other on said rod so that said display character members mounted thereto lie substantially flat on said frame; latching means mounted on said frame for selectively unlatching and rotating desired display character members on said hinge assembly for changing said display and for clamping said display characters in display position on said frame; said latching means including a pair of latching arms pivotally mounted to said frame on each side of said hinge assembly and immediately adjacent the other end of said display character members for urging said display character members against said frame, and means for selectively clamping said latching arms to said frame to maintain said display character members in display position on said frame; and a pair of latching tabs pivotally mounted on said frame on each side of said hinge assembly intermediate said respective latching arms, and means for respectively simultaneously pivoting respective pairs of said latching arms and tabs during changing of said display.

4,005,537 FOLD-A-BOARD

Peter A. von Camber, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed Mar. 11, 1975, Ser. No. 557,279
Int. Cl.² G09F 7/18

U.S. Cl. 40-125 H

2 Claims



1. In a fold-a-board, the combination of a foldable framework for standing on a ground surface and an upper frame secured symmetrically thereupon for holding a first sign panel, said framework including a lower frame for holding a second sign panel, said upper frame being pivotally secured to the framework along a central longitudinal axis including means for disposing the framework in a triangular shaped supporting position and pivotally folding said framework upwards on either side of the upper frame to assume a folded position, wherein said means comprises spaced pairs of hinges fixedly secured to said upper frame and pivotally secured to pairs of legs disposed below said upper frame, wherein said pairs of legs from a triangular base in said supporting position and can be pivoted upward to a folded position with the upper frame adjacent to said legs wherein one pair of legs include the

second said frame mounted thereon, wherein the frames include rear pockets with inflatable means for retaining signs therein.

4,005,538

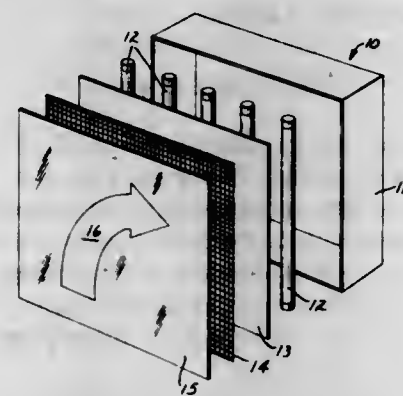
INTERNALLY ILLUMINATED RETROREFLECTIVE SIGNS

Chi Fang Tung, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 418,419, Nev. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 220,152, Jan. 24, 1972, Pat. No. 3,790,431, and Ser. No. 244,837, April 17, 1972, Pat. No. 3,802,944. This application Aug. 29, 1975, Ser. No. 608,915

Int. Cl.² G09F 7/08

U.S. Cl. 40—132 R

2 Claims



1. An illuminated sign comprising a box-like enclosure closed over its whole periphery except for an opening at the front of the sign, a light source within the enclosure, a transparent plate supported in front of the light source and carrying a printed image that is readable at the front of the sign by light from the light source, and light-diffusing means and a retroreflective light-transmissive sheeting between the transparent plate and the light source, and extending uniformly over the whole area defined by said opening, said sheeting comprising an open-mesh fabric of filaments that are encased around their whole circumference over at least those parts of their length that define open spaces of the web by a monolayer of minute transparent microspheres, the microspheres being partially embedded in a layer of binder material coated on the filaments and partially exposed above the layer of binder material whereby at least at the front of the sign the microspheres are uncovered over the whole area of said opening and open to the air, and said microspheres being covered over their partially embedded surface with specular reflective material, said sheeting permitting the light source to illuminate the sign image through the open spaces of the fabric while also retroreflecting light incident on the sign so as to further illuminate the sign image.

4,005,539

PEG BOARDS

George H. N. Chamberlain, Great Yeldham, England, assignor to Signco Limited, Bury, England

Filed Mar. 27, 1975, Ser. No. 562,634

Claims priority, application United Kingdom, Apr. 4, 1974, 15021

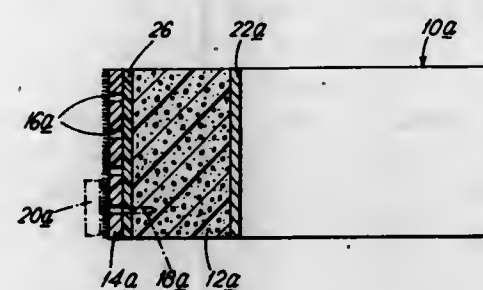
Int. Cl.² G09F 7/06; B32B 3/26

U.S. Cl. 40—143

9 Claims

1. A peg-board having a plurality of removable alphanumeric characters securely mounted thereto in selected positions for display purposes, the peg-board comprising: a sheet of a resiliently deformable plastics material having two faces, one face being exposed and consisting of a mass of short spikes matted together to give a flock-like finish, and the other face being secured to a body of a cellular polymeric material, a plurality of similar apertures extending through the sheet

and being arranged as a regular lattice of intersecting rows and columns with the flock-like finish of the exposed face of the sheet acting to obscure the location of the apertures but not to hide their location completely, each of the removable characters being formed with at least one elongate pin which has a lateral dimension greater than the largest lateral dimension of



any of the apertures, and all of the pins extending through respective selected apertures and into the body, the cellular polymeric material of which is thereby deformed to define continuations of said selected apertures, whereby all of said pins are firmly gripped by a resilient deformation of at least the sheet.

4,005,540

GUN TRIGGER MECHANISM

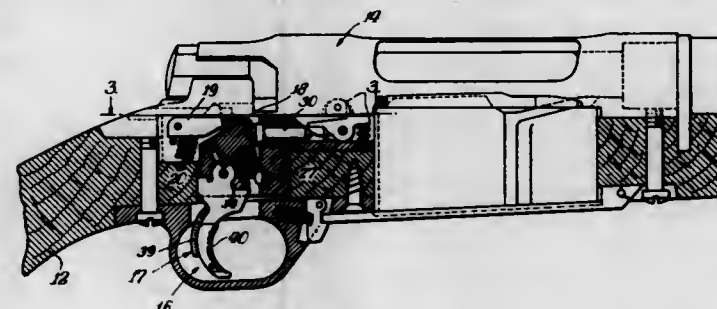
Marion M. Robinson, Schaumburg, Ill., assignor to Kanematsu-Gosho (U.S.A.), Inc., Arlington Heights, Ill.

Filed Aug. 27, 1975, Ser. No. 608,213

Int. Cl.² F41C 19/02

U.S. Cl. 42—69 R

18 Claims



1. A firearm trigger mechanism comprising: a trigger piece; means for movably mounting said trigger piece for releasably holding a sear against firing movement; first spring means for urging said trigger piece to a sear holding position; a finger loop blade having a pivot portion pivotally mounting said trigger piece; pivot means for pivotally mounting said blade adjacent said trigger piece for selectively effecting a sear releasing movement of said trigger piece as a result of a finger pull on said blade rearwardly from a first pull position against the biasing action of said first spring means; relatively lightly biased detent means for holding the finger loop blade in a second, light pull position forwardly of said first pull position; and second, relatively strong spring means for moving said finger loop blade rearwardly from said light pull position upon release of said detent means to cause sufficient force to be developed in said finger loop blade to effect said sear releasing movement of said trigger piece, said pivot portion being coaxial of said pivot means whereby said trigger piece and said finger loop blade are coaxially pivotable.

4,005,541

FISHING LEADER TENDER

Robert Brent Henriksen, 1883 Zenda Way, Salt Lake City, Utah 84121

Filed Aug. 22, 1975, Ser. No. 606,875

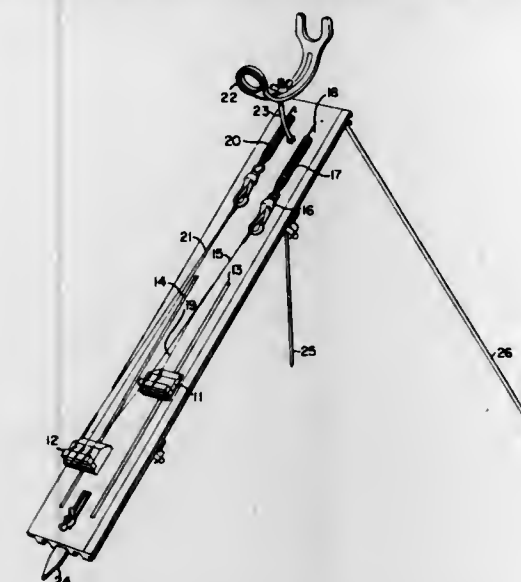
Int. Cl.² A01K 97/06

U.S. Cl. 43—57.5 A

10 Claims

1. A ganged fishing hook-leader tender comprising:

- an elongated rigid base having a length substantially greater than its width,
- a pair of hook engaging blocks on said base, said blocks positioned near one end of said base and spaced longitudinally and laterally from one another, said blocks having



- soft hook engaging means facing the nearer end of said base,
- tension spring means attached near an end of said base opposite said blocks,
- clip means attached to said tension spring means for holding the loop of a leader.

4,005,542

HUMANE ANIMAL TRAP

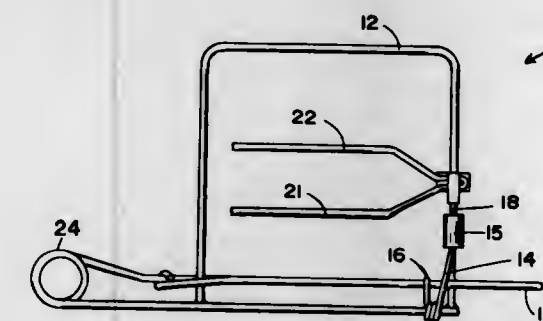
Guy C. Anderson, 2048 E. County Road F, White Bear Lake, Minn. 55110

Filed Sept. 26, 1975, Ser. No. 616,925

Int. Cl.² A01M 23/34

U.S. Cl. 43—85

4 Claims



1. A lightweight animal trap for swiftly and humanely killing an animal, said trap being sufficiently compact for ease in carrying by a trapper while making the rounds of his trap line, said lightweight animal trap comprising:

- a base member;
- a first jaw connected to said base member so as to coact with said base member and outline an opening which an animal can enter;
- a second movable jaw;
- a spring connected to said movable jaw and said base member for powering said movable jaw toward said first jaw when said second movable jaw is in a set position;
- said spring, said base member and said second movable jaw comprised of a continuous member with said spring located intermediate said base member and said movable jaw, said spring being spaced from the opening in said trap so that said movable jaw transverses the opening in said trap;
- means for holding said movable jaw in a set position, said means including a latch member having one end for engaging said movable jaw and a second end for engaging

said first jaw, further means on said latch member for releasably engaging a trigger mechanism;

a triggering mechanism, said triggering mechanism comprising a trigger finger for projecting into the opening in the trap where an animal can enter; said triggering mechanism including a rotatable cam member slidably mounted on said first jaw, said trigger finger connected to said rotatable member, said rotatable member operable to hold said latch member in a stable position when said trigger finger is in a set position so that when an animal enters the opening in the trap, the animal rotates said triggering mechanism thereby releasing said latch member so that said movable jaw is freed to swiftly swing toward said first jaw in a scissoring action capable of instantly killing an animal located in the opening of the trap.

4,005,543

TOY VEHICLE-AIRCRAFT COMBINATION

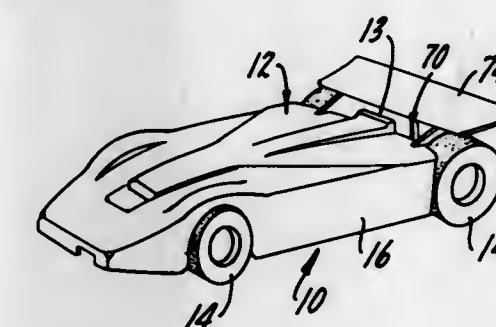
Robert S. McKay, 7420 Beckwith Road, Morton Grove, Ill. 60053

Filed Sept. 11, 1975, Ser. No. 612,490

Int. Cl.² A63H 27/14

U.S. Cl. 46—81

12 Claims



- A toy vehicle - airplane combination comprising:
- a miniature wheeled vehicle having a threaded shaft constrained for rotation with one of the wheels of said vehicle;
- means on said vehicle for carrying a miniature airplane;
- spring biased propulsion means on said vehicle for ejecting said airplane from said vehicle;
- detent means for maintaining the bias of said propulsion means until released;
- release means threadedly mounted on said shaft for releasing said detent means, said release means reciprocating along said shaft in direct proportion to the linear travel of said vehicle;
- indicator means on said vehicle for preselecting and indicating the distance to be traveled prior to release of said release means; and
- stationary spring launch for receiving said vehicle and for propelling said vehicle along a surface.

4,005,544

PARACHUTE TOY

Donald L. Donner, P.O. Box 97, Rte. 2, Durham, Calif. 95938

Filed July 28, 1975, Ser. No. 599,633

Int. Cl.² A63H 33/20

U.S. Cl. 46—86 R

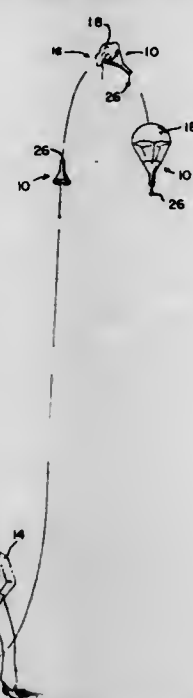
11 Claims

9. In a parachute toy having a hollow body with an open back, a parachute stored in said body when said parachute is undeployed and means for placing said parachute in its undeployed position, said means comprising:

a line extending from the forward end of said body rearwardly through a central aperture in said parachute; and

a restraining button secured to said line rearwardly of said aperture, said button being larger than said aperture

whereby said parachute may be placed in its undeployed position by pulling the forward end of said line forwardly



so that said button contacts said parachute and carries it into the hollow interior of said body.

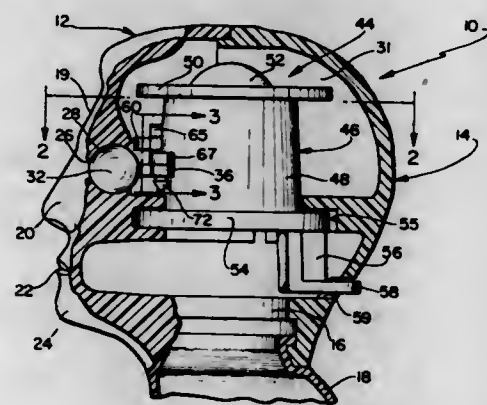
4,005,545 EYE SHIFTING MECHANISM FOR DOLL CONSTRUCTION

George W. Ptaszek, Pascoag, and James A. King, Providence, both of R.I., assignors to Hasbro Development Corporation, Pawtucket, R.I.

Filed Jan. 12, 1976, Ser. No. 648,951
Int. Cl.³ A63H 3/40

U.S. Cl. 46-167

10 Claims



1. A mechanism for effecting movement of simulated eyes as mounted in the head of a doll construction, said head being formed with an interior chamber in which sockets are located for receiving the eyes therein, openings formed in said head and communicating with said sockets to provide visual access to said eyes exteriorly of said head, an actuator mounted for rotating movement in said head, a connector member operatively connected to said actuator and being responsive to rotating movement thereof for movement in a linear direction, said eyes being interconnected to said connector member and being movable in said sockets in response to linear movement of said connector member, and an operator joined to said actuator and being movable to produce the rotating movement of said actuator and the corresponding linear movement of said connector member, wherein a variety of positions of said eyes as moved in said sockets are selectively obtained.

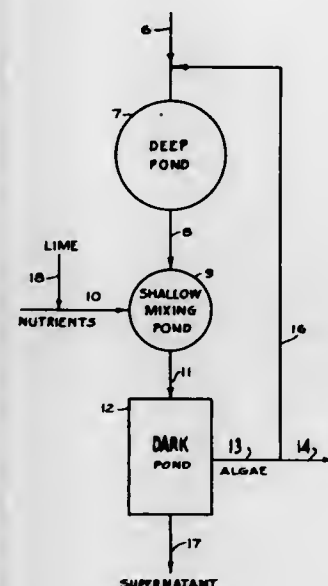
4,005,546 METHOD OF WASTE TREATMENT AND ALGAE RECOVERY

William J. Oswald, Concord, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed July 21, 1975, Ser. No. 597,437
Int. Cl.³ C02C 1/00; A01G 31/00

U.S. Cl. 47-1.4

11 Claims



1. A method of waste treatment and algae recovery comprising making available in a first pond open to light and air a first body of sewage containing algae, retaining said first body under natural culture conditions for from ten to twenty days, then transferring to a second pond as a second body open to light and air at least a portion of said first body, substantially continuously agitating said second body in said second pond for from three to six days, then transferring to a third pond as a third body substantially closed to light at least a portion of said contents of said second pond, retaining said third body quiescent for from one and a half to three days during which algae settle, and removing settled algae from said third pond.

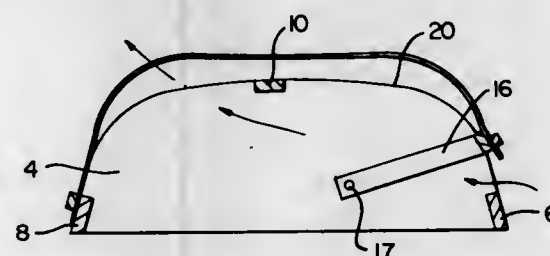
4,005,547 THERMALLY RESPONSIVE VENTILATED COLD FRAME

Edward N. Caldwell, Rte. 17 Coward Mill Road, Knoxville, Tenn. 37921

Filed Aug. 7, 1975, Ser. No. 602,551
Int. Cl.³ A01G 13/04, 9/24

U.S. Cl. 47-28 R

5 Claims



1. A cold frame comprising frame means including end walls and side walls, a cover mounting frame pivotally mounted on said frame means and movable through a plurality of positions opening and closing said cold frame, a cover member of light-transmitting, flexible sheet material of sufficient thickness and stiffness to cause the cover to assume a generally arcuate configuration when the ends thereof are constrained at a distance less than the length of said cover member, said cover member being connected at one end to

one of said end walls and at the other end to said cover mounting frame at a distance less than the length of said cover member whereby said cover member will assume a generally arcuate unsupported configuration in a closed position of said cover mounting frame, said closed position being defined when said cover mounting frame is in adjacent mating relationship to the other end wall, said side walls having edges formed to be complementary with the configuration of said cover member when said cover mounting frame is in said closed position and engageable with said cover member when said cover mounting frame is in said closed position to define an enclosed space, and thermally responsive actuator means for rotating said cover mounting frame to flex said cover member and move said cover member relative to said side walls and to provide at least one ventilation opening between said side walls and said cover member for said enclosed space.

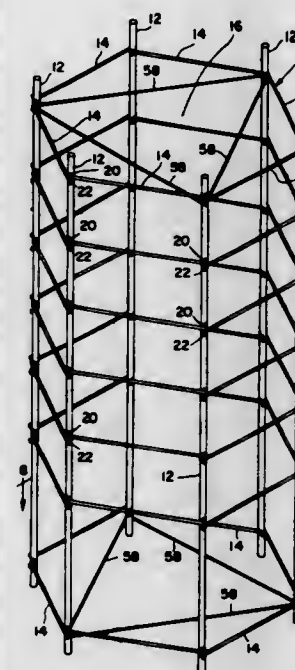
4,005,548 PLANT SUPPORT

Abraham S. Nahon, 1026 Arboretum Road, Wyncote, Pa. 19095

Filed July 2, 1975, Ser. No. 592,395
Int. Cl.³ A01G 17/06

U.S. Cl. 47-45

22 Claims



1. A plant support comprising
 - A. at least three cylindrical support rods each having a longitudinal axes and a peripheral surface,
 - B. a plurality of cross wire holding means extending from the support rods,
 1. said holding means being longitudinally spaced along the support rods,
 2. some of said holding means defining a cross wire receiving opening therebetween,
 3. said cross wire receiving opening extending outwardly from the support rod,
 4. said cross wire receiving opening being open outwardly from the support rod and being closed at the support rod;
 - C. a plurality of cross wires interconnecting adjacent support rods at the holding means,
 1. said cross wires comprising a medial portion and bent ends the bent ends being slidable upon said support rods, said support rods being rotatable in said bent ends,
 2. the bent ends defining openings between the ends and the medial portion,
 3. the openings being of a size to receive therein the holding means.

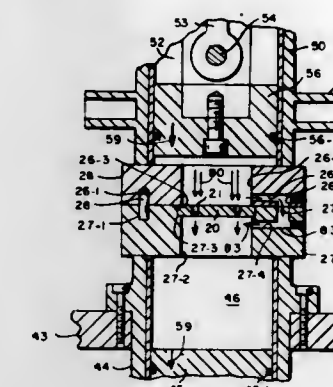
4,005,549 ABRASIVE FLOW MACHINING METHOD AND TOOLING

Kenneth E. Perry, Wellesley, Mass., assignor to Dynetics Corporation, Woburn, Mass.

Filed July 28, 1975, Ser. No. 599,472
Int. Cl.³ B24C 3/32, 1/00

U.S. Cl. 51-8 H

17 Claims



1. In an abrasive flow machine having means for passing an abrasive flow composition in two directions through a hole of a workpiece held by a tool having a first flow passage means in flow alignment with both ends of the hole of said workpiece, the improvement of said tool having a second flow passage means for diverting a portion of said abrasive flow composition away from said first flow passage means prior to it flowing through the hole of the workpiece and redirecting said diverted composition at the abrasive flow composition passing out of the hole of said workpiece and into said first fluid passage means when said composition is being passed through said workpiece in either direction.

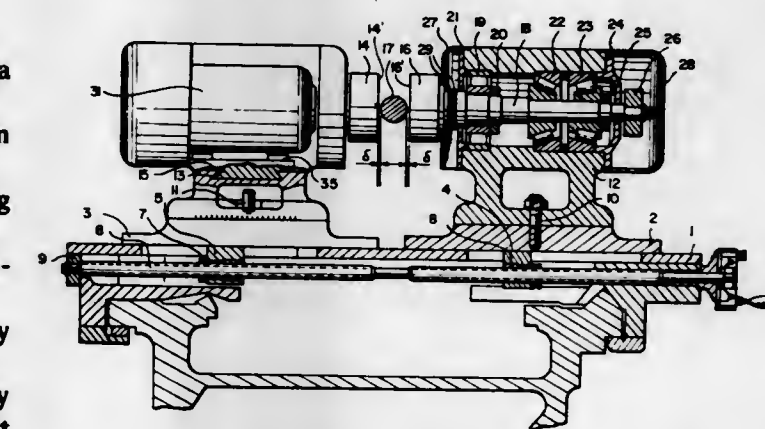
4,005,550 MACHINE FOR MAGNETICALLY POLISH-GRINDING WORK PIECES HAVING LARGE DIMENSIONS

Atanas Dimltrov Kochemidov; Boris Georgiev Makedonski; Ivan Minkov Dumanov, and Stefan Georgiev Payakov, all of Sofia, Bulgaria, assignors to Znitmash of Chaussee za Gara Izkar, Sofia, Bulgaria

Continuation-in-part of Ser. No. 336,896, Feb. 28, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,781
Claims priority, application Bulgaria, Feb. 28, 1972, 19845
Int. Cl.³ B24B 5/02

U.S. Cl. 51-56 R

3 Claims



1. A machine for magnetically polish-grinding work pieces having large dimensions, said machine comprising:
 - a. workpiece holding means for holding said work piece;
 - b. work piece rotating means for rotating said work piece holding means about a first axis and thereby rotating said work piece about said first axis;
 - c. rotating electromagnetic head means, said head means rotating about a second axis perpendicular to said first axis, said head means comprising first and second magnetic heads positioned on opposite sides of said work

piece such that the faces of said heads face said work piece and first and second drive means for independently rotating said first and second heads respectively, wherein said first and second drive means are independent of said work piece rotating means;

d. support means for holding said first and second heads and simultaneously moving said first and second heads in a direction along said second axis, said support means movable parallel to said first axis, whereby said first and second heads are simultaneously movable along said first axis; and

e. ferromagnetic powder held on said head means by the magnetic force of said head means, wherein said head means are positioned such that said ferromagnetic powder contacts said work piece whereby the movement of said head means causes the ferromagnetic powder to polish and grind said work piece.

4,005,551

CAM OPERATED STONE GRINDING DEVICE

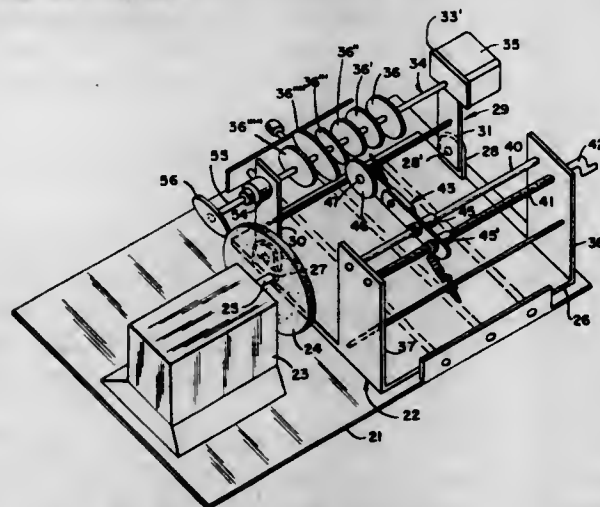
Roy C. Lines, Box 383, Oriska, N. Dak. 58063

Filed Apr. 7, 1975, Ser. No. 565,418

Int. Cl.² B24B 17/02

U.S. Cl. 51-101 R

1 Claim



1. A stone grinding device for grinding stones for neck pendants into desired shapes and sizes, comprising a main frame and a sliding frame, a rotary grinding wheel in a fixed position on said main frame, means to slide said sliding frame transverse to the axis of rotation of said grinding wheel, a cam shaft support apparatus having a pair of arms pivotally mounted at one end to said sliding frame, a cam shaft rotatably mounted at the other end of said arms, an adjustable roller, a plurality of cams of different sizes and shapes on said cam shaft, a stone supporting shaft, a motor means mounted on said cam shaft for rotating said cam shaft, said cam shaft having a drill chuck mounted at one end of said cam shaft to receive and lock said stone supporting shaft to support the stone thereon from only one end of said cam shaft with said grinding wheel in front of said stone for grinding, means to adjust said roller along an axis parallel to said cam shaft in front of a selected one of said cams, spring means urging said cam shaft toward said roller, so that said stone to be ground will engage said grinding wheel, said selected cam having variations in its outer surface so that said selected cam is rotated by said cam shaft, said selected cam will push said cam shaft away and allow it to move toward said roller depending upon the variations, so that the grinding wheel will push said cam shaft away or allow it to move toward the roller depending upon the variations, so that the grinding wheel will grind the stone at the end of the cam shaft into shape variations of the selected cam.

4,005,552
APPARATUS FOR IMPROVED CONTROL OF A GRINDING MACHINE

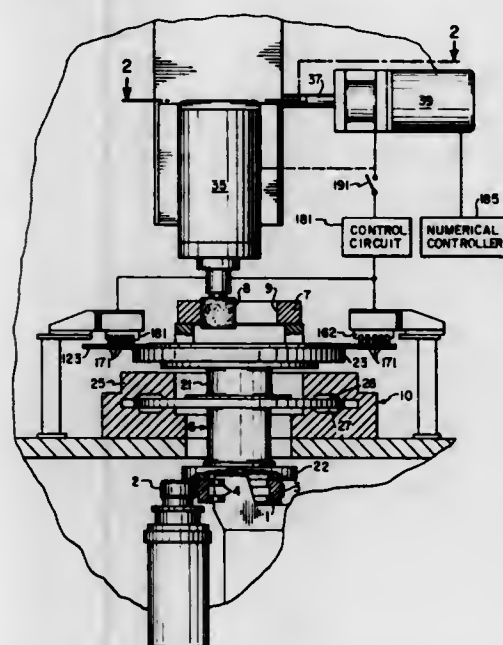
Nils O. Hoglund, Short Hills, and Carl Hoglund, Murray Hill, both of N.J., assignors to Tri-Ordinate Corporation, Berkeley Heights, N.J.

Filed Oct. 21, 1974, Ser. No. 516,396

Int. Cl.² B24B 17/06, 19/00

U.S. Cl. 51-101 R

31 Claims



1. In a grinding machine comprising a grinding tool, a worktable on which a workpiece may be mounted for grinding, means for feeding said grinding tool into said workpiece, and a cam and cam driver means for driving said worktable repeatedly through the same path, apparatus comprising:

at least one sensing means,
at least one means for triggering said sensing means to produce an output signal,

a programming table rigidly connected to said worktable, one of said sensing means and said triggering means being selectively mounted on said programming table and the other being mounted in such a position that said sensing means is triggered whenever the one is moved past the other as a result of movement of the worktable through the path on which it is driven, and

means for modifying at least one of the speed of the grinding tool, the position of the grinding tool, the lateral movement of the grinding tool across the workpiece, and the speed of the driving means in accordance with said output signal as the grinding tool is being fed into said workpiece.

4,005,553

CLAMPING DEVICE FOR USE IN SHARPENING SHEARS AND THE LIKE

Millard H. Eller, P.O. Box 111, Granville, Mass. 01034

Filed July 11, 1975, Ser. No. 594,958

Int. Cl.² B24B 3/52

U.S. Cl. 51-218 R

6 Claims

1. A freely movable and manipulable clamping device for use in sharpening shear blades and the like with a grinding wheel, which device comprises:

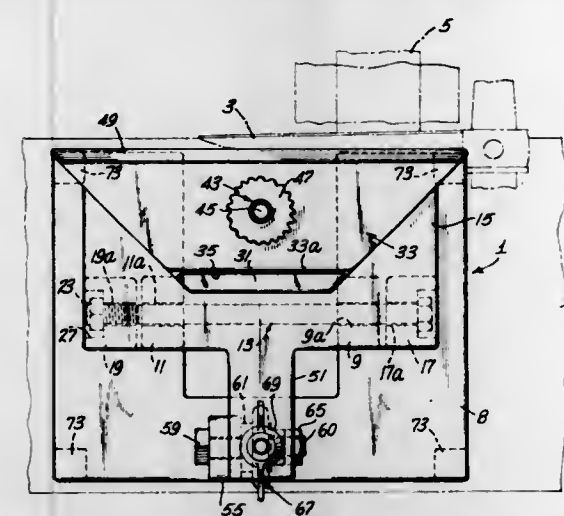
a. a base member;

b. a support member pivotally carried by the base member for free and unbiased pivotal movement with respect thereto, wherein the pivot point of the support member is disposed rearwardly of the center of gravity thereof to thereby provide a forward portion that is counterbalanced in a downward direction;

c. a clamping means carried by the forward portion of the support member, which clamping means includes:

i. a flange having a longitudinal wall section, and

ii. a detachable plate having a substantially isosceles trapezoidal configuration, wherein the shorter parallel side of the plate is disposed adjacent and parallel to the longitudinal wall of the flange and the longer parallel side overlaps the blade when the latter is in a clamped position; and



d. adjustable means for limiting the degree of free and unbiased pivotal movement of the support member with respect to the base member to thereby control the desired grinding angle between the blade edge and the grinding wheel.

4,005,554

BLADE SHARPENING DEVICE FOR ROTATABLE CHOPPING CYLINDERS

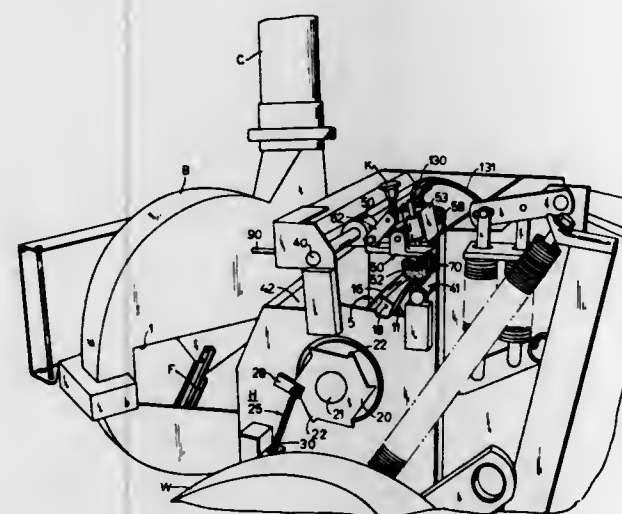
Steven James Campbell, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.

Filed Aug. 20, 1975, Ser. No. 606,057

Int. Cl.² B24B 19/00

U.S. Cl. 51-249

4 Claims



1. A blade sharpening device for use with a forage harvester having a housing and a cutting cylinder rotatable about an axis and retained within the housing and having a plurality of circumferentially spaced spiral shaped cutting blades to be sharpened, said blades each having a radially inner surface, a radially outer surface, and a bevelled cutting surface, said sharpening device comprising guide track means supported on said housing, a carriage movably supported on said guide track means for movement generally parallel to said cylinder axis, a grinding wheel supported on the carriage and including a flat side selectively engageable with the bevelled cutting surface of one of said cutting blades to be sharpened, and guide means including an arm secured to said carriage and extending therefrom, said guide means also including guide rollers supported on said arm and engageable with the inwardly facing surface of said one cutting blade adjacent and opposite said bevelled cutting surface for guiding said grinding wheel along said bevelled cutting surface, and means biasing

said cutting blade into said guide rollers to position said knives for grinding engagement with said wheel.

4,005,555

ROOF EXPANSION JOINT

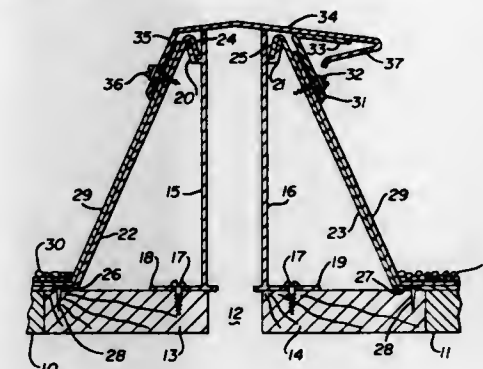
Abraham H. Roth, and Dave Roth, both of Youngstown, Ohio, assignors to Roth Bros. Inc., Youngstown, Ohio

Filed July 3, 1975, Ser. No. 593,013

Int. Cl.² E04D 1/36

U.S. Cl. 52-60

6 Claims



1. A roof expansion joint structure for bridging and closing an elongated opening in a roof and comprising spaced upright longitudinally extending members defining said opening, longitudinally extending cants attached to said upright members adjacent their upper ends and extending downwardly and outwardly therefrom so as to engage said roof, a longitudinally extending outturned angular flange on the upper end of one of said cants extending opposite said opening, and a longitudinally extending cover strip having a downturned angular flange on one edge and an intumed angularly disposed flange on its other edge extending toward said opening and positioned on and attached to the other one of said cants and slidably engaged on said outturned angular flange, said intumed angularly disposed flange on the cover strip extending inunder said outturned angular flange on the other cant so as to form a movable weather tight seal across said elongated opening in said roof.

4,005,556

LIGHTWEIGHT TRUSS-FRAMED HOUSE

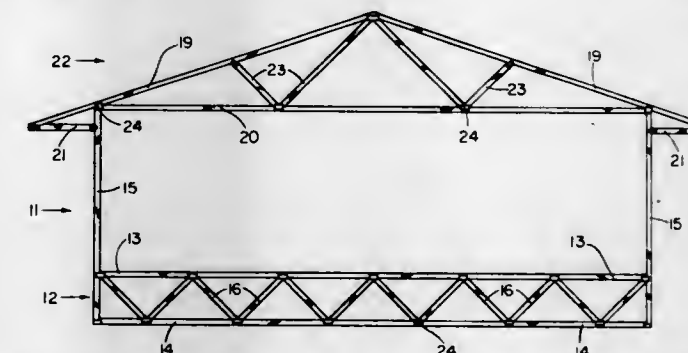
Roger L. Tuomi, Madison, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 509,610, Sept. 26, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 615,016

Int. Cl.² E04B 7/02, 7/12

U.S. Cl. 52-93

7 Claims



1. A building, comprising a plurality of sill plates installed on a foundation, a plurality of frames disposed in parallel vertical planes normal to the plane of said sill plates, each frame comprising a floor truss system, wall studs connected to the ends of said system and extending upward therefrom, and a roof truss extending between and connected to the upper ends of said studs, said floor truss system, comprising a top floor chord and

bottom floor chord, parallel with one another, which extend between and connect at their ends to said studs, with said bottom floor chord being adjacent to said studs' lower ends, with web members extending between and connected to said chords,
means connecting said frames to said sill plates,
means securely anchoring said frames in proper vertical orientation, said last-mentioned means running perpendicular to said frames.

4,005,557

SUCTION REDUCTION INSTALLATION FOR ROOFS
Carl Kramer, Aachen, and Karl Hange, Troisdorf-Spich, both of Germany, assignors to Dynamik Nobel Aktiengesellschaft, Germany

Continuation of Ser. No. 459,069, April 8, 1974, abandoned.

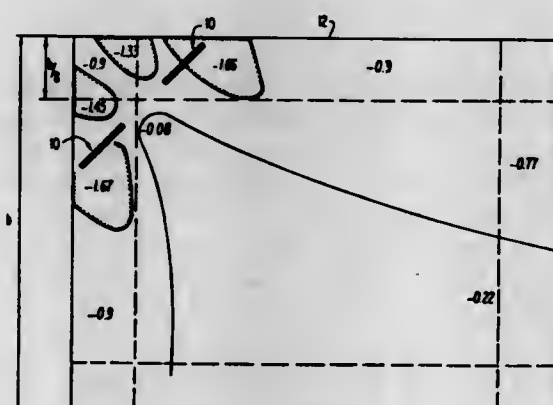
This application Dec. 1, 1975, Ser. No. 636,451

Claims priority, application Germany, Apr. 7, 1973, 2317545

Int. Cl.² E04D 13/00; E04H 9/14, 9/16

U.S. Cl. 52-173 R

30 Claims



1. An arrangement for reducing wind suction forces on a roof the surface of which has no gradient, the roof surface in a horizontal projection being polygonal in shape with sides thereof intersecting and forming roof corners, the arrangement comprising: at least two wind disturbing means for disturbing the flow condition of the wind along the surface of the roof and for reducing eddy formations thereon, said at least two wind disturbing means being provided only in the zone of at least one of the roof corners at a right angle to a bisector of the angle of the at least one roof corner, and means for mounting said wind disturbing means to project beyond the normal limitation of the roof.

4,005,558

EXTRUDED DOOR FRAME

John Albert Barrison, 670 Hampden Place, Pacific Palisades, Calif. 90272

Filed June 7, 1976, Ser. No. 693,310

Int. Cl.² E06B 1/04

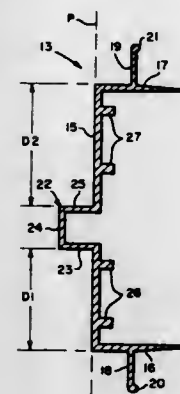
U.S. Cl. 52-213

5 Claims

1. An extruded door frame including left, right and top elongated extruded strips each of identical configurations when viewed in transverse cross section, the right extruded strip having its face lying in a vertical plane normal to the plane of the door opening for abutment against the right door jamb trimmer and having, when viewed in top transverse cross section:

- opposite longitudinal edges rearwardly extending from said face at right angles to said vertical plane to straddle said trimmer, said edges including integrally formed finishing flanges extending laterally outwardly from intermediate points on the rearwardly extending portions of said edges,
- a door stop portion formed in the front face of the strip by a portion extending forwardly at right angles from the vertical plane, thence parallel to said plane and thence

rearwardly at right angles to said plane, said door stop portion lying parallel to and intermediate said opposite longitudinal edges, and
c. two pairs of parallel ribs, one pair on each side of said



door stop, extending rearwardly a given distance at right angles to said vertical plane and running parallel to the longitudinal edges of the strip to abut against the face of said trimmer and stabilize said strip in its secured position.

4,005,559

ASSEMBLING PIECE AND APPLICATION TO A PANEL ASSEMBLY

Marcel Edouard Mathou, Rte. de Cantaranne Zone Industrielle, 12000 Rodez, France

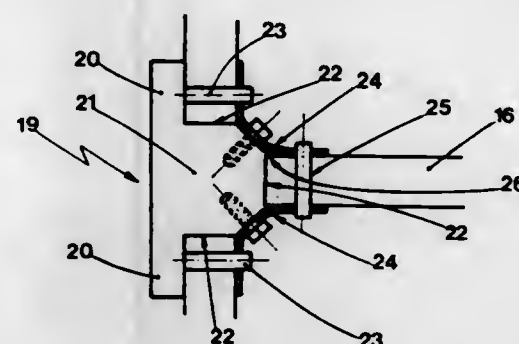
Filed June 9, 1975, Ser. No. 584,876

Claims priority, application France, June 13, 1974, 74.20567

Int. Cl.² E04F 19/06

U.S. Cl. 52-282

8 Claims



4. An assembling system, comprising an assembling piece having two wings forming an angle, at least two abutting surfaces perpendicular to the wings, at least two pins extending perpendicular to the wings on the same side as the abutting surfaces, with respect to the wings, at least one aperture in said assembling piece, at least two panels mounted on said pins, at least one clamp mounted on the free end of said pins and maintained by securing means associated to said apertures in said assembling piece.

4,005,560

REINFORCED CONCRETE APPLIANCE

Herbert John Simpson, Andover, England, and Walter Heller, Horgen, Switzerland, assignors to Preformed Line Products Company, Cleveland, Ohio

Continuation of Ser. No. 506,263, Sept. 16, 1974, abandoned, which is a continuation of Ser. No. 329,580, Feb. 5, 1973, abandoned. This application Oct. 31, 1975, Ser. No. 627,614

Claims priority, application United Kingdom, Feb. 11, 1972, 6437/72

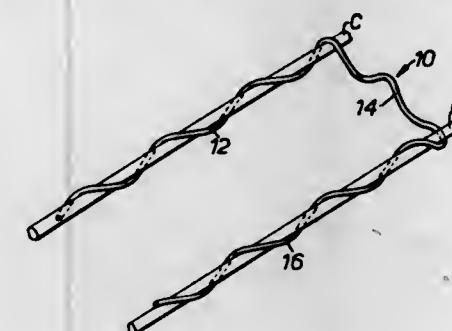
Int. Cl.² E04C 5/18

U.S. Cl. 52-677

4 Claims

1. An appliance for holding a pair of elongated non-coaxial reinforcement members for a cast material relative to one

another and spaced from the surface of a form while said material is being cast and is hardening, said appliance comprising: a pair of resilient non-coaxial legs each adapted to encircle and grip a corresponding one of said reinforcement members, each of said legs being helically preformed to a multi-turn helix having a predetermined internal diameter and an open pitch, said internal diameter of each helix being less than the external diameter of the corresponding reinforcement member and said pitch of each helix being long enough that the leg can be wrapped around the corresponding reinforcement member without exceeding the elastic limit of the material from which the appliance is made, the axes of said legs lying in a common first plane, said legs having first ends



spaced apart and interconnected by a bridging portion lying in a second plane extending through said first ends perpendicular to said first plane, said bridging portion including opposite ends each integral with one of said first ends of said legs and a form surface engaging portion extending between said opposite ends and spaced from said legs to engage said form surface and space said legs therefrom, each said leg gripping the corresponding reinforcement member against displacement relative thereto and said bridging portion being entirely spaced from said reinforcement members and maintaining said legs in said non-coaxial relationship, whereby said legs and bridging portion cooperatively position said reinforcement members relative to one another and space said reinforcement members from said form surface.

4,005,561

DOVE JOINT

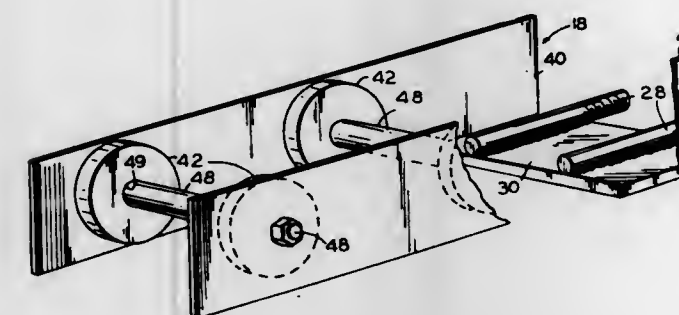
Hollis C. Scott, Portland, Oreg., assignor to Western Wood Structures, Inc., Portland, Oreg.

Continuation of Ser. No. 610,307, Sept. 4, 1975, which is a continuation of Ser. No. 540,399, Jan. 13, 1975, which is a continuation of Ser. No. 416,736, Nov. 19, 1973, abandoned, which is a division of Ser. No. 318,466, Dec. 26, 1972, Pat. No. 3,810,342. This application Feb. 19, 1976, Ser. No. 659,348

Int. Cl.² F16B 7/18

U.S. Cl. 52-260

5 Claims



1. In a beam connector assembly, a plurality of elongated straps lying in parallel planes and adapted to be secured to a beam, bridge means comprising a plate secured to end portions of the straps and extending across the beam, the plate lying in a plane transverse to said parallel planes and parallel to the longitudinal axis of the beam, fastener means comprising at least one stud fixed to the

plate in a position lying on the plate and parallel to and extending longitudinally of and beyond the straps, the space between the straps being entirely unobstructed except for the plate and the stud, the portion of the stud secured to the plate lying entirely between the plates.

4,005,562

CONTAINER PACKER

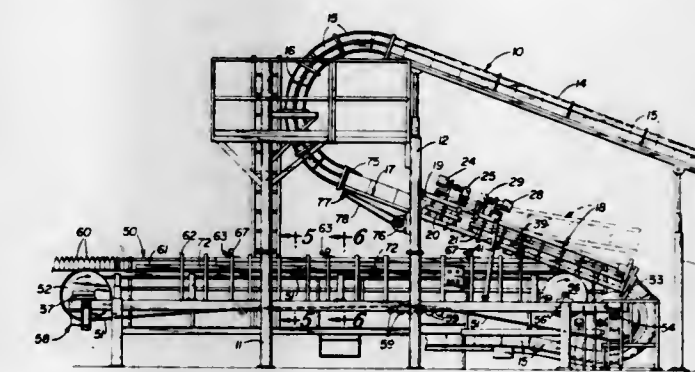
Peter Vischer, Golden, Colo., assignor to Coors Container Company, Golden, Colo.

Filed July 24, 1975, Ser. No. 598,825

Int. Cl.² B65B 5/06

U.S. Cl. 53-57

10 Claims



1. Bottle packer apparatus, in combination with cases provided with divider means which divide the cases into separate single bottle spaces, for encasing bottles in said cases in a continuous operation comprising

- a case conveyor on which inverted cases are moved in a downwardly inclined plane, said conveyor comprising a stationary section and a pivotally mounted section extending in continuation of the stationary section,
- means on the case conveyor contacting the side walls of the inverted cases and moving said cases to a position where the cases drop downwardly, and
- a bottle conveyor having a moving belt on which bottles are carried neck up in a plurality of lanes parallel to the direction of travel of the belt to an area beneath an inverted case which is dropped from the case conveyor, the bottle conveyor speed exceeding the speed of the case conveyor and causing accumulation of bottles adjacent one end of a loaded case.

4,005,563

HOLDER AND SHEAR LEDGER PLATE FOR PACKAGE TYING MACHINES

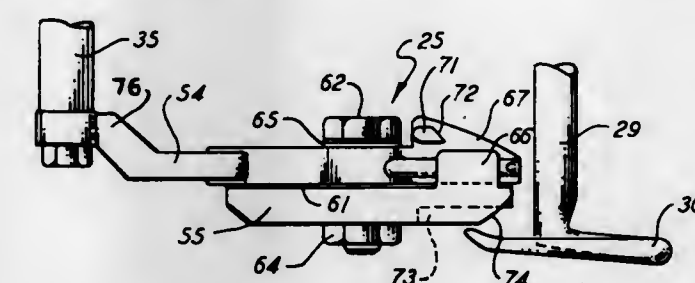
J. Leonard Nitsch, 101 Park St., Syracuse, N.Y. 13203

Filed Sept. 24, 1975, Ser. No. 616,433

Int. Cl.² B65B 51/08

U.S. Cl. 53-138 A

1 Claim



1. In a bag tying machine in which an endless conveyor belt carries bagged loaves of bread past a tying station with means for guiding the open end of each bag toward the tying station and bunching it into a neck, a reel carrying a supply of wire-reinforced tie ribbon adjacent the tying station, the ribbon being led over a series of rollers to a needle carried roller, tie tensioning means connected to the supply reel, a tie holder

and shear ledger plate assembly at the tying station, the assembly having a holder and shear arm pivotally secured to the stationary plate, the plate having a cut-out portion at its approach end for access therethrough for the tie ribbon and having shear edges and holding projections at either side, the arm having at its approach end an angularly tapered nose having on either side a shear edge and a holding projection adapted to cooperatively engage the shear edge and holding projection of the plate on either side, machine means for moving the arm from side to side, support means at the tying station including a horizontally projecting support flange, a twister rotatably supported from above at the tying station, the twister having a horizontally disposed C-shaped hook adapted to underlie the plate and adapted to twist a loop of tie passing through the cut-out portion of the plate when the hook is rotated, means for rotating the hook, a vertically disposed C-shaped needle carrying the needle roller on its free end normally disposed under the twister hook and over which the tie ribbon passes to a sheared end held between a holding projection of the plate and the adjacent holding projection of the arm nose when the arm is moved to one side, the other end of the needle being secured to a horizontally disposed shaft, means for compressing the bag neck into a tubular configuration under the twister hook and forcing the neck against the tensioned length of tie ribbon extending from the ledger plate approach end to the needle roller, means for rotating the needle shaft to move the free end of the needle and its tie-carrying roller up and over the cut-out portion of the ledger plate, the nose having tie-stop portions on either side to contact the tie adjacent its roller; timing means initiated by the passing of each bag open end for rotating the twister hook, rotating the needle shaft, operating the neck compressing means, and after a delay, moving the holder and shear arm from one side to the other for cutting the length of tie around the bag neck and holding the sheared end of the tie for the next cycle of the tying operation; the improvement comprising: the ledge plate having an integral upwardly projecting flange connected to said support flange and which offsets the ledger plate downward to distance for lowering the ledger plate to a level at which its bottom surface is substantially at the level of the upper surface of the twister hook, the holder and shear arm having a flange that offsets the trailing end of the holder and shear arm upward a like distance for connection with its moving means, the bottom surface of the ledger plate having an arcuate relieved portion for clearance above the twister hook, and the approach end of the ledger plate being beveled downward and toward its trailing end for deflection of an accidentally bent twister hook.

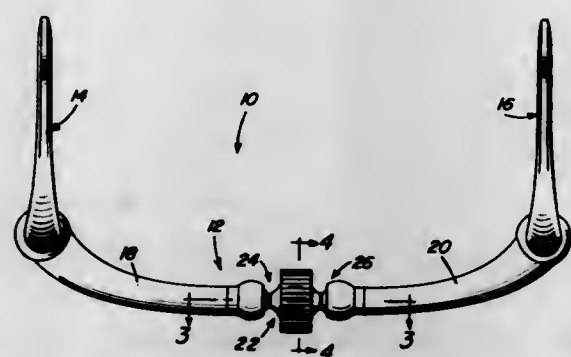
4,005,564 BRIDLE BIT

Donald L. Simington, P.O. Box 401, Calabasas, Calif. 91302
Filed May 27, 1975, Ser. No. 581,418

Int. Cl.² B68B 1/06

U.S. Cl. 54-8

4 Claims



1. In a bit for horses which includes an elongated mouthpiece provided at opposite ends with respective attachment means for attaching a bridle to the bit, the improvement wherein the mouthpiece comprises, in combination:

- a. a pair of longitudinally extending, substantially rigid arms, each of the arms being connected to a respective one of the attachment means;
- b. a center coupling member disposed between and connected to the arms; and
- c. the mouthpiece further including separate, spaced joint means for connecting the center coupling member to each of the arms for universal movement between the coupling member and the respective arms, each of the joint means including a ball and socket joint means permanently attached integral with the coupling member and detachably connected to the associated one of the arms, each ball and socket means joint including a ball integral with the coupling member and a socket means mating with the ball and forming a universal joint therewith, and the coupling member including a substantially cylindrical surface disposed between, and rigidly connected to, the balls of the joint means, and a roller rotatably and slidably arranged on the cylindrical surface, the roller cooperating with the joint means to provide a smooth action and freedom of movement that will permit the bit to function as a pacifier and eliminate such behavior as tongue protruding, teeth grinding, and lip smacking by an associated animal due to extreme nervousness of the animal.

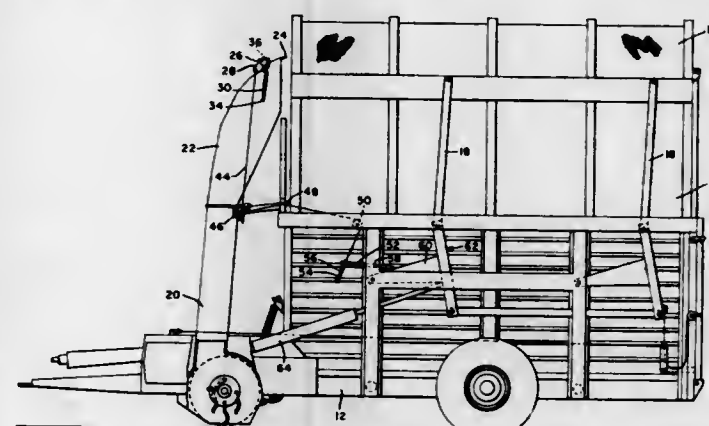
4,005,565 STACK WAGON

Terry Lee Lowe, Ankeny, and Glenn Dale Head, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.
Continuation of Ser. No. 473,746, May 28, 1974, abandoned.
This application Aug. 15, 1975, Ser. No. 605,142

Int. Cl.² A01D 87/00

U.S. Cl. 56-344

11 Claims



1. In a crop harvesting machine having a mobile frame, a crop-receiving body on the frame, a crop pickup and delivery means carried on the frame independent of the body for picking crop material up and delivering same to the body, said body having a crop compressor roof movable between raised and lowered positions to compress crop material contained in the body, and lift means for effecting vertical movement of the compressor roof, the improvement comprising: a deflector movably carried by the crop delivery means; interconnecting means between the compressor roof lift means and deflector for causing the deflector to respond to the vertical movement of the compressor roof and control the inclination of the crop stream issuing from the delivery means; and biasing means acting with said interconnecting means to move the deflector towards the limits of its movement.

4,005,566 PROCESS AND APPARATUS FOR IMPORTING COHERENCE TO TOW

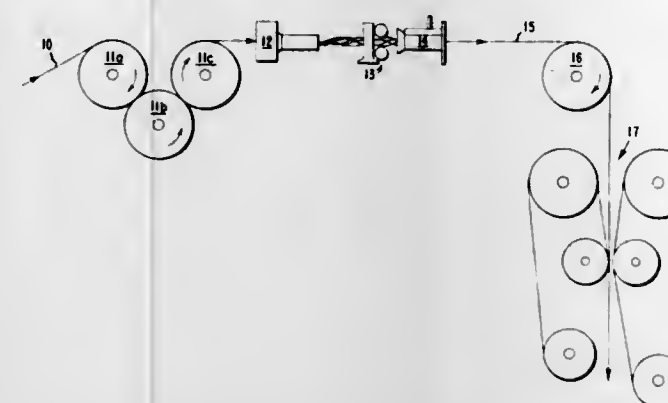
William Edward Hawkins, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 749,245, July 16, 1968, abandoned, which is a continuation of Ser. No. 669,634, Aug. 9, 1967, abandoned, which is a continuation-in-part of Ser. No. 524,750, Feb. 3, 1966, abandoned. This application Mar. 3, 1969, Ser. No. 814,492

Int. Cl.² D02J 1/04, 1/08

U.S. Cl. 57-34 B

16 Claims



1. In the process of combining a large number of filaments into a tow for subsequent processing, the improvement for imparting coherence to the tow which comprises feeding the filaments as a bundle through a fluid zone, jetting into the fluid zone a plurality of high velocity fluid streams which include streams angled to exert a braking action on the forward travel of the bundle while maintaining the bundle open and streams directed tangentially against the traveling bundle for providing a torquing vortical whirling motion to the filaments to inter-tangle the filaments into a coherent tow, and withdrawing the tow from the fluid zone through a belt piddler to provide a tow having good interfilament cohesion.

14. Apparatus for treating a large bundle of filaments to form a coherent tow which comprises feed means for supplying a tow bundle of filaments at uniform speed, a first jet device for pulling the bundle from said feed means and for opening the bundle, an internal axial passage through said device for the bundle, a nozzle for jetting fluid into said passage in a spiralling path and directed to forward the bundle with a torquing action, a second jet device for maintaining the bundle open and intertangling the filaments to form a coherent tow, a treating chamber in said second device for the bundle, a fluid duct into said chamber for directing fluid against the direction of bundle movement to provide a turbulent braking action on the bundle, other fluid ducts into said chamber for directing fluid in a generally tangential direction to the path of the bundle to impart a vortical whirling motion in the same direction as the spiralling path of fluid in said first jet device, guiding means between said jet devices for confining lateral motion of the bundle during passage from the first jet device to the second jet device and for preventing interference by exhaust fluid from the jet devices, and takeup means comprising a belt piddler for withdrawing the bundle at uniform speed from the second jet device to provide a coherent tow of essentially straight configuration.

4,005,567 DEVICE FOR SECURING THE TAIL END OF YARN BOBBINS

Giuseppe Mariani, Milan, Italy, assignor to Snia Viscosa Societa Nazionale Applicazioni Viscosa S.p.A., Milan, Italy
Filed Oct. 16, 1975, Ser. No. 623,004

Claims priority, application Italy, Oct. 25, 1974, 28791/74
Int. Cl.² D01H 1/38

U.S. Cl. 57-34 TT

7 Claims

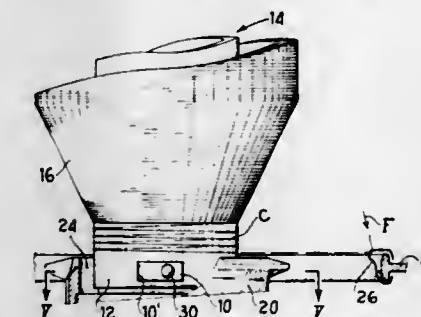
1. In a thread or yarn winding system of the type including

a rotating bobbin tube onto which thread or yarn is wound to form a thread or yarn cop, wherein after formation of the cop said tube and cop are withdrawn from a spindle to form a thread or yarn transfer tail, and means for grasping and retaining said transfer tail; the improvement wherein said grasping and retaining means comprises:

at least one flexible plate-shaped member attached to the outer surface of said tube adjacent one end thereof and extending substantially circumferentially thereof, said plate-shaped member having a first portion secured to said outer surface of said tube, said plate-shaped member having at least one circumferentially endwise second portion free of attachment to said outer surface of said tube;

a thermoplastic coating covering at least that portion of said outer surface of said tube to which said first portion of said plate-shaped member is attached;

thermoplastic attachment means melted into and secured to said thermoplastic coating for attaching said first portion



of said plate-shaped member to said outer surface of said tube;

said plate-shaped member having a flexibility such that upon rotation of said tube said second portion of said plate-shaped member bends and separates from said outer surface of said tube due to centrifugal force, whereby said transfer tail may be engaged between said second portion of said plate-shaped member and said outer surface of said tube; and

a cup-shaped element having a cavity into which said one end of said tube and said plate-shaped member extend during the formation of said cop, said cavity being defined by an inner surface spaced from said outer surface of said tube by a distance to form means for limiting the amount of separation of said second portion of said plate-shaped member from said outer surface of said tube and for preventing said second portion from bending circumferentially backwardly over said first portion of said plate-shaped member.

4,005,568 SELF-CLEANING OPEN-END YARN SPINNING APPARATUS

Craig L. Folk, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 18, 1975, Ser. No. 633,066

Int. Cl.² D01H 1/00, 1/12

U.S. Cl. 57-56

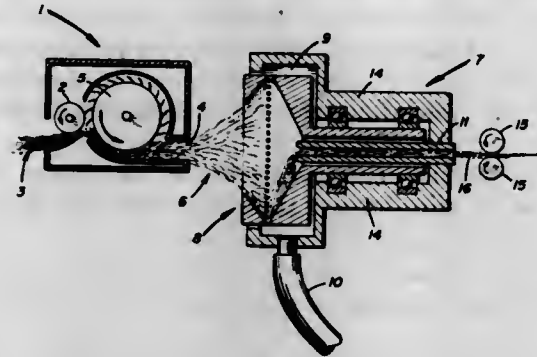
4 Claims

1. An apparatus for the removal of dust, dirt, and foreign material from fiber feedstock and the production of a better quality and more efficient yarn comprising in combination:

a. a cylindrical forward or first section horizontally positioned, said cylinder diameter several times greater than its length, said first section also critically designed with a hollow V-groove center to receive, gather, and spin fiber feedstock into yarn, said critically designed hollow center described as follows:

1. a wide entrance opening to allow for efficient gathering of fiber feedstock said entrance opening hollowed back at an angle to the periphery of the outer cylinder wall leaving only a thin outer wall in the vertex of the V-

groove, said vertex of said V-groove defined by passing an imaginary vertical plane through the vertexes formed in the cross-sectional view of the said open end spinner thus forming complementary angles with 37° on the entrance opening side of said vertical plane and 14° on the exit opening side, and said thin wall perforated in equal spaces with holes around the entire circumfer-



ence in the vertex at the base of the V-groove forming a plurality of equally sized, equally spaced holes and said hollow center leading into a narrow exit opening which then leads into

- b. a second or aft section, said second/aft section comprising a hollow tube affixed to the exit of the said first section, said second section also being positioned in the horizontal.

4,005,569

TEXTURED YARN

Claude Corbiere, Villa "Ce Regal," Route de Saint-Alban, Riorges, Loire (42), France

Division of Ser. No. 241,166, April 5, 1972, abandoned. This application Oct. 2, 1974, Ser. No. 511,373

Int. Cl. D02G 3/24, 1/00

U.S. Cl. 57-140 J

16 Claims



1. A textured yarn composed of continuous filaments and having a crimp with equally spaced marked cusps, the molecular structure of said continuous filaments in said cusps being different from the molecular structure of the portions of said continuous filaments between consecutive cusps, and additional deformations on said filaments, wherein said additional deformations occur between said cusps.

4,005,570

LEAF-TYPE DIGITAL CLOCK

Kazuo Miyamoto, Showa; Hideo Koide, Urawa, and Isao Suzuki, Noda, all of Japan, assignors to Rhythm Watch Company, Limited, Japan

Filed July 8, 1975, Ser. No. 593,971

Claims priority, application Japan, July 9, 1974, 49-77827

Int. Cl. G04C 21/16; G04B 19/02

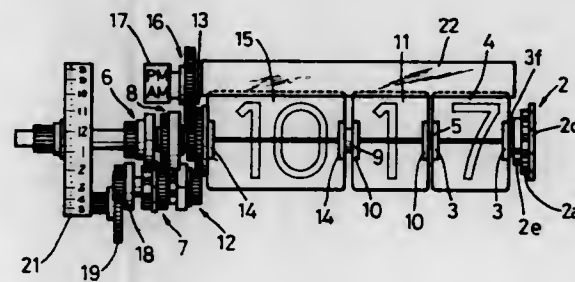
U.S. Cl. 58-16 D

4 Claims

1. In a leaf-type digital clock in which hour indicating, 10-minute indicating and 1-minute indicating leaves are hinged on the horizontally oriented frames and shown in the front windows of the clock, providing that m, n and p are all positive integers, a combination of the following A-14 J:

- A. the 2nd wheel (time) (1) connected with a synchronous motor and having the Geneva-gear part (1a),
B. a 1-minute wheel (2) mounted loosely on the shaft (5)

- and having the Geneva-gear part 2a which engages intermittently with said Geneva-gear part (1a),
C. a 1-minute median wheel (6) secured to the shaft (5) and having the Geneva-gear part (6a),
D. a 10-minute median wheel (7) consisting of the Geneva-gear part (7a) which engages intermittently with said Geneva-gear part (6a) and the gear part (7d),
E. a 10-minute wheel (8) secured to the shaft (9) in which the shaft (5) is telescoped, and consisting of the Geneva-gear part (8a) and the gear part (8d) which meshes with said gear part (7d),
F. a hour median wheel (12) consisting of the Geneva-gear part (12a) which engages intermittently with said Geneva-gear part (8a), and the gear part (12d),
G. an hour wheel (13) mounted loosely on the shaft (9) and



having the gear part (13d) which meshes with said gear part (12d),

- H. 1-minute unit frames (3, 3) of one body secured to said shaft (5) but connected with said one-minute wheel 2 through ratchet mechanism, and carrying (10m) sheets of one-minute indicating leaves (4, 4), ... on their peripheries, said ratchet mechanism being so composed as the points of jumper springs (2e, 2e), ... which are anchored on the wheel (2) are engaged with corresponding teeth of the ratchet gear (3f) which is anchored on the frame (3),
I. 10-minute unit frames (10, 10) of one body secured to said shaft (9) and carrying 6n sheets of 10-minute indicating leaves (11, 11), ... on their peripheries,
J. hour unit frames (14, 14) of one body secured to said hour wheel (13) and carrying 12p sheets of hour indicating leaves (15, 15) ... on their peripheries.

4,005,571

ELAPSED TIME REMINDER WITH CONVERSION OF CALENDAR DAYS INTO ELAPSED TIME

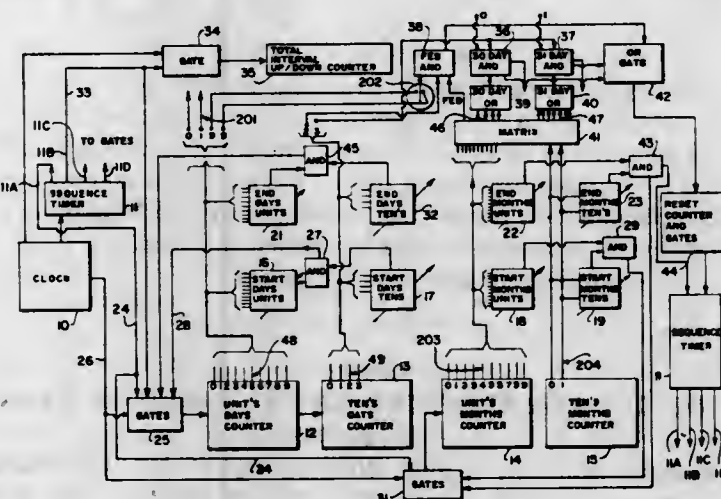
Emanuel Wolff, 1241 Welsh Road, Huntington Valley, Pa. 19006

Filed Nov. 6, 1975, Ser. No. 629,511

Int. Cl. G04F 8/00

U.S. Cl. 58-39.5

11 Claims



1. An electronic reminder comprising:
first means for manually entering the present time,
second means for manually entering a selected future time desired,

electronic means for obtaining the elapsed time interval between the present and selected future time,
an electronic timer associated with said electronic means for counting the elapsed time between the present and selected future times as it expires,
and indicator means responsive to said electronic means and timer means for signaling the completion of said elapsed time.

4,005,572

GAS TURBINE ENGINE CONTROL SYSTEM

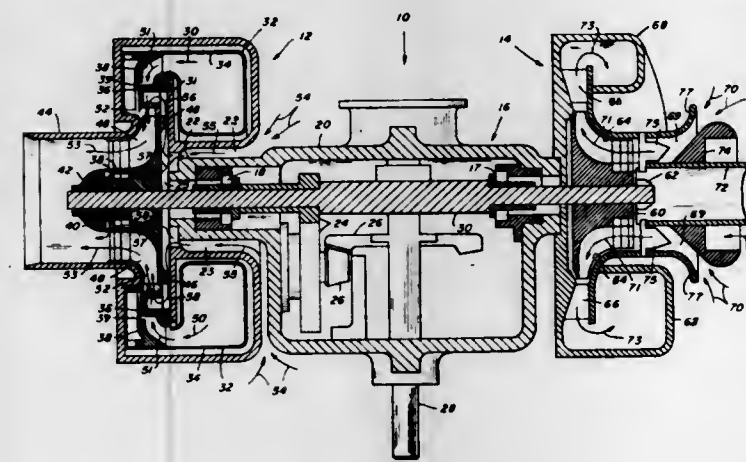
William A. Giffhorn, 1101 McKinley Blvd., Miami, Okla. 74354

Filed Apr. 18, 1975, Ser. No. 569,579

Int. Cl. F02C 9/04

U.S. Cl. 60-39.28 R

15 Claims



1. A gas turbine engine, comprising:
a. a rotary air compressor, having a stator with an air inlet, a substantially circular outlet air duct, and a compressor rotor said compressor including an axial air inlet for said compressor comprising the annular space between an inner cylinder, coaxial with said rotor shaft, and an outer flared coaxial cylindrical wall, and including means to adjustably partially close off said annular opening;
a variable angle pre-whirl vanes in the inlet of said compressor;
b. a gas turbine having a stator with a substantially circular hot gas inlet duct, a gas outlet and a turbine rotor and means to control the cross-section for flow of hot gases to said turbine rotor;
c. a housing having a rotor shaft journaled in said housing, said compressor rotor mounted on a first end of said rotor shaft, and said turbine rotor mounted on the second end of said rotor shaft;
d. substantially cylindrical combustion chamber means connecting the end of said compressor outlet air duct to the inlet end of said turbine hot gas inlet duct;
e. a tubular extension of said housing in which is positioned the support bearing for said second end of said rotor shaft on which said turbine rotor is mounted;
f. said circular hot gas inlet duct for supplying hot gas to the turbine inlet nozzles surrounding said tubular extension with an annular clearance therebetween; and
g. auxiliary blade means on the back surface of said turbine rotor to draw cool outside air axially through said annular clearance, and radially along the back surface of said turbine rotor, and into said turbine nozzle along with said hot gases from said hot gas inlet duct;
whereby said tubular extension, the turbine nozzle and said turbine rotor are cooled by said cool air flow.

4,005,573

RECUPERATIVE MOUNTING

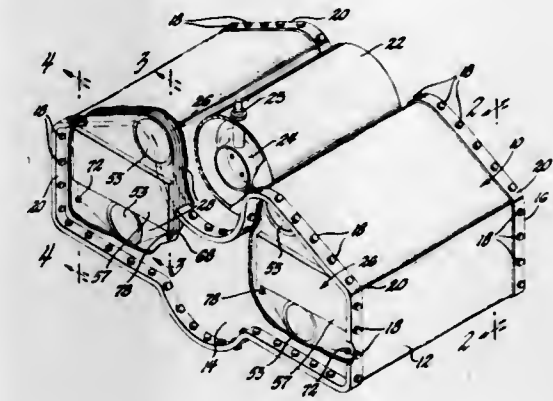
Charles H. Smale, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1975, Ser. No. 618,450

Int. Cl. F02C 7/10

U.S. Cl. 60-39.32

2 Claims



1. In a recuperative turbine engine, a mounting arrangement for a heat exchanger of the type having an elongated core extending between relatively stationary walls of the turbine and with lateral flanges extending from either side of the core to engage mounting components comprising:
rod supports on either side of said core extending normal to the opposite turbine walls with the ends spaced relative to the adjacent walls to permit axial expansion thereof without engagement with the walls;
tubular rings loosely encircling the end portions of one of said rod supports being fastened at one end to the turbine walls for supporting the rod and core and to permit rotation of the rod;
linking means with a bore in one end for loosely engaging the end portions of the second rod support and having an opening in the other end;
pin means fastened to the turbine walls and extending into loose engagement into the openings of the linking means to support said second rod support and the core and also to permit pivotal movement of the core about the axis of the first rod support.

4,005,574

REVERSE PITCH FAN WITH DIVIDED SPLITTER

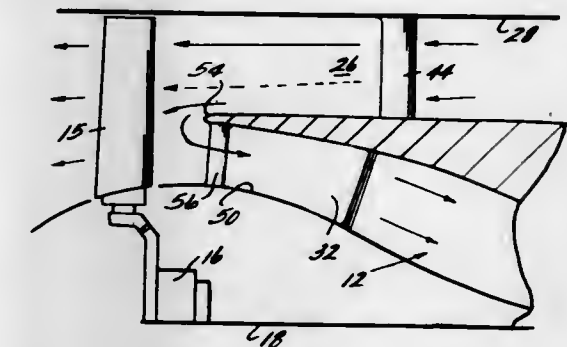
Leroy H. Smith, Jr., Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 21, 1975, Ser. No. 569,925

Int. Cl. F02K 3/06

U.S. Cl. 60-226 A

7 Claims



1. A gas turbfan engine including:
a core engine;
a substantially annular fan duct having an inner wall and an outer wall;
a variable pitch fan disposed in said fan duct and adapted to pressurize a motive fluid in a forward thrust mode and a reverse thrust mode;

flow splitter means disposed within said fan duct and adapted to partially define a core engine duct, for receiving a core flow portion of said motive fluid, and a surrounding bypass duct;
 means disposed within said fan duct axially forward of said flow splitter means to define a circumferentially disposed opening therebetween;
 outer vane means disposed within said bypass duct; and inner vane means disposed forward of said opening to effect swirl angle reduction of said core flow portion in the forward thrust mode prior to entering said core duct, but not substantially in the reverse thrust mode.

4,005,575

DIFFERENTIALLY GEARED REVERSIBLE FAN FOR DUCTED FAN GAS TURBINE ENGINES

Alexander Scott, and Peter Eric Peck, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, England

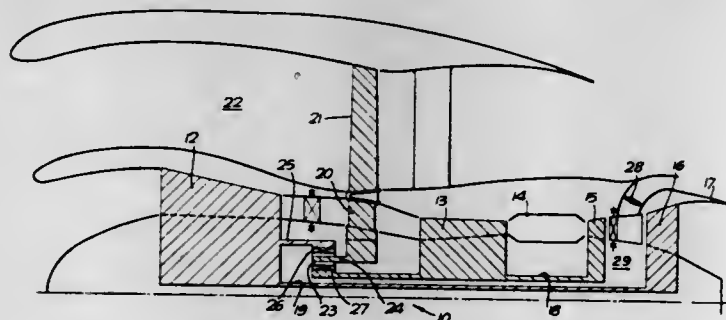
Filed Sept. 3, 1975, Ser. No. 609,931

Claims priority, application United Kingdom, Sept. 11, 1974, 39694/74

Int. Cl.² F02K 3/04; F02C 3/06

U.S. Cl. 60—226 R

8 Claims



1. A ducted fan gas turbine engine comprising a fan, two shafts, a turbine drivingly connected to each shaft for driving the shafts in opposite rotational directions, and a gear mechanism, wherein the two shafts are connected with the gear mechanism, the output of the gear mechanism being connected to drive the fan, the gears of the gear mechanism being arranged so that a given change of the relative speeds of rotation of the two shafts causes a reversal of the direction of rotation of said output, and means for varying the relative speeds of rotation of the shafts for achieving said given change of relative speeds of rotation thereof.

4,005,576

INTERNAL COMBUSTION ENGINE EXHAUST MANIFOLD WITH CYLINDRICAL BUILT-IN CATALYST CONTAINER

Hidetaka Nohira; Hironori Bamba, and Yasuyuki Sakai, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

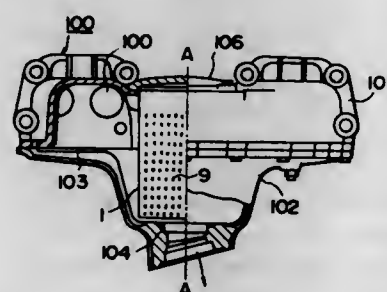
Filed Apr. 18, 1975, Ser. No. 569,558

Claims priority, application Japan, Jan. 20, 1975, 50-8976

Int. Cl.² F01N 3/15

U.S. Cl. 60—302

1 Claim



1. An internal combustion engine exhaust manifold having a

built-in catalyst container of a cylindrical shape, wherein said exhaust manifold comprises:

upper and lower casings,

a heat shielding liner of heat resistant material provided inwardly of and spaced from said upper and lower casings, and

an air injection port provided within said exhaust manifold at a position adjacent a cylindrical catalyst container for injecting secondary air thereto during operation of an engine, said secondary air being fed from a secondary air pump which is separately mounted on said engine, said cylindrical catalyst container being filled with a catalyst suitable for cleaning the engine exhaust, and comprising concentric inner and outer cylinders having a radius differential of 20 to 30 mm., and

annular lids fitting at opposite ends of said inner and outer cylinders to define therebetween an annular volume filled with said catalyst,

said inner and outer cylinders having an upper wall portion with no perforations over a predetermined distance from the upper ends thereof and a lower wall portion containing multiple perforations which extend contiguously from said upper wall portion down to the lower ends of the cylinders such that the engine exhaust gas is introduced into said annular volume through perforations in said outer cylinder to undergo the cleaning reactions and then is discharged to the outlet of said exhaust manifold through the perforations in the inner cylinder of said cylindrical catalyst container,

the cylindrical catalyst container being replaceably mounted through said heat shielding liner and having in the upper portion thereof a cover member to be fitted in said upper casing and a lower portion disposed in alignment with the outlet of said exhaust manifold.

4,005,577

VEHICLE DRIVE UNIT UTILIZING HYDRAULIC PUMP AND MOTOR

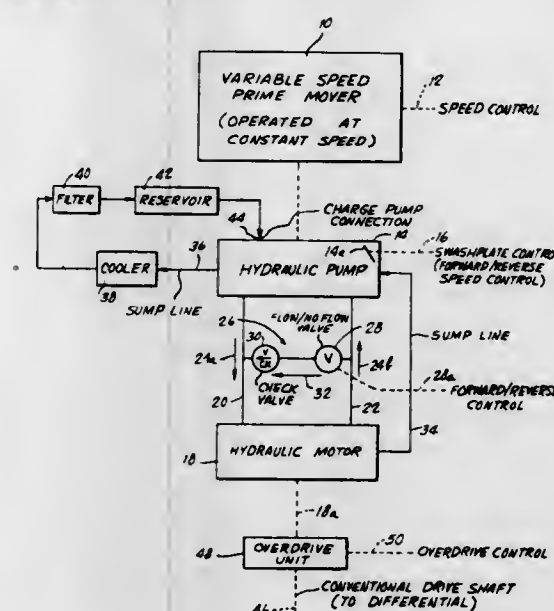
Robert Haumaier, Mahopac, N.Y., assignor to Haumaier Automotive Energy Saver, Inc., Bedford Hills, N.Y.

Filed Dec. 30, 1975, Ser. No. 645,441

Int. Cl.² F16H 39/46

U.S. Cl. 60—431

3 Claims



1. An hydraulic drive system to power a drive shaft of a vehicle to be driven over a wide range of speeds, comprising an engine controlled to operate at a substantially constant speed during vehicle operation, engine speed control means for varying that speed of operation of said engine dependent upon a desired sub-range of operation within said wide range, an hydraulic pump powered by the engine and providing a maximum fluid output flow depending upon said engine speed and including pump flow control means for varying the flow of

fluid output from the pump, an hydraulic motor receiving fluid output from the pump and driven thereby, and means coupling the hydraulic motor to the drive shaft of the vehicle to power that drive shaft which is driven over said sub-range of operation corresponding to the speed at which said engine operates.

4,005,578

METHOD AND APPARATUS FOR TURBOCHARGER CONTROL

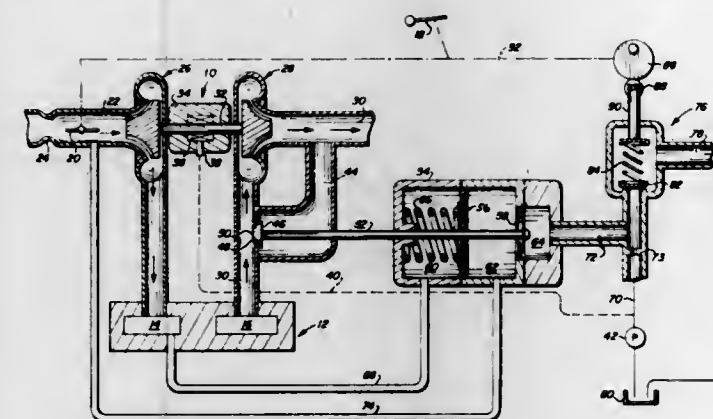
Charles E. McInerney, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 31, 1975, Ser. No. 564,005

Int. Cl.² F02D 23/00; F02B 33/44

U.S. Cl. 60—602

20 Claims



1. In combination with an internal combustion engine having an intake manifold, a turbocharger driven by flow of exhaust gases from said engine, and a throttle positionable to vary power developed by the engine, apparatus for controlling intake manifold pressure comprising:

a member exposed to said exhaust gas flow and movable to regulate exhaust gas flow through said turbocharger to vary said intake manifold pressure;

first sensing means for sensing said intake manifold pressure;

means responsive to said first sensing means and operably associated with said member for exerting a pneumatic force thereon in relation to intake manifold pressure, said pneumatic force urging said member to move in a direction decreasing intake manifold pressure;

second sensing means for sensing said throttle position; a source of pressurized hydraulic fluid; and

means responsive to said second sensing means and operably associated with said source of fluid and said member for exerting a hydraulic force thereon in relation to throttle position, said hydraulic force opposing said pneumatic force and urging said member to move in an opposite direction increasing intake manifold pressure whereby said member moves substantially in response to the difference between said hydraulic and pneumatic forces to regulate said intake manifold pressure in relation to said throttle position.

4,005,579

TURBOCHARGER CONTROL AND METHOD

Richard J. Lloyd, Huntington Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 31, 1975, Ser. No. 563,864

Int. Cl.² F02D 23/00

U.S. Cl. 60—602

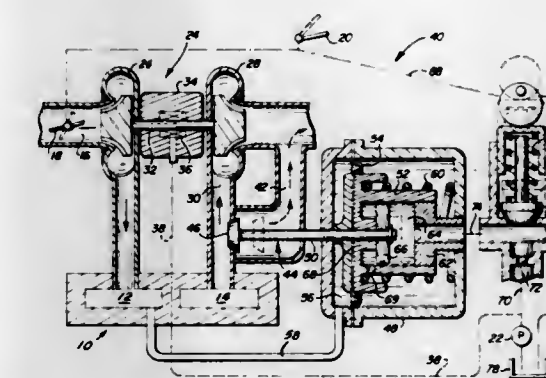
18 Claims

1. In combination with a turbocharger, an internal combustion engine having an intake manifold, an exhaust manifold, and a throttle positionable to vary power developed by the engine, said turbocharger comprising:

a turbine operably associated with said exhaust manifold to be driven by exhaust gas flow from the engine; a compressor driven by said turbine and operably associated

with said intake manifold to deliver gas flow thereto at a pressure which varies with the speed of said compressor; a member exposed to said exhaust gas flow and movable toward an open position diverting exhaust gas flow from said turbine to reduce turbine speed and pressure developed in said exhaust manifold, said exhaust manifold pressure exerting a first force on said member urging the latter toward an open position;

means operably associated with said throttle and said member for exerting a second force on said member in relation to said throttle position, said second force opposing said first force to urge said member toward a closed position to increase turbine speed;



an element engageable with said member; means operably associated with said intake manifold and said element for exerting a third force on said element in relation to the pressure in said intake manifold, said third force urging said element into engagement with said member to move the latter toward said open position; and biasing means engaging said element to exert a biasing force on said element opposing said third force without acting upon said member, whereby said first force must overcome only said second force to move said member to said open position.

4,005,580

SEAL SYSTEM AND METHOD

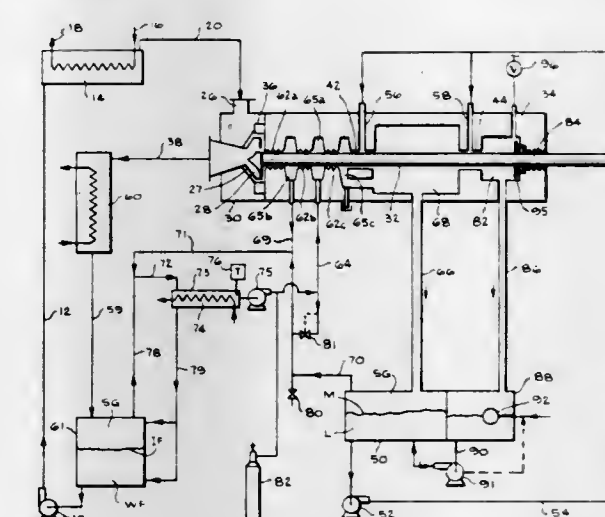
Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed June 12, 1975, Ser. No. 586,491

Int. Cl.² F01K 25/18, 25/22

U.S. Cl. 60—657

17 Claims



1. In a system including a working chamber closed to the exterior except for a working fluid inlet and outlet and a shaft passing through an opening in a wall of the chamber, said chamber containing a captive working fluid subject to being evaporated and condensed under pressures and temperatures within predetermined ranges to be employed in the system during operation, and a seal means for preventing escape of said working fluid from said chamber along said shaft, said

seal means comprising a lubricant type bearing seal spaced from said chamber with means for injecting lubricant into said bearing seal intermediate its extremities and under pressure greater than the working pressure within said chamber so that part of the lubricant injected will flow in said bearing seal toward said chamber, means for trapping lubricant flowing from said bearing seal toward said chamber before it reaches said chamber, a labyrinth type seal between said chamber and said trapping means, means for injecting a seal fluid into said labyrinth type seal with a portion of the labyrinth seal between the chamber and the point of such injection, and at a pressure great enough to cause the seal fluid to flow toward said chamber and thereby prevent escape of working fluid through said labyrinth type seal means to the point of injection of seal fluid, and cause part of the seal fluid to flow toward and into said trapping means and thereby prevent the flow of lubricant toward said chamber through said labyrinth seal, the improvement which comprises a separator in communication with said trapping means for receiving and separating from one another a mixture of said lubricant and seal fluid so received, condenser means connected to receive such seal fluid as flows through said labyrinth type seal toward said chamber, and for cooling said mixture to condense and separate working fluid from the seal fluid, said means for injecting seal fluid being connected to draw seal fluid from the seal fluid from said separator and condenser means.

4,005,581

METHOD AND APPARATUS FOR CONTROLLING A STEAM TURBINE

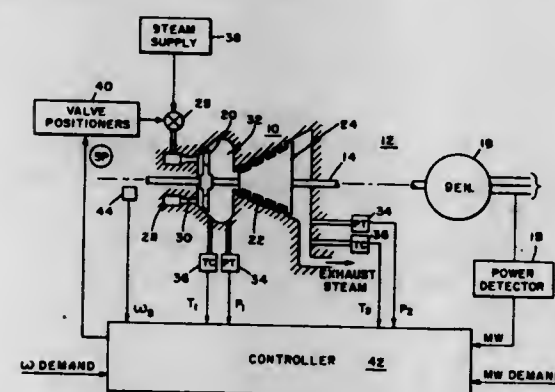
Ola J. Aanstad, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 24, 1975, Ser. No. 543,852

Int. Cl.² F01K 13/02

U.S. Cl. 60-660

59 Claims



1. An improved steam turbine system comprising: a steam turbine in which steam expands as it imparts torque to the turbine shaft; means for generating a representation of the drop in steam enthalpy resulting from the expansion of steam in the turbine; and means for controlling the operation of said turbine as a function of said steam enthalpy drop representation, whereby the turbine is controlled as a function of the actual steam conditions in the turbine.

4,005,582

METHOD OF CONSTRUCTING UNDERGROUND CONCRETE WALLS AND REINFORCEMENT CAGE THEREFOR

George John Tamare, Leonia, N.J., assignor to ICOS Corporation of America, New York, N.Y.

Filed Aug. 12, 1975, Ser. No. 603,982

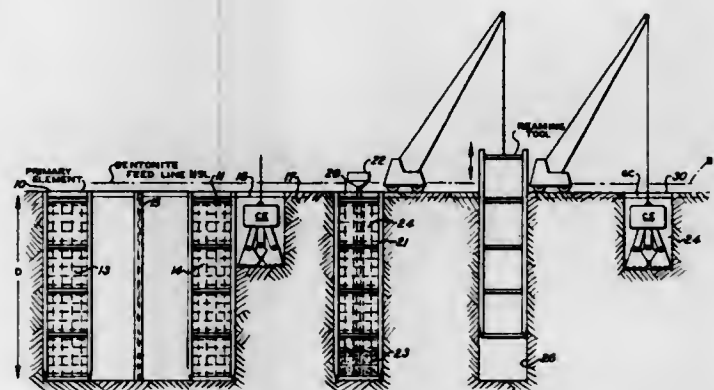
Int. Cl.² E02D 5/10, 27/00

U.S. Cl. 61-35

14 Claims

1. A method for the construction of a waterproof wall formed by interlocked horizontally elongated vertical con-

crete elements in the ground using as reinforcement connected flanged steel H-beam pairs comprising the steps of: excavating at least a pair of elongated primary trench sections said primary sections being spaced apart at least a multiple of the length of each said primary section, each elongated primary trench excavation being carried out in the presence of a thixotropic liquid slurry, reaming and smoothing the walls of at least one of said elongated primary trench excavations by lowering and raising a connected beam pair to thereby square off the ends and even out said walls, inserting one connected flanged steel H-beam pair in each elongated primary trench section, filling each said elongated primary trench section with concrete from the bottom up to form said primary wall panel sections,



and then excavating, in the presence of said thixotropic liquid slurry, the intermediate earth section between said pair of primary sections in at least two excavations, one of said two excavations using the flanged steel H-beam end in one of said intermediate earth sections as a guide with the opposite end of said one of said two excavations being unguided and at least another of said at least two excavations using the flanged steel H-beam end of the other of said at least two primary elements as a guide to thereby form a secondary wall excavation extending between said flanged steel H-beam ends, and displacing the thixotropic liquid from said secondary wall excavation by filling said secondary wall excavation from the bottom up with concrete to form a secondary wall panel section in the space between the two primary wall panel sections.

4,005,583

COMBINATION HEAT PUMP AND LOW TEMPERATURE SOLAR HEAT COLLECTOR

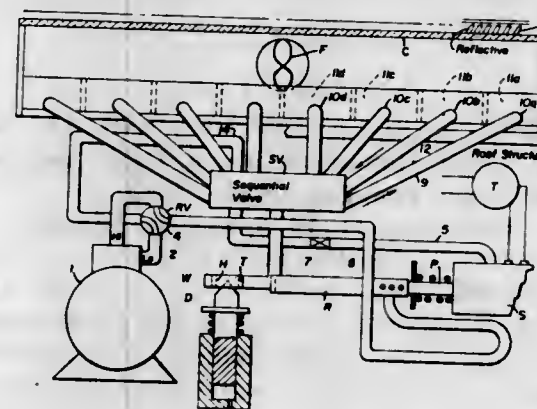
Harry Borders Ramey, Rte. 5, Box 272, Berea, Ky. 40403

Filed Dec. 5, 1974, Ser. No. 529,995

Int. Cl.² F25B 27/00; F24J 3/02

U.S. Cl. 62-2

9 Claims



1. A heat transfer means including a heat pump comprising a compressor having high and low pressure lines containing a

refrigerant, a heat exchange device, said heat exchange device having means forming separate compartments therein, a distinct mass of material in each of said compartments, heat transfer ducts disposed in heat exchange relation with said mass of material in each of said compartments, said heat transfer means including circulation means to conduct said refrigerant from said compressor through said lines and into said heat transfer ducts in heat exchange relation with said distinct masses in said heat exchange device, said circulation means including a second means to sequentially direct the refrigerant into only one of the heat transfer ducts while the other ducts are disconnected from said circulation means, and means to expose said compartments to the open sky including the portion of the sky encompassing the apparent path of the sun, thereby tending to restore the original level of heat energy to said disconnected portions.

4,005,584

COMPOSITION, METHOD AND APPARATUS FOR ABSORPTION HEATING

Chien C. Li, Williamsville, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

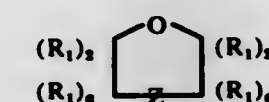
Filed Apr. 10, 1975, Ser. No. 567,043

Int. Cl.² F25B 15/00

U.S. Cl. 62-112

14 Claims

1. The method of absorption heating which comprises: a. releasing heat of solution in the vicinity of an area to be heated by absorbing a compound selected from the group consisting of dichloromonofluoromethane, monochlorodifluoromethane, trifluoromethane and monochloromonofluoromethane in an asymmetrical furan ring containing compound having a boiling point between about 140° and 250° C. and the generic formula



- wherein R₁ is independently at each occurrence H; lower alkyl; lower alkoxy; phenyl; lower alkylene phenyl; hydroxy containing lower alkyl; lower alkyl carboxy; alkoxy alkyl of from 2 through 6 carbon atoms; lower alkylene carboxylate of from 2 through 6 carbon atoms; fluorine or chlorine, a is independently at each occurrence an integer of 1 or 2; and Z is a single or double bond; provided that, when Z is a single bond, a is 2, when Z is a double bond, a is 1, and provided that the compound contains at least one R₁ group having an oxygen atom which has a single bond to a carbon atom,
- b. heating the resulting solution to release said fluorocarbon from said solvent,
 - c. condensing released fluorocarbon to form liquid fluorocarbon,
 - d. evaporating the liquid fluorocarbon at a location removed from the vicinity of the area to be heated, and
 - e. returning the evaporated fluorocarbon to the vicinity of the area to be heated for reabsorption into said solvent.

4,005,585

CONTROL ARRANGEMENT FAIL-SAFE TIMING CIRCUIT

Russell B. Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Division of Ser. No. 447,165, March 1, 1974, Pat. No. 3,970,864. This application June 9, 1975, Ser. No. 585,237

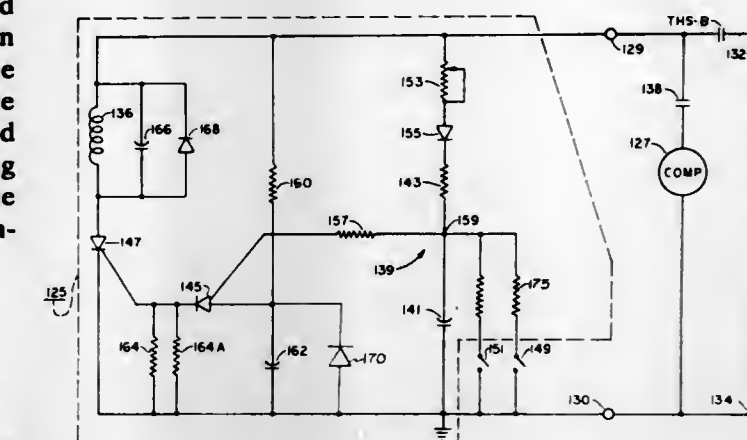
Int. Cl.² F25B 31/00; G05D 23/32

U.S. Cl. 62-158

7 Claims

1. In an air conditioning control arrangement for activating an air conditioning system, a fail-safe timing circuit energizable in response to a request signal to initiate the operation of a compressor for the air conditioning system, said fail-safe

timing circuit comprising first switching means operable when enabled to activate the compressor to commence its operation tentatively second switching means, first timing means responsive to said request signal for controlling said second switching means to enable said first switching means, second timing means responsive to said request signal for generating a time-



out signal after a predetermined time delay interval for inhibiting said first timing means whereby said first and second switching means are disabled to de-activate the compressor, and circuit means responsive to the oil pressure of the compressor becoming a predetermined value for preventing said second timing means from generating its time-out signal.

4,005,586

REFRIGERATED BUTTER DISH

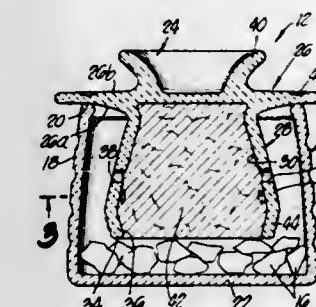
Arthur Lyons, 646 Morongo Road, Palm Springs, Calif. 92262

Filed Mar. 11, 1976, Ser. No. 665,909

Int. Cl.² F25D 3/08, 3/10

U.S. Cl. 62-372

7 Claims



1. A refrigerated butter dispenser comprising: a. a first receptacle adapted to contain crushed ice having: 1. side walls terminating in an upper rim portion defining an open upper end; and 2. a bottom wall formed integrally with said side walls for closing the lower end of said first receptacle; and b. a cover comprising: 1. a flange portion having first and second sides adapted to engage said upper rim portion of said first receptacle; 2. a skirt extending from said first side of said flange portion defining a second receptacle adapted to be telescopically received within the open upper end of said first receptacle; and 3. a handle extending from said second side of said flange portion for lifting the cover, said handle being receivable within the open upper end of said first receptacle.

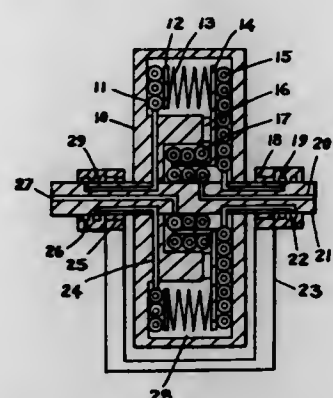
4,005,587

ROTARY HEAT EXCHANGER WITH COOLING AND REGENERATION

Michael Eskell, 7994-41 Locke Lee, Houston, Tex. 77042
Continuation-in-part of Ser. No. 474,729, May 30, 1974, and
a continuation-in-part of Ser. No. 393,571, Aug. 31, 1973, Pat.
No. 3,972,203. This application Oct. 1, 1975, Ser. No. 618,456
Int. Cl.³ F25B 3/00

U.S. Cl. 62-401

6 Claims



1. In a rotary heat exchanger wherein a compressible working fluid is circulated within a rotor outwardly in a first passage and inwardly toward center of rotation in a second passage, with the inward ends and outward ends of said passages connected by passage means to allow the circulation of said working fluid, and wherein a heat delivery heat exchanger is provided to remove heat from the working fluid during and after compression, and a heat source heat exchanger is provided to add heat into the working fluid during and after expansion, the improvement comprising:

a. a regenerative heat exchanger provided to exchange heat between two streams of the working fluid, with the working fluid stream leaving said heat delivery heat exchanger being in heat exchange relationship with the working fluid stream entering said heat delivery heat exchanger and being upstream of said heat delivery heat exchanger, and wherein a cooling means is provided to remove heat from said working fluid downstream of said heat source heat exchanger.

4,005,588

SPRING BRACELET CONSTRUCTION USING SNAP-FITTED WINGS

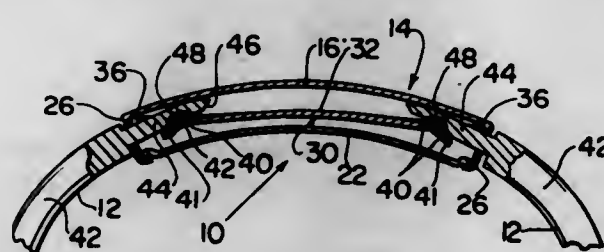
Max Marquardt, West Warwick, R.I., assignor to Marquardt-Hudes, Inc., Providence, R.I.

Filed Feb. 17, 1976, Ser. No. 658,848

Int. Cl.³ A44C 5/12

U.S. Cl. 63-9

10 Claims



1. A bracelet-type construction comprising a pair of wings of a size and shape to engage around a body member and a hollow intermediate connecting head, each of said wings having a tongue extending from one end, said head having an opening at either end thereof for receipt of said tongues, a spring member positioned within said head and having an upwardly biased leaf extension at either end thereof proximate said head openings, said tongues and said leaf extensions cooperatively provided with mutually engageable detent and recess means whereby said tongues and leaf extensions are

snap-fit interengaged each other so as to retain said wings in assembled position with said head and to normally bias said wings towards each other to a relatively closed position at their ends remote from said head, said wings being separately outwardly movable against the force of said spring member to a relatively open position at said remote ends wherein said tongues downwardly depress said leaf extensions.

4,005,589

KNITTING ELEMENTS

Pavel Uhlir, Trebic, Czechoslovakia, assignor to Elitex, Zavody textilního strojírenství generální ředitelství, Liberec, Czechoslovakia

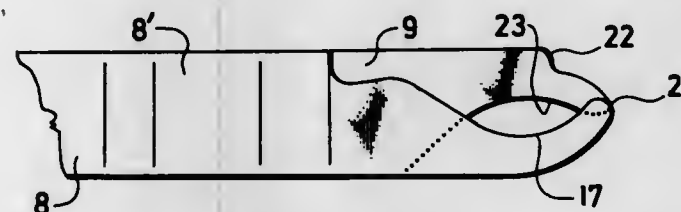
Filed Nov. 27, 1974, Ser. No. 527,649

Claims priority, application Czechoslovakia, Nov. 28, 1973, 8181/73

Int. Cl.³ D04B 35/02, 9/06

U.S. Cl. 66-95

7 Claims



1. In a knitting machine having a vertically grooved cylinder and a horizontally grooved dial, a plurality of needles each reciprocatingly mounted in the grooves of said cylinder, and a plurality of knitting elements each reciprocatingly mounted in the grooves of said dial to cooperate with associated ones of said needles to form knit work loops and to transfer said loops to said needles, said knitting elements comprising a pair of blade-like members arranged along one longitudinal edge in each of the respective grooves of said dial and being movable within said groove with respect to each other, one of said members having an operative end comprising an upwardly directed finger having a forward tip and spaced along the upper edge thereof with indentations thereon forming a front yarn receiving bed and a rear yarn receiving bed which serve to positively support the loops during the transfer operation, the second of said members having an operative end comprising a downwardly directed finger having a forward tip above the level of the surface of the front bed of said one member said second member having an upper edge rising from the tip thereof to the level above the rear bed of said one member and an indentation thereon forming a yarn receiving bed thereat and a lower edge forming with the front bed of said one member a space therebetween for gripping a yarn loop when the forward tips of each member are abreast of each other.

4,005,590

HANK DYEING

Nathan Coah McLean, Shepshed, England, assignor to C.D.B. Europ, Villeneuve d'Ascq., France

Filed Apr. 15, 1975, Ser. No. 568,376

Int. Cl.³ D06B 1/02

U.S. Cl. 68-5 D

6 Claims

1. Dyeing apparatus comprising:

A. yarn conveying means comprising a longitudinally extending endless support having a plurality of longitudinally extending support elements for yarns arranged transversely across the support, the support elements being spaced transversely with respect to the endless support to permit dye liquor to pass between the support elements, and means for guiding and driving the support elements along an endless path;

B. dye liquor application means comprising a plurality of arrays of nozzles for expelling dye liquor under pressure, means for fixedly mounting the nozzles with respect to the longitudinal extent of said endless path and means for adjustably mounting the nozzles heightwise with respect

to said endless path to permit dye liquor to be expelled by the nozzles from a predetermined controllable height towards said endless support; a set of tubes for individually supplying dye liquor to the nozzles in each array, a respective manifold means for supplying liquor to each set of tubes collectively, a respective conduit pipe for supplying dye liquor to each manifold means, a respective pressure control means for controlling dye liquor flow through each conduit pipe a plurality of pumps and a

site sides of the member which move the member at a controlled rate from the head end of the passageway to the tail end thereof.

4,005,592

STRIP AND WIRE STRAIGHTENER ROLL

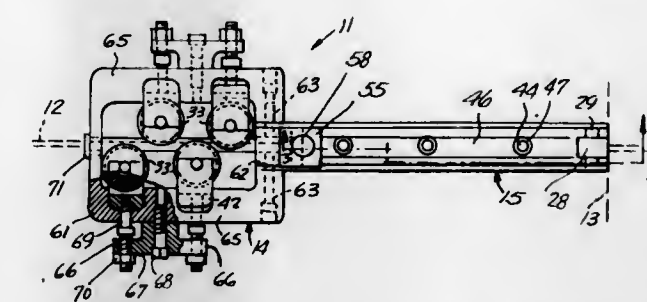
Alfred H. K. Haeussler, 5841 W. 107th St., Chicago Ridge, Ill. 60415

Filed Dec. 12, 1975, Ser. No. 640,394

Int. Cl.³ B21F 1/02

U.S. Cl. 72-165

20 Claims



1. A straightening device for an elongated member comprising a fixed longitudinally elongated bottom support, upstanding post means on said bottom support, a plurality of spaced peripherally grooved bottom vertical rollers journaled transversely in said bottom support, a longitudinally extending block member overlying said bottom support and slidably engaging said upstanding post means, a pressure bar member pivoted to said upstanding post means and overlying said block member, said block member being formed with vertical guide means staggered relative to said bottom rollers, roller-positioning means in said guide means, respective peripherally grooved top vertical rollers rotatably engaged with the bottom ends of the positioning means, means connecting said roller positioning means to said pressure bar member, and means to exert downward force on said pressure bar member.

4,005,591

BALL SIZING MACHINE AND METHOD

John A. Werner, Milwaukee, Wis., assignor to Besser Industries, Inc., Roanoke, Ill.

Filed Feb. 11, 1976, Ser. No. 657,178

Int. Cl.³ B21B 17/06

U.S. Cl. 72-75

16 Claims



1. In a ball sizing machine wherein a ball is forced through a passageway in a workpiece to size the internal diameter of the passageway; the improvement comprising means for inserting said ball into a first end of said passageway, first and second retractable sealing means respectively engageable with said first and second ends of said passageway to seal the opposite ends of said passageway with said ball in said passageway adjacent said first end thereof, fluid pressure supply means, first means for filling said passageway with fluid from said supply means via second sealing means, second means responsive to the filling of said passageway by said first means for conducting fluid from said supply means at a given pressure into said passageway via said first sealing means and for draining fluid from said passageway via said second sealing means at a restricted rate to thereby establish a differential pressure in said passageway on opposite sides of said ball to drive said ball from said first end of said passageway to said second end, and third means responsive to the arrival of said ball at said second end of said passageway for retracting said sealing means from the respective ends of said passageway.

12. An improved method of sizing a passageway in a workpiece by moving a sizing member of substantially the configuration thereof, but of greater size, through it; the improvement comprising creating differential fluid pressure forces on oppo-

4,005,593

BENDING CLAMP

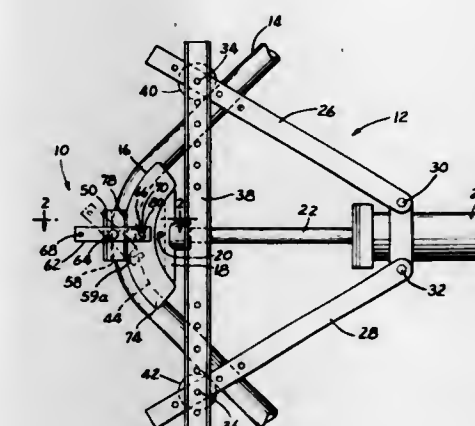
Harold D. Goldberg, Hazelcrest, Ill., assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Aug. 20, 1975, Ser. No. 606,302

Int. Cl.³ B21D 7/04

U.S. Cl. 72-213

7 Claims



1. For use with an apparatus for bending pipe which includes a bending shoe having a curved bending surface for engagement with a pipe during bending of the pipe, said pipe bending apparatus having attaching pin means thereon, clamping means including a clamping block and a pair of attaching arms pivotally to said clamping block and releasably cooperable with said attaching pin means for releasably securing said clamping block to said bending shoe adjacent the apex of said bending surface, said clamping block being adapted to retain a pipe against the apex of said bending surface so as to prevent wrinkling, collapsing or flattening of the pipe adjacent said apex surface during bending of the pipe.

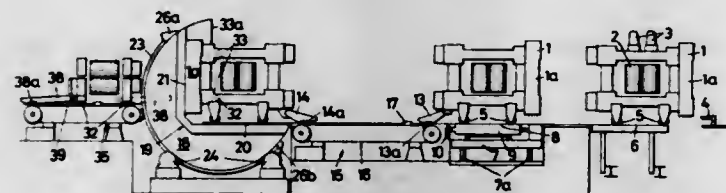
4,005,594

ROLL CHANGING MECHANISM FOR ROLLING MILLS
Erich Reth, Duisburg, and Hans Gockel, Mulheim (Ruhr),
both of Germany, assignors to Demag Aktiengesellschaft,
Duisburg, Germany

Filed Mar. 3, 1976, Ser. No. 663,287
Int. Cl.² B21B 31/08

U.S. Cl. 72-239

8 Claims



1. A roll changing mechanism for a rolling mill having rolls mounted in a roll stand and defining therebetween a pass line extending in a given direction, said mechanism comprising a roll stand changing cart movable in directions parallel to the direction of said pass line, a horizontal turntable on said changing cart having guideways thereon for receiving said roll stand, a swiveling frame adapted to have said roll stand supported therein, said swiveling frame being mounted for rotation in a vertical plane, first conveyor means extending on one side of said swiveling frame between said roll stand changing cart and said swiveling frame for engaging said roll stand and for moving said roll stand from said changing cart into said swiveling frame, said conveyor means including guideways for guiding said roll stand therebetween, and second conveyor means located on the opposite side of said swiveling frame and including guideways, said rolls including insert members enabling said rolls to be removed from said roll stand and to be moved along said guideways of said second conveyor means, said second conveyor means including means for engaging said insert members and for extending and retracting said insert members and said rolls from said roll stand along said guideways of said second conveyor means.

4,005,595

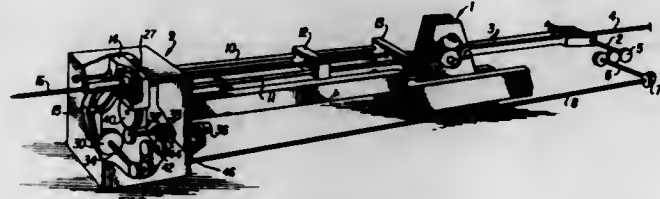
FEEDING WORKPIECE APPARATUS FOR COLD PILGER ROLLING MILLS

Josef Gerretz, Viersen, and Klaus Rehag, Rheydt, both of
Germany, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Sept. 26, 1975, Ser. No. 616,978
Int. Cl.² B21B 17/06, 39/06

U.S. Cl. 72-250

11 Claims



1. A feeding apparatus for advancing a workpiece to a cold pilger rolling mill,
feed spindle means,
a workpiece feed carriage engaged for advance by said feed spindle means,
feed transmission means,
drive means,
means for connecting said feed transmission means to said drive means,
said feed transmission means having two drive lines for said feed spindle means,
a first of said drive lines being connected to gear means secured to said feed spindle means for producing a continuous rotational movement of said feed spindle means,
a second of said drive lines being connected to said feed

spindle means by a lever for producing intermittent axial movement of said feed spindle means,
said feed spindle means comprising two feed spindles arranged on opposite sides of the rolling center of said mill, a longitudinal movable transverse member for connecting said two feed spindles to one another,
axial-radial bearing means for each feed spindle mounted in said feed transmission means, and
said lever arranged operably with said second drive line for acting on said transverse member.

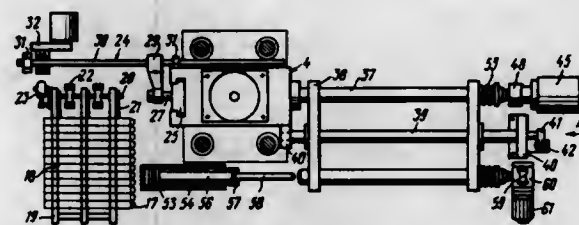
4,005,596

APPARATUS FOR HYDRAULIC PRESSING OF METALS
Viktor Ivanovich Uralsky, Pervomorskaya ulitsa, 82, kv. 71,
and Vadim Leonidovich Kolmagorov, ulitsa Lenina, 101, kv. 6,
both of Sverdlovsk, U.S.S.R.

Filed Apr. 7, 1975, Ser. No. 565,456
Int. Cl.² B21C 33/00, 35/00

U.S. Cl. 72-257

3 Claims



1. An apparatus for hydraulic pressing of metals, comprising a container; a vertical chamber provided in said container for being filled with hydraulic fluid; a horizontal chamber in said container communicating with said vertical chamber and having inlet and outlet holes axially aligned relative to each other; a plunger slidably arranged in said vertical chamber; lock means for repeatedly closing the inlet hole in said horizontal chamber; loader means for loading workpiece blanks into said horizontal chamber and located adjacent the inlet hole thereof; a die installed in the outlet hole of said horizontal chamber; a receiver means for receiving finished articles from said die, said receiver means being located adjacent the outlet hole in said horizontal chamber and comprising a framework consisting of two mutually parallel horizontal tubes and arms interconnecting the tubes at the ends thereof; a shaft rigidly connected to the arms of said framework and serving as an axis of symmetry of said framework; drive means for said shaft for turning framework in a vertical plane for successive axial alignment of each tube with the outlet hole in said horizontal chamber for discharge of a finished article into said tube during the pressing process, a ring installed in the outlet hole in the horizontal chamber at a location downstream of the die, said ring having a hole with a shape corresponding to that of the finished article for effecting additional shaping of the article and for sealing the outlet hole between the die and the end face of the tube which receives the finished article, a source of hydraulic pressure connected to said receiver means to produce a back pressure during the pressing process, said source communicating with the internal space of the respective tube, said receiver means further comprising an actuating cylinder axially aligned with the horizontal chamber of the container and including a rod with a cover at the end of said rod for sealing the internal space of the tube and for pressing the tube against said ring around said hole therein to effect the sealing between said tube and ring.

4,005,597

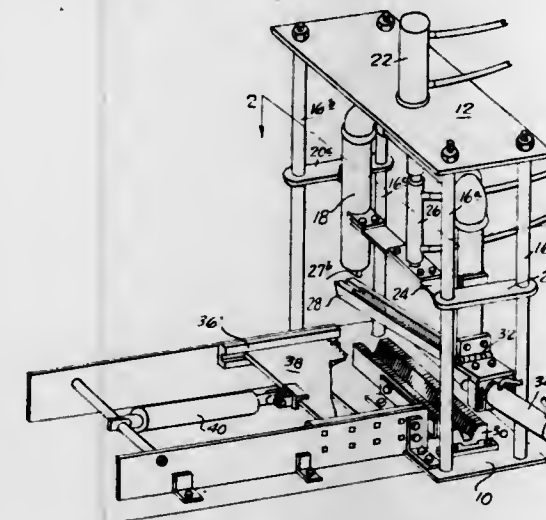
FILE FORMING PRESS

James A. Coon, 929 Drever St., West Sacramento, Calif.
95691

Filed Nov. 18, 1975, Ser. No. 632,913
Int. Cl.² B21D 5/02

U.S. Cl. 72-380

8 Claims



1. A file forming press for bending toothed file blanks into their final form comprising; a base plate adapted to support a die and a top plate, means connecting said top and bottom plates, an inverted U-shaped vertically movable press element presenting downwardly extending arms and having pressing surfaces at the lower ends of said arms, hinge means secured at the lower end of one arm of said inverted U-shaped element, a die supported by said hinge so as to be normally in firm contact with said pressing surfaces, said hinge permitting said die to be pivoted downwardly away from the pressing surface remote from said hinge, a hydraulic piston and cylinder means operatively connecting said inverted U-shaped press element to said top plate adapted to lower and raise said inverted U-shaped press element from a lowermost to an elevated position, a pressure element including means to support a die mounted between and guided by the arms of said inverted U-shaped press element, a die mounted on said pressure element, a hydraulic cylinder and piston means mounted on said U-shaped press element connected to said pressure element to move said pressure element with respect to said U-shaped press element whereby said die mounted on said press element may be pressed against said die supported by said hinge, cylinder and piston rod means adjustably mounted on said hinge whereby said piston rod may be aligned with the said die mounted on said hinge, a die mounted on said base plate to cooperate with said die mounted upon said hinge, horizontal guide means mounted on one side of said base plate, a slidable bending plate mounted for horizontal movement in said guide means, and hydraulic cylinder and piston means operative to move said bending plate over said die supported by said press means is in its lowermost position engaging said die mounted on said base plate.

4,005,598

PNEUMATIC BLIND RIVETER WITH CASCADED PISTONS

Hans Ehmann, Frankfurt am Main, and Günther Klein, Wall-dorf, Hessen, both of Germany, assignors to GESIPA Blind-niettechnik Gesellschaft mit beschränkter Haftung, Frank-furt am Main, Germany

Filed May 23, 1975, Ser. No. 580,328

Claims priority, application Germany, May 25, 1974,
2425385; May 25, 1974, 7418183[U]

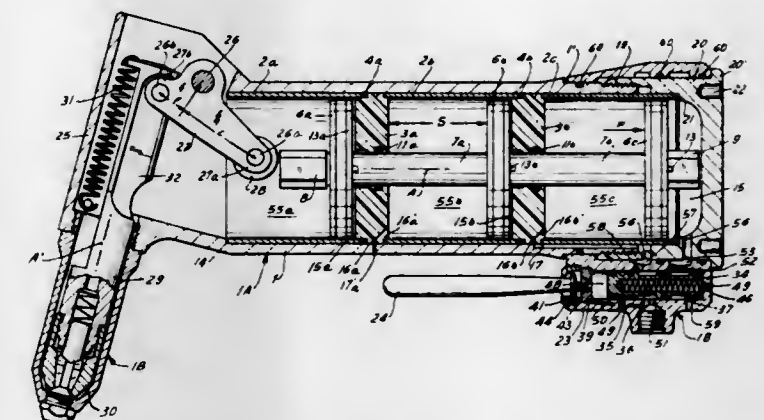
Int. Cl.² B21J 15/34

U.S. Cl. 72-391

17 Claims

1. A blind riveter comprising:

a housing having a front end and an opposite rear end and formed with an elongated chamber extending between said ends;
at least one piston longitudinally displaceable in said chamber;
a rivet-gripping chuck at said front end displaceable generally transversely to said chamber;
a pivot at said front end of said housing;
a lever pivotal on said pivot and having a relatively long arm extending from said pivot and having an outer end opera-



tively engageable with said piston and a relatively short arm having an outer end engageable with said chuck, whereby a mechanical advantage effective on said chuck is gained by pivoting of said lever with said piston; and means for pressurizing said chamber behind said piston and thereby displacing same toward said front end to pivot said lever and transversely displace said chuck, said means including a collar longitudinally fixed but rotatable on said housing, and a control valve mounted on said collar operable to feed compressed air to said compartment through said collar.

4,005,599

FLUID PROPERTY DETECTION SYSTEM

Gerald L. Schlatter, and Charles E. Miller, both of Boulder, Colo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

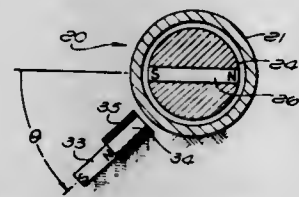
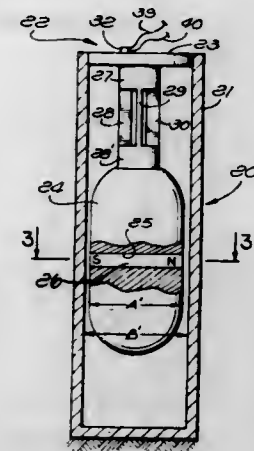
Filed Aug. 5, 1975, Ser. No. 602,384
Int. Cl.² G01N 1/16

U.S. Cl. 73-59

11 Claims

1. In a system for producing an output directly proportional to the magnitude of a property of a fluid, the combination comprising: an electromechanical oscillator including a body movably mounted in a manner to be at least partially immersed in a fluid, sensor means to produce a first periodic signal responsive to oscillation of said body, first means connected from said sensor means to receive said first periodic signal, electrical drive means mounted to oscillate said body, said first means including an amplifier and supplying second and third periodic signals having first and second frequencies, respectively, substantially equal to those of said first periodic signal at different corresponding times, said first means supplying said second and third periodic signals to said electrical drive means to cause the same to oscillate said body and to form a closed loop, said first means producing signals of frequencies f_1 and f_2 , the gain of said amplifier being adequate to cause said loop to have sustained oscillations at one of said first and second frequencies directly proportional to said frequencies f_1 and f_2 , said first means including a phase shifter connected to receive a signal of said first periodic frequency, said first means applying said second and third period signals to said electrical drive means alternately on a time shared basis, said second periodic signal, when applied, being in

phase with said first periodic signal, said third periodic signal, when applied, being out of phase with said first periodic signal;



and second means connected from said sensor means for producing an output p in accordance with the equation

$$p = [K] \left[\frac{f_s - f_n}{f_n} \right] - B$$

where K and B are constants.

4,005,600

APPARATUS FOR MEASURING THE RELEASE FORCE OF SAFETY SKI BINDINGS

Sivert Hoog, Namjo, Sweden, assignor to Aktiebolaget Elof Malmberg, Gavle, Sweden

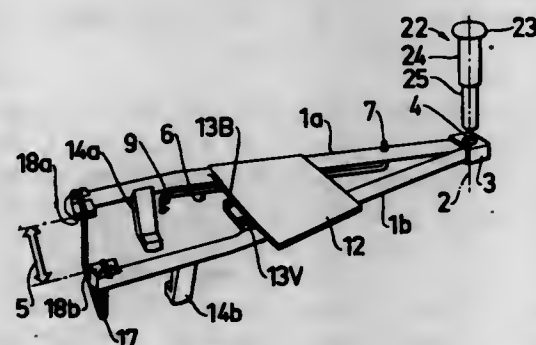
Filed Apr. 25, 1975, Ser. No. 571,519

Claims priority, application Sweden, May 6, 1974, 7405974

Int. Cl.² G01L 5/03

U.S. Cl. 73-133 A

11 Claims



8. Apparatus for measuring the force required to release the heel and toe pieces of a safety ski binding releasably holding a ski boot on a ski, said apparatus comprising:

- a force measuring tool;
- a lever comprising two pivotally interconnected shanks extending from a common pivot point on said lever and having spaced apart free ends, said lever further including means connectable to said force measuring tool, and a depending projection on said lever located closer to said free shank ends than to said last-mentioned means for permitting pivotal movement of said lever about said projection in a vertical plane;
- lifting means connectable to said free ends of said shank to extend therebetween beneath the heel portion of the ski

boot for applying an upward force on the boot heel when a downward force is applied through said force measuring tool to said means connectable to said force measuring tool, whereby to measure the upward force required to release the boot heel from the heel piece of the binding; the free ends of said shanks comprising a pair of opposing projections for engaging the opposite sides of a part of the human body to define the transverse dimension thereof, and further comprising indicia means cooperatively associated with said shanks for correlating said dimension with the maximum force necessary for releasing said fastening means of a ski binding of the safety type from a ski boot fastened in said ski binding.

4,005,601

APPARATUS FOR DETECTING RAIL DISCONTINUITIES

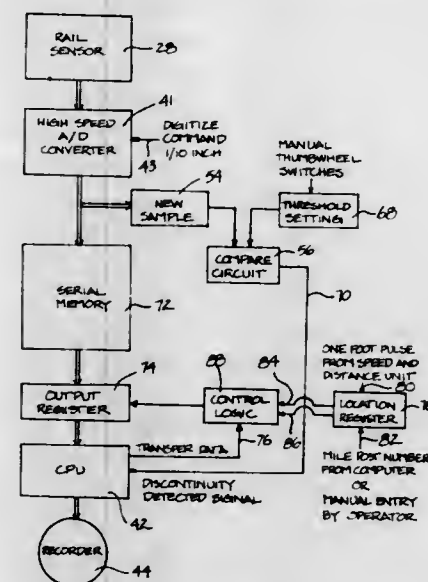
Ramon J. Botello, Annandale, Va., assignor to AMAC, Inc., Springfield, Va.

Filed Aug. 29, 1975, Ser. No. 609,090

Int. Cl.² B61K 9/08

U.S. Cl. 73-146

2 Claims



1. A system for detecting rail discontinuities comprising:
I. at least one data channel having;

- a. means for sensing a preselected type of rail discontinuity and generating an electrical signal indicative thereof;
- b. means connected to an output of the sensing means for converting the signal from an analog form to a digital form;
- c. storage means connected to an output of the converting means for storing data relating to a new sample interval;
- d. register means connected in circuit with the output of the converting means for storing data relating to a new sample interval;
- e. means for establishing a threshold level;
- f. means connected to the output of the register means and the threshold means for comparing the contents of both; and

II. connecting means responsive to a preselected comparison by the comparing means for enabling the transfer of the new sample data from the storage means to a central processing unit.

4,005,602

APPARATUS FOR MEASURING HIGH ALTITUDE TEMPERATURES

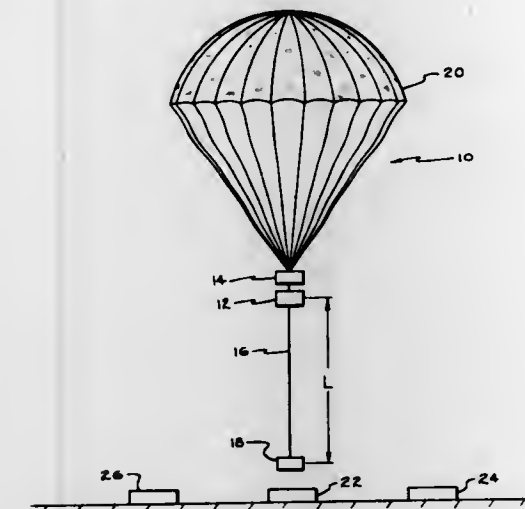
Wallace J. Wilkie, P.O. Box 3, 7465 Plymouth Road, Ann Arbor, Mich. 48105

Filed Aug. 1, 1974, Ser. No. 493,513

Int. Cl.² G01W 1/00; G01K 1/00

U.S. Cl. 73-170 R

3 Claims



1. In apparatus for determining atmospheric temperatures which includes a device for emitting a sound signal, a sound receiving device for receiving a sound signal from said emitting device, aerodynamic decelerator means movably positioning said devices in the atmosphere, means for detecting the initiation of a sound signal at the emitting device, means for detecting the reception of said sound signal at the receiving device, and means operable to continuously record the position of said sound emitting and receiving devices in the atmosphere;

the improvement comprising: cord means mounted on and extending away from said decelerator means, and sound emitting and sound receiving devices being mounted on said cord means so as to fix the relative positions of said sound emitting and sound receiving devices thereby facilitating the determination of the distance over which said signal has travelled between emission and reception at said sound receiving device.

4,005,603

APPARATUS FOR MEASURING FLUID FLOW

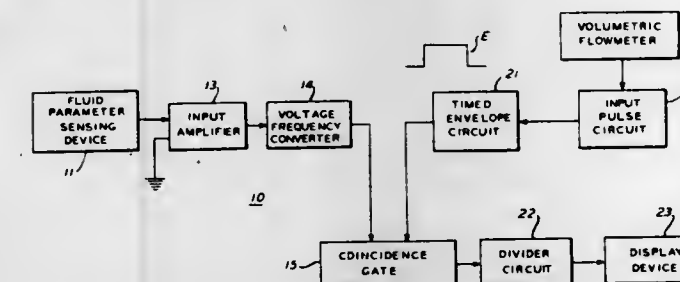
Yehuda Golahny, Newton, Mass., and Douglas A. Johns, Eden, N.Y., assignors to Airco, Inc., Montvale, N.J.

Filed Sept. 3, 1975, Ser. No. 610,495

Int. Cl.² G01F 1/86

U.S. Cl. 73-194 M

3 Claims



1. Apparatus for producing a density corrected measurement of the volumetric flow of a cryogenic liquid, the density of which varies inversely with respect to the temperature thereof comprising temperature sensing means adapted to be disposed in said cryogenic liquid; means for supplying a substantially constant energizing current to said temperature sensing means to develop thereacross a voltage having a magnitude which varies inversely with respect to the temperature of said cryogenic liquid; means coupled to said temperature

sensing means for generating pulses at a frequency which varies directly with respect to the magnitude of said voltage; fluid flow detecting means for producing a signal which exhibits a discrete transition in response to each unit of volumetric flow of said cryogenic liquid; means responsive to said signal for producing an envelope signal of predetermined duration commencing upon the occurrence of said discrete transition, said duration being a predetermined multiple of the period of said generated pulses which period corresponds to a reference temperature of said cryogenic liquid; coincidence means coupled to said pulse generating means and to said means for producing an envelope signal for passing said generated pulses only for the duration of said envelope signal; frequency divider means coupled to the output of said coincidence means for dividing the frequency of said generated pulses passed by said coincidence means by said multiple regardless of the actual frequency of said pulses such that whenever the number of generated pulses passed to said frequency divider means equals said multiple, an output pulse corresponding to one density corrected unit of volumetric flow of said cryogenic liquid is produced; and means for displaying said output pulses whereby a visual display of the value of said density corrected volumetric flow of said cryogenic liquid is enabled.

4,005,604

NON-CONTACT SENSOR FOR VORTEX-TYPE FLOWMETER

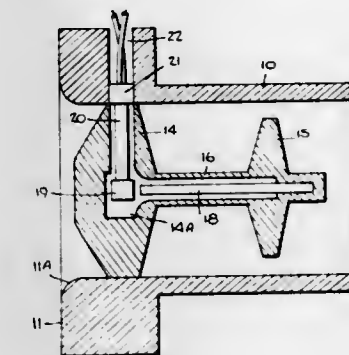
Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Sept. 30, 1975, Ser. No. 618,277

Int. Cl.² G01F 1/32

U.S. Cl. 73-194 VS

8 Claims



1. A non-contact sensor for a vortex-shedding flowmeter having an obstacle assembly mounted in a flow tube which intercepts the fluid passing therethrough and gives rise to vortices, to cause a deflectable section of the assembly to vibrate at a frequency proportional to the flow rate of the fluid, said assembly including a fixed section mounted across the flow tube, the deflectable section being cantilevered from the fixed section by a hollow, flexible beam, said sensor comprising:

- A. a magnetically-dependent device which when subjected to a varying magnetic field produces a corresponding varying electrical value, said device being disposed within a cavity in said front section which communicates with said hollow beam and is accessible by way of a passage extending through said fixed section and said tube, and
- B. a proximity element enclosed in said hollow beam mechanically coupled to said deflectable section and vibrating therewith, the free end of said element being disposed adjacent to said device in said cavity but out of contact therewith and being adapted to vary the magnetic field to which the device is subjected in accordance with said vibrations, whereby the device produces a signal indicative of said flow rate.

4,005,605

REMOTE READING INFRARED THERMOMETER

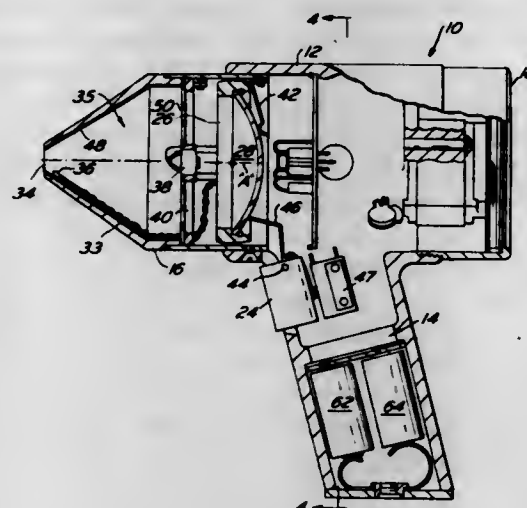
Donald S. Michael, Ridgewood, N.J., assignor to Mikron Instrument Company, Inc., Ridgewood, N.J.

Filed July 22, 1974, Ser. No. 490,883

Int. Cl.² G01J 5/00

U.S. Cl. 73-355 R

9 Claims



1. In a remote reading infrared thermometer having a housing defining a cavity, an aperture in said cavity for admitting to said cavity radiation emanating from a target object, radiation detector means disposed in said cavity, and radiation directing means disposed in said cavity for selectively directing toward said detector means ambient radiation from within said cavity and then radiation emanating from a target object of unknown temperature outside said cavity, and manually operable means coupled to said radiation directing means for moving said radiation directing means from a first position wherein said radiation directing means directs toward said detector means ambient radiation from within said cavity and a second position wherein said radiation directing means directs toward said detector means radiation emanating from said target object, said radiation directing means being a mirror of concave cross-section, and having its optical axis aligned with said aperture when in said second position.

4,005,606

SUBMERSIBLE LOAD CELL FOR MEASURING GAS BUOYANCY

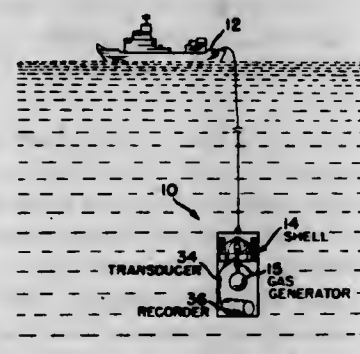
Herbert L. Mummery, Kaneohe, and Robert T. Hoffmann, Kailua, both of Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 29, 1975, Ser. No. 617,912

Int. Cl.² G01N 9/12

U.S. Cl. 73-438

10 Claims



1. A submersible load cell for measuring gas buoyancy comprising:
a rigid shell which has an open bottom so that gas can be introduced therein to make the shell positively buoyant;
means supporting the shell for vertical movement so that a

change in buoyancy results in the shell exerting a corresponding upward force;
at least one hydraulic actuator mounted between the support means and the shell for registering a pressure which corresponds to the degree of upward force or positive buoyancy of said shell; and
means connected to the hydraulic actuator for indicating the change in buoyancy of the shell as gas is introduced therein.

4,005,607

STATIC WHEEL BALANCER

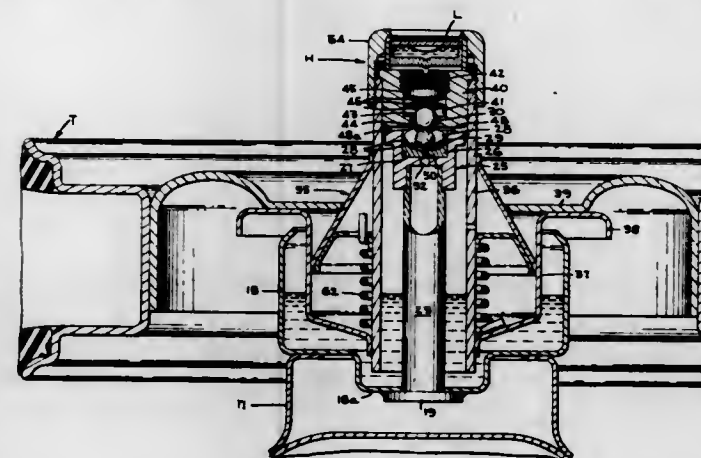
James L. Wiederrich, Lodi, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 20, 1975, Ser. No. 633,894

Int. Cl.² G01M 1/04

U.S. Cl. 73-483

4 Claims



1. In a wheel balancer of the type comprising a post having a generally vertical axis, means for supporting said post on the floor, pivot ball support means on an upper portion of said post, a wheel balance head having means for mounting and centering a wheel to be balanced in a plane that is normally horizontal, a level on said head, and means for mounting a pivot ball on said balance head for support by the ball support means on said post; the improvement wherein said pivot ball mounting means comprising a pivot ball socket member on an upper portion of said balance head, metallic spring means comprising an assembly of Belleville washers in said socket member and engaging an upper portion of said pivot ball, and means for preloading said spring means against said ball, for absorbing shock loads imparted to said balance head, said preloading means comprising a threaded plug in said socket member for adjusting the preload of said Belleville washers.

4,005,608

ELECTRICALLY CONTROLLED RATE INTEGRATING DEVICE

Michael J. Lanni, Ridgewood, N.J.; John Calamera, Staten Island, N.Y.; Leon Krebs, Fair Lawn, N.J., and Bernard J. O'Connor, Eastchester, N.Y., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Apr. 15, 1975, Ser. No. 560,900

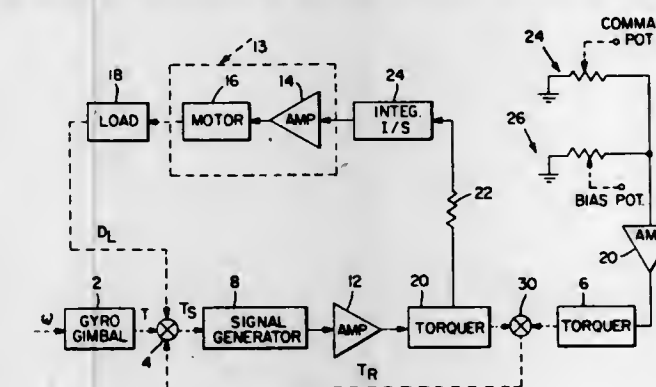
Int. Cl.² G01P 9/02; G01C 19/42

U.S. Cl. 73-504

5 Claims

1. A sensor system, comprising:
a sensor for providing a first torque in response to a sensed condition;
means for providing a second torque;
a displaceable load;
means for combining the first and second torques and the load displacement;
a signal generator connected to the combining means and responsive to the combined first and second torques and load displacement for providing a corresponding signal;
means connected to the signal generator and responsive to the signal therefrom for providing another signal;

means connected to the last mentioned means and connected to the load, and responsive to the signal from the last mentioned means for displacing the load; and
the means for providing a second torque including means



for providing a third torque in response to command and bias signals, means connected to the signal generator and responsive to the signal therefrom for providing a fourth torque, and means for combining the third and fourth torques to provide the second torque.

4,005,609

AUTOMATIC VARIABLE SPEED TRANSMISSION

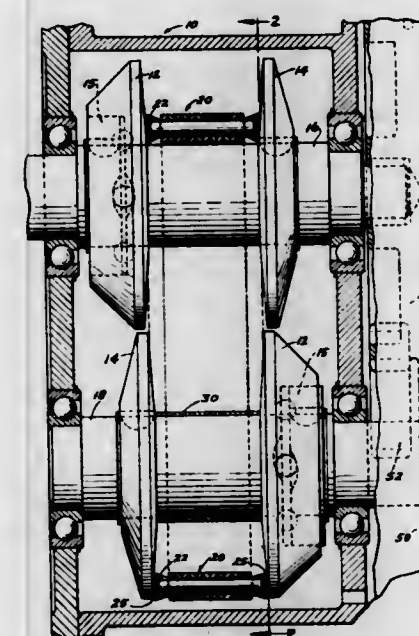
Wilfrid H. Bendall, 12 Castle Hill Road, Pawcatuck, Conn. 02891

Filed Jan. 19, 1976, Ser. No. 650,167

Int. Cl.² F16H 55/52, 55/56, 13/02

U.S. Cl. 74-230.17 S

9 Claims



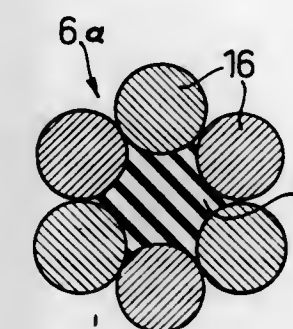
1. An automatic variable speed transmission comprising a housing containing a lubricating medium and having axially opposed pairs of conical discs on parallel driving and driven shafts and a loosely pin-jointed link chain for transmitting torque between said discs, the link members of said chain having apertures in rocking bearing contact with the pins and having traction members on extended pin end portions for engaging the discs, said chain being in transversely compressed traction therebetween, said traction members having coating edge portion holding them in alignment with each other and having an internally conical traction engagement surface adapted to collect and wedge the lubricating medium between the traction member and disc engagement surfaces, one disc of each opposed pair being axially movable relative to the other and having torque responsive means adapted to automatically vary the chain engagement pitch diameter and disc traction pressure by moving the discs in response to

varying driving and driven shaft torques, said chain initially being out of full engagement contact with one of said disc pairs when rotation is started, to permit a graduated, wedged lubricant engagement therewith.

4,005,610
CONVEYOR BELTHarald Simonsen, Lundersen; Hans Specht; Klaus Baumgärtel, both of Berenboedel, and Hans Meumann, Hannover, all of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany
Continuation-in-part of Ser. No. 337,129, March 1, 1973, abandoned. This application Mar. 27, 1975, Ser. No. 562,543
Claims priority, application Germany, Mar. 1, 1972, 2209752Int. Cl.² F16G 1/22

U.S. Cl. 74-237

8 Claims



1. A conveyor belt of elastomeric material for transport purposes, especially rubber material, which includes in combination strength members arranged substantially parallel and in transversely spaced relationship to each other and extending in the longitudinal direction of said belt while being embedded directly in bonding connection with the elastomeric material of the belt to lessen weight, said strength members consisting only of individual bare strands as conveyor belt inserts each composed of a plurality of finished wires united to each other about a solid core support member by a single twist in a preliminary product formed by rotating together several individual solid elements thereof.

4,005,611

CHAINLESS BICYCLE DRIVE MECHANISM

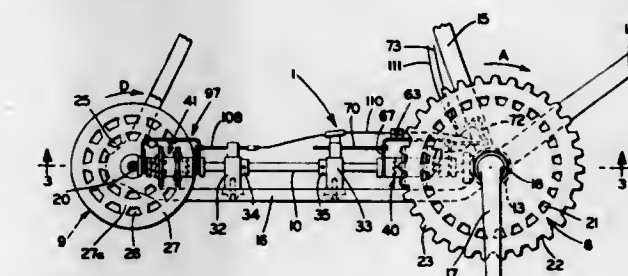
Warren E. Jeffries, 4859 Cheyenne Ave. SE., Canton, Ohio 44707

Filed Apr. 5, 1976, Ser. No. 673,665

Int. Cl.² F16H 1/12; B62M 9/00

U.S. Cl. 74-416

20 Claims



1. A multispeed, chainless drive mechanism for a bicycle-type vehicle including:

- a drive disc mounted on a pedal actuated crankshaft of the vehicle for rotation with said crankshaft, said drive disc being formed with a pair of circularly arranged series of openings concentric with the crankshaft;
- a driven disc mounted on a rear wheel of the vehicle for rotation with said rear wheel, said driven disc being formed with a pair of circularly arranged series of openings concentric with the axis of the rear wheel;
- rigid drive shaft means extending between the drive and

driven discs for transmitting the rotating force from the crankshaft to the vehicle rear wheel;

- d. first and second sprocket means rotatably mounted on the drive shaft means, each of said sprocket means having outer circumferential teeth and a series of ratchet teeth, with said circumferential teeth being engageable with a respective series of disc openings for rotating said sprocket means upon rotation of the drive disc in a forward direction;
- e. first and second ratchet gear means mounted on the drive shaft means and operatively engageable with the first and second sprocket means, respectively, with said ratchet gear means being rotatable with the drive shaft means and axially movable with respect thereto;
- f. first shift means operatively engageable with the first and second ratchet gear means for selectively engaging one of said ratchet gear means with the ratchet teeth of its respective sprocket gear means by movement of the selected ratchet gear means axially along the drive shaft means to drivingly connect the selected ratchet gear means and sprocket gear means with the drive disc and the drive shaft means;
- g. third and fourth sprocket means rotatably mounted on the drive shaft means, each of said sprocket means having outer circumferential teeth and a series of ratchet teeth, with said circumferential teeth being engageable with a respective series of disc openings for rotating said driven disc upon rotation of said sprocket means and drive shaft in a forward direction;
- h. third and fourth ratchet gear means mounted on the drive shaft means and operatively engageable with the third and fourth sprocket means, respectively, with said ratchet gear means being rotatable with the drive shaft means and axially movable with respect thereto; and
- i. second shift means operatively engageable with the third and fourth ratchet gear means for selectively engaging one of said ratchet gear means with the ratchet teeth of its respective sprocket gear means by movement of the selected ratchet gear means axially along the drive shaft means to drivingly connect the drive shaft means with the driven disc for imparting rotation to the vehicle rear wheel upon rotation of the drive shaft means.

4,005,612

PRELOADED ANTI-RATTLE DEVICE

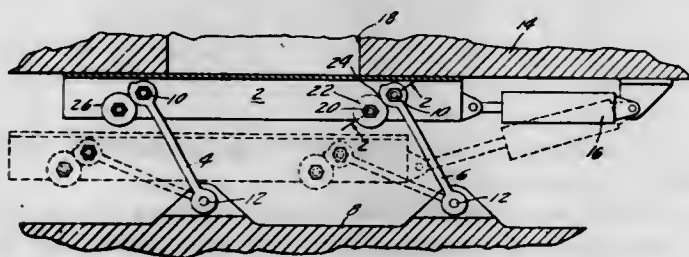
Leander H. Lippincott, deceased, late of Middletown, Conn. (by Dorothy M. Lippincott, executrix), assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 31, 1975, Ser. No. 628,161

Int. Cl.² G05G 1/00

U.S. Cl. 74-470

7 Claims



1. An anti-rattling device for a linkage including: a pivoted arm forming part of the linkage, a member on which the arm is pivoted, and a compressible roller also mounted on the member adjacent to the arm and engaging the latter on an external surface surrounding the pivot point.

4,005,613

BRAKE OPERATING LEVER

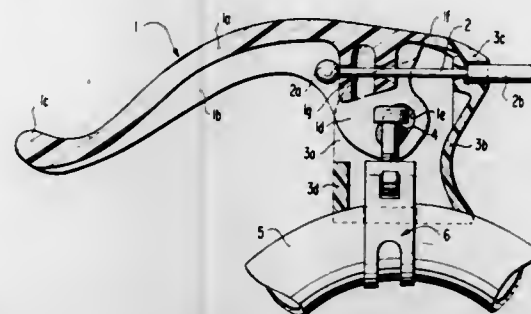
Alan D. Kaufman, Williamsport; Arne M. Reistad, Jr., Philadelphia, and David J. Wilke, York, all of Pa., assignors to Pennsylvania Wire Rope Corporation, Williamsport, Pa.

Filed May 2, 1975, Ser. No. 573,926

Int. Cl.² G05G 7/00; B62K 23/06; B62L 3/02

U.S. Cl. 74-489

7 Claims



1. An operating lever for a cable actuated bicycle brake comprising, a housing connected to a bicycle handle bar, a lever connected to one end of the brake actuating cable, and pin and slot means connected between the lever and the housing for pivotally connecting the lever to said housing, said lever having an edge portion adapted to abut an edge portion on the housing, the tension of the cable maintaining the lever in the operative position while in said abutting position with said pin means being disposed at one end of said slot means, the lever being movable from the operative, abutting position to the inoperative position within the housing wherein the pin means is disposed at the opposite end of the slot means, to thereby slacken the cable.

4,005,614

MOTION TRANSFER SYSTEM

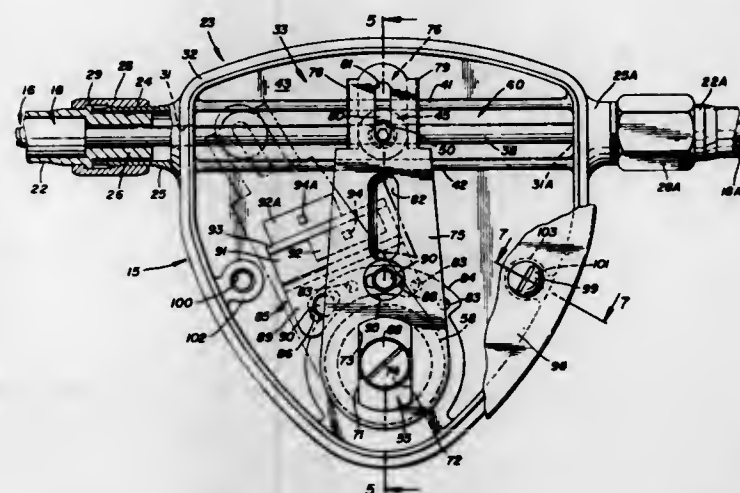
Bruce H. Moore, Kent, and Richard D. Houk, Stow, both of Ohio, assignors to Samuel Moore and Company, Mantua, Ohio

Filed Nov. 13, 1975, Ser. No. 631,634

Int. Cl.² F16C 1/12, 1/20

U.S. Cl. 74-501 R

11 Claims



1. A system for transferring motion between locations remote with respect to each other by a push-pull control cable assembly, said system having a motion conversion unit comprising: a housing, shaft means rotatably mounted in said housing, a throw arm secured to said shaft means and movable within said housing, a core element included in said push-pull control cable assembly and extending within said housing, means to rigidify that portion of said core element extending within said housing, a crosshead secured to said rigidified portion of said core element and means to effect linear movement of said crosshead in response to rotational movement of said throw arm.

4,005,615

RESET FOR THREADED ENCLOSURE

Christian De Visser, Clinton, Ill., assignor to General Electric Company, New York, N.Y.

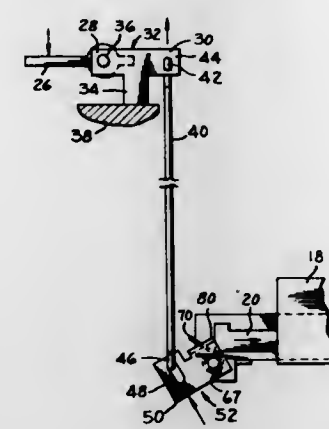
Continuation of Ser. No. 410,956, Oct. 29, 1973, abandoned.

This application Mar. 7, 1975, Ser. No. 556,087

Int. Cl.² G05G 1/08

U.S. Cl. 74-504

5 Claims



1. In a threaded explosion proof enclosure for motor starting devices, the combination of a rigid elongated flat support member mounted within said enclosure, an overload relay mounted on said support member, said overload relay having a reset button extending therefrom, and reset means for depressing said reset button to reset said overload relay comprising:

- a. a handle mounted external to said enclosure for enabling said overload relay to be reset from outside of said enclosure;
- b. a rod mounted for reciprocal movement within said enclosure;
- c. means for mechanically coupling one end of said rod to said handle, whereby upon movement of said handle in a first direction by an operator, said rod moves from an initial position to a reset position;
- d. an actuating member having a first, a second and a third section, said second section having an initial position adjacent said reset button of said overload relay;
- e. means for pivotally mounting said actuating member to said support member;
- f. means for biasing said second section of said actuating member to its initial position adjacent said reset button of said overload relay and to hold said rod in its initial position;
- g. means for mechanically coupling another end of said rod to said first section of said actuating member, whereby when said rod is moved by said handle to the reset position, said second section of said actuating member depresses said reset button to reset said overload relay, and when said handle is released by the operator, said second section of said actuating member is returned by said biasing means to its initial position adjacent said reset button and said rod is returned to its initial position; and
- h. said means for mechanically coupling said rod to said actuating member further comprising:

1. said other end of said rod constituting a hook section; and
2. said first section of said actuating member having an aperture for receiving and engaging said hook section of said rod, said aperture in said first section being elongated to have a major axis longer than the bight of said hook section of said rod, whereby when said rod is in its initial position, and said actuating member is manually moved by the operator to depress said reset button until the major axis of said aperture in said first section is aligned with the plane of said hook section, said hook section is removable from said first section of said actuating member to facilitate the removal of said support member from said enclosure.

4,005,616

FOOT PEDAL ASSEMBLY WITH A RETURN SPRING

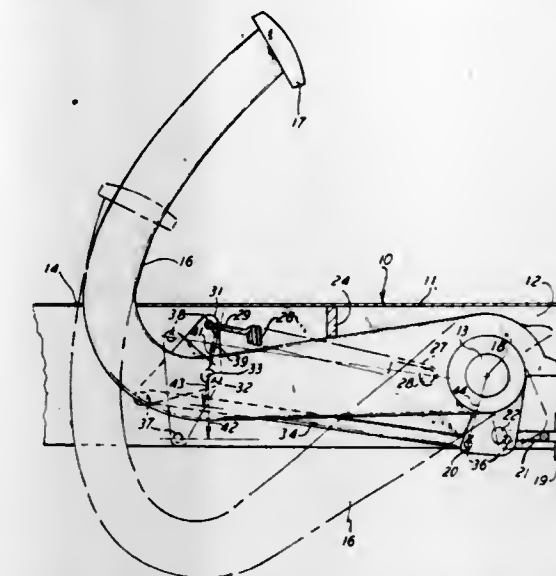
Thomas Patrick Casey, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 11, 1975, Ser. No. 603,633

Int. Cl.² G05G 1/14

U.S. Cl. 74-512

5 Claims



1. A foot pedal assembly with a return spring, comprising a foot pedal having a pivotally mounted arm pivotal relative to a fixed axis for pivotal movement of said foot pedal between a depressed position and a return position, a lever pivotally mounted adjacent said arm and having a pivot axis and two ends disposed on opposite sides of said pivot axis, a longitudinal link interconnected with one of said two ends of said lever and with said arm for pivoting said lever in accordance with and in response to pivotal movement of said foot pedal and to have said lever pivot in one direction when said pedal is depressed, and a longitudinal return spring connected with the other end of said two ends of said lever for yieldingly urging said link in the direction to pivot said foot pedal to its said return position, the location of the connection of said spring with said lever is related to said pivot axis of said lever with said connection of said link being located in the said one direction of pivot of said lever and from the plane along the shortest line from said pivot axis to the longitudinal center line of said spring, and with the location of the connection of said link with said lever being related to said pivot axis of said lever with said connection of said link being located against the said one direction of pivot of said lever and from the plane along the shortest line from said pivot axis to the longitudinal center line of said link, and with said connections being so located that the moment arm of said link and said spring relative to said lever respectively increase and decrease in accordance with pivotal movement of said foot pedal toward its said depressed position.

4,005,617

VARIABLE FORCE REDUCING PEDAL CONTROL DEVICE FOR PRESSURE EMITTER

Jean-Claude Sourbel, La Garenne-Colombes, and Michel Guettier, Rueil Malmaison, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Societe Anonyme Dite: Automobiles Peugeot, Paris, both of, France

Filed July 14, 1975, Ser. No. 595,984

Claims priority, application France, July 18, 1974, 74.25072

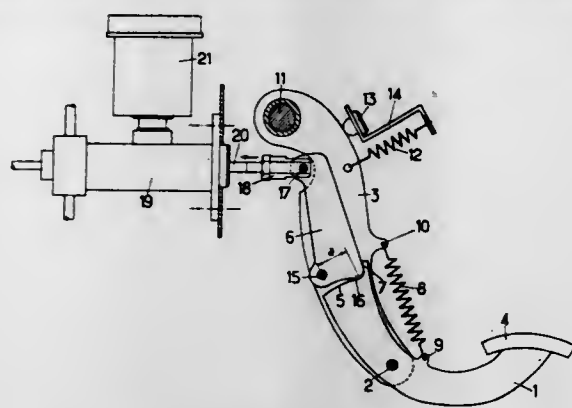
Int. Cl.² G05G 7/04

U.S. Cl. 74-516

5 Claims

1. A pedal control device with variable reduction for a pressure elevator comprising a lever mounted for pivotal movement about a first axis, a pedal pivotally mounted on said lever for movement about a second axis spaced from said first

axis, first stop means limiting movement of said lever in one direction and spring means resiliently urging said lever against said first stop means, a pusher member pivotally mounted on said lever for limited movement about a third axis spaced from said first and said second axes, said pusher member being operably connected to the pressure elevator for commanding actuation thereof, and means on said pedal engaging said



pusher member for rotating said pusher member about said third axis to thereby apply a force to the pressure elevator upon rotation of said pedal about said second axis, said lever, pedal and pusher acting as a unit pivoted about said first axis and without relative movement therebetween when force applied to the pressure elevator exceeds the resistance of said spring means.

4,005,618

TRANSMISSION WITH CONTINUOUSLY VARIABLE SPEED RATIO

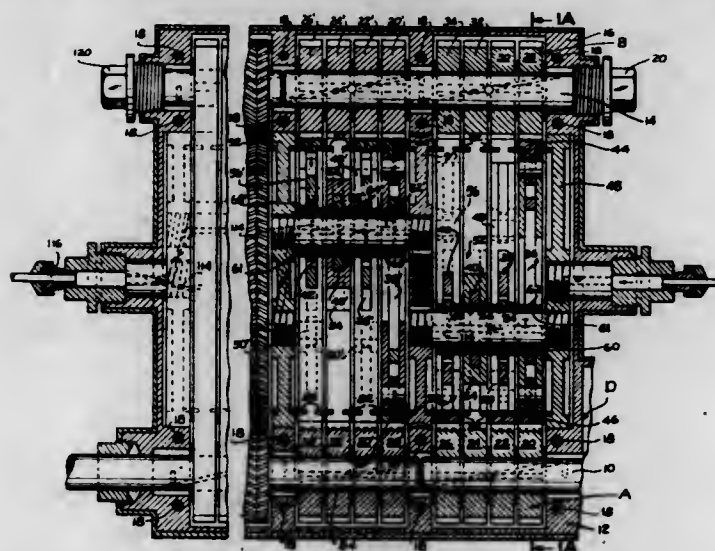
William A. Cohen, Brooklyn, N.Y., assignor to Sphero International Co., Brooklyn, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,365

Int. Cl.² F16H 33/00

U.S. Cl. 74-640

15 Claims



1. A transmission for transmitting torque from a drive gear to a driven gear comprising a composite ring gear operatively connecting said drive and driven gears, said ring gear comprising first and second ring gear sectors, a rotatable element, each of said sectors being mounted on a different end of said element such that when one sector engages said drive gear the other sector engages said driven gear and means operatively connected to said element for varying the position of the axis of rotation of said element relative to said drive and driven gears to change the ratio of the distances between the axis of rotation of said element and the drive and driven gears, respectively.

4,005,619
STEPLESSLY SETTABLE ELLIPTICAL GEARING
Alfred Schermund, 62, Kornerstrasse, 5820 Gevelsberg, Germany

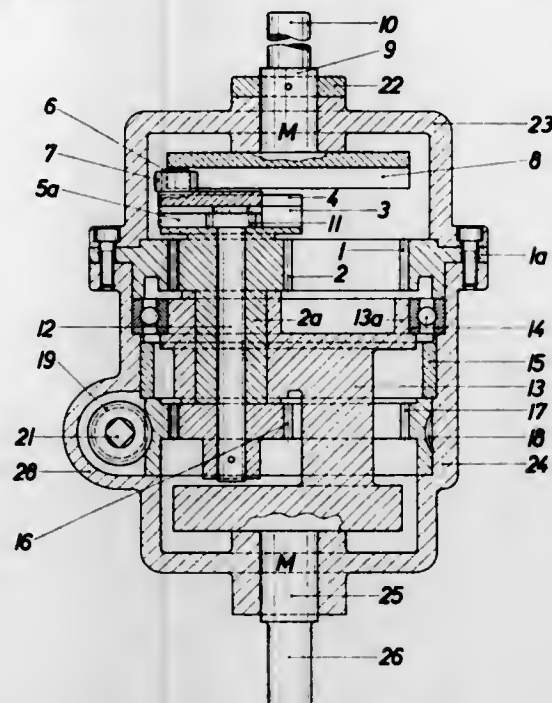
Filed Oct. 15, 1975, Ser. No. 622,793

Claims priority, application Germany, Oct. 19, 1974, 2449773

Int. Cl.² F16H 1/28

U.S. Cl. 74-804

10 Claims



1. A gear box comprising in combination:
a housing;
an input shaft extending into said housing;
an output shaft extending into said housing;
a first internally toothed annular gear fixedly secured to said housing;
a first spur gear coupled to said input shaft and disposed within said first internally toothed annular gear to rollably engage the teeth thereof;
a second internally toothed annular gear supported by said housing to be angularly settable with respect thereto;
a second spur gear disposed within said second internally toothed annular gear to rollably engage the teeth thereof; and
a sliding head element disposed within said housing and slidably supported on said first spur gear, said head element being coupled to said output shaft and being steplessly displaceable relative thereto through said second spur gear in dependence upon the angular setting of said second internally toothed annular gear.

4,005,620

HYDRAULIC GEAR-SHIFT CONTROL FOR AUTOMOTIVE TRANSMISSION SYSTEMS

Hansjörg Dach, Friedrichshafen, and Robert Marlon, Lindau, both of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Apr. 23, 1975, Ser. No. 570,773

Int. Cl.² B60K 41/18

U.S. Cl. 74-865

10 Claims

1. In a hydraulic load-control system for driving an output shaft from a fuel-powered engine with a variable torque ratio, including an operator-controlled accelerator for varying the fuel supply to said engine, a source of high-pressure fluid, drive-establishing means shiftable under fluid pressure from said source between torque ratios, and fluid-actuable switchover means for controlling said drive-establishing means, the combination therewith of:

first pressure-modulating means connected to said source for producing a fluid pressure varying generally propor-

tionally to the speed of said output shaft, said first pressure-modulating means communicating with said switchover means for actuating same in an upshifting sense; biasing means for said switchover means opposing upshifting, said biasing means including second pressure-modulating means connected to said source; third pressure-modulating means connected to said source for producing a fluid pressure varying generally proportionally to load in an upper part of a load range as determined by a displacement of said accelerator from a retracted position to an advanced position, said third pressure-modulating means communicating with said switchover

within said interior cavity in spaced relationship to each other about the periphery of said member receiving opening; means for selectively pivoting said tong jaws through a range of positions including a fully retracted position and member gripping positions; said tong jaws, in said fully retracted position, being retracted from said opening at least a sufficient amount to permit a member to be received within said opening; and said free ends of said tong jaws, in said member gripping positions, being pivoted to grip such a member received within said opening at peripherally spaced intervals of less than 180°.

4,005,622

CIRCULAR SAW WRENCH

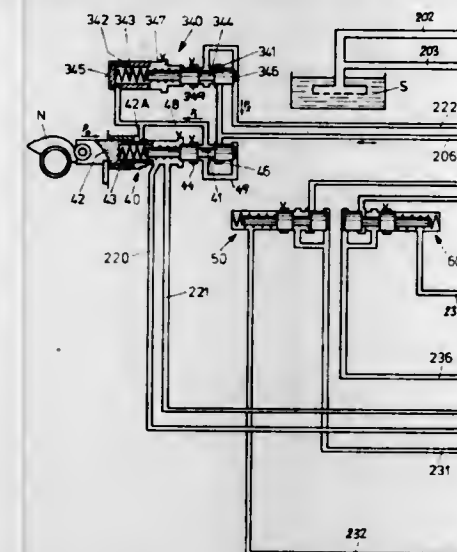
Alvin L. Bassett, 102 S. 13th St., St. Joseph, Mo. 64501

Filed Apr. 30, 1976, Ser. No. 681,917

Int. Cl.² B25B 13/48

U.S. Cl. 81-180 R

10 Claims



over means for creating a hysteresis effect with upshifting at higher loads and downshifting at lower loads; and fourth pressure-modulating means connected to said source for producing a fluid pressure rising with increasing load in a lower part of the load range and remaining substantially constant in the remainder of said load range, said fourth pressure-modulating means communicating directly with said drive-establishing means for moderating the actuation thereof by said switchover means and further communicating with said second pressure-modulating means for progressively increasing the output pressure thereof in said lower part of the load range.

4,005,621

DRILLING TONG

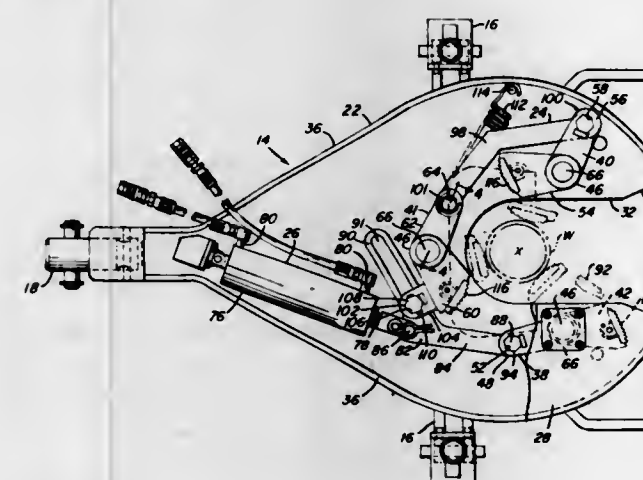
John W. Turner, Jr., and Russell A. McLaughlin, both of Houston, Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 27, 1976, Ser. No. 680,604

Int. Cl.² B25B 17/00

U.S. Cl. 81-57.2

16 Claims



1. A gripping tong comprising: a main body housing having an interior cavity in open communication with a forwardly open member receiving opening; a plurality of at least three pivotal tong jaws having free member ends and received

1. A wrench for tightening or loosening the central mounting screw of a circular saw blade, said wrench comprising:
a. first and second elongated lever handles,
b. pivot means connecting said lever handles together for relative angular movement about an axis transverse to said lever handles,
c. a wrench socket carried fixedly by the first of said lever handles, said socket opening coaxially with said pivotal axis and being operatively engageable over the head of said mounting screw, and
d. a restraining finger fixed to the second of said lever handles, being parallel to but spaced apart from said pivotal axis, and being adapted, when said wrench socket is applied to said mounting screw, to project between a consecutive pair of teeth of said saw blade.

4,005,623

FASTENER APPARATUS

Charles C. Faroni, Summit, N.J., assignor to Assembly Line Products, Inc., Hinsdale, Ill.

Division of Ser. No. 438,851, Feb. 1, 1974, which is a continuation of Ser. No. 341,824, March 16, 1973, abandoned.

This application June 11, 1975, Ser. No. 586,030

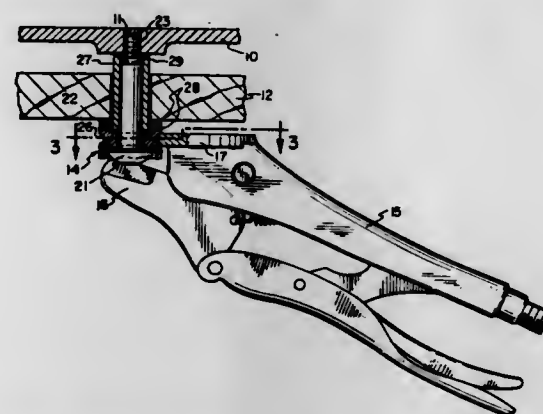
Int. Cl.² B25B 7/02

U.S. Cl. 81-426

2 Claims

1. Fastener apparatus for attaching an object having a threaded aperture to a platform having parallel surfaces proximal and distal to said object and having a through aperture in alignment with said threaded aperture, the apparatus comprising:

1. a shoulder bolt having a head and a shank, at least a portion of said shank being threaded for mating with said threaded aperture, said head having a smooth non-wrenchable surface;
2. a cup washer adapted to be rotatably mounted on the shank of said bolt and having side walls partially enclosing the head of the bolt when the cup washer is positioned adjacent said head, the side walls having bearing surfaces thereon for receiving an externally applied force in a direction parallel to the longitudinal axis of the bolt when the cup washer is so mounted;
3. sheathing means adapted to be rotatably mounted on the shank of said bolt and of such a length that when said bolt and sheathing means are inserted into the through aper-



- ture of said platform and the bolt has been threaded into the threaded aperture of said object substantially all of the shank of said bolt is enclosed and said cup washer and sheathing means are free to rotate on said shank; and
- a. an installation tool, said tool having
 - a. first jaw means for contacting the head of said bolt;
 - b. second jaw means for engaging the bearing surfaces of said cup washer;
 - c. releasable means for applying a compressive force between said first and second jaws to hold said bolt and cup washer together when said first and second jaws are engaged with said head and bearing surfaces, respectively; and
 - d. means for applying a torquing moment to said second jaw means.

4,005,624

METAL PEELING MACHINE WITH MOVABLE CLAMPING CARRIAGE

Alfons Goeke, and Franz Riedel, both of Solingen, Germany, assignors to Th. Kleserling & Albrecht, Solingen, Germany
Filed May 13, 1975, Ser. No. 576,979

Claims priority, application Germany, May 14, 1974, 2423210

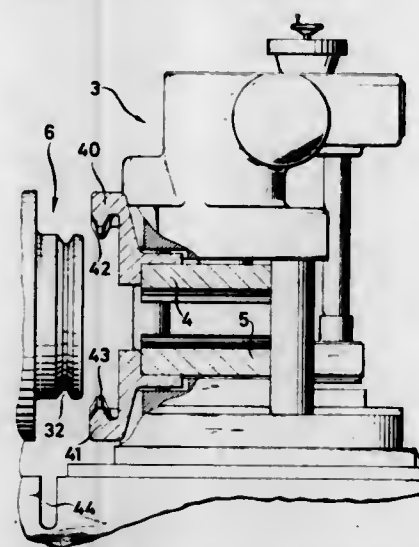
Int. Cl.² B23B 5/00; B23P 19/00; B23Q 7/00

U.S. Cl. 82-20

7 Claims

1. In a metal peeling machine for workpieces such as rods and tubes comprising:
 - a machine bed and a machine housing therefor;
 - a workpiece clamping carriage movably mounted relative to said bed;
 - a workpiece cutting means mounted on said bed;
 - workpiece guide sleeve means arranged for stationary position adjacent to said cutting means and movement relative to said bed, and arranged adjacent to said clamping carriage and projecting into said machine housing;
 - disengageable mounting means securing said sleeve in fixed relation to said bed;
 - and clamping arrangement mounting and dismounting

means secured to said clamping carriage and axially movable therewith for clamping engagement with said sleeve



to move said sleeve means in relation to said bed after disengagement of said mounting means.

4,005,625

TREE SLASHER

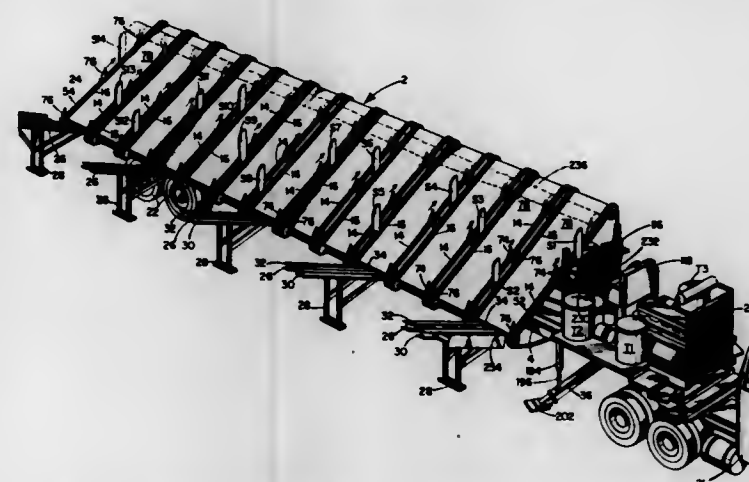
André Brochu, and Adrien Brochu, both of P.O. Box 332, Stratton, Maine 04982

Filed Apr. 17, 1975, Ser. No. 568,902

Int. Cl.² B27B 17/00, 25/04

U.S. Cl. 83-100

15 Claims



1. A tree slasher comprising a supporting frame, a transversely upwardly sloping surface carried by said frame and whose long dimension is more or less as long as the tree to be cut, said surface being interrupted at selected intervals with pairs of spaced tracks in each of which resides a continuous conveyor chain with the remaining portion of each said chain running beneath said sloping surface, a plurality of spaced dogs on each said chain, all said dogs being longitudinally aligned with the dogs on the other said chains, a first hydraulic motor and other means for driving all said chains at the same speed along said tracks, a chain saw located between each said pair of spaced tracks and an individual hydraulic motor for driving each said chain saw, a hydraulic cylinder and piston and other associated means for moving the cutting part of each said chain saw from a cutting position above said sloping surface to a non-cutting position below said sloping surface, a prime mover mounted on said frame, hydraulic pumps driven by said prime mover, oil tanks supplying said pumps, hydraulic pipe lines running from one of said pumps to said first hydraulic motor which drives said conveyor chains, other hydraulic pipe lines running from other pumps to said individual hydraulic motors which drive said chain saws,

other hydraulic pipe lines running from one of said pumps to said hydraulic cylinders and pistons which control the positions of said chain saws, manually operable means for controlling the operation of said first hydraulic motor that drives said conveyor chains, and manually operable means for actuating selectively each hydraulic cylinder and piston for positioning each said saw.

4,005,626

MACHINE FOR INDEXING GROUPS OF NESTABLE TRIMMED ARTICLES IN A STACK

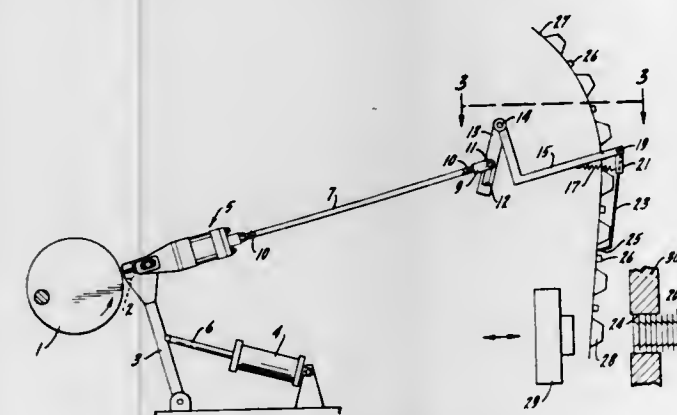
Allen H. Bateman, Chippewa Falls; Charles B. Case, Eau Claire; David W. Kragness, Colfax, and Edward C. LeDuc, Chippewa Falls, all of Wis., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 28, 1975, Ser. No. 572,219

Int. Cl.² B26D 7/06

U.S. Cl. 83-238

1 Claim



1. In a conventional die cutting machine comprising:
 - a means for engaging a sheet of preformed articles,
 - an actuator arm,
 - a cam follower means,
 - a cam,
 - a pivoting means to cause said means for engaging to shift between predetermined positions when said actuator arm is moved under the influence of said cam, the improvement which comprises:
 - a pneumatic cylinder,
 - a piston rod of said cylinder parallel to said actuator arm,
 - a plurality of yokes attached to a surface of said pneumatic cylinder so as to be parallel to and spaced radially apart from said piston rod and said yokes being provided with adjustable sized holes,
 - a yoke pin fixedly attached to said piston rod and extending radially therefrom so as to be contained within said adjustable sized holes, and
 - a means for moving the piston within said cylinder; wherein said pneumatic cylinder and said piston rod are part of said actuator arm so that motion of said piston rod with respect to said cylinder changes said length of said actuator arm.

4,005,627

ROTARY CUTTER DRUMS

Richard Adrian Craddy, Bristol, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, Great Britain
Filed Dec. 22, 1975, Ser. No. 643,269

Claims priority, application United Kingdom, Jan. 17, 1975, 2077/75

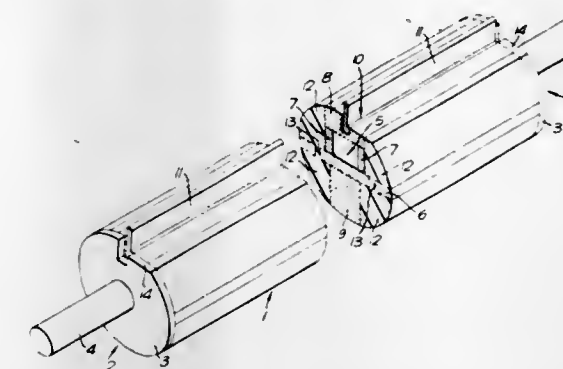
Int. Cl.² B26D 1/36

U.S. Cl. 83-674

6 Claims

1. A rotary cutter drum for use in apparatus for cutting continuous web material into discrete lengths including a load carrying member, means for attachment of a cutter blade

thereto, and non-load carrying light-weight material secured to said load carrying member and so arranged that the whole forms a body whose outer surface is rotationally symmetrical,



interrupted as necessary to allow for the presence of such cutter blade, in which means is provided on said load carrying member to balance said cutter blade and said attachment means.

4,005,628

TUNING KEY FOR STRINGED INSTRUMENTS

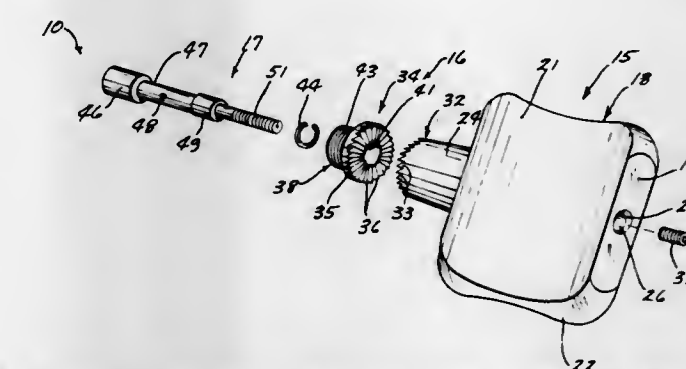
Myron E. Darling, Webster City, Iowa, assignor to B.J.D. Industries, Minneapolis, Minn.

Filed Sept. 5, 1975, Ser. No. 610,544

Int. Cl.² G10D 3/14

U.S. Cl. 84-304

7 Claims



1. A tuning key for stringed instruments having a peg box having an opening therein comprising:
 - an elongated spindle member rotatably received in said peg box opening;
 - a head piece connected to one end of said spindle member; ratchet means for alternately engaging said head piece and disengaging therefrom to allow effective rotational motion of said head piece and said spindle member with respect to said peg box in one direction only when engaged, whereby the tautness of a string wound upon said spindle member is maintained, and to allow rotational motion in the opposite rotational direction when disengaged, whereby the tautness of the string is lessened, said ratchet means comprising:
 - means secured to said peg box for allowing longitudinal movement of said spindle member between a first and a second longitudinal position with respect to said peg box;
 - means in engagement with said spindle member for biasing said spindle member to said first position;
 - first tooth means rigidly attached to said peg box; and
 - second tooth means rigidly attached to said head piece for selectively engaging said first tooth means, said second tooth means being in engagement with said first tooth means in said first position and disengaged from said first tooth means in said second position.

4,005,629

TRUSS BOLT DRIFT PIN

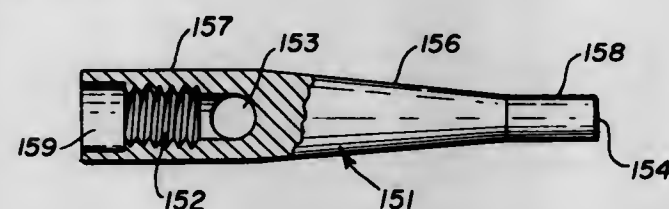
James W. Franklin, P.O. Box 3646, Albuquerque, N. Mex. 87110

Continuation of Ser. No. 457,957, April 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 214,699, Jan. 3, 1972, Pat. No. 3,826,057. This application Sept. 22, 1975, Ser. No. 615,265

Int. Cl.² F16B 1/00

U.S. Cl. 85-1 P

2 Claims



1. A truss bolt and drift pin combination for use in connection with the fabrication of truss systems comprising a truss bolt having a shank of length corresponding to the overall width of components to be joined, a head at one end of the shank, a shoulder at the opposite end of said shank, a threaded section on said bolt in position past said shoulder of size smaller than the size of said shank whereby the threads will not come into engagement with surfaces of the components to be joined, a drift pin extension for use with said truss bolt, a tapered exterior surface on said extension of size increasing gradually to a size corresponding to the size of said bolt shank, said drift pin extension at this larger end providing a mating surface for close engagement with the shoulder provided by said bolt shank and a longitudinally disposed central bore, and threads in said bore whereby the drift pin extension may be engaged to the threaded section of said bolt for the protection of said threads and to provide with said bolt a drift pin combination having a continuous transitional exterior surface facilitating forced placement of said truss bolt, said drift pin extension further providing a cross hole disposed transversely through the body thereof in position at the bottom of said central bore and of diameter corresponding to the minor diameter for said threads to facilitate the cutting of said threads during manufacture and the subsequent user removal of the drift pin extension after the truss bolt has been set, and further comprising a tip section at the smaller end of said drift pin extension, said tip section being of size and length for insertion through said cross hole whereby one drift pin extension may be used for wrenching action on another.

4,005,630

APPARATUS FOR SEPARATING A BULLET FROM A CARTRIDGE CASE

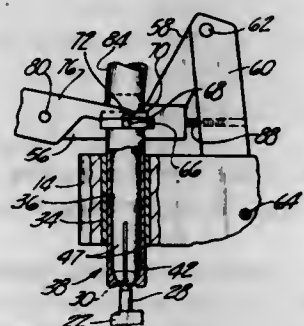
Dale M. Patrick, Wyandotte, Mich., assignor to Nathan A. Adler, Southfield, Mich., a part interest

Filed Feb. 25, 1975, Ser. No. 552,741

Int. Cl.² F42B 33/06

U.S. Cl. 86-1 A

8 Claims



1. An apparatus for separating a bullet from a cartridge case, said apparatus comprising a frame, hold-down means mounted on said frame, a reciprocating chuck comprising an inner and an outer sleeve concentrically and slidably disposed

one within the other, said inner sleeve having an end forming engageable inner jaw surfaces over said bullet defined by at least a pair of end segments formed by diametrically opposed longitudinal slots extending all the way to the end of said inner sleeve, a tapered peripheral surface formed on said inner sleeve proximate said end and a tapered portion on the inner surface of said outer sleeve for engagement with said tapered peripheral surface for applying said gripping force to said jaw surfaces by urging said opposed segments toward each other, and lever means reciprocating said chuck, said lever means comprising a first lever having a floating fulcrum pivot on said frame and being pivotally attached to said outer sleeve for reciprocating said outer sleeve, a second lever pivotally attached to said inner sleeve and having a floating fulcrum on said first lever for reciprocating said outer sleeves relative to said first sleeve for applying said gripping force to said jaw surfaces and for subsequently reciprocating said inner and outer sleeves in unison away from said cartridge hold-down means.

4,005,631

DEVICE FOR SETTING MECHANICAL TIME FUSES

Hans Kaiser, Königsfeld; Arthur Kopf, and Josef Müller, both of Schramberg, all of Germany, assignors to Gebrüder Jung-hans GmbH, Schramberg, Germany

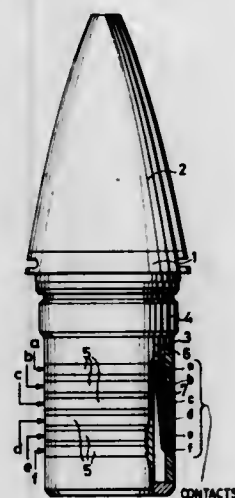
Filed Oct. 21, 1974, Ser. No. 516,417

Claims priority, application Germany, Oct. 23, 1973, 2352967

Int. Cl.² F42C 17/00

U.S. Cl. 89-6.5

7 Claims



1. In combination with an apparatus for adjusting a mechanical time fuse for a projectile in which a rotatable element is provided for adjusting the time period of the fuse; a housing forming a part of the projectile associated with the fuse, an electric motor in the housing coupled to the rotatable element to rotate the element, a setting device for the motor to rotate the motor to a predetermined rotated position to adjust the rotatable element thereby to set the fuse to a desired time period, said setting device being disposed outside the firing tube in which the projectile is disposed, and control wires leading from said setting device to said motor subject to including separable connector means therebetween.

4,005,632

LIQUID PROPELLANT GUN

John W. Holtrop, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 15, 1975, Ser. No. 613,690

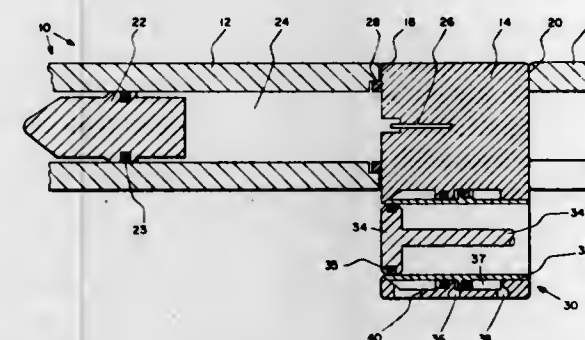
Int. Cl.² F41F 1/04

U.S. Cl. 89-7

4 Claims

1. In a gun, a sliding breech block movable between a firing position and a loading position, a firing device chambered in a first portion of said block,

valve means including a cylindrical valve slidably mounted in a second portion of said block and defining with said second block portion a fuel chamber and a hydraulic control chamber,



so that said valve means is removed from the breech area when the gun is in said firing position ready to be fired by said firing device.

4,005,633

STRUCTURE FOR ARTICLE HANDLING SYSTEMS

Robert G. Kirkpatrick, Shelburne, Vt., assignor to General Electric Company, Burlington, Vt.

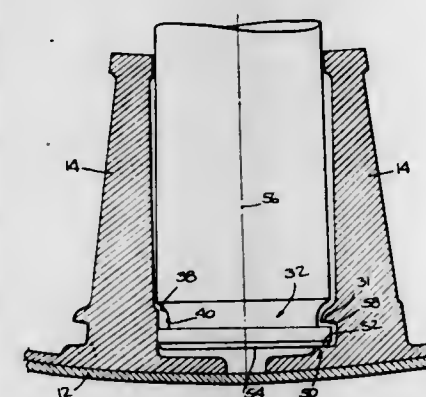
Continuation of Ser. No. 414,205, Nov. 9, 1973, abandoned.

This application Mar. 21, 1975, Ser. No. 560,346

Int. Cl.² F41D 9/06

U.S. Cl. 89-33 D

10 Claims



1. An article handling system, for use in conjunction with a source of gravitational attraction, and with a plurality of substantially cylindrical articles, each article having a longitudinal axis, a transverse end surface perpendicular to the longitudinal axis, and an annular groove adjacent to and spaced from the transverse end surface and providing a transverse annular surface parallel to the transverse end surface, the transverse annular surface and the transverse end surface jointly defining an annular disk, including:

- a pair of longitudinally extending, transversely spaced apart side walls, jointly defining a channel having a transverse width which is slightly greater than the diameter of one article, for receiving and freely passing therebetween a longitudinally extending column of side-by-side articles, each article standing on its transverse end surface disposed between said side walls and having a distal portion remote from the transverse end surface and projecting beyond said side walls;
- pushing means for pushing the entire column of articles along said channel;
- a first, longitudinally extending transverse track surface, facing toward said pushing means and adjacent one of said side walls and spaced from the other of said side walls, and defining the bottom of said channel, for solely abutting and supporting the transverse end surface of each article in said channel when the articles are substantially between said pushing means and the source of gravitational attraction;

a second, longitudinally extending transverse track surface, facing away from said pushing means, and disposed adjacent yet spaced from said first track surface by a distance slightly greater than the thickness of the annular disk of the article, and adjacent one of said side walls and spaced from the other of said side walls, for solely abutting and supporting the transverse annular surface of each article in said channel when said pushing means is substantially between the articles and the source of gravitational attraction;

said pushing means and one of the group comprising said first and second track surfaces jointly interacting with each article, whereby the abutment of said one track surface under the influence of the source of gravitational attraction with one of the group comprising the transverse end surface and the transverse annular surface of each article while such article advances along said channel provides a frictional drag which is eccentric to the longitudinal axis of such article which causes each such article to rotate about its own longitudinal axis.

4,005,634

METHOD AND APPARATUS FOR RAISING A COLLAPSIBLE SCREEN MOUNTED ON A VEHICLE SUCH AS A TANK

Curt Olof Ekman, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

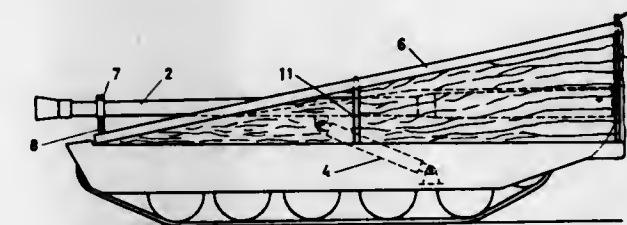
Filed Dec. 13, 1974, Ser. No. 532,580

Claims priority, application Sweden, Dec. 20, 1973, 7317183

Int. Cl.² F41H 5/00

U.S. Cl. 89-36 H

5 Claims



1. A method for selectively raising and lowering a collapsible screen which is normally stored in its collapsed state in a storage channel formed peripherally about the upper surface of a vehicle such as a tank or the like which vehicle pivotally supports therein a gun barrel, said method comprising the steps of:

- a. operatively connecting to the non-pivoted end of the barrel one end of a rigid frame to which the screen is permanently secured along its upper edge while its lower edge is secured to the vehicle's peripheral surface,
- b. raising said one end of said frame by elevating said barrel,
- c. pivotally interconnecting said frame with the upper surface of the vehicle at the midsection of the opposed longitudinal sides of the frame,
- d. lowering the barrel to thereby pivot said frame about its midsection pivotal supports to thereby raise the rear end of the frame,
- e. pivotally supporting the rear end of the frame in its upwardly pivoted position,
- f. pivoting said frame upwardly about its pivots at its rear end by again raising the barrel,
- g. and supporting the forward end of the frame in its raised position.

4,005,635
METHODS AND EQUIPMENT FOR MACHINING
ELECTRODES

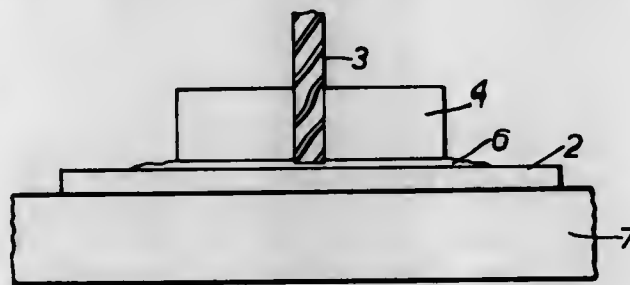
Edward George Feldcamp, Tudor Cottage, Church End Twyn-
ing, Tewkesbury, Gloucestershire, England

Filed Nov. 4, 1974, Ser. No. 520,741

Int. Cl.³ B23C 3/00

U.S. Cl. 90-11 C

3 Claims



1. A method of manufacturing a spark erosion electrode, comprising

1. providing a rough-cut electrode blank,
2. soldering the blank to the upper surface of a base plate,
3. fixing the base plate to the table of a milling machine having a spindle with said surface at right angles to the axis of the spindle,
4. mounting a milling tool in said spindle,
5. milling the side edges of the blank throughout the full depth of the blank by means of said milling tool, and
6. removing the base plate from the table and detaching the milled blank from the base plate by fusing the solder.

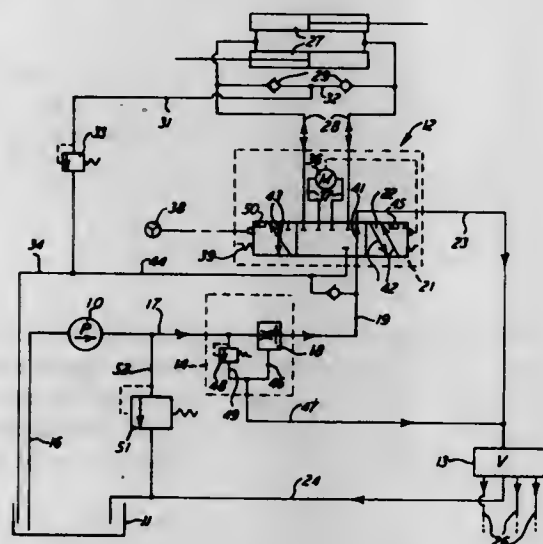
4,005,636
HYDRAULIC SYSTEM FOR A WORKING MACHINE
Donnell L. Dunn, Terre Haute, Ind., assignor to J. I. Case
Company, Racine, Wis.

Filed Feb. 13, 1975, Ser. No. 549,835

Int. Cl.³ F15B 13/04

U.S. Cl. 91-31

1 Claim



1. A hydraulic system for a working machine of a vehicle type having a hydraulically powered power steering mechanism and a hydraulically powered working implement, a hydraulic valve included in said steering mechanism, an additional hydraulic valve for operating said implement, the improvement comprising a flow control valve hydraulically connected with each of the other two said valves and being of the type and connected therewith for dividing hydraulic flow between said other two valves and to be free of any hydraulic pressure altering means and to be thus arranged to always have the same hydraulic pressure flow to said two valves, a hydraulic pump hydraulically connected with said flow control valve for pumping hydraulic fluid to all said valves, a hydraulic line connected directly between said other two valves to have said other two valves directly hydraulically

connected together, said flow control valve being hydraulically connected with said other two valves to have said vehicle steering valve in a hydraulically parallel type of connection relative to the hydraulic connection between said flow control valve and said additional hydraulic valve, said other two valves being of the open-center type for the flow of fluid through said other two valves without utilizing the flow therethrough for any useful work, said steering mechanism hydraulic valve being hydraulically connected with said implement hydraulic valve to be upstream from said implement hydraulic valve relative to the hydraulic output of said pump, whereby all the flow through said flow control valve may be passed through said implement hydraulic valve, a fluid pressure relief valve hydraulically connected with said other two valves and being disposed upstream from said flow control valve for diverting the pump flow from said pump away from said steering mechanism hydraulic valve and to said implement hydraulic valve when hydraulic pressure at said steering mechanism hydraulic valve is at a minimum pressure, and an additional fluid pressure relief valve hydraulically connected with said pump and connected to by-pass said implement hydraulic valve for diverting flow from said pump away from said implement hydraulic valve when hydraulic pressure at said implement hydraulic valve is at a minimum pressure, and with said additional fluid pressure relief valve being arranged and of a type to divert the flow only at a hydraulic pressure greater than that at which the first said fluid pressure relief valve diverts the flow.

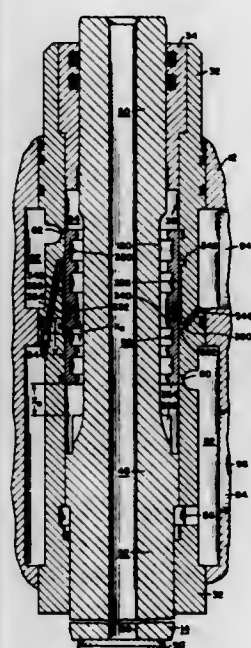
4,005,637
HYDROACOUSTIC APPARATUS AND VALVING
MECHANISMS FOR USE THEREIN
John V. Bouyoucos, Rochester; Roger L. Selsam, Fairport, and
Dennis R. Courtright, Canandaigua, all of N.Y., assignors to
Hydroacoustics Inc., Rochester, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,977

Int. Cl.³ F01L 17/00, 25/04; F01B 7/18

U.S. Cl. 91-276

12 Claims



1. An impact tool for producing percussive forces for application to a load which comprises
a housing having a generally cylindrical opening therein,
a hammer mounted in said opening for oscillatory movement in opposite directions axially of said opening toward and away from an impact position, said hammer and said housing including a side wall defining in said opening an annular cavity,
a valve mechanism modulating the flow of hydraulic fluid into and out of said cavity for producing pressure variations therein for sustaining the oscillations of said hammer,
said valve mechanism including a valve element mounted in

said cavity for movement in opposite directions axially of said cavity,
pressurized hydraulic fluid supply and return means in said housing including supply and return ports into said cavity spaced from each other in a direction axially of said cavity and disposed in porting relationship with said valve element to alternately open and close said ports as said valve moves in said opposite directions,
said hammer having a radially extending portion which engages said valve element when said hammer moves in one of said opposite directions and moves said valve element therewith in said one of said opposite directions,
said valve element and the side wall of said housing which defines said cavity forming a chamber therebetween extending axially of said housing, said valve element having a portion extending radially into said chamber and presenting an area in a plane perpendicular to the axis of said housing,
means communicating with at least one of said pressurized hydraulic fluid supply and return means for providing communication between said chamber and said supply and return means for applying hydraulic forces acting continuously in the other of said opposite directions upon said valve element to move said valve element continuously in the other of said opposite directions.

4,005,638
VACUUM-SUSPENDED TIRE SERVO-MOTOR
Hiroo Takeuchi, Ueda, Japan, assignor to Nishin Kogyo Kabu-
shiki Kaisha, Ueda, Japan

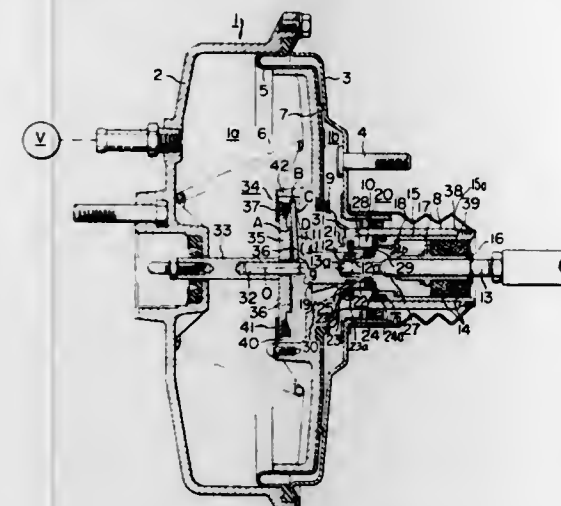
Filed Dec. 8, 1975, Ser. No. 638,689

Claims priority, application Japan, Feb. 18, 1975, 50-19473

Int. Cl.³ F15B 9/10

U.S. Cl. 91-369 B

3 Claims



1. A servo-motor of the vacuum-suspended type including:
a casing structure and a movable wall member dividing the casing structure into a front, first power chamber to which vacuum is always communicated and a rear, second power chamber;
an input member slidably fitted in said movable wall member;
an output member operatively connected with said movable wall member on the front side thereof; and
control valve means operatively connected with said input member and adapted to selectively place said second power chamber into communication with said first power chamber and the external atmosphere;
said control valve means comprising:
a tubular valve casing integral with said movable wall member on the rear side thereof and slidably supported by the rear wall of said casing structure, said valve casing having a front end wall constituting part of said movable wall member and opening at the rear end to the external atmosphere;

a first valve seat on said front end wall of said valve casing inside thereof in encircling relation to said input member;
a first annular valve member including an inner peripheral portion sealingly secured to said input member around the outer periphery thereof, an outer peripheral portion formed to serve as a valve closure element engageable with said first valve seat and an intermediate flexible web portion, said first valve seat and said first valve member cooperating with each other to define in said valve casing radially inner and outer spaces respectively communicating with said first and second power chambers;
a second valve seat on the rear end face of said input member;
a second valve member having an outer peripheral porting sealingly secured to said valve casing around the inner peripheral wall thereof, an inner peripheral portion adapted to serve as a valve closure element engageable with said second valve seat and an intermediate flexible web portion;
an annular reinforcement member provided with a radial through hole therein and interconnecting said valve closure elements of said first and second valve members integrally with each other to define therebetween an axial distance smaller than that between said first and second valve seats when said input member is in its rearmost position; and
spring means associated with said first and second valve closure elements to bias the two elements toward said respective valve seats.

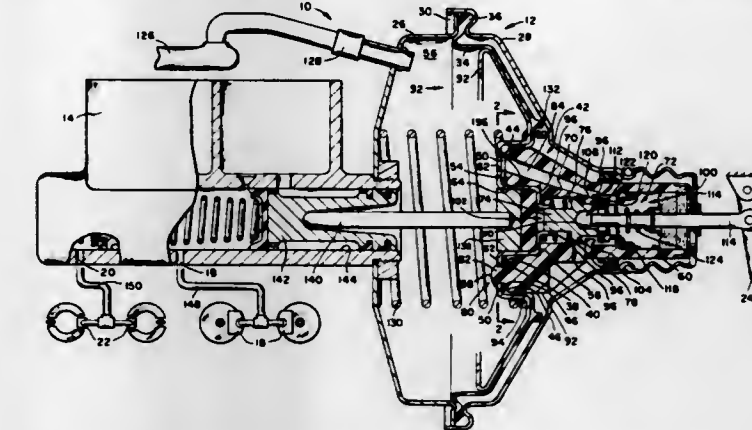
4,005,639
BACKING PLATE MEANS FOR A SERVOMOTOR
Harold H. Welsh, Jr., South Bend, Ind., assignor to The Bendix
Corporation, South Bend, Ind.

Filed June 6, 1975, Ser. No. 584,309

Int. Cl.³ F15B 9/10

U.S. Cl. 91-376 R

10 Claims



1. A servomotor for use in a vehicle, comprising:
a housing having a front shell and a rear shell, said front shell and said rear shell being joined together to form a sealed cavity therein;
diaphragm means having an external bead located between the front shell and the rear shell for establishing a front chamber and a rear chamber, said diaphragm means having an inner bead separated from an annular rib, said diaphragm means having a sleeve section which extends rearwardly from said annular rib, said diaphragm means having a series of holes located between said annular rib and said inner bead;
hub means having a first groove and a second groove, said first groove being associated with said annular rib and said second groove being associated with said inner bead, said hub means having an axial bore therethrough, said axial bore being connected to at least one of said series of holes in said diaphragm means through a passageway means;
backing plate means located adjacent said diaphragm means having a second series of holes therein aligned with said first series of holes in the diaphragm means, said

backing plate means having an inner surface which extends into said axial bore of the hub means, said hub means urging said sleeve section against said backing plate means to radially seal the rear chamber from the front chamber;

fastener means connecting said backing plate means to said hub means through some of said first and second series of holes for urging said annular rib and inner bead of diaphragm means into said first and second grooves, respectively, to sealingly separate the front chamber from the rear chamber; and

control means located in said axial bore of the hub means for allowing free communication between the front chamber and the rear chamber by way of communication through the axial bore through said passageway means, said control means responding to an input force to interrupt communication between the axial bore and the front chamber through said passageway means for allowing a source of fluid under pressure to enter the rear chamber and establish a pressure differential across the diaphragm means and backing plate means and create an output force which is directly transmitted through said inner surface of said backing plate means into an output means.

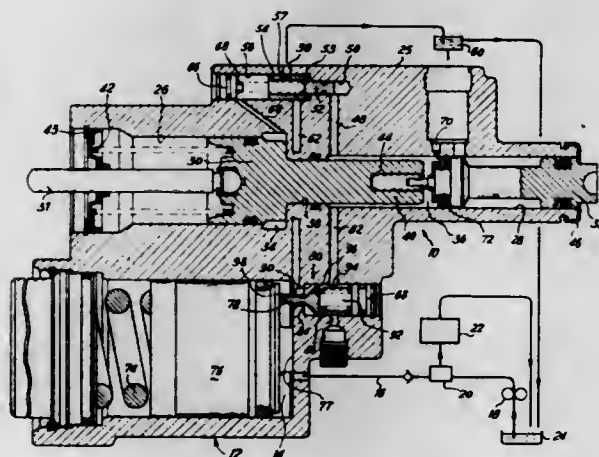
4,005,640

POWER BOOST MECHANISM

Alfred William Thomas, Saarbrücken, Germany, assignor to Deutsche Bendix Ausrüstungs GmbH, Germany
Filed Nov. 7, 1975, Ser. No. 630,115
Int. Cl.² F15B 13/042, 17/02

U.S. Cl. 91-460

6 Claims



1. A power boost mechanism including a housing defining a working chamber and a control chamber filled with fluid, a fluid pressure accumulator having a pressure responsive element and a chamber filled with fluid for providing pressure fluid for operation of said power boost mechanism, control valve means responsive to the fluid pressure level in said control chamber to shift from a released position venting said working chamber to a position communicating pressure from the accumulator chamber into said working chamber as said control valve means is shifted from said released position, a piston slidably received within said working chamber, an output plunger operatively connected to said piston and slidably received within said control chamber, operator-actuated means including an input plunger slidably received within said control chamber, said control chamber communicating with said accumulator chamber by means of an exhaust passage including a spring biased relief valve allowing hydraulic fluid to flow from the accumulator chamber towards the control chamber when the pressure differential across said relief valve is above a first predetermined level, and said pressure responsive element responsive to the pressure level in the accumulator chamber being engageable with said relief valve to open the same when the pressure in the accumulator chamber is below a predetermined minimum level lower than said first predetermined level.

4,005,641

APPARATUS FOR ROTATING AND DISPLACING IN AXIAL DIRECTION A MACHINE ELEMENT

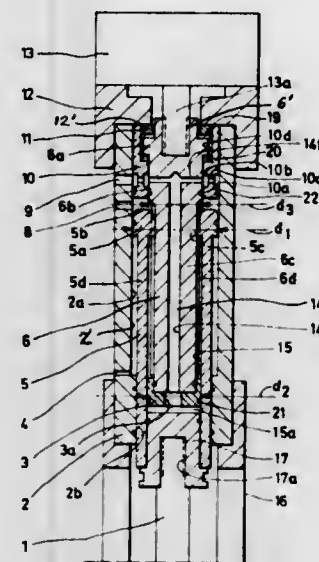
Thomas Nassbaumer, Zug, Switzerland, assignor to Patent & Inventionen Ltd., Zug, Switzerland

Filed Dec. 23, 1974, Ser. No. 535,847

Claims priority, application France, Jan. 4, 1974, 74.00225
Int. Cl.² F01B 21/00

U.S. Cl. 92-2

4 Claims



1. An apparatus for selectively moving a machine element mounted to be rotatable and axially displaceable, comprising a motor, a hollow cylinder, a piston displaceably arranged in said hollow cylinder, a machine element, said piston being provided with a connection element for rigidly connecting said piston with said machine element, said piston having a lengthwise extending opening including opposed ends, means for sealing one end of the lengthwise extending opening confronting the connection element, a drive shaft extending into said lengthwise extending opening from the other end thereof opposite said one end, means for connecting said drive shaft with said motor first sealing means for sealing said drive shaft at the region of the connection element with respect to an inner surface of the piston forming a first sealing section said piston being slidably with respect to said drive shaft, second sealing means for sealing said drive shaft at the region of its end connected with said motor with respect to said cylinder and forming a second sealing section, said second sealing means including means which together with the second sealing section form a tightly closing seat, said piston and said drive shaft possessing coupling means disposed between both of said sealing sections, said coupling means rigidly rotatably connecting the piston and the drive shaft with one another but permitting axial displacement relative to one another, means defining a first hydraulic connection for the infeed of a hydraulic agent for displacing said piston in one direction, said drive shaft possessing a throughpassage means which connects said first hydraulic connection with an end section of the lengthwise extending opening of the piston, said end section being located at the side of the connection element, a second hydraulic connection for the infeed of a hydraulic agent which opens into the hollow cylinder between the second sealing section and an end of a sliding surface of the piston which confronts said second sealing section for displacing the piston in said one direction, said first sealing section and said second sealing section possessing the same diameter, said first sealing section and said second sealing section constituting the sole sealing sections for preventing the hydraulic agent from impinging the drive shaft with axial forces during a working phase of the apparatus.

4,005,642

CROSS-OVER PORT CONSTRUCTION FOR HYDRAULIC MOTORS

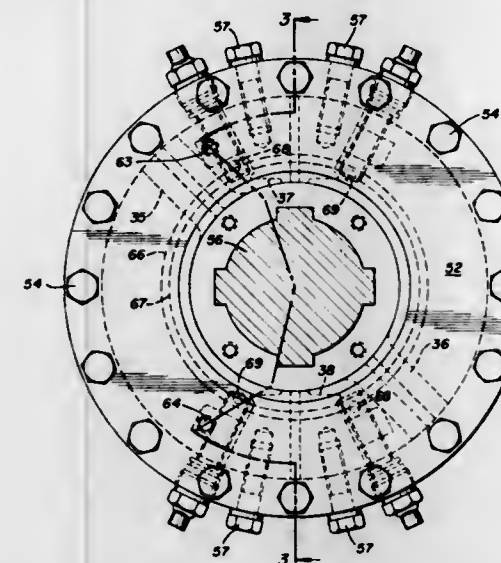
Larry D. Hanawak, Mansfield, Ohio, assignor to Shafer Valve Company, Mansfield, Ohio

Filed Aug. 6, 1975, Ser. No. 602,381

Int. Cl.² F01C 9/00

U.S. Cl. 92-122

3 Claims



1. In a hydraulic motor having a rotor with diametrically opposite vanes for rotating between stationary shoes providing two pairs of fluid pressure chambers of varying volume on opposite sides of the vanes, conduits for supplying pressure fluid to one pair of said chambers and exhausting it from the other pair, a housing including a top plate enclosing said rotor, said top plate having a bearing bushing journaling said rotor; the improvement comprising two ports alternating as pressure fluid supply and exhaust ports in the top plate connected one to one chamber of each said pair, and cross-over passageways in said top plate connecting the chambers of each pair together, said cross-over passageways being annular grooves encircling said bearing bushing and having one open side abutting said bearing bushing.

4,005,643

APPARATUS FOR SECURING A BAND ON SHEET BLANKS

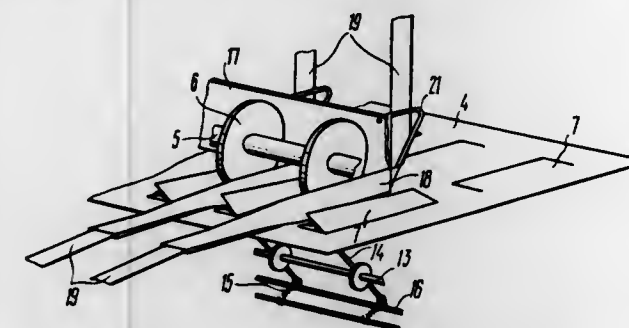
Myalik Khasyanovich Nurimanov, ulitsa Svobody, 89, korpus 1, kv. 19; Vkhly Afanasievich Khariamov, Novopeshanaya ulitsa, 13/3, kv. 131, and Ivan Ivanovich Zaboltn, Sevastopolsky prospekt, 34, kv. 22, all of Moscow, U.S.S.R.

Filed Mar. 5, 1975, Ser. No. 555,617

Int. Cl.² B310 1/00

U.S. Cl. 93-1 R

3 Claims



1. An apparatus for securing a band on sheet blanks for the formation of pockets for collection albums and the like, comprising: a framework; a system of vertically arranged pairs of driving rollers supported by said framework for positively advancing a succession of blanks therebetween; means for rotating said rollers; each of the first of said pairs of said rollers, in the direction of the advance of the blanks, being

constituted as an arbor with a plurality of discs mounted on said arbor in spaced relationship; a plurality of spring-loaded rods supported adjacent the path of the blanks to bend away pre-punched flaps formed in said blanks, said rods being arranged parallel to one another in a row within respective spaces between said discs and under the advancing blanks; a plurality of guides for positive feed of respective bands, said guides being arranged parallel to one another in a row within said respective spaces between said discs above the advancing blanks, each said guide being in the form of a twisted plate having a vertical inlet portion and a horizontal outlet portion to turn a respective band from a vertical position into a horizontal position, said horizontal portion being positioned to introduce said band under the flap bent away by the respective one of said rods.

4,005,644

METHOD FOR MAKING A CAN CARRIER

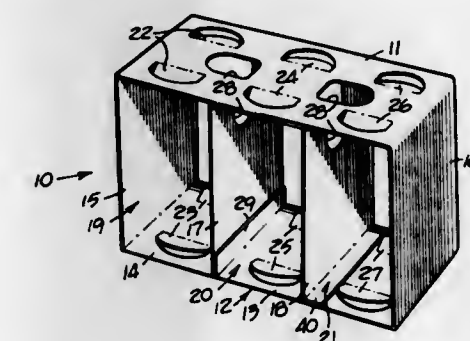
George V. Tranquillitsky, 3161 Lynde St., Oakland, Calif. 94601

Division of Ser. No. 489,132, July 17, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,492

Int. Cl.² B31B 1/26

U.S. Cl. 93-37 SP

2 Claims



1. A method for making a side loading carrier on a straight-line gluer from a pre-cut and scored one-piece blank comprising a plurality of parallel scorelines formed thereon to consecutively define a first flap, a first bottom panel portion, a first end panel, a top panel, a second end panel, a second bottom panel portion, a first partition, a bridging panel, a second partition and a second flap, comprising the steps of moving said blank along a linear path, first folding said blank and adhesively securing said bridging panel to a mid-portion of said top panel, second folding said blank and adhesively securing said second flap to said first bottom panel portion, and third folding said blank and adhesively securing said first flap to a side of said first partition directly.

4,005,645

COOKING UTENSIL ACCESSORIES

Alexander Patton Janssen, 28 Old Farm Road, Bellair, Charlottesville, Va. 22903

Continuation-in-part of Ser. No. 327,658, Jan. 29, 1973, Pat. No. 3,946,654. This application Dec. 5, 1975, Ser. No. 637,966

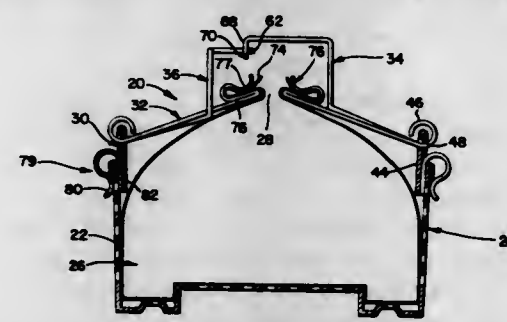
Int. Cl.² A47J 27/10

U.S. Cl. 99-403

37 Claims

1. An attachment for use with a cooking vessel and a disposable bag to facilitate the cooking of comestibles in said bag, said attachment including a base; means for supporting the base from and fixing it relative to the cooking vessel; and a plurality of inwardly extending elements fixed to said base for concomitant pivotal movement relative thereto, there being bag engageable means at the inner ends of said elements to which the bag can be attached at an opening defining end

thereof, whereby said elements can be concomitantly rotated toward each other to constrict the opening during the cooking



of the comestibles and away from each other to enlarge the opening and furnish access to the comestibles in the bag.

4,005,646 ROTATABLE GRILL

Burkhard Krüper, Menden, Germany, assignor to Firma Gebr. Cramer, Menden, Germany

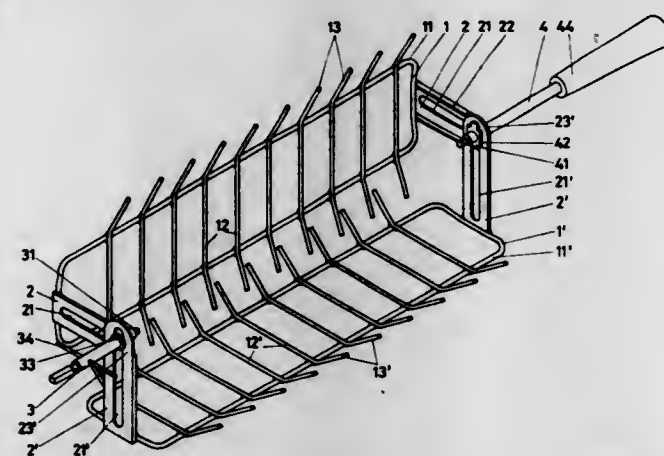
Filed Sept. 2, 1975, Ser. No. 609,465

Claims priority, application Germany, Oct. 4, 1974, 7433343[U]

Int. Cl.² A47J 37/04

U.S. Cl. 99-427

9 Claims



1. A rotatable grill for demountably retaining food objects comprising:

- a first basket half;
- a second basket half similar in size to said first basket half;
- and
- pivotal bracket means for adjustably joining the ends of said basket halves to form a closed basket at their longitudinal sides, said baskets being pivotably moveable with respect to each other in the opened position.

4,005,647 STRAPPING MACHINE

George F. Goodley, Media; William H. Woome, Glen Riddle; Udaykumar B. Inamdar, Kennett Square, and Robert L. Gallagher, Aston, all of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 3, 1976, Ser. No. 654,814

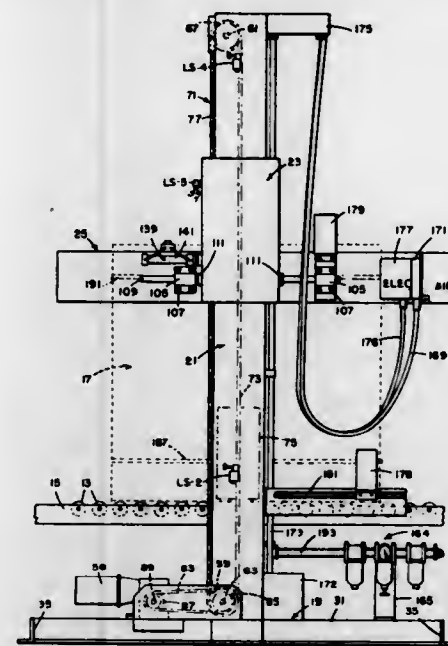
Int. Cl.² B65B 13/04

U.S. Cl. 100-4

16 Claims

1. A machine for applying a tensioned strap loop horizontally about the girth of an object including a mast, a ring extending laterally from said mast in substantially a horizontal plane and supported on said mast for movement longitudinally thereof between a retracted position and a projected position in which said ring encircles an object which is to be strapped, a sealing head mounted on said ring, means supporting said ring for traversing in its horizontal plane relative to said mast between a retracted position and a projected position in which said sealing head is located immediately adjacent to an object which is to be strapped, and a strap yoke mounted on said ring

in the horizontal plane thereof and opening along the interior thereof, said yoke communicating with said sealing head and together there- with providing a generally continuous passage for lacing of strap along said ring as a loop having its leading



end overlying with a trailing portion thereof at said sealing head, said sealing head including means for tensioning a strap laced within said ring to provide a tensioned strap loop about an object which is to be strapped and means for securing together overlapping portions of the tensioned strap loop.

4,005,648 TRASH COMPACTOR

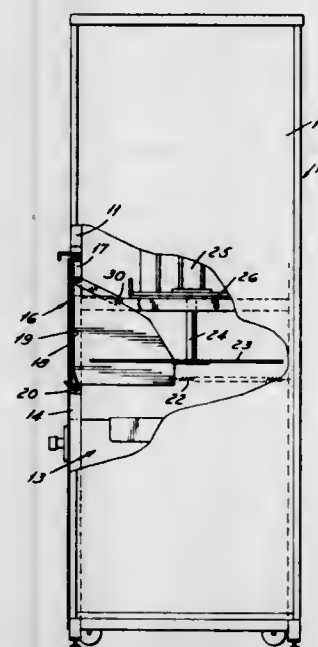
Earl S. Edwards, Windsor, Canada, assignor to McClain Industries Inc., Utica, Mich.

Filed Apr. 28, 1975, Ser. No. 572,110

Int. Cl.² B30B 15/00

U.S. Cl. 100-53

6 Claims



6. In a trash compactor, the combination comprising a body, said body having a trash receiving area, a pivotally mounted access door through which trash may be deposited to said trash receiving area, and a vertically movable ram, means for moving said ram from a position adjacent said access door to a compacting position in said trash receiving area, and gravity operated lock means mounted on said body and

having engaging means normally urged by gravity in a direction to interengage said access door directly to lock said door,

said gravity operated lock means being operable by the ram upon downward movement of said ram to permit said engaging means to move downwardly by the action of gravity to engage said access door directly and lock said access door during the downward movement of the ram and operable by the ram upon upward movement of the ram to disengage said engaging means from said door against the action of gravity and unlock the access door.

4,005,649

SPECIAL ARTICLE SCREEN PRINTER AND DRIVE THEREFOR

Karl Strauch, Kirchleugern, and Wilfried Kammann, Bunde, both of Germany, assignors to Werner Kammann Maschinenfabrik, Bunde, Germany

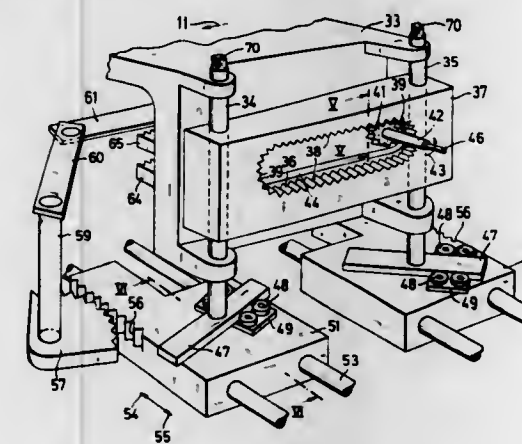
Filed Jan. 16, 1975, Ser. No. 541,411

Claims priority, application Germany, Jan. 22, 1974, 2402836

Int. Cl.² B41F 17/08, 15/08

U.S. Cl. 101-40

18 Claims



1. In a screen-printing machine, a combination comprising at least one printing station past which an object to be printed travels in a path in a predetermined direction, and which includes a movable printing screen and a cooperating movable squeegee; a rack extending along said path; means for mounting said rack so as to be stationary in said direction of movement; means for rotating said object to be printed, including a gear meshing with said rack; means for moving said squeegee at a constant rate of speed; means for varying the speed of movement and the stroke of said printing screen in dependence upon the peripheral speed of the rotating object; mounting means for mounting said printing screen; mounting means for mounting said squeegee, including a carriage and a control member; a movable element connected between both of said mounting means and mounted on a support which is elongated in direction of said path to perform to-and-fro movements in direction of the elongation of said support; drive means for moving said movable element in said to-and-fro movements so as to effect relative movement between said printing screen and said squeegee; and a control slide operated by said control member in dependence upon the movements of said carriage and in turn operative for controlling the to-and-fro movements of said element.

16. In a screen-printing machine, a combination comprising at least one printing station past which an object to be printed travels in a path in a predetermined direction, and which includes a movable printing screen and a cooperating movable squeegee; a rack extending along said path; means for mounting said rack so as to be stationary in said direction of movement; means for rotating said object to be printed, including a gear meshing with said rack; means for moving said squeegee at a constant rate of speed; means for varying the speed of movement and the stroke of said printing screen in dependence upon the peripheral speed of the rotating object; and a

discrete rack section located upstream of said rack with reference to the travel of the object in said path, said rack section being movable parallel to said rack between two end positions in one of which it contacts and forms a longitudinal extension of said rack.

4,005,650

PRINT HAMMER

Donn F. Moore, Utica, Mich., assignor to Computer Peripherals, Inc., Rochester, Mich.

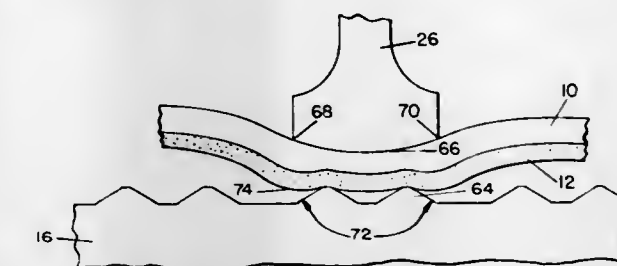
Continuation of Ser. No. 431,110, Jan. 7, 1974. This

application July 16, 1975, Ser. No. 596,348

Int. Cl.² B41J 1/20, 9/02; B41B 1/02

U.S. Cl. 101-111

4 Claims



1. A print hammer for printing on record media in a printer having type characters movable along a path adjacent the hammer, each of said type characters having an included angle of chamfer greater than a right angle, said record media being located between said print hammer and said type characters, and means for actuating said hammer into contact with said record media and against said characters, said hammer including an impact face defined by spaced side edge portions and having a curvature of predetermined length from one side edge portion along said curvature to the other side edge portion and assuming a convex shape in which normals at neighboring points diverge in relation to one of said type characters, thereby causing flexure of said record media around said curvature upon impact of said face therewith and against said character, said angle of chamfer limiting the extent of flexure of said record media adjacent said character upon the impacting of said hammer against the record media.

4,005,651

APPARATUS FOR ORIENTING PATTERNS PROVIDED ON MASKS FOR SERIGRAPHY

Pierre Louis Sigel, Villeneuve-le-Roi, and Karel Gaston Kurzwel, Eaubonne, both of France, assignors to Societe Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 350,549, April 2, 1973, abandoned.

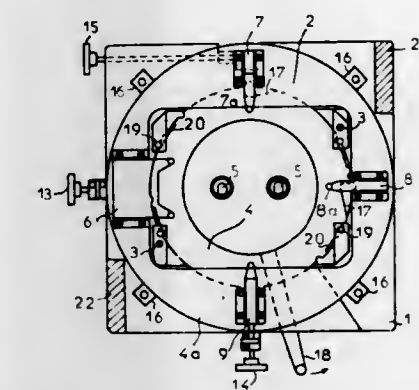
This application Feb. 10, 1975, Ser. No. 548,215

Claims priority, application France, Apr. 25, 1972, 72.14643

Int. Cl.² B41F 15/36

U.S. Cl. 101-127.1

7 Claims



1. An improved support for orienting a pattern provided on a mask with respect to the frame on which the mask is mounted with a reference pattern provided on a supporting

alignment base having at least two prongs mounted on the base and projecting from the base, the prongs each having a longitudinal central axis and being positioned so that their longitudinal central axes are a predetermined distance from said reference pattern and from each other comprising:

support means for mounting a mask, said mask having a pattern and a marking thereon, said support means including apertures to be selectively positioned on and removed from the prongs on the base and a frame to support said mask to the support in a fixed, predetermined position with respect to the base and with respect to the base reference pattern, said frame being selectively movable with respect to the support such that the marking on the mask may be brought into alignment with the reference pattern;

means for moving said frame with respect to the support to effect said alignment;

means for locking the position of the frame with respect to the support after the marking on the mask has been brought into alignment with the reference pattern, whereby said mask support means may then be removed from the base and may thereafter be employed in the production, by serigraphy, of multi-layer connector circuit.

4,005,652

ADDRESSING MACHINE AND VARIABLE DRAG DRIVE THEREFORE

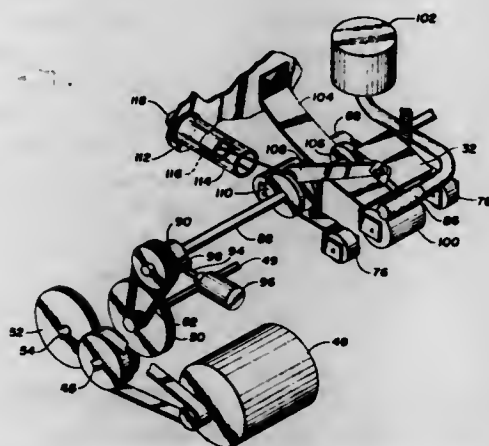
Eduard C. Petry, Richfield, Minn., assignor to Speedaddress, Inc., Minneapolis, Minn.

Filed Feb. 10, 1975, Ser. No. 548,625

Int. Cl.³ B41L 1/12

U.S. Cl. 101-131

1 Claim



1. A machine for duplicating printed matter from an imprint area of a master card to a selected area on one face of a workpiece comprising:

rotary drive means for imparting rotary motion to a first shaft;

transfer means driven by said first shaft, said transfer means accepting said workpiece upon which material is to be duplicated and transporting the workpiece continuously along a transfer path through the machine;

workpiece moistening means for applying solvent to at least a portion of said face of said workpiece as said workpiece is transported along the transfer path;

card feed means mounted on a shaft for delivering a single master card each time its said shaft is rotated through a complete revolution;

clutch means connected to transmit rotary motion from an input shaft to said shaft of said card feed means to drive said card feed means only when actuated;

means for actuating said clutch when a workpiece reaches a predetermined point on the transfer path, and rotating said shaft of said card feed means through one complete revolution to deliver said single master card with said imprint area in confronting aligned relationship with said moistened portion of said face of said workpiece as said workpiece is transported along the transfer path;

resilient coupling means connected to said first shaft and said input shaft of said clutch means for providing a resilient coupling between said first shaft and said input shaft of said clutch means whereby the rotary motion of said input shaft of said clutch means is permitted to lag the rotary motion of said first shaft;

adjustable drag means comprising a piston mounted in a cylinder having a variable aperture orifice therein to control the amount of drag, said drag means connected to said card feed means to adjustably inhibit motion thereof, said adjustable drag means and said resilient coupling means cooperating to adjustably inhibit rotational movement of said shaft of said card feed means relative to said first shaft to cause said card feed means to provide an adjustable time lag in the delivery of said master card from said card feed means relative to the transporting of said workpiece through the machine thereby altering the location of the area on said workpiece where the printed matter is to be duplicated.

4,005,653

VACUUM CYLINDER FOR PRINTING PRESSES

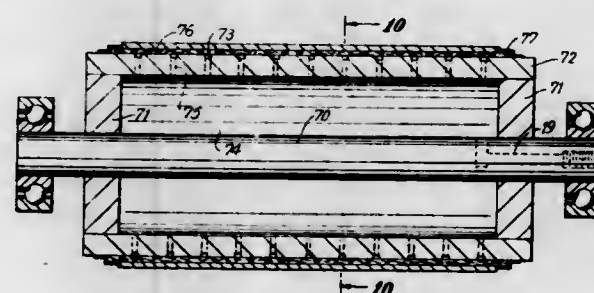
William C. Arkell, Cornwall, England, assignor to Livermore and Knight Co., Inc., Palm Beach, Fla.

Filed Sept. 9, 1974, Ser. No. 504,254

Int. Cl.³ B41F 27/06, 27/12

U.S. Cl. 101-382 MV

6 Claims



1. A vacuum-operated printing cylinder, which comprises
 - a. a shaft,
 - b. a cylinder sleeve supported on said shaft and defining a vacuum chamber,
 - c. a plurality of closely spaced, generally continuous annular grooves formed on the outer surface of said cylinder sleeve,
 - d. air passage means connecting each of said annular grooves with said vacuum chamber,
 - e. said cylinder sleeve having at least one axially disposed groove intersecting said annular grooves,
 - f. axially disposed sealing strip means tightly received in and completely filling said axial groove, whereby said sealing strip means forms a continuation of the outer surface of the sleeve in the circumferential direction and blocks said annular grooves to provide a predetermined circumferential discontinuity between adjacent ends of each annular groove, and
 - g. a printing plate mounted on the outer surface of said sleeve whereby said printing plate is held on said cylinder by the vacuum power of said chamber without the aid of mechanical clamping means,
 - h. said printing plate being arranged so that the end edge portions thereof overlap said sealing strip means thereby avoiding leakage adjacent to the ends of the vacuum-held printing plate.

4,005,654

PROCESS FOR SHALLOW RELIEF PRINTING

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

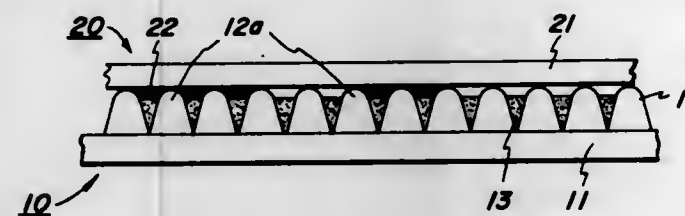
Continuation-in-part of Ser. No. 207,846, Dec. 14, 1971,

abandoned. This application Dec. 23, 1975, Ser. No. 643,716

Int. Cl.³ B41M 1/02; B41N 1/12; B41F 31/22

U.S. Cl. 101-426

6 Claims



1. A printing process comprising forming a resilient image having a relief of from about 4 microns to about 50 microns on a hard, non-resilient surface forming a background for the image, providing a gravure donor member, providing a liquid developer recessed within the cells of said gravure donor member from about 4 microns to about 50 microns below the surface of the contact plane, contacting both image and non-image areas of the master with the gravure donor member whereby the resilient image reaches into the recesses to contact and remove developer whereby said contacting selectively transfers said developer to said resilient image and not to the background areas of the master, and contacting said developer resilient image with a receiver sheet to transfer said developed image to said receiver sheet.

4,005,655

INFLATABLE STABILIZER/RETARDER

Nick Kleinschmidt, China Lake, and James V. Netzer, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1976, Ser. No. 654,315

Int. Cl.³ F42B 25/02

U.S. Cl. 102-4

11 Claims



1. A tail assembly for a fin stabilized retarded bomb comprising:
 - an adapter ring configured to permit attachment to the aft end of a bomb;
 - a plurality of fin members each having one end pivotally attached to said adapter ring;
 - said fin members comprising a structural member of T-shaped cross section with the fin portion attached to a base cross member or web portion extending orthogonal to said fin portion;
 - said fin members forming together a cylindrical enclosure area;
 - an inflatable bag positioned within said cylindrical enclosure area and being fastened to said web portions;
 - said inflatable bag having first and second ram air openings designed to admit air to the inside of said bag when the bomb is released from an aircraft;
 - means for confining said fin members at the aft end thereof

so that the fin portions of said members are substantially confined within the envelope diameter of the bomb; means for confining said bag from opening further than a predetermined amount;

means for removing the restraint of said confining means and allowing full inflation of said bag.

4,005,656

DEVICE FOR A PYROTECHNICAL FLARE BODY COMPRISING A FLAME SPREADER FOR THE FLAME EMITTED BY THE FLARE BODY

Nils Göran Gellerstedt, and Yngve Bertil Stradalen, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

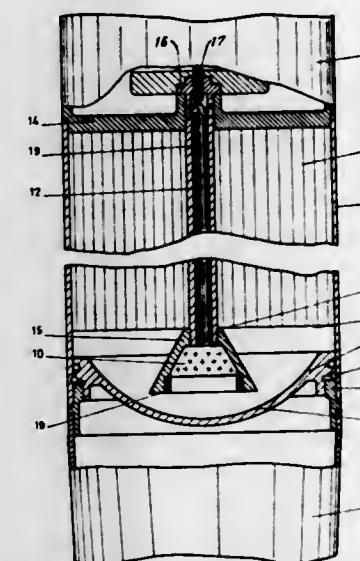
Filed June 9, 1975, Ser. No. 585,425

Claims priority, application Sweden, June 27, 1974, 7408464

Int. Cl.³ F42B 4/12

U.S. Cl. 102-35.6

8 Claims



1. In a pyrotechnical device of the type comprising a cylindrical container having an elongated cylindrical flare body therein, one end of said container being open to emit an outwardly directed flame from said container upon ignition of an ignitable end surface of said flare body that is disposed adjacent to the open end of said container, the improvement comprising an elongated support element embedded within said flare body at a central location therein and extending along the central axis of said cylindrical container and flare body completely through said flare body in the direction of elongation of said body, and a flame spreader attached to one end of said support element at a position adjacent to said ignitable end surface of said flare body, said flame spreader having at least one flame deflection surface disposed at a central location relative to said ignitable end surface for controlling the emission of said outwardly directed flame from said end surface in the region between said flame deflection surface and the sides of said container, the side walls of said container adjacent the pen end of said flare body and beyond at least a major portion of said flame deflection surface, said flame spreader being shaped substantially as a truncated cone coaxial with said support element and being positioned with the smaller end of said truncated cone located adjacent to said ignitable surface of said flare body, the outer conical surface of said truncated cone acting as said flame deflection surface, said outer conical surface being freely spaced from the cylindrical side walls of said container that extend beyond said ignitable surface of said flare body to permit said outwardly directed flame to pass freely therebetween.

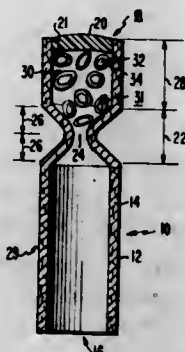
4,005,657

PYROTECHNIC NOISEMAKER

Barry Rothman, deceased, late of Downingtown, Pa. (Shirley Rothman, administratrix), assignor to Morton C. Jacobs, Philadelphia, Pa., a part interest
Filed Apr. 7, 1975, Ser. No. 565,752
Int. Cl.² F42B 4/16

U.S. Cl. 102-37

16 Claims



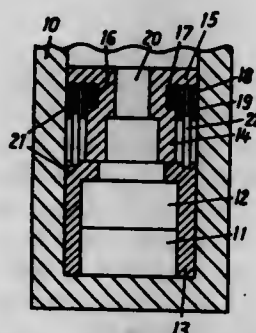
1. A noisemaking device comprising: a thin-walled container having a constricted passage to pass explosive gas out of said container; a small explosive charge inside said container and a plurality of particles for detonating said charge on impact to produce an explosive force of a certain magnitude, the size of said particles being greater than that of said constricted passage and thereby blocked with said charge from passing therethrough during quiescence, the wall of said container being sufficiently thin to expand substantially said constricted passage under pressure of gas produced by detonation of the explosive charge to release said pressurized gas and produce a desired noise and retain said particles safely within said container, and having strength sufficient to withstand without rupture said explosive force produced within the container upon detonation of said explosive charge and release of said pressurized gas.

4,005,658

SAFETY DEVICE FOR A CURRENT GENERATOR USED WITH AN ELECTRICAL PROJECTILE FUZE

Panayotis Karayannakis, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Nov. 20, 1975, Ser. No. 633,925
Claims priority, application Switzerland, Dec. 13, 1974, 16589/74
Int. Cl.² F42B 15/00, 19/34; F42C 11/04, 13/00
U.S. Cl. 102-70.2 G 4 Claims



1. A safety device for a current generator of an electrical projectile fuze having a lengthwise axis for a projectile, comprising a housing member, a permanent magnet component, an induction coil component and a soft iron core component arranged in said housing member, two of said components being mounted to be relatively movable with respect to one another, means for preventing unintentional movement of the movable component, said movement preventing means comprising rods structured for buckling, a member fixed to the

housing member, each of the rods having opposed ends and secured at one end to the housing-fixed member and at the other end at the movable component and permitting displacement of the movable component only after overcoming the buckling resistance of the rods, said rods being arranged along a cylinder surface extending about the lengthwise axis of the projectile fuze and in spaced relationship therefrom, said rods being subjected to compressive load in the axial direction by both said housing-fixed member and said movable component.

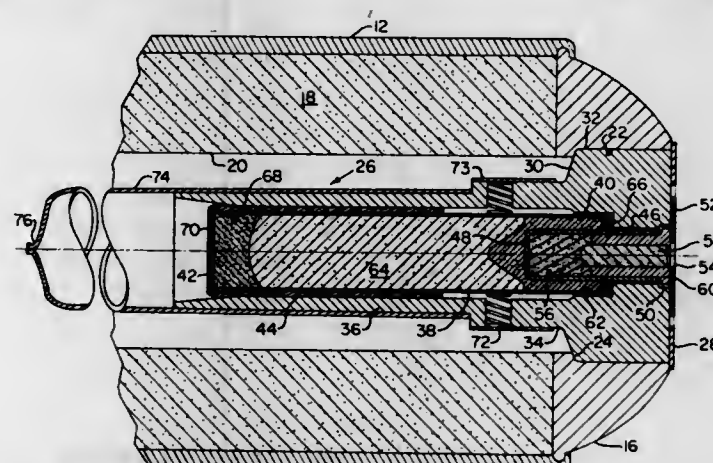
4,005,659

IMPACT ACTUATED PROJECTILE FUZE

Clayton J. Schneider, Jr., East Aurora; Harold A. Washburn, Williamsville, and John E. Blickenstaff, North Tonawanda, all of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.
Filed Aug. 20, 1975, Ser. No. 606,136
Int. Cl.² F42C 11/12

U.S. Cl. 102-72

16 Claims



13. A projectile fuze, comprising:
 - a. a fuze housing,
 - b. a delay casing releasably fixed to said housing,
 - c. a body of ignitable fusing material located in said casing,
 - d. heat transfer means secured to said housing for transferring heat to said fusing material, and
 - e. means for releasing at least a portion of said delay casing from said housing and separating said fusing material from said transfer means upon impact prior to ignition of said fusing material.

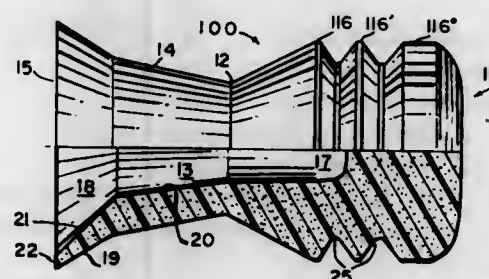
4,005,660

PROJECTILES FOR AIR ARMS

Joseph Francis Louis John Pichard, 14, Allard St., Hull, Quebec, Canada (J8X 1H2)
Continuation of Ser. No. 560,399, March 20, 1975, abandoned. This application Apr. 2, 1976, Ser. No. 672,978
Int. Cl.² F42B 11/02

U.S. Cl. 102-92.1

10 Claims



5. In a projectile for an air arm wherein the projectile form is a body of revolution about a longitudinal axis comprising a head portion dimensioned for free sliding fit in the bore of the air arm and an after portion of frusto-conical form having its rearward end dimensioned to be an interference fit in the said bore and having its forward end of reduced diameter joined

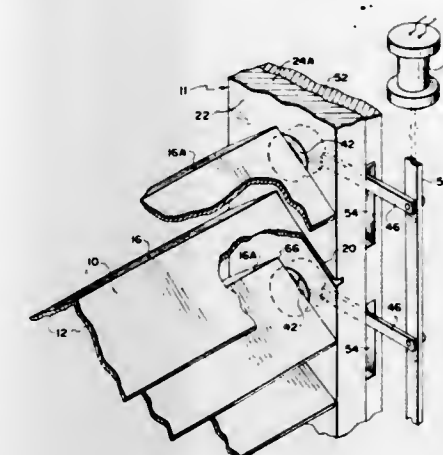
4,005,662

ARMOR WINDOW

Robert A. Kohn, and Karen Kohn, both of 3902 E. Weldon Ave., Phoenix, Ariz. 85018
Filed Mar. 21, 1975, Ser. No. 560,791
Int. Cl.² E05G 7/00

U.S. Cl. 109-16

4 Claims



1. An armor window comprising: a frame including symmetrically opposing side members and opposing end members; a plurality of angle irons each having two depending flanges disposed at right angles to each other and joined along proximate upper edges to form an apex, said angle irons defining optically flat mirror surfaces on the outer and inner sides of both flanges; means for supporting said angle irons at their opposite ends upon said opposing side members with said flanges and apexes spaced from each other for movement of air and sound between them and said apexes being disposed on a center line and spaced a distance less than approximately one-half the width of one of said flanges for continuous overlapping of flanges with their apexes parallel with each other to interrupt direct lines of sight between the angle irons; said supporting means including opposing support journals secured to the opposite ends of said alternate angle irons; bearing means for journaling said opposing support journals in said opposing side members for pivotally supporting the alternate angle irons upon axes disposed in close proximity to the apexes of said angle irons; means for rotating said journal means including radially extending elements on said journal means; and manually controlled means for actuating said extending elements in unison.

4,005,663

BELT LOOP FORMING ATTACHMENT FOR SEWING MACHINE

Raymond Barthelmes, P.O. Box 602, Wurtsboro, N.Y. 12790
Filed Dec. 18, 1975, Ser. No. 641,913
Int. Cl.² D05B 3/00

U.S. Cl. 112-115

4 Claims

with the head portion, the frustum being shell-walled and having a coaxial recess enlarging toward said rearward end and extending axially forwardly into said head portion, the improvement wherein: a major forward axial length portion of said after portion is conformed generally to a cone of a first predetermined apical angle, and wherein the outer surface of a minor rearward terminal axial length portion of said after portion flares outwardly rearwardly from a junction with the said major forward length portion and said outer surface conforms generally to a cone of a second predetermined acute apical angle which is larger than said first predetermined acute apical angle, and the shell wall thickness of said minor rearward terminal axial length portion reduces rearwardly so that the projectile has a pliant annular trailing edge.

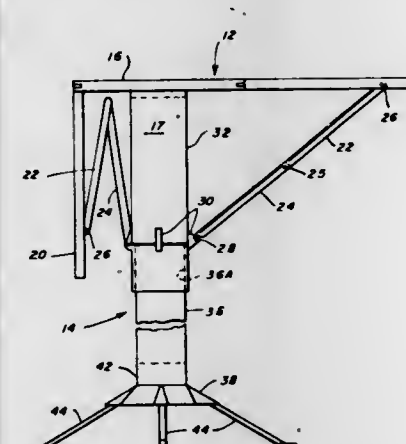
4,005,661

FOLDING UMBRELLA TABLE

Dewey Mason, 6428 S. 42nd W. Ave., Tulsa, Okla. 74107, and Riley C. Mason, Rte. 2, Box 25, Hulbert, Okla. 74441
Filed Jan. 14, 1975, Ser. No. 540,826
Int. Cl.² A47F 3/00

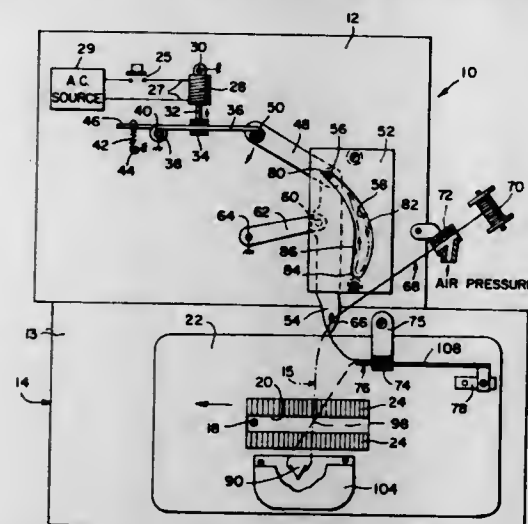
U.S. Cl. 108-128

6 Claims



1. A folding umbrella table, comprising:
 - a. a central columnar support, comprising:
 1. at least a first upper cylindrical tube;
 2. at least a second lower cylindrical tube adapted to slide inside of said upper tube, and including latch means to hold said upper and lower tubes in extended position; and
 3. a plurality of feet hingedly mounted inside of said lower tube;
 - b. a circular table top comprising a central plate attached to the top of said upper tube, the peripheral edge of said plate having a plurality of radial slots spaced equally around the circumference;
 - c. a plurality of radial arms equal in number to said radial slots formed of angle material having a triangular shaped horizontal web, and means for hinging each of said arms by their vertical webs, one in each of said radial slots; whereby when said arms are in a radial position their triangular webs contiguously fit to form the annular outer portion of said table top;
 - d. a second plurality of radial support arms, forming a selected fraction of said radial arms and having wide vertical webs equally angularly spaced, serving as support arms, and including means including hinged bracket means for supporting said support arms near their outer ends in a horizontal plane;
 - e. hinged beam means attached as by hinges in the space between each pair of radial support arms near their ends;
 - f. the remainder of said radial arms having narrow vertical webs, resting on said hinged beam means.

proximate the bed of the sewing machine apparatus on the other side of said throat, said linkage including a horizontally moveable arm having an eye at one end nearest the throat adapted to receive thread from said source therethrough; means on said other side of said throat for holding a free end of said thread after passage through said eye; said eye having



an initial position on said other side of said throat, said linkage being actuable for moving said eye across said throat, around a side of the prong facing away from the throat, and then returning across the throat to its initial position for forming said thread loop supported at its point greatest curvature on said prong, and motor means for actuating said linkage.

4,005,664

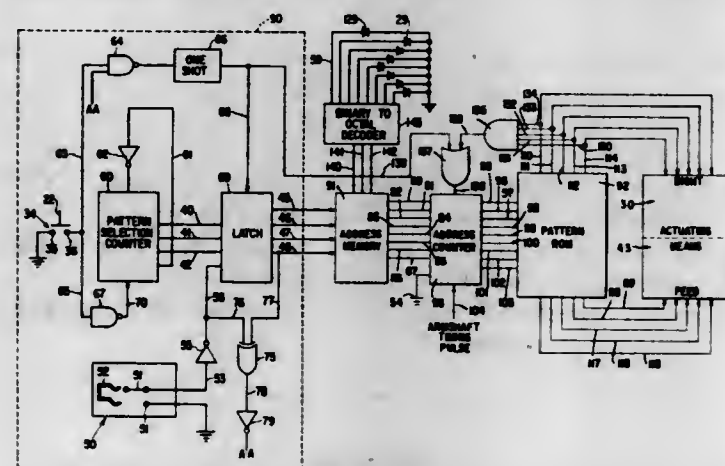
SEWING MACHINE PATTERN SELECTION SYSTEM
Stephen Alexander Garroa, Elizabeth, N.J., assignor to The Singer Company, New York, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,288

Int. Cl.² D05B 3/02

U.S. Cl. 112-158 E

9 Claims



1. A multiple pattern sewing machine having instrumentalities for forming a succession of stitches individually placed in a selected one of a plurality of different patterns, said sewing machine including a static pattern memory means in which a multiplicity of separate digitally coded words are stored in a predetermined sequence with each word corresponding to one individually placed stitch in a pattern, an address memory means in which separate signals are stored in a numerical sequence each addressing the starting code word address in said static pattern memory means for a different one of said plurality of patterns, means for providing timing pulses related to the formation of successive stitches by said sewing machine, means utilizing said timing pulses for addressing digital code words in said static pattern memory means in said predetermined sequence beginning with said starting word identified by an address memory signal, means effective automatically to return to said starting word identified by said address memory signals to repeat said predetermined sequence, and actuating

means responsive to said predetermined sequence of digitally coded words and operatively connected to said stitch forming instrumentalities for influencing said stitch forming instrumentalities to form a selected pattern in response thereto, the improvement which comprises a pattern selection means rendered effective by manipulation of a single operator influenced pattern selector switch means for selecting any one of said pluralities of different patterns, said pattern selection means comprising:

- a pattern selector switch means accessible to a sewing machine operator on said sewing machine,
- a pattern selection counter arranged to deliver as an output to said address memory means a predetermined numerical sequence including at least a portion of that in which said separate signals are stored in said address memory, and
- means effective in response to actuation of said pattern selector switch means for indexing said pattern selection counter through said predetermined numerical sequence.

4,005,665

METHOD FOR MAKING PRESS-WORKING BLANKS WITH REDUCED EAR OCCURRENCE

Toshiro Nishihara; Nobuyuki Takahashi; Hiroshi Katoh, and Tetsu Ishimaru, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

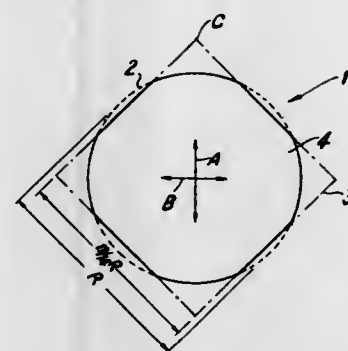
Filed May 7, 1975, Ser. No. 575,262

Claims priority, application Japan, May 8, 1974, 49-51430

Int. Cl.² B21D 53/00

U.S. Cl. 113-116 V

2 Claims



1. A method for preparing a steel blank which comprises cutting a cold rolled steel sheet in a planar shape obtained by overlapping a circle having a diameter R and a square having a side length of about 13/14 with their center points being at the same point and by cutting unoverlapped portions.

4,005,666

FLUID VACUUM RELEASE FOR ICE CUTTING SYSTEMS
Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Continuation of Ser. No. 458,905, April 8, 1974, abandoned.

This application June 23, 1975, Ser. No. 589,411

Int. Cl.² B63B 35/12

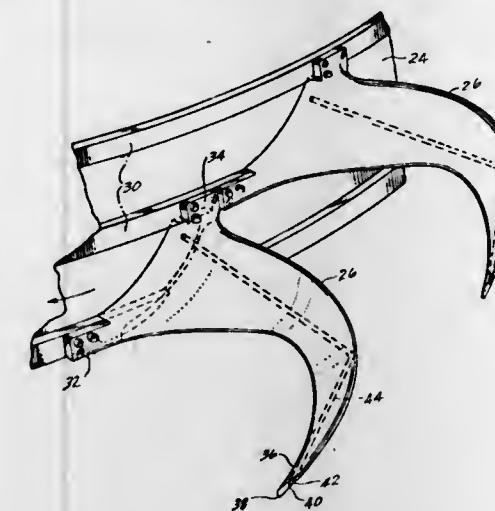
U.S. Cl. 114-42

5 Claims

1. A comminuting ice cutter comprising a plurality of rotating cutter elements, the cutter elements having a plurality of cutting edges spaced circumferentially around a common axis and adapted to engage ice and dislodge pieces of ice by impacting action, drive means rotating the cutter elements continuously in a direction around said common axis for applying high velocity impacts on the adjacent ice, and means for directing fluid under pressure at the interface between each of the cutting edges of the cutter elements and the ice when it comes in contact with the cutting edges, said fluid means by

fluid ejection dissipating the partial vacuum resulting from ice cleavage and changing it into a positive pressure which aids

means for mounting the hydrofoils also adjusting the angle of attack of the lifting surfaces relative to the surface of the water.



the separation and removal of the chips by the cutter elements.

4,005,667

WATERCRAFT WITH HYDROFOILS

Tomo Staba, Kleine Reichenstrasse 24, 2 Hamburg 11, Germany

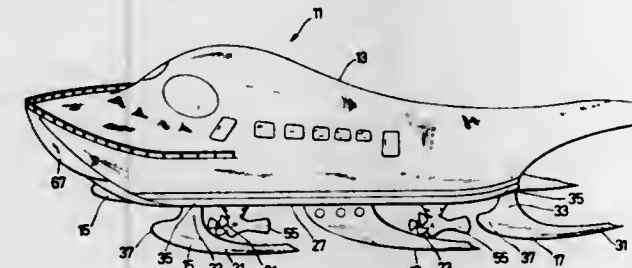
Filed Mar. 25, 1975, Ser. No. 561,876

Claims priority, application Switzerland, Mar. 25, 1974, 4152/74

Int. Cl.² B63B 35/44

U.S. Cl. 114-283

12 Claims



1. A watercraft, comprising: only a single one-piece hull having a longitudinal axis of symmetry and opposite sides; at least two pairs of adjustable hydrofoils having lifting surfaces and being respectively mounted beneath and on opposite sides of said hull; a plurality of propellers respectively arranged adjacent at least one pair of said hydrofoils; means for swiveling said propellers about respective generally vertical axes for changing the travelling direction of said watercraft; said hull having two side keels arranged in lateral spaced relationship with respect to each other and each extending substantially the entire longitudinal length of the watercraft, and a bottom shaped concavely in an upward direction and extending between said two keels; said bottom lying below the normal water level when the watercraft is at rest; means including said propellers said concave bottom and said hydrofoils for lifting said watercraft upwardly and lifting said bottom above the water level during driving of the watercraft by said propellers; means for pivotally mounting one pair of hydrofoils on one keel so as to have front and rear hydrofoils on the one keel, and the other pair of hydrofoils on the other keel so as to have front and rear hydrofoils on the other keel; each of said hydrofoils having a portion extending downwardly from its keel at an angle with respect to the longitudinal vertical plane of symmetry of said hull and a curved lifting surface portion curving outwardly from said downwardly extending portion so that in each position of the boat and hydrofoil the lifting surface extends generally horizontally and approximately at right angles to the longitudinal plane of symmetry with an angle of attack relative to the surface of the water; and said

4,005,668

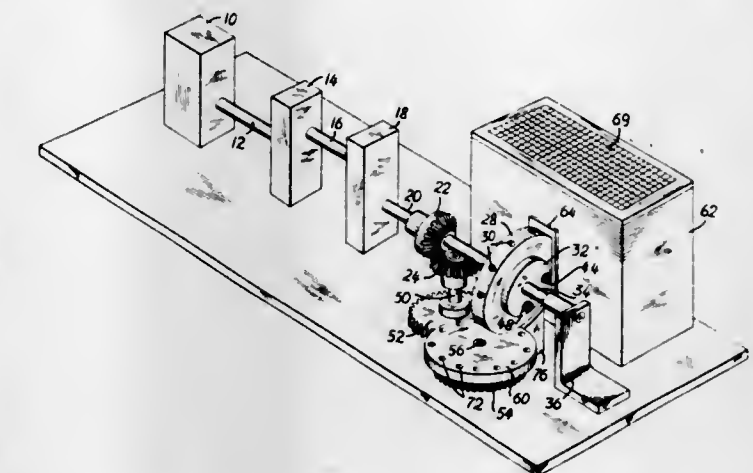
MATERIAL TRANSFER METHOD AND APPARATUS
James M. Washington, Richmond, and Emil A. Marx, Chester, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed June 9, 1975, Ser. No. 585,105

Int. Cl.² B65B 1/16, 3/10

U.S. Cl. 141-67

10 Claims



1. Apparatus for use in making cigarette filters containing granular material comprising:

- a hopper means for containing said material;
- a material collector wheel supported for rotation about a first axis and having a slot with a first end open at the circumference of said collector wheel and an opposite end, said collector wheel supporting an air permeable member in said slot thereof;
- a receptor wheel supported for rotation about a second axis perpendicular to said first axis and having a slot with an end open at a side surface of said receptor wheel, said receptor wheel supporting in said slot thereof a filter assembly defining a cavity having an opening facing said side surface;
- drive means for rotating said collector wheel about said first axis to move said collector wheel slot first end interiorly of said hopper means and then exteriorly thereof to a registration position and for rotating said receptor wheel about said second axis to move said receptor wheel slot end into facing relation with said collector wheel slot first end at said registration position; and
- air pressurization means for negatively pressurizing said collector wheel slot opposite end selectively upon disposition of said collector wheel slot first end interiorly of said hopper means, whereby material is transferred into the extent of said collector wheel slot extending outwardly of said air permeable member thereof, and for providing selective differential pressurization axially of said collector wheel and receptor wheel slots at said registration position, thereby discharging said material from said collector wheel slot into said filter assembly cavity

4,005,669

MAST DISPLACEMENT MECHANISM

Jellus Roland Klemm, 408 NE. 28 Road, Boca Raton, Fla. 33432

Filed Apr. 28, 1975, Ser. No. 572,123

Int. Cl.² B63B 15/00

U.S. Cl. 114-91

3 Claims

1. A mast displacement mechanism for a vessel having a hull and an upstanding mast with a lower end, said mechanism comprising:

a cradle supported by the hull and defining arcuate track means of a radius of curvature of a first predetermined finite length,
 a carriage movable with respect to said track means and limit means to limit movement of said carriage,
 means on the carriage to connect to the mast at about the hull level for movement of said lower end together with the carriage relative to the track;
 lock means to lock the carriage in selected positions with respect to said track means for tilting the mast;



said carriage comprising a forward pair and a rearward pair of wheels captivated by said track means;
 operator means effective to tilt the mast when said lock means is not restraining movement of the lower end of the mast; and
 said operator means comprising a plurality of teeth comprising a rack in said track means and a gear on said carriage in engagement with said rack including an operator shaft extending outwardly of said track and in engagement with said gear so that upon rotation of the gear the carriage will move with respect to said track means.

4,005,670

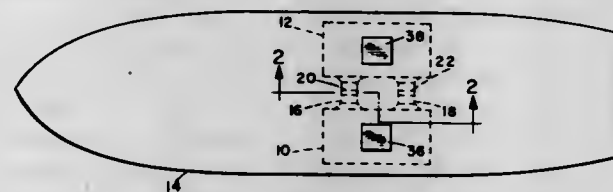
PASSIVE STABILIZATION SYSTEM FOR SHIPS

John Zaslavich, Chula Vista, and Ante Stipich, San Diego, both of Calif., assignors to Campbell Industries, San Diego, Calif.

Filed Feb. 1, 1971, Ser. No. 111,207
 Int. Cl.³ B63B 43/06

U.S. Cl. 114—125

8 Claims



1. A stabilization system for a ship comprising:
 at least two tanks means for the storage of liquid,
 cross over means comprising an enclosed duct means connecting said tank means below the tops thereof, for transferring water between said tank means during rolling of said ship,
 said tank means being located on either side of the fore and aft center line of said ship,
 said tank means being spaced from one another by a distance less than the beam-wise width of a single one of said tank means,
 said cross over means is effective for permitting only a portion of said liquid to move from one tank means to another during rolling of said ship, and
 said enclosed duct means is spaced from the bottom of said tank means.

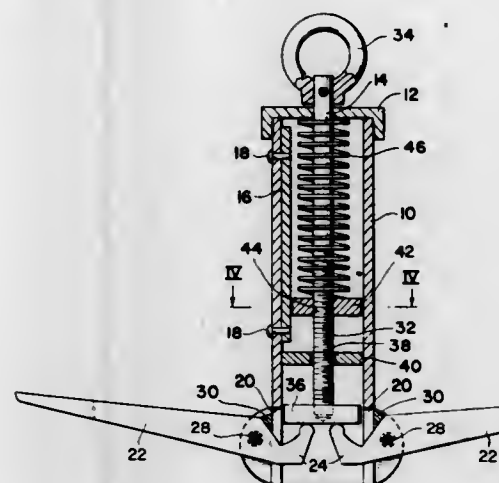
**4,005,671
ADJUSTABLE STRENGTH ANCHOR**

Leo D. Ogle, Longview, Tex., assignor to The Raymond Lee Organization, Inc., a part interest

Filed June 21, 1976, Ser. No. 698,054
 Int. Cl.³ B63B 21/44

U.S. Cl. 114—298

4 Claims



1. An anchor comprising:
 a hollow elongated cylinder having a cap with a central opening at one end and open at the other end, said cylinder having a plurality of equidistantly spaced like slots in the wall which extend for a short distance in the axial direction from the other end toward the cap;
 an elongated bar parallel to the axis of the cylinder and secured to the inner wall of the cylinder, one end of the bar being adjacent the cap, the other end of the bar being adjacent the slots;
 a threaded bolt aligned with the axis of the cylinder and disposed therein, the head of the bolt being alignable with the slots, the end of the bolt extending through the opening of the cap;
 an eye secured to the exposed end of the bolt;
 a flat circular disc having a central threaded bore threadedly engaged by said bolt, said disc being disposed in the cylinder and having a diameter slightly smaller than that of the interior of the cylinder, said disc having a portion cut away whereby the disc bears against the bar slidably but non-rotatably;
 a coil spring disposed concentrically about the bolt inside the cylinder, one end of the spring bearing against the cap, the other end of the spring bearing against the disc;
 a plurality of like elongated arms, each arm extending through a corresponding slot, one end of each arm being disposed within the cylinder and engagable by said bolt head, a major portion of each arm extending outside of the cylinder; and
 a like plurality of means disposed outside the cylinder, each means being aligned with a corresponding slot and pivotally securing each arm to said cylinder at a point intermediate its ends but adjacent said one end of the arm.

4,005,672

BUMPER WITH CUSHION PIVOT AT BOTTOM

James Harold Files, New Orleans, La., assignor to Regal Tool & Rubber Co. Inc., Corsicana, Tex.

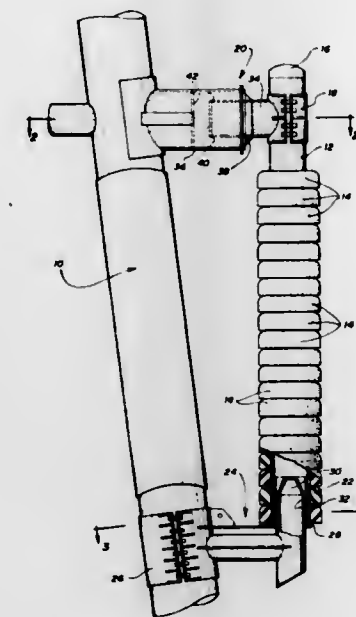
Filed Apr. 15, 1976, Ser. No. 677,447
 Int. Cl.³ B63B 59/02; E02B 3/22

U.S. Cl. 114—219

8 Claims

1. In a bumper assembly where a vertical main cylinder is secured at the upper end to a marine structure by a releasable connection, the combination comprising:

a. a lower support for said main cylinder including an upstanding stab post extending into the bottom of said main cylinder in coaxial alignment with said upper end; and



b. a resilient cylinder between said main cylinder and said stab post.

4,005,673

AIR PROPULSION DEVICE FOR SURFACE CRAFT

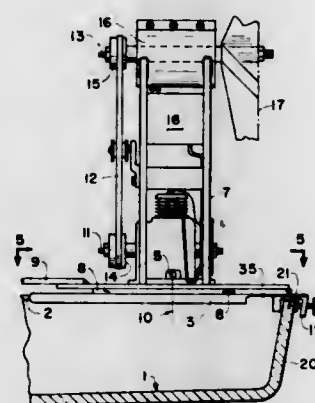
Alfred V. Carrero, Miami, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 10, 1976, Ser. No. 665,578

Int. Cl.³ B60F 3/00

U.S. Cl. 115—1 C

8 Claims



1. An air propulsion device for surface craft comprising a lateral craft engaging platform having gunwale engaging means to removably engage opposing outboard gunwale sides of a craft and bulkhead engaging means to removably engage a bulkhead athwart said gunwales at a point astern of said gunwale engaging means, a pivot point having a pivot axis normal to said lateral craft engaging platform located substantially centered between said gunwales and forward of said bulkhead, a lateral propulsion device mounting platform pivotally secured to said lateral craft engaging platform normal to said pivot axis, means to rotate said lateral propulsion device mounting platform about said pivot axis, engine means adapted to mount to said lateral propulsion device mounting platform, said engine means rotatably adapted to drive a horizontal shaft whose longitudinal axis is substantially parallel to said lateral propulsion device mounting platform and having an air propulsion blade extending radially outwardly therefrom.

4,005,674

PIVOT POSITION SENSING APPARATUS

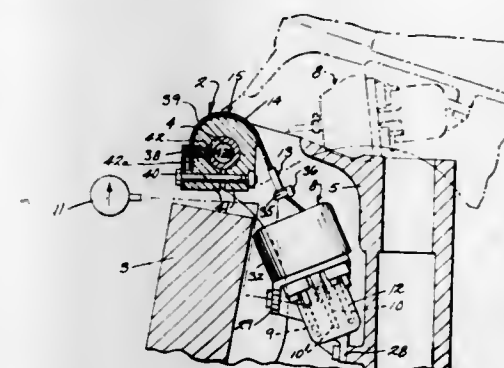
James Arthur Davis, Ripon, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 4, 1975, Ser. No. 610,416

Int. Cl.³ B63H 5/12

U.S. Cl. 115—41 R

15 Claims



1. A position sensor unit for a pivotally mounted marine propulsion apparatus adapted to be secured to the aft end of a boat and having a pivot support means, comprising a signal device having a support member for providing a position related output signal, mounting means for said support member for connecting of the signal device to the propulsion apparatus and thereby positioning the signal device related to said pivot support means, a rectilinear operating member slidably journaled on said support member in engagement with said signal device for changing the output signal and having an outer flexible end, and coupling means connected to said outer flexible end for attachment to the pivot support means and providing for movement of the flexible end in response to the pivoting of propulsion apparatus.

4,005,675

MACHINE FOR TRIMMING A COPY SHEET AND APPLYING ADHESIVE THERETO

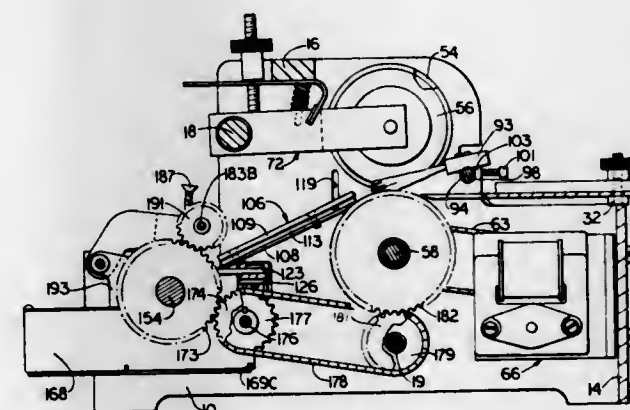
Harold E. Sterne, 5815 Cherokee Drive, Madelra, Ohio 45243

Filed Mar. 22, 1976, Ser. No. 669,168

Int. Cl.³ B05C 1/02

U.S. Cl. 118—38

7 Claims



1. A machine for trimming edges from a sheet of copy and for applying adhesive to a back face of the sheet which comprises a rotatably mounted backup roll, means for guiding the sheet to the backup roll, knife means in cutting relation to the backup roll, means for turning the backup roll to cause the sheet to be drawn between the knife means and the backup roll to trim the sheet, guide receiving the trimmed sheet from the backup roll, an adhesive applying roll, an adhesive pan underlying the adhesive applying roll, means for turning the adhesive applying roll to cause a lower portion of the adhesive applying roll to dip into adhesive in the adhesive pan to pick up adhesive, and a metering blade in adhesive metering relation to the adhesive applying roll, the guide discharging the trimmed sheet onto the metering blade, the metering blade

directing the sheet to the adhesive applying roll so that the trimmed sheet receives adhesive on a back face thereof.

4,005,676

AIR KNIFE COATER TOP LIP SCRUBBER

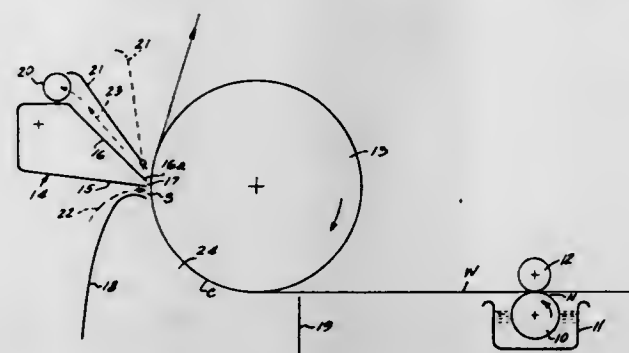
Irvin J. Phillips, South Beloit, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 22, 1972, Ser. No. 255,326

Int. Cl.² B05C 11/06

U.S. Cl. 118—63

4 Claims



1. A coating mechanism comprising in combination, a rotary backup roll for carrying a traveling web wrapped on its outer surface through a coating smoothing zone along the periphery of the roll,

a coating applicator ahead of said zone applying liquid coating to the outer surface of the web,

an air knife smoothing mechanism extending axially along the roll at said smoothing zone positioned for directing a stream of air toward the oncoming coated web for smoothing the coating,

an air supply means ahead of the air knife for generating a cleansing flow of air over the air knife between the web and knife for carrying away airborne coating particles and preventing accumulation of said particles on the air knife, an exhaust outlet passage extending over the surface of the air knife on its downstream side from said zone relative to the direction of travel of the web and leading away from the web and including a baffle forming one wall of the passage with a downstream surface of the knife forming the other wall of said passage,

the inner edge of said baffle adjacent the roll being spaced from the roll so that air flows between the web and inner edge of the baffle when entering said exhaust outlet passage,

said passage receiving air from said air supply means after the air flows between the air knife and web and also receiving air from between the web and the inner edge of the baffle so that air flows in a direction away from the web following said coating smoothing zone, and a hinged support at said inner edge of the baffle pivotally mounting the baffle so that the baffle is pivotally movable about its inner edge away from said exhaust outlet passage for access to the passage and downstream surface of the knife for inspection and cleanup.

4,005,677

APPARATUS FOR CIRCUMNAVIGATING A DISPENSER ABOUT A PIPE OR THE LIKE

Robert J. Hart, Tulsa, Okla., assignor to Commercial Resins Company, Tulsa, Okla.

Filed Mar. 6, 1974, Ser. No. 448,670

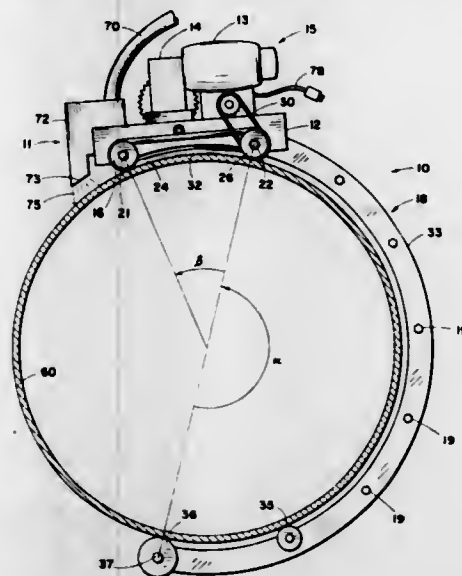
Int. Cl.² B05C 5/00, 19/00

U.S. Cl. 118—307

6 Claims

1. Apparatus for carrying a dispenser circumferentially around a cylindrical object comprising, two frames hinged together to be moveable to a configuration surrounding more than one-half of the circumference of said object, said dispenser being carried upon one of said two frames in dispensing

relationship with said object, a lock means connected between said two frames to secure them in surrounding position, a plurality of wheels mounted on said two frames to ride upon said object in said surrounding position, a motor carried on one of said two frames and operably connected to two of said



4,005,678

COATING AND STAINING MATERIAL COLLECTING DEVICE

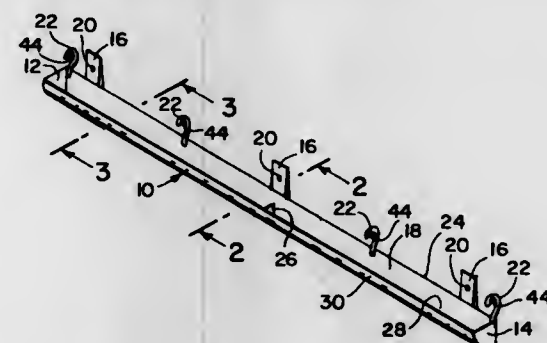
Joseph J. O'Toole, Staten Island, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 4, 1976, Ser. No. 692,804

Int. Cl.² B05C 11/00

U.S. Cl. 118—505

5 Claims



1. A coating and staining material collecting device for removable attachment to a vertical surface comprising an elongated trough, a pair of caps, one of said pair of caps fixedly secured at each free end of said elongated trough, at least one gusset, said at least one gusset fixedly secured to the interior surfaces of said trough dividing said trough into at least two separate open mouth containers, fastening means for fastening said trough to said vertical surface, said trough possessing semi-flexible properties along the longitudinal axis thereof said open mouths of said containers having a straight line marginal edge adjacent a vertically disposed marginal edge of said trough, said open mouths being disposed upwardly, said fastening means comprising a plurality of upwardly extending tapered tabs fixedly secured at the intersection of said vertical edge and said open mouthed portion, said plurality of tapered tabs being disposed in spaced apart relationship along said longitudinal axis, each of said plurality of tapered tabs having a hole located in the lateral surfaces thereof, and the narrowest portion of said each of said plurality of tapered tabs being disposed upwardly and parallel to said longitudinal axis and said intersection whereby said de-

vice is adapted to be attached through said holes or by frictional hold of said tabs inserted beneath a shingle comprising said vertical surface.

response thereto to the cluster removal means and to the milk transfer means whereby cluster removal is effected, in use, on

4,005,679

METHOD AND APPARATUS FOR PRE-INCUBATING EGGS

Henricus Gerhardus Hermanus Maria Pas, 's-Heerenbergseweg 13, Zeddam, Netherlands

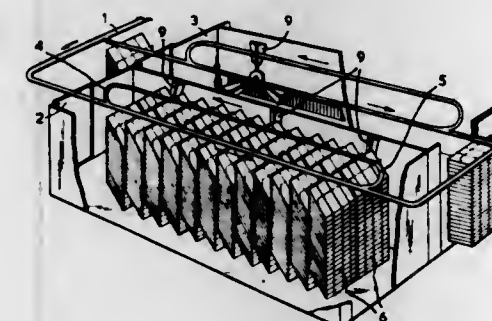
Filed Feb. 11, 1975, Ser. No. 548,936

Claims priority, application Netherlands, Feb. 13, 1974, 740194

Int. Cl.² A01K 41/00

U.S. Cl. 119—35

1 Claim



1. In a method for incubating chicken eggs in an incubator in which hot air is displaced and distributed, wherein stacks consisting of a plurality of egg racks are introduced into the incubator, the stacks being maintained in said incubator during the required incubation period and then being discharged from said incubator, said racks being tilted a plurality of times, and during the incubation period of 18 days, each 3 days a group of said stacks being introduced into said incubator wherein the improvement comprises introducing said stacks into said incubator by a continuously moving conveyor, spacing equidistantly said stacks of the first group introduced on a substantially oval shaped conveyor track located inside said incubator, disposing stacks thereafter introduced on said track equidistantly apart and behind each said stack of the preceding group, and tilting each said egg rack in said incubator so that it rotates approximately 90° about a horizontal axis passing through said rack at least twice during each circulation thereof around said track.

4,005,680

EQUIPMENT FOR MILKING PARLOURS

Mark Roger Lole, Hermitage Farm, Wadborough, Worcester, England

Filed June 10, 1974, Ser. No. 477,748

Claims priority, application United Kingdom, June 9, 1973, 27651/73

Int. Cl.² A01J 7/00

U.S. Cl. 119—14.08

9 Claims

1. Equipment for use in a milking parlour comprising cluster removal means, milk transfer means and sensing means for sensing cessation of milk flow and for transmitting a signal in

cessation of milk flow and transfer of milk from a receiver to a bulk storage vessel is then obtained.

4,005,681

VAPOR GENERATOR

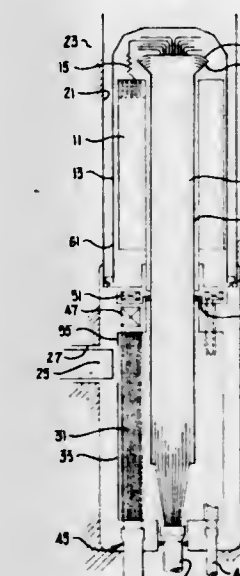
George E. Lockett, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed July 23, 1975, Ser. No. 598,321

Int. Cl.² F22B 1/06, 37/24

U.S. Cl. 122—32

7 Claims



1. In a vapor generator having first and second tube bundles subject to thermal expansion of different amounts, and having first and second structural elements also subject to thermal expansion of different amounts, a plurality of substantially helical connecting tubes communicating between the tubes in said first tube bundle and the tubes in said second bundle, support means engaging the upper portions of said helical connecting tubes for suspending said tubes on a substantially vertical axis, lever means secured to said support means, said lever means having fulcrum means displaced from said support means, actuating means engaging said lever means on the opposite side of said fulcrum means from said support means, said actuating means and said fulcrum means being secured, respectively, to said first and second structural elements and being positioned on said lever means to provide movement of

said support means for accommodating the different thermal expansions of said first and second tube bundles.

4,005,682

ROTARY INTERNAL COMBUSTION ENGINE

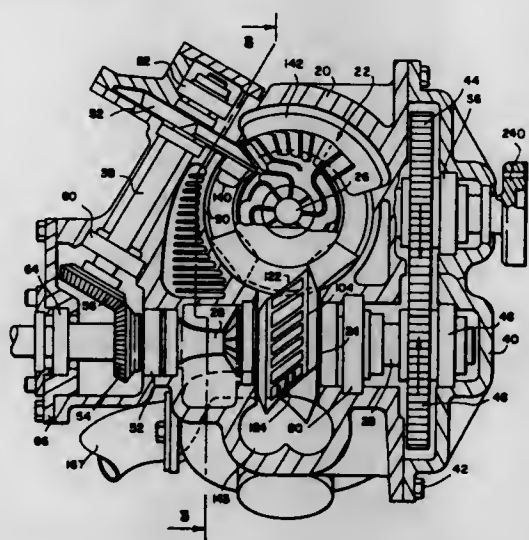
William B. McCall, 1447 E. Town and Country Lane; William J. Harper, 417 E. Echo Lane, and William P. Harper, 311 E. Orchid Lane, all of Phoenix, Ariz. 85020

Filed May 8, 1975, Ser. No. 575,491

Int. Cl.³ F02B 53/08

U.S. Cl. 123-8.19

16 Claims



1. In a rotary machine the combination of: a plurality of cooperating rotors; each rotor having a peripheral portion provided with a plurality of notch like chamber recess portions disposed radially inward from the respective peripheral portions; each rotor having radially projecting lobe portions disposed between respective chamber recess portions; said rotors having respective axes of rotation; means rotatably mounting said rotors such that their axes of rotation are at an angle to each other and such that said projecting lobe portions of each rotor pass through respective chamber recess portions of the other of said rotors; means for synchronizing rotary motion of said rotors; centrifugal compressor blade means internally of said rotors; said rotors each having an air compressor inlet means near its respective axis of rotation; each of said rotors having an air compressor outlet at the peripheral extremities of said projecting lobe portions; a housing for said rotors; said housing having a compressed air receiving plenum adjacent to and communicating with said peripheral portions of each of said rotors and adapted to supercharge each of said chamber recess portions as it passes in communication with said respective plenum.

4,005,683

ENERGY CONVERSION DEVICE

Raymond Douglas Whitt, 4664 19th St., San Francisco, Calif. 94114

Filed Oct. 7, 1974, Ser. No. 512,695

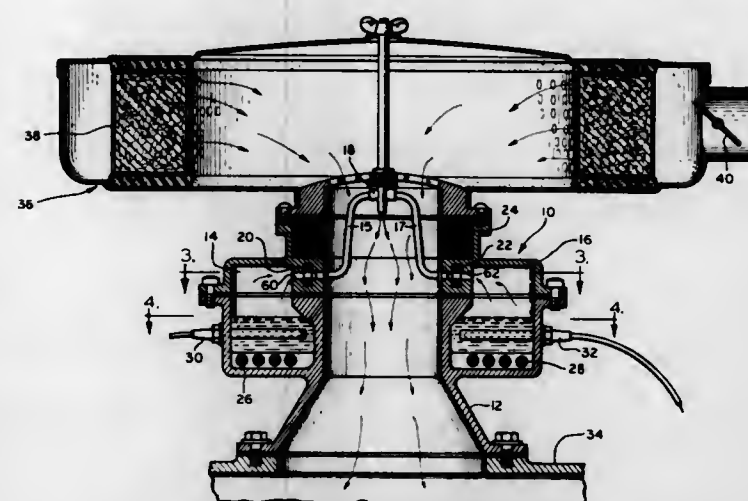
Int. Cl.³ F02D 19/00

U.S. Cl. 123-25 B

18 Claims

1. An energy conversion device for supplying a combustible mixture to an engine comprising:
an injector body for carrying an air stream;
discharge means for directing fuel and water into the air stream of the injector body;
means for providing a supply of heated fuel to said discharge means;
means for providing a supply of heated water to said discharge means;

means for generating a randomly oriented electromagnetic field downstream of the discharge means for acting on the



fuel and water directed into the air stream of the injector body.

4,005,684

INTERNAL COMBUSTION ENGINE

Nobuo Habu, Shizuoka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

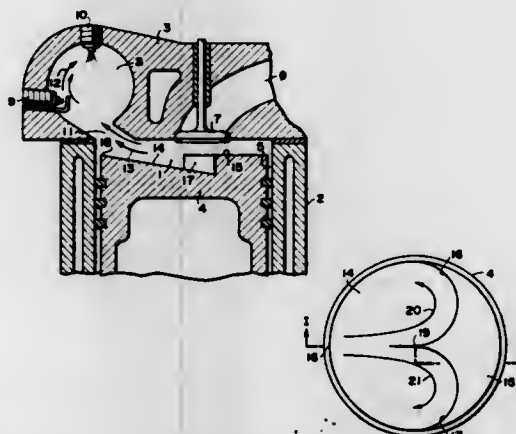
Filed Mar. 26, 1975, Ser. No. 562,191

Claims priority, application Japan, Aug. 8, 1974, 49-94788(U)

Int. Cl.³ F02B 3/00

U.S. Cl. 123-30 D

9 Claims



1. An internal combustion engine comprising a cylinder block having cylinder bores, a piston having a crown disposed reciprocally in each cylinder bore, a cylinder head secured onto the cylinder block, a main combustion chamber defined by the inner surface of the cylinder bore, the upper surface of the crown and the under surface of the cylinder head in each cylinder bore, an auxiliary combustion chamber formed in the cylinder head at a position above said main combustion chamber, a spark plug disposed in the cylinder head for the auxiliary combustion chamber, means for supplying fuel to said auxiliary combustion chamber, a communication passage formed in the cylinder head for fluidly communicating the main combustion chamber and the auxiliary combustion chamber, the upper surface of the crown of the piston having an entirely planar inclined portion extending gradually downward and toward the opposite side from the peripheral edge which is brought to a position adjacent to said communication passage when said piston reaches the top dead center position and a stepped portion formed at said opposite side remote from said communication passage, the inclined portion terminates at a pair of curved surfaces as the inner wall of the stepped portion, the curved surfaces being joined to each other at a point diametrically opposite to the highest point of the peripheral edge of the crown and extending away from each other to the peripheral edge of the crown.

4,005,685

FUEL INJECTION APPARATUS

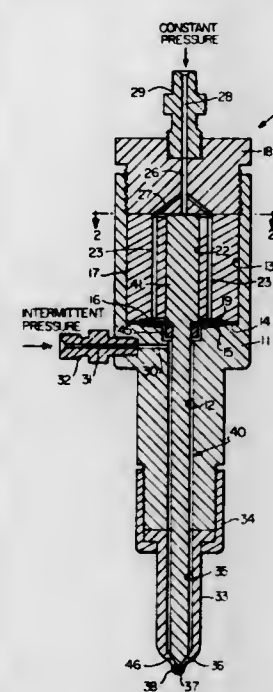
Eadre Kovacs; Peter Kovacs; Michael Kovacs, all of 1708 Cedar Drive; Marta Kovacs, 1707 Cedar Drive, and Geza Kovacs, 1610 Cedar Drive, all of Plant City, Fla. 33566

Filed July 29, 1975, Ser. No. 600,023

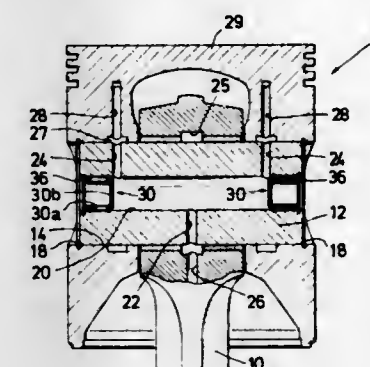
Int. Cl.³ F02M 47/06

U.S. Cl. 123-33 G

5 Claims



consist of a base and a rim, the outer diameter of which rim while in the unstressed condition is slightly larger than the inner diameter of the longitudinal bore, while the wall thick-



ness of the base is smaller than the rim wall thickness, and with the latter rim wall thickness being substantially less than the wall thickness of the piston-pin surrounding the longitudinal bore.

4,005,687

CONCEALED REGENERATIVE COMBUSTION ENGINE

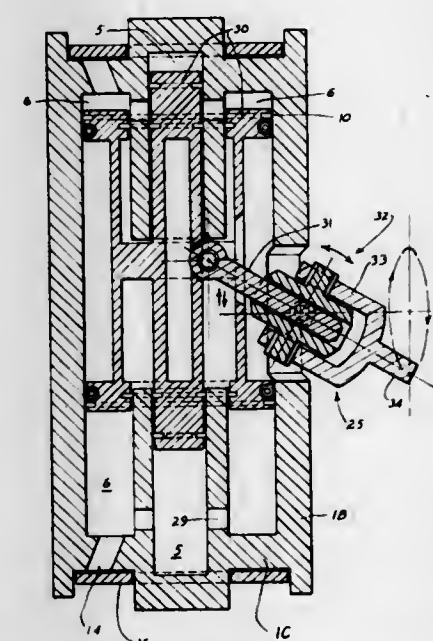
Johan Jonathan, 22 Milton St. North, Ashfield, New South Wales, 2131, Australia

Filed Feb. 1, 1974, Ser. No. 438,841

Int. Cl.³ F02B 23/00, 53/00

U.S. Cl. 123-53 A

1 Claim



1. A fuel injection apparatus for injecting combustible fuel under pressure into an internal combustion engine comprising a body having an axial bore and counterbore, one end of said body having a valve seat and at least one orifice, a diaphragm positioned within said counterbore, sleeve means mounted within said counterbore in sealing engagement with the periphery of said diaphragm, said sleeve means and said body having opposed recesses defining a diaphragm expansion cavity, said sleeve means having an axial guide bore and at least one passage for fluid communicating with said cavity, means for introducing lubricating fluid under a predetermined constant pressure into said guide bore and through said passage into a portion of said cavity, and injector needle having first and second portions, said first portion being slidably received within the guide bore of said sleeve means, said second portion extending through and sealingly connected to said diaphragm, said second portion extending freely through and being in spaced relationship to the bore of said body and guided therethrough by the sliding engagement of said first portion of said injector needle and said guide bore of said sleeve means, a valve member at the end of said second portion which is remote from said first portion, said valve member normally engaging said valve seat, and means for intermittently introducing fuel under a pressure which is higher than said constant pressure into said bore of said body and into another portion of said cavity, whereby said high pressure fuel moves a portion of said diaphragm and said injection needle axially against the constant pressure to unseat said valve member from said seat and discharge high pressure fuel through said orifices.

4,005,686

PISTON-PIN FOR LIQUID COOLED PISTONS

Kurt Wizemann, Stuttgart, and Manfred Pflz, Nellingen, both of Germany, assignors to J. Wizemann & Co., Quellenstr. 7, Germany

Filed June 26, 1975, Ser. No. 590,421

Int. Cl.³ F01P 1/04

U.S. Cl. 123-41.38

6 Claims

6. Piston-pin for liquid cooled pistons, comprising a longitudinal bore which at its ends is sealed by cup shaped sealing elements, which are emplaced in a stressed condition, and

1. An internal combustion engine characterized by its ability to operate in multi-stroke modes, comprising, in combination: an engine body formed with first and second end head portions disposed at opposite ends of and being integral with an outer annular wall, said outer annular wall having inwardly facing surfaces, said body including first and second spaced substantially central and concentrically extending hollow cylindrical first and second combustion walls each defining separate first and second combustion chambers therewithin, said first and second combustion walls being integral with said respective first and second engine body end head portions, said first and second combustion walls further defining first and second annular expansion chambers intermediate outer surfaces thereof and said inwardly facing surfaces of said outer annular wall, said first and second annular expansion chambers extending concentrically about said first and second combustion chambers, respectively, each of said first and second end head portions being formed with a port extending therethrough in communication with said first and second annular expansion chambers, each of said first and second combustion walls being formed with a port extending through at a predetermined distance from said respective first

and second end head portions and in communication with said combustion and expansion chambers, said outer annular wall having a substantially central relief opening, a piston assembly supported for reciprocating movement within said engine body, said piston assembly including an elongated central inner portion extending between first and second piston end portions thereof, said piston end portions being integral with a central portion having an outwardly extending flange, said piston assembly further comprising an elongated outer portion integral with said flange and extending between first and second annular piston discs, said first and second piston end portions being slidably disposed within said first and second combustion chambers, respectively, said first and second annular piston discs being slidably disposed within said first and second annular expansion chambers, piston sealing rings carried by each of said piston end portions as well as each of said piston discs, said sealing rings each remaining in contact with the respective chamber with which it is associated during the entire stroke of said piston assembly, conversion means pivotally supported and disposed in part within said central relief opening for converting rectilinear reciprocatory movement of said piston assembly into arcuate movement, linkage means interconnecting said piston assembly and said conversion means, valve means associated with each of said end head portion ports for controlling the flow of fluid therethrough, the presence of said first piston end portion adjacent to said first end head portion at one extremity of the stroke of said piston assembly sealing said first combustion wall port, thereby sealing said respective combustion and expansion chambers from each other, and cooling means supported by said first engine body end head portion for transferring heat generated within said first and second combustion chambers from said engine body to fluid disposed within said first and second expansion chambers, said cooling means comprising a plurality of substantially thin members of predetermined size and shape.

4,005,688

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Noriaki Kawai, Okazaki; Hideo Okamoto, Aichi; Yosaki Takeda, Nagoya; Fukuzi Sano, Kariya; Akio Kakuchi, Nagoya; Masami Mamebe, Kariya; Takashi Nomura, Kariya, and Sigeo Abe, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Kabushiki Kaisha, Kariya, both of Japan

Division of Ser. No. 386,874, Aug. 9, 1973, Pat. No. 3,930,474, which is a continuation of Ser. No. 116,343, Feb. 18, 1971, abandoned. This application July 25, 1975, Ser. No. 599,127

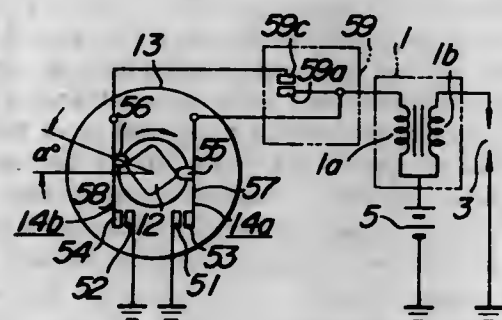
Claims priority, application Japan, Feb. 27, 1970, 45-17189; Mar. 30, 1970, 45-30471; Apr. 9, 1970, 45-34366; Apr. 9, 1970, 45-34367

The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

Int. Cl.³ F02P 5/04

U.S. Cl. 123—117 R

3 Claims



1. An improved ignition system, in combination with a spark-ignition type internal combustion engine having at least one spark plug, to advance the spark at a selected engine temperature corresponding to a coolant temperature less than

about 40° C and to retard the spark above that temperature including

an ignition coil having a primary winding and a secondary winding connectable in circuit with said spark plug, a power source connected in circuit with said primary winding for supplying power to said primary winding, and breaker means connected in series with the circuit including said primary winding and said power source to interrupt power supplied from said power source to said primary winding so as to induce a high voltage in said secondary winding, wherein the improvement comprises, first and second current interrupting means connected in parallel with each other and each connected in series circuit with said primary winding and said power source, said first current interrupting means being positioned in advance of said second current interrupting means by a selected rotational angle for interrupting power supplied to said primary winding from said power source, a temperature detecting element for detecting engine temperature having an effect on engine torque efficiency to produce respective output signals below and above said selected level of said engine temperature, and spark timing change means connected between said temperature detecting element and said breaker means for changing spark timing to selected discrete levels to interrupt power supplied from said power source to said primary winding in response to the output of said temperature detecting element,

said spark timing change means including switch means for switching off said second current interrupting means in response to said below output signal from said temperature detecting element for advancing said spark timing from a normal pre-TDC level to a selected discrete level that is more advanced by about 5° to 15° when the engine temperature is lower than said selected engine temperature for improving the power of said engine by generally optimizing engine shaft torque regardless of engine load and increasing the stability at idling and during acceleration and running speeds of said engine at temperatures thereof below said selected engine temperature, said switch means being operative in response to the said above temperature output signal to switch on said second current interrupting means and thereby to render said second current interrupting means operative for retarding said spark timing to said normal level when said engine temperature is above said selected temperature,

said switching means having a single pole and a single contact for a single throw action, said single pole being connected directly to said primary winding and to said first current interrupting means, and said single contact being connected to said second current interrupting means.

4,005,689

FUEL INJECTION SYSTEM CONTROLLING AIR/FUEL RATIO BY INTAKE MANIFOLD GAS SENSOR

Daniel Dewey Barnard, Farmington Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 30, 1975, Ser. No. 573,509

Int. Cl.³ F02M 25/00

U.S. Cl. 123—119 A

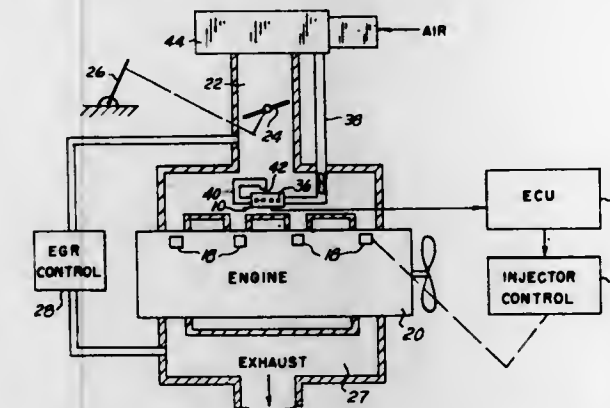
3 Claims

1. In a fuel injection system, a system for controlling the air/fuel ratio in response to an amount of a constituent gas content of the mixture in the intake manifold of the engine comprising:

an internal combustion engine including;
a plurality of cylinders,
air intake means for receiving and controlling ambient air for combustion,
exhaust gas recirculation means connected to said air intake means for supplying an amount of exhaust gas to the ambient air in said air intake means forming a gas mixture, and

intake manifold means for distributing said gas mixture to said cylinders said intake manifold means connected to said air intake means downstream of said exhaust gas recirculation means connection;
fuel injector means;
means for supplying the fuel to said fuel injector means;
a gas sensor means positioned in said intake manifold means and adjacent said air intake means and comprising means for supplying ambient air to one surface thereof, said gas sensor means responsive to all of the flow to another

portion of relatively great height constituting a low temperature cam portion and means coupling said fast idle cam with said drive means so that the low temperature cam portion is in operative position when the drive means undergoes said excess rotation.



surface thereof of the gas mixture for generating an electrical signal proportional to the difference in the amount of the sensed constituent gas in said gas mixture flowing into the intake manifold means and the amount of the sensed constituent gas in the ambient air, and control means responsive to said electrical signal for controlling the operation of said fuel injector means thereby controlling the operation of said fuel injector means in accordance with the amount of said sensed constituent gas in said gas mixture in the intake manifold means.

4,005,690

AUTOMATIC CHOKE VALVE APPARATUS IN AN INTERNAL COMBUSTION ENGINE

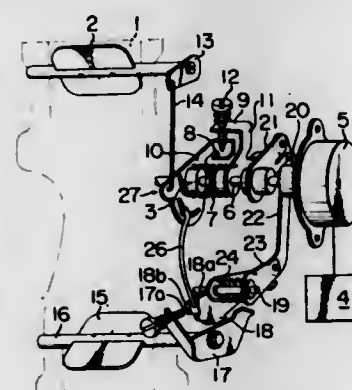
Yoshiaki Hirose, Tokyo; Toshio Nomura, Niiza, and Masahiko Iiyama, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 23, 1975, Ser. No. 589,515

Int. Cl.³ F02M 1/10; F02D 11/08; F02M 23/04

U.S. Cl. 123—119 F

10 Claims



1. Choke valve apparatus for an internal combustion engine comprising a rotatable choke valve, drive means for said choke valve including means for said choke valve including means for directly rotating the choke valve only in one direction of rotation of the drive means, and a spring rotatably coupling the drive means and said choke valve for rotation in the other direction, said choke valve being initially driven in reverse direction by said drive means in preparation for engine starting, to a fully closed position, the drive means undergoing continued excess rotation in reverse direction to place said spring under stress, a fast idle cam adapted for cooperating with a throttle valve for the engine and including an extended

1. In a control installation for internal combustion engines having exhaust gas recycling, the engine including:
a. suction tube;
b. an arbitrarily settable throttle flap valve mounted within the suction tube, the throttle flap valve setting being dependent on the load condition of the engine; and
c. an exhaust gas pipe; the installation including:
d. an exhaust gas recycling valve whose setting is dependent on the pressure in the suction tube; and
e. a return line leading from the exhaust gas pipe to the recycling valve and from the recycling valve to the suction tube, the return line being connected to the suction tube downstream of the throttle flap valve, the improvement in the installation comprising a bypass line which extends from the suction tube upstream of the throttle flap valve to the recycling valve and back to the suction tube downstream of the throttle flap valve, with the air passing through the bypass line serving as an engine supply during engine idling and to cool the recycling valve; and
f. a control line having a first end thereof connected to the recycling valve and another end connected to the suction tube upstream of and proximate to the throttle flap valve so that the pressures prevailing in the immediate region of the throttle flap valve are communicated to the recycling valve.

4,005,692

CARBURETOR ARRANGED FOR RECIRCULATING EXHAUST GASES

Hidetaka Nohira, and Masatoshi Sugura, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 481,323, June 20, 1974, abandoned.

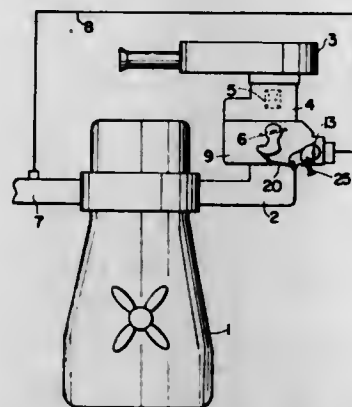
This application May 19, 1975, Ser. No. 578,752

Claims priority, application Japan, July 5, 1973, 48-75221

Int. Cl.³ F02M 25/06

U.S. Cl. 123-119 A

4 Claims



1. In a carburetor comprising a carburetor barrel forming a fuel-air mixture passage, a throttle valve located within said fuel-air mixture passage for controlling the flow of the mixture therethrough, said throttle valve including a first rotary shaft for supporting and moving said throttle valve between its closed and open positions, a venturi located upstream in the direction of flow through said fuel-air mixture from said throttle valve, means connected to said fuel-air mixture passage for recirculating exhaust gases into said fuel-air mixture passage, said means including a control valve for regulating the flow of exhaust gases into said fuel-air mixture passage, said control valve including a second rotary shaft for supporting and moving said control valve between its closed and open positions, wherein the improvement comprises a first spring connected to said second rotary shaft for biasing said control valve into the closed position, linkage means interconnecting said first rotary shaft and said second rotary shaft for coupling the operation of said throttle valve to said control valve for effecting a one-to-one correspondence between the rotary displacement of the throttle valve and the control valve and said linkage means includes a second spring for connecting said linkage means to said second rotary shaft so that said throttle valve can operate independently of said control valve so that said throttle valve can rotate though rotation of said control valve is prevented.

4,005,693

WARMING-UP SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kenji Masaki, and Masaki Saito, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 28, 1974, Ser. No. 437,157

Claims priority, application Japan, Jan. 29, 1973, 48-11697

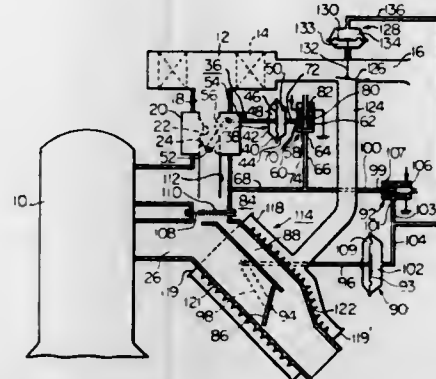
Int. Cl.³ F02M 31/00

U.S. Cl. 123-122 D

6 Claims

1. A warming-up system for an internal combustion engine, comprising an engine intake passageway having a throttle valve rotatably mounted therein, an engine exhaust gas passageway, a combustible mixture heating device comprising an exhaust gas by-pass passageway connected at both ends to said exhaust gas passageway and sharing a common heat transfer wall with said intake passageway downstream of said throttle valve through which wall engine exhaust gases heat a combustible mixture passing through said intake passageway when diverted into said exhaust gas by-pass passageway, an exhaust gas valve rotatably mounted in said exhaust gas passageway to normally open it, a servo unit operatively connected to said

exhaust gas valve, passage means communicating with said intake passageway downstream of said throttle valve and with said servo unit to feed thereto a vacuum prevailing in said intake passageway, said servo unit being operable by said vacuum to rotate said exhaust gas valve to close said exhaust gas passageway to divert engine exhaust gases into said exhaust gas by-pass passageway, first switch means closed in response to a temperature of the engine lower than a predetermined value, and valve means disposed in said passage means to normally close said passage means to inhibit feed of said vacuum to said servo unit and having a solenoid which is electrically connected to said switch means and causes said valve means to open said passage means to permit feed of said



vacuum to said servo unit when said switch means is closed, and an ignition timing change-over device comprising an advancing breaker contact assembly normally connected to an ignition coil of the engine, a retarding breaker contact assembly normally disconnected from said ignition coil, second switch means closed in response to a temperature of a catalytic converter of the engine lower than a predetermined value and connected in parallel with said first switch means, and control means connected to said second switch means and operable to change over connection of said ignition coil from said advancing breaker control assembly into said retarding breaker control assembly when said second switch means is closed.

4,005,694

ELECTRONIC IGNITION SYSTEM

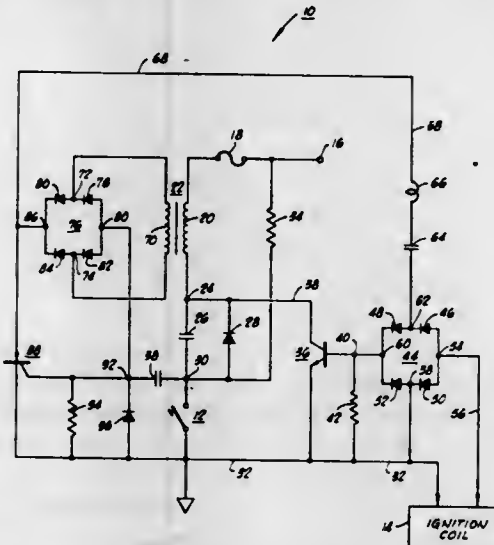
John B. Noe, Norman, Okla., assignor to The Plasmatronics Company, Norman, Okla.

Filed Aug. 18, 1975, Ser. No. 605,533

Int. Cl.³ F02P 1/00

U.S. Cl. 123-148 E

11 Claims



1. An electronic ignition circuit for use in combination with an internal combustion engine having an electrical power source and ignition means for energization of at least one spark discharge device, comprising: a capacitor;

switch means actuatable between open and closed positions; means including a transformer connected to said power source and energized by said switch in the closed position to charge said capacitor to an increased voltage value; controlled rectifier means energized by opening said switch means to effect discharge of said capacitor; and bridge rectifier means connected to conduct current from discharge of said capacitor to said ignition means while clamping the instantaneous voltage value relative to ground.

4,005,695

TOURNAMENT TRAP

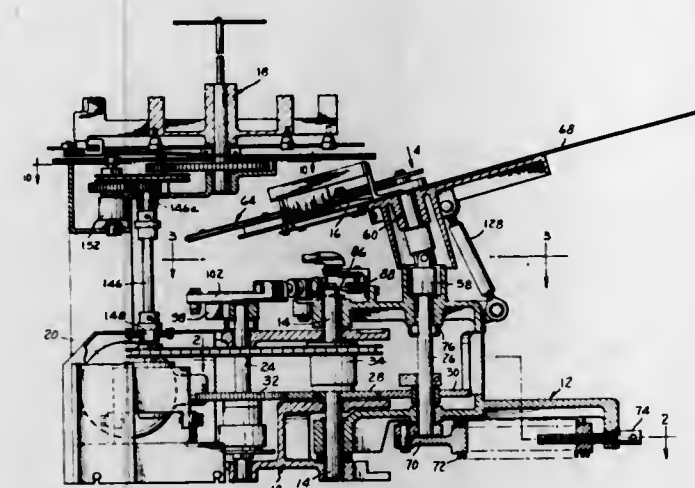
James Marion Alday, Williamson, and Kenneth Charles Rowlands, Utica, both of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 417,185, Nov. 19, 1973, Pat. No. 3,937,204. This application June 12, 1975, Ser. No. 586,207

Int. Cl.³ F41B 3/04

U.S. Cl. 124-8

5 Claims



1. A target throwing trap comprising a housing, a main shaft mounted on said housing, a target throwing arm secured on one end of said shaft, a crank arm secured to the other end of said shaft, a mainspring connected to said crank arm and to said housing, cocking means for rotating said shaft and associated throwing arm and crank arm so as to tension the mainspring and cock the throwing arm, means associated with said cocking means for stopping the rotation of the shaft just before the axis of the mainspring reaches the top dead center line, means on said shaft to prevent the shaft from being rotated in the opposite direction by the action of the mainspring when the trap is in the cocked position, and means to actuate said cocking means so that upon actuation said shaft is rotated until the mainspring axis passes overcenter whereupon the force of the mainspring acts on the shaft and throwing arm thus providing the necessary centrifugal force to throw a target, said cocking means continuing to rotate the shaft until the cocked position is reached whereupon shaft rotation is stopped, the mainspring is tensioned and held just short of overcenter position and the trap is cocked and ready to be fired again.

4,005,696

COMPOUND BOW

Thomas Paul Jennings, San Valley, Calif., assignor to Jennings Compound Bow, Inc., Valencia, Calif.

Filed Mar. 28, 1975, Ser. No. 562,816

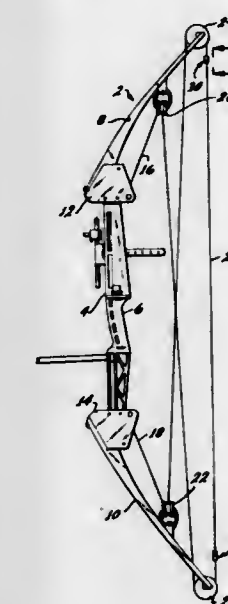
Int. Cl.³ F41B 5/00

U.S. Cl. 124-24 R

23 Claims

1. In a compound bow having a center portion with a handle formed thereon, a lower limb and an upper limb connected to said center portion, and eccentrically mounted bow string pulleys mounted at the outer ends of each of said limbs for supporting a cable and bow string, the improvement comprising:

bow string holder means constructed and disposed to be supported by each of said eccentrically mounted pulleys; each of said bow string holder means having shaft means and constructed to be connected at its outer end through the cable to one of said pulleys; the bow string holder means further including a pair of aligned bow string support means each extending at its inner end from an opposite side of said shaft means; each of said support means having an upwardly extending outer end which is shaped and positioned in spaced relationship to the shaft means to maintain the bow string between said outer end and said shaft; curved upper surface means on each of said support means; said upper surface means curving upwardly toward the outer end of said shaft means to merge into the surface of said shaft; said upper surface means also curving upwardly toward said upwardly extending outer end of the support means to merge into the surface of said outer end and to define with the upper end of the support means and the shaft means a recess for receiving the bow string; transversely curved outer side surface means on each of said support means for facilitating the disposition of the bow string in frictional relationship with the support means along an extended length of the bow string;



said transversely curved outer side surface means merging smoothly into said upper surface means on each of the support means for facilitating the disposition of the bow string in frictional relationship with the support means along an extended length of the bow string; lower curved surface means on each of said support members; the lower surface means on said support means merging together to form a continuous and straight lower surface extending across the bottom of said bow string holder means for facilitating the disposition of the bow string in symmetrical relationship with the shaft means, and said transversely curved outer side surface means on each of said support means merging smoothly into the curved lower surface on the support means for facilitating the disposition of the bow string in frictional relationship with the support means along an extended length of the bow string, said upper surface means, and transversely curved outer side surface means, and said lower surface means being constructed and disposed to provide a relatively uniform contact between the bow string and the bow string holder means along the extended length of the bow string holder means for facilitating a uniform support for the bow string in a symmetrical relationship to the shaft means and for preventing stress concentrations in the bow string in its engagement with said bow string holder means.

4,005,697

GAS COOK TOP

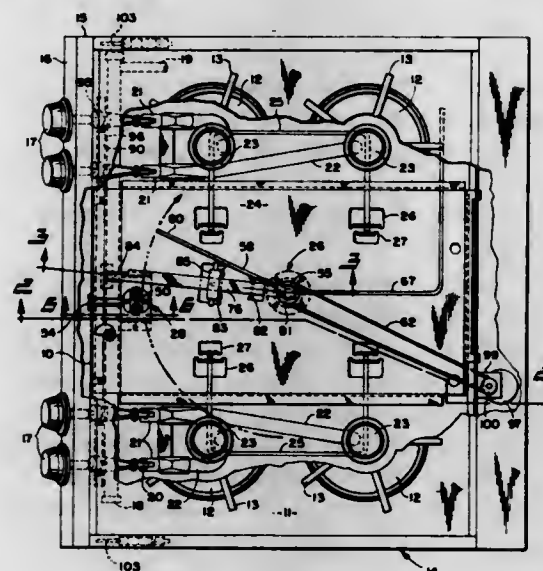
Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed Feb. 9, 1976, Ser. No. 656,540

Int. Cl.² F24C 3/00

U.S. Cl. 126-39 E

28 Claims



1. A cook top comprising a plurality of gas burners, an electric igniter for the plural burners, movable pilot light means, and drive means for moving the pilot light means relative to the igniter and the gas burners such that the pilot light means is lit by the igniter and the latter brought into ignition proximity to the respective burners to ignite any turned on.

4,005,698

PHOTON ENERGY CONVERTER

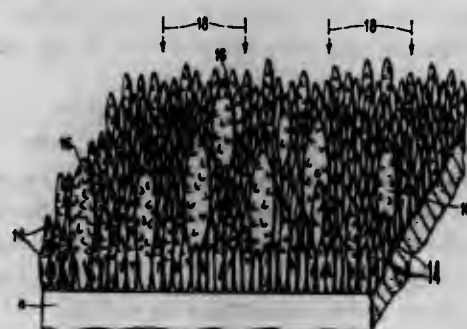
Jerome John Cuomo, Bronx, N.Y.; Jerry MacPherson Woodall, Saratoga, Calif., and James Francis Ziegler, Putnam Valley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1974, Ser. No. 515,780

Int. Cl.² F24J 3/02

U.S. Cl. 126-270

22 Claims



1. An efficient broad band absorber of photons, comprising:
a thermally conductive substrate;
a dendritic distribution of material on said thermally conductive substrate, said distribution including effectively aligned needle-like protrusions extending from said substrate and arrayed in a random pattern thereover, the density of said protrusions being such that their individual height and width dimensions as well as their respective separations are of the order of a few incident photon wavelengths such that said protrusions act as a broad band photon absorber to convert the energy of said photons to heat in said thermally conductive substrate.

4,005,699

METHODS AND APPARATUS FOR USE IN MAGNETIC TREATMENT OF THE BODY

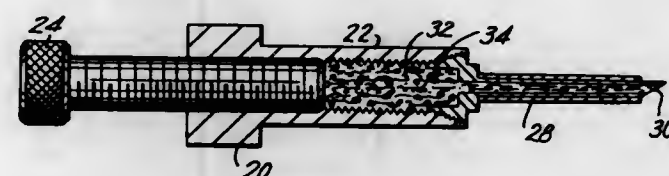
Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Filed Oct. 9, 1974, Ser. No. 513,295

Int. Cl.² A61M 5/00

U.S. Cl. 128-1.3

8 Claims



1. In a method of treating a living being, the step of injecting with a syringe, into tissue of the living being, an absorbable viscous substance, in which a plurality of solid bodies are suspended to an extent sufficient to be distributed throughout the viscous substance, in an amount sufficient to change the characteristics of the tissue receiving the injection, at least a portion of the bodies being non-absorbable, and at least a portion of the non-absorbable bodies being permanently magnetizable for maintaining the changed tissue characteristics independently of any outside source of magnetism.

4,005,700

DEVICE FOR MEASURING BLOOD GASES

Dawood Parker, London, England, assignor to G. D. Searle & Co. Limited, Bucks, England

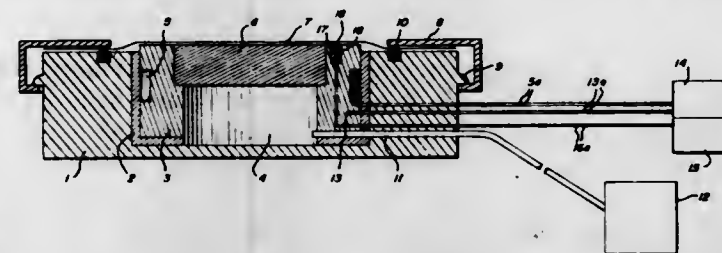
Filed Apr. 7, 1975, Ser. No. 566,008

Claims priority, application United Kingdom, Apr. 5, 1974, 15233/74

Int. Cl.² A61B 5/00

U.S. Cl. 128-2 E

6 Claims



1. A device for the measurement of the partial pressure of gases or vapours in the blood stream of animals, including man, said device comprising a body having a boundary wall which can be placed on the skin of an animal and an internal collecting chamber in which gases or vapours which diffuse through an area of skin defined by the boundary wall can be collected, heating means in the body operable to heat said area of skin, an outlet from the collecting chamber through which gases or vapours collected in the chamber can be led away to an analysis instrument, control means responsive to the temperature of said body of the device and operable to control said heating means, and means responsive to the temperature of the skin of the animal and connected with an indicator operable to monitor said temperature.

4,005,701

NOISE REJECTING ELECTRONIC SPHYGMOMANOMETER AND METHODS FOR MEASURING BLOOD PRESSURE

Sol Aisenberg, Natick, and Ronald W. Chabot, Winchester, both of Mass., assignors to Whitaker Corporation, Los Angeles, Calif.

Filed June 11, 1975, Ser. No. 585,889

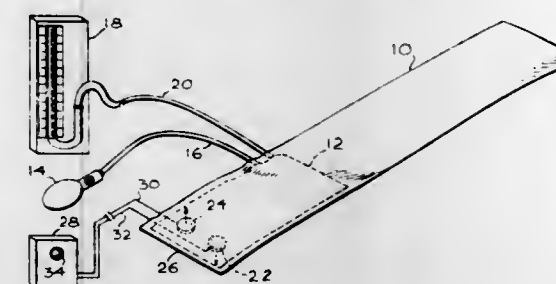
Int. Cl.² A61B 5/02

U.S. Cl. 128-2.05 G

29 Claims

1. In a sphygmomanometer having a cuff, a cuff inflating bladder and a bladder pressure measuring element, where the

cuff is adapted for positioning around a patient's limb, for measuring the patient's blood pressure intensity by monitoring Korotkoff sounds as bladder pressure is slowly reduced from above systolic blood pressure, the improvement comprising:
a first acoustical pickup disposed within the cuff and positioned relative to a patient's brachial artery to pick up said Korotkoff sounds;
a second acoustical pickup disposed within the cuff and positioned away from the brachial artery to pick up background sounds;
transducing means associated with said pickups for produc-



ing a first electrical signal corresponding to the sounds received by the first pickup and a second electrical signal corresponding to the sounds received by the second pickup; and
electronic logic means connected to receive the first and second signals for providing an output at a first voltage level upon a comparison of said electrical signals when and only when there is a first electrical signal corresponding to Korotkoff sounds and no second electrical signal of comparable magnitude and for providing an output at a second voltage level except when said first output signal is provided.

4,005,702

SYSTEM AND METHOD FOR EXPLORATION OF THE INTRATHORACIC VENTILATORY MECHANISM

Daniel Ernest Louis Bargeton; P. Valda, both of Paris, and G. Vardon, Neuilly Plaisance, all of France, assignors to Institut National de la Sante et de la Recherche Medical, France

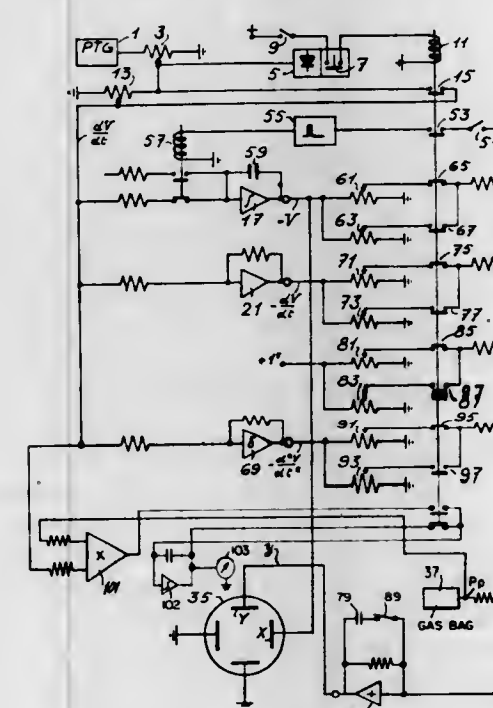
Filed May 22, 1975, Ser. No. 579,971

Claims priority, application France, May 22, 1974, 74.17785

Int. Cl.² A61B 5/08

U.S. Cl. 128-2.08

19 Claims



1. A method of exploring the intrathoracic ventilatory mechanism of a subject comprising the steps of producing a signal y formed at least according to the equation:

$$y = \lambda_1 V + \lambda_2 \frac{dV}{dt} + Pp + \lambda_3$$

wherein V is the volume displaced in the mouth of the subject, dV/dt is the first derivative of V with respect to time, Pp is the pleural pressure given by an oesophageal gas-bag, and λ_1 , λ_2 and λ_3 are adjustable parameters, displaying the signal y as a function of V on an oscilloscope so that a loop is traced on the screen of the oscilloscope then successively adjusting the parameter λ_2 so that the loop traced on the oscilloscope screen closes in a straight line, adjusting the parameter λ_1 so that the straight line becomes horizontal, and adjusting the parameter λ_3 so that the horizontal straight line lies over the x axis on the oscilloscope screen whereby the adjusted values of the parameters are:

$\lambda_2 = R$ -intrathoracic resistance, $\lambda_1 = E$ -intrathoracic elastance, and $\lambda_3 = E(V_0 - V_r)$ —where V_0 is the pulmonary volume at the beginning of the inhalation and V_r is the relaxation volume.

6. A system for exploring the intrathoracic ventilatory mechanism of a subject, comprising pneumotachograph means for supplying a signal dV/dt of the first derivative with respect to time of the volume V displaced at the mouth of the subject, integrating circuit means for receiving the signal dV/dt and supplying a signal $-V$, first parameter means for providing an adjustable parameter signal λ_1 and providing an output signal $-\lambda_1 V$; second parameter means for providing an adjustable parameter signal λ_2 and providing an output signal

$$-\lambda_2 \frac{dV}{dt}$$

third parameter means for providing an adjustable parameter signal λ_3 , means for supplying a signal Pp of the pleural pressure of the subject, summing means for receiving at least the signal $-\lambda_1 V$,

$$-\lambda_2 \frac{dV}{dt}$$

Pp and λ_3 for supplying a signal

$$y = \lambda_1 V + \lambda_2 \frac{dV}{dt} + Pp + \lambda_3$$

and oscilloscope means having a vertical input for receiving the signal y and a horizontal input for receiving the signal $-V$, whereby the signal y is displayed on the screen of the oscilloscope means as a function of V in the form of a loop, said second parameter means being adjusted so that the loop is closed in a straight line, said first parameter means being adjusted so that the straight line becomes horizontal and the third parameter means being adjusted so that the horizontal line lies on the x axis of the oscilloscope means whereby the adjusted values of said first, second and third parameter means represent $\lambda_1 = E$ -intrathoracic elastance, $\lambda_2 = R$ -intrathoracic resistance, and $\lambda_3 = E(V_0 - V_r)$ where V_0 is the pulmonary volume at the beginning of inhalation and V_r is the relaxation volume.

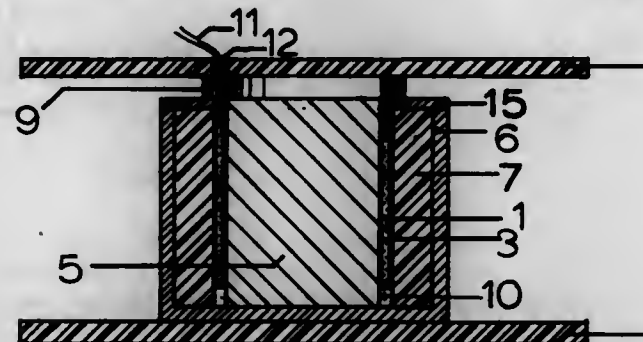
4,005,703

VIBRATORY MASSAGE THERAPEUTIC DEVICE

Arnold Rosen, 580 Christie St., Apt. 510, Toronto, Ontario, Canada (M6G3E3), and William Harvey Harris, 2641 Widemarr Road, Mississauga, Ontario, Canada (L5J1M4)
Filed June 4, 1975, Ser. No. 583,520
Int. Cl.² A61H 1/00

U.S. Cl. 128—33

6 Claims



1. In an electrically powered vibrator massage therapeutic device the combination of a resilient supporting material encasing and supporting a plurality of electrically operable vibrator units the frequency of mechanical vibration of which is substantially the same as the frequency of electrical voltage applied thereto by an electrical power supply, and electrical power supply as aforesaid, the output voltage of which varies cyclically with time in accordance with the setting of preselectable control means, the power output of which is preselectable between a low level and the maximum allowable dissipation of the combination of vibrator units within the vibrator massage therapeutic device, the electrical power supply driving the said vibrator units; said vibrator unit including a stator having a permanent magnet with longitudinally oriented magnetic poles and stator casing of magnetically permeable material providing a return magnetic path for magnetic flux from one pole of the magnet to the other a driver coil assembly comprising a multiturn coil mounted on a tube which is adapted to vibrate with little friction longitudinally along the pole axis of the permanent magnet, the driver coil assembly remaining substantially within the stator, the outer surface of the coil assembly being of low friction material permitting substantially free vibration in cooperation with the inner liner of the stator casing, the upper section of the coil assembly being attached to a substantially rigid thin mechanical excitation plate wider than the stator casing, a flexible resilient material preventing contact of excitation plate and stator casing, a second mechanical excitation plate attached to the underside of the stator unit, the electrical excitation by time varying electrical power causing the driver coil assembly to vibrate correspondingly along the longitudinal magnetic axis.

4,005,704

DEVICE FOR THE FOOT END OF A LEG CAST

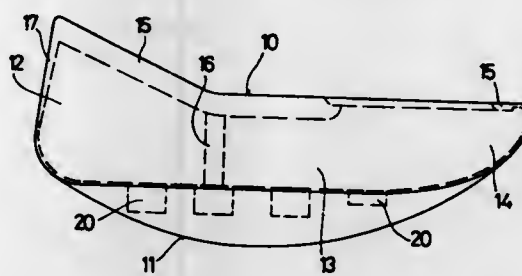
Christoph Stühr, Eisenstr. 2, and Klaus Kerkrath, Tannenweg 3, both of 6619 Lohndorf, Germany
Filed Sept. 3, 1975, Ser. No. 609,955
Claims priority, application Germany, Sept. 11, 1974, 2443416; Feb. 17, 1975, 047573
Int. Cl.² A61F 5/04

U.S. Cl. 128—83.5

6 Claims

1. A device for the foot end of a leg cast comprising a flexible overshoe adapted to be removably placed over the foot end of the cast, said overshoe having a rolled sole bounded in the longitudinal direction by a downwardly curved line extending from the heel portion to the tow portion of said overshoe and being flat in the transverse direction, said rolled sole having an anti-slip section on the surface which comes into contact with the ground and further having air chambers recessed into the surface which comes into contact with the

cast-covered sole of the foot, said chambers forming at least one row in the longitudinal direction with the depth of the



chambers at the ends of the row being less than those in the portion where the rolled sole is high.

4,005,705

SPLINTS

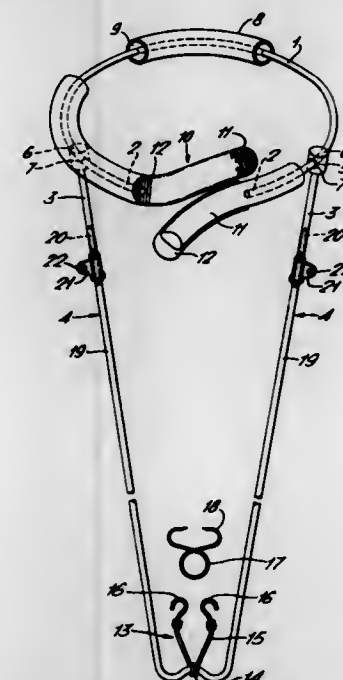
Douglas Paviour Short; Donald James Gillon, and Henry Britton Coates Milson, all of Tauranga, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand
Continuation of Ser. No. 67,958, Aug. 28, 1970, abandoned.
This application Sept. 10, 1975, Ser. No. 611,890
Claims priority, application New Zealand, Aug. 29, 1969, 157633

The portion of the term of this patent subsequent to Mar. 1, 1992, has been disclaimed.

Int. Cl.² A61F 5/04

U.S. Cl. 128—87 R

2 Claims



1. A splint comprising a foot member, a ring member, and a pair of leg members, said ring member having a malleable core and being discontinuous, positioning means positioning the pair of leg members on the ring member, said positioning means including, for each leg member, an apertured member passing over the core of the ring member and being positioned to prevent circumferential movement by an annular enlargement of the core on either side of said apertured member while permitting pivotal movement thereof on said core, said leg members being adjustable in length by providing telescopic tubular members into which rod members may telescope, compression clamps which are lockable to fix the rod members at a suitable relative position to the tubular members, said ring member being adjustable in diameter by being discontinuous and having a malleable core, a flexible resilient material covering said core, and a protective outer covering, the resilient material being divided over the discontinuity between the ends of the core, the divided portions being adapted to be fixed to each other with a fastening material, said positioning means in use restraining movement of said leg

members around the periphery of said ring member but allowing pivoting relative to the plane of the ring member, the arrangement permitting adjustment of length of the leg members and adjustment of the obliquity of the ring member relative to the leg members to assist in adapting the splint to a patient.

4,005,706

TYPE OF ADHESIVE CEMENT AND CERTAIN IMPROVED PRODUCTS MADE POSSIBLE THEREBY

David F. Smith, 6511-1 Bay Club Drive, Fort Lauderdale, Fla. 33308
Continuation-in-part of Ser. No. 473,751, May 28, 1974, abandoned. This application June 9, 1975, Ser. No. 585,382
Int. Cl.² A61L 15/07

U.S. Cl. 128—90

10 Claims

1. An orthopedic bandage comprising a thin, porous, flexible, inert backing material carrying a substantially uniform discontinuous spread of an intimate mixture of a dry, finely-divided zinc oxide and a dry, finely-divided, essentially non-allergenic, non-toxic, rapidly water-wettable and very water-soluble, weak polycarboxylic acid, the proportion of zinc oxide to acid being from that which is chemically equivalent to the acid up to 300 per cent in excess of its equivalent, the amount of the spread being from 70 to 250 grams per 5 square feet of backing, said mixture being such as to become rapidly adhesive when wet with water at room temperature and shortly thereafter to set forming a strong, firm mass.

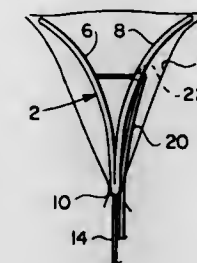
4,005,707

VARIABLE SIZE INTRAUTERINE CONTRACEPTIVE DEVICE

Thomas S. Moulding, Jr., 1954 Glencoe St., Denver, Colo. 80220
Filed May 30, 1975, Ser. No. 582,261
Int. Cl.² A61F 5/24

U.S. Cl. 128—130

14 Claims



1. A variable-sized intrauterine contraceptive device for substantially filling the uterus in the plane thereof and having minimal thickness in the anterior-posterior direction, said device comprising:

an angular member having first and second legs interconnected at an acute angle and being bendable at said interconnection to a collapsed position to facilitate insertion of said device into the uterus and being expandable in the plane of the uterus;

means in said member for expanding said member in the plane of the uterus until said legs engage the uterine wall irrespective of the size of the uterus in which said device is placed; and

means to lock said legs to prevent further expansion thereof after they are in engagement with the uterine walls but permitting said legs to move toward said collapsed position upon contraction of the uterus.

4,005,708

APPARATUS FOR ENDOTHERMAL ABSORPTION OF CARBON DIOXIDE

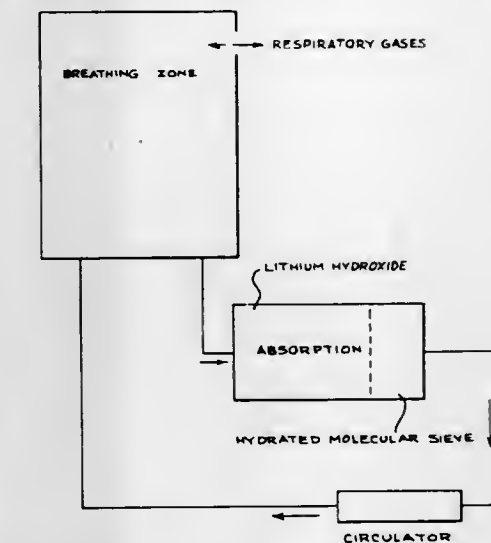
Loyal G. Netteland, East Aurora, and Clifford E. Heintz, Buffalo, both of N.Y., assignors to A-T-O Inc., Willoughby, Ohio
Continuation-in-part of Ser. No. 464,738, April 29, 1974, Pat. No. 3,906,945. This application Sept. 22, 1975, Ser. No. 615,608

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.² A62B 19/00

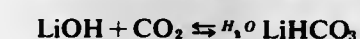
U.S. Cl. 128—142 R

6 Claims



1. Apparatus for absorbing carbon dioxide from respiratory gases in a recirculatory breathing apparatus comprising:

- a means including a recirculatory gas stream flow path extending from a breathing zone to a carbon dioxide absorption zone and back to said breathing zone;
- means for introducing to said breathing zone carbon dioxide containing respiratory exhalations;
- means for removing from said breathing zone respiratory exhalations;
- means for causing said exhalations to flow in said recirculating gas stream flow; and
- said carbon dioxide absorption zone comprising a first chamber containing lithium hydroxide and downstream immediately thereafter a second chamber containing hydrated molecular sieve containing about 40 to 60 moles, per mole of said sieve, of water, whereby said carbon dioxide is caused to react with said lithium hydroxide at least in part by the reaction:



4,005,709

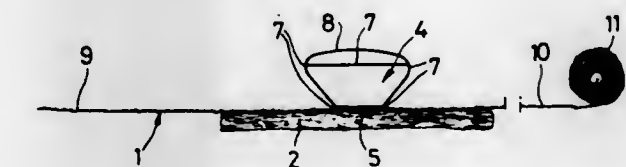
COMPRESSION BANDAGE

Asmund Sigurd Laerdal, Stavanger, Norway
Filed Apr. 2, 1976, Ser. No. 673,094
Claims priority, application Germany, Apr. 11, 1975, 2515786

Int. Cl.² A61F 13/00

U.S. Cl. 128—155

12 Claims



1. A compression bandage comprising a bandage strip having first and second sides, a pressure piece consisting of a molding of slightly deformable and slightly absorbent material firmly attached to said first side, and an absorbent layer fixed

on said second side of said bandage strip in the region of said pressure piece whereby when the bandage is applied and the strip wound around the injured part, the pressure pad exerts pressure through the strip and absorbent layer onto the wound.

4,005,710

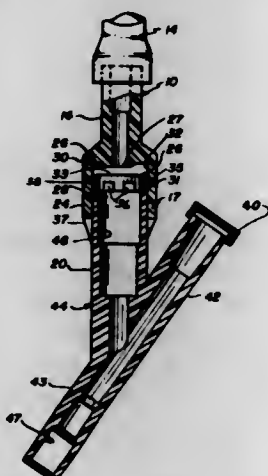
PARENTERAL APPARATUS WITH ONE-WAY VALVE
Armand Al Zeddie, Richmond, Va., and Andrew John Muetterth, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 12, 1975, Ser. No. 549,408

Int. Cl.² A61M 5/14

U.S. Cl. 128-214 R

11 Claims



1. A one-way valve for use in an apparatus for administering a parenteral solution to a patient comprising a valve body defining opposing end walls and a lateral wall surface with an intake orifice and an outlet orifice in said end walls, a freely movable, flexible valve member having a substantially thin body section with a width of a given dimension positioned between said end walls and spaced from said lateral wall surface, said valve member presenting a substantially solid surface portion facing said intake orifice, a plurality of substantially, uniformly spaced projections extending from said body section in one direction from one side of said valve member and inwardly over said body section within the extended confines of said body section to define a plurality of uniformly spaced openings between said projections in the valve member facing the outlet orifice, said projections having approximately the same height as said given width dimension for said body section and another projection extending from said body section from the other side thereof in a direction opposite to said plurality of projections and positioned substantially centrally with respect to said body section, said valve member constructed and arranged to be freely positioned in said valve body without substantial contact with said lateral wall surface of said valve body.

4,005,711

INHALATION DEVICE

Albert Glenn, San Francisco, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.

Filed Jan. 13, 1975, Ser. No. 540,918

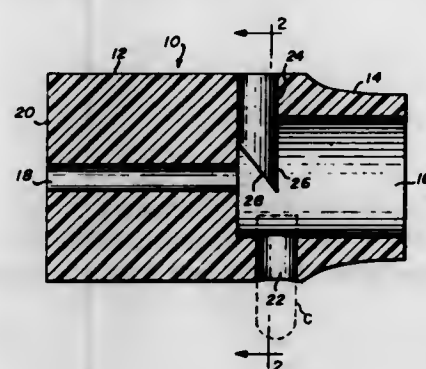
Int. Cl.² A61M 13/00

U.S. Cl. 128-266

18 Claims

1. A breath-actuated inhalation device for dispensing a medicament from a medicament-holding container comprising a housing having a passageway for the movement of air therethrough, one end of said housing being an output end adapted for insertion into the mouth or nasal passages of a user thereof; said passageway terminating in an emptying chamber adjacent the output end of said housing, the cross-sectional area of said passageway being less than the cross-sectional area of said emptying chamber; aperture means extending through a side wall of said housing and opening into said

emptying chamber for receiving a medicament-holding container; and means extending into said emptying chamber adjacent the interface thereof with said passageway and transversely thereto a distance into the projected air flow path of the air stream exiting from said passageway for deflecting only



a portion of the air being drawn through said passageway during inhalation into said aperture means whereby, during inhalation, only a portion of the air drawn through said passageway is deflected by said deflecting means into a medicament-holding container held within said aperture means to cause medicament held therein to be dispensed therefrom.

4,005,712

DISPOSABLE DIAPER WITH ADJUSTABLE TAPE FASTENER

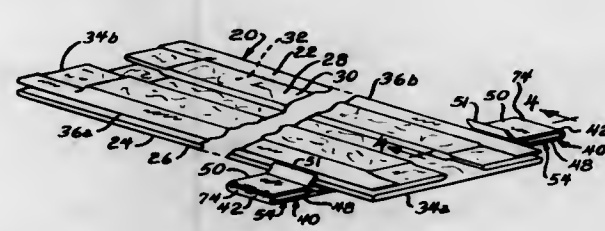
Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,438

Int. Cl.² A61F 13/16

U.S. Cl. 128-284

11 Claims



9. A disposable diaper comprising:
an absorbent pad assembly having opposed surfaces, and a side edge; and
a tape fastener comprising,
an elongated pressure-sensitive tape strip having an adhesive surface, a first end portion secured to one of said surfaces of the pad assembly adjacent said side edge, and a second attachment end portion extending past said side edge, and
an adjustment member comprising an elongated sheet having a first section fixedly attached to said diaper, and a second section releasably attached to an adhesive area on said second strip portion, with said second sheet section being spaced from an end of said second strip portion to expose a region of adhesive for use in securing the diaper about an infant, and with said second sheet section being peelable from said strip to selectively enlarge said region of adhesive.

4,005,713

DISPOSABLE DIAPER HAVING TAB FASTENERS PROVIDED WITH A PULL STRING AND ATTACHED TO RELEASE SURFACES ON DIAPER FACING

Frederick K. Mesek, Downers Grove, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 8, 1975, Ser. No. 539,487

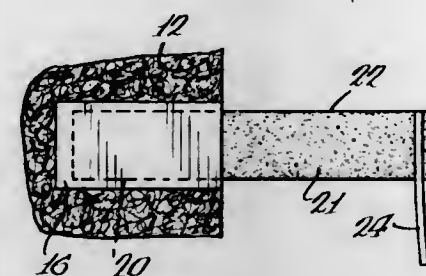
Int. Cl.² A61F 13/16

U.S. Cl. 128-287

6 Claims

1. A disposable diaper which comprises a moisture-

impermeable backing sheet forming a diaper outside surface for direction away from an infant when the diaper is worn by that infant, a moisture-retaining layer adhered to the backing sheet and having a fibrous facing which forms a diaper inside surface for direction toward the infant, a release region directly on said fibrous facing and situated on and extending



inwardly from longitudinal margin of the diaper, tab fastener means having a fixed end secured to said diaper backing sheet and a free working end removably attached to said release region, and pull string means attached to said free working end for separating said free working end from the underlying release region.

4,005,714

BIPOLAR COAGULATION FORCEPS

Siegfried Hiltbrandt, Kuttlingen, Germany, assignor to Richard Wolf GmbH, Kuttlingen, Germany

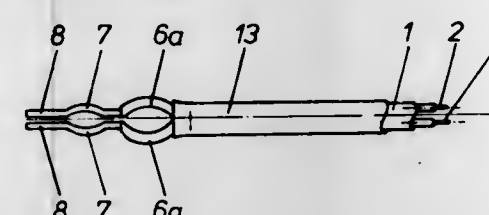
Filed July 30, 1975, Ser. No. 600,462

Claims priority, application Germany, May 3, 1975, 2519827

Int. Cl.² A61N 3/04; A61B 17/28

U.S. Cl. 128-303.17

8 Claims



1. Bipolar frequency coagulation forceps for the coagulation of the Fallopian tubes, said forceps including two insulated current conductors affording a pair of resiliently spreading forceps arms which are closed by relative longitudinal shifting of an actuating sleeve accomplished with the aid of a handle, portions of the forceps arms located proximally to free ends of the conductors being insulated and each having a first curvature for closing the forceps by means of said sleeve, and having insulation-free second curvatures of less diameter than said first curvature located between said first curvature and said free end for clamping a Fallopian tube, and the free ends of the conductors being straight and insulation-free, adapted during the closing of the forceps to be placed approximately parallel to one another on opposite sides of the adjacent mesosalpinx.

4,005,715

MATERNITY SUPPORTER

Robert G. Moore, 635 Spar Drive, Redwood City, Calif. 94065

Filed Jan. 19, 1976, Ser. No. 650,198

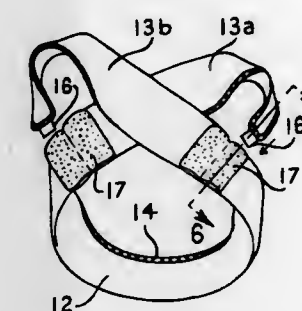
Int. Cl.² A41C 1/08

U.S. Cl. 128-579 R

7 Claims

1. A maternity supporter comprising a strip of elastic material formed to fit around and provide support for the lower half of the abdomen, the strip having elastic harness straps at either end, said straps being of sufficient length such that when the strip is placed in supporting position around the lower portion of the abdomen, the straps can be drawn behind the wearer's back, crossed over one another, and stretched

over the shoulders and toward the sides of the body; and fastening means located on the harness straps so that when the



straps are stretched over the shoulders, each strap can be fastened to the opposite strap, whereby comfortable support and uplift is provided for the abdomen.

4,005,716

HAND DEVICE FOR MAKING CIGARETTES

Rudolf Messner, and Walter Weissner, both of Trossingen, Germany, assignors to Martin Brinkmann AG, Bremen, Germany

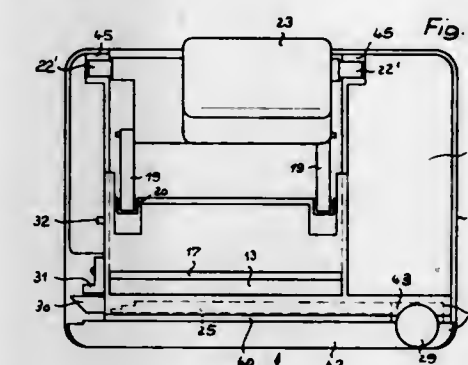
Filed Feb. 9, 1972, Ser. No. 224,741

Claims priority, application Germany, Aug. 5, 1971, 2139242

Int. Cl.² A24C 05/42

U.S. Cl. 131-70

4 Claims



1. A device for manually filling cigarette tubes with a plug of tobacco comprising a housing having upper and lower portions, said housing defining a chamber for receiving loose tobacco; a press bar movably mounted in said housing for movement horizontally at a right angle to the longitudinal axis of the chamber between a first position to the rear of said chamber and a second position compressing the tobacco to form a plug; a toggle lever system for actuating said press bar including a pair of parallel spaced first levers each pivotally connected at one end opposite longitudinal ends of said press bar adjacent the bottom of the lower housing portion, and a second lever arranged between said first levers and pivotally connected to the other end of the first levers and to the bottom of said lower housing portion at a distance from said press bar to permit said press bar to move between said first and second position said second lever defining a handle projecting out of said housing and positioning the connection between the first and second levers for manual actuation, substantially at a right angle to the direction of movement of said press bar; said lower housing portion including bearing boxes for pivotally supporting said handle, said upper housing portion including an interior projection for retaining said handle in said bearing boxes, a slide for ejecting the tobacco plug including a spoon in said chamber and a tube mounted in one side of said housing at the discharge end of said chamber for holding a tube to be filled with a plug of tobacco.

4,005,717

TOBACCO STREAM MANUFACTURE

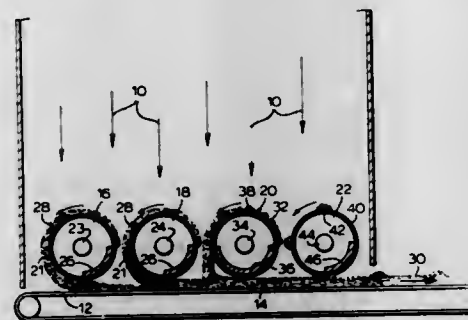
Warren A. Brackmann, Cookeville, and Daniel DiIanni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Continuation of Ser. No. 384,914, Aug. 2, 1973, abandoned, which is a continuation of Ser. No. 176,109, Aug. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 128,412, March 26, 1971, abandoned. This application Dec. 22, 1975, Ser. No. 643,100

Int. Cl.² A24C 5/18

U.S. Cl. 131-84 R

2 Claims



1. A process for forming a narrow tobacco filler rod having longitudinally spaced-apart zones of increased quantity of tobacco in the cross section of the filler rod to provide dense ends in cigarettes ultimately formed from the filler rod, which comprises:

showing a relatively wide broad stream of tobacco particles of narrow thickness substantially in a plane onto a plurality of continuously moving arcuate suction surfaces located in said plane across the width of said broad stream,

continuously moving each of said continuously moving surfaces in said plane between a first position in which said surfaces move transverse to said broad stream and contact and intercept particles of said broad stream and a second position in which said surfaces are out of contact with particles of said broad stream;

applying suction through each of said surfaces while located in said first position to attract tobacco particles from said broad stream onto said surfaces and grip said attracted particles thereto whereby said attracted particles assume the speed of said moving surfaces to form directly from said broad stream one tobacco substream constituted by discrete discontinuous clusters of tobacco particles and a plurality of narrow elongate tobacco substreams containing substantially the same quantity of tobacco and extending the length of the portion of each of said continuously moving surfaces located in said first position;

transporting the tobacco particles in each of said substreams on said continuously moving surfaces under the influence of suction grip by said continuous movement of said surfaces to said second position;

moving a tobacco stream-receiving and filler rod-forming surface transversely to and within the plane of said broad stream adjacent said continuously moving surfaces in their second position;

releasing said suction grip on the particles of each of said plurality of substreams from the respective continuously moving surface when said respective continuously moving surface is in said second position, said particles of said plurality of substreams are moving in substantially the same direction as and adjacent to said receiving surface, and said particles of said plurality of substreams are moving at substantially the same speed as said receiving surface;

depositing said particles of said plurality of substreams immediately after said release from said moving surfaces onto said receiving surface or onto tobacco already deposited thereon while maintaining said deposited tobacco particles in substantially the same positions with respect to one another as existed in the transported plurality of

substreams whereby each of the transported substreams is released from the respective continuously moving surface and is coherently positioned on the receiving surface or on tobacco already positioned thereon to provide a filler stream constituted substantially by superimposed coherent layers of tobacco in which each layer corresponds to one of said plurality of substreams;

successively releasing said suction grip on ones of said discrete cluster substreams at predetermined intervals of time;

depositing said released discrete cluster substream immediately after said release thereof substantially in coherent form onto said receiving surface or onto tobacco already deposited thereon from said plurality of continuous substreams immediately after release from the respective continuously moving surface to provide predeterminedly longitudinally spaced apart zones of increased quantity of tobacco in the cross section of the filler rod; and removing a tobacco filler rod from said receiving surface.

4,005,718

SMOKING MATERIALS

Ronald Ernest Prouse, Uplminster; Anthony Alfred West, Basildon; Derek Anthony King, Ferrers, and Roger Poulson, Billericay, all of England, assignors to Carreras Rothmans Limited, England

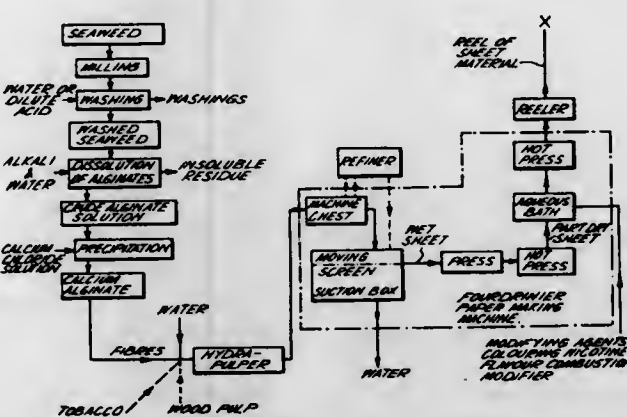
Division of Ser. No. 385,694, Aug. 6, 1973, Pat. No. 3,951,155, which is a continuation-in-part of Ser. No. 159,741, July 6, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,327

Claims priority, application United Kingdom, July 11, 1970, 33784/70; May 20, 1971, 16129/71

Int. Cl.² A24B 3/14

U.S. Cl. 131-140 C

27 Claims



1. A method of manufacturing a smokeable material comprising a base material together with additional material which provides both a minor proportion of flavor-modifying agent and a combustion modifier, the additional material being incorporated so as to communicate selected flavor to and to allow the burning of the smokeable material suitable for use in place of smoking tobacco, in which the base material is calcium-alginate fibers, which method includes the steps of forming sheet-material from a stock by steps including the steps of mechanically working calcium-alginate fibres in the presence of water so as to disperse those fibres and to hydrate them and to provide the stock, and presenting the stock to a web-forming unit of a papermaking machine, the said additional material being incorporated into the smokeable material either prior to and/or subsequent to the said presentation of the stock to the web-forming unit.

4,005,719

METHOD OF SPREADING OUT TOBACCO LEAVES AND A DEVICE FOR SPREADING OUT TOBACCO LEAVES BY MEANS OF THIS METHOD

Ian Kjaer, Allerød, Denmark, assignor to A/S A. M. Hirschsprung & Søner, Virum, Denmark

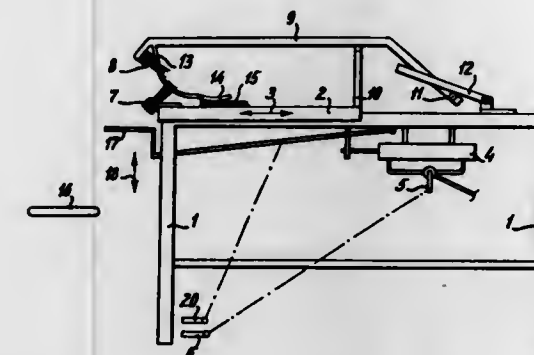
Filed Nov. 10, 1971, Ser. No. 197,246

Claims priority, application Denmark, Nov. 10, 1970, 5705/70

Int. Cl.² A24B 5/14

U.S. Cl. 131-148

5 Claims



1. A device for spreading out tobacco leaves comprising a means for receiving leaves, a frame having means defining a path of advance of a leaf in a direction transverse to its stalk and point ends from the receiving means, a pair of smoothing implements movable relative to each other extending transversely of said path and arranged above and below the path in such positions as to exert a braking action on the tobacco leaf moved along said path, a platform on which said pair of smoothing implements are mounted and an operator's seat at one end of said frame, said platform being guided for reciprocating movement in said frame parallel to said path towards and away from the operator's seat.

4,005,720

SPRAY NOZZLE

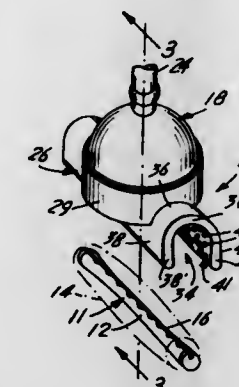
Charles Machata, 3 Shore Road, Rye, N.Y. 10580

Filed Aug. 4, 1975, Ser. No. 601,624

Int. Cl.² A45D 1/00

U.S. Cl. 132-9

8 Claims



1. A spray nozzle for directing a spray of liquid at substantially the entire body of an elongated object, comprising: a substantially rigid housing which includes a chamber for receiving liquid under pressure from a source, and an elongated channel formed by an integral top wall, and, merging therewith, two substantially vertically depending side walls, the side walls having bottom edges spaced from each other such that the channel width from side wall bottom edge to side wall bottom edge is greater than the transaxial width or longest diameter of the elongated object, the top and side walls being structured to encompass substantially the entire body of the elongated object and having perfora-

4,005,721

DENTAL FLOSS HOLDER

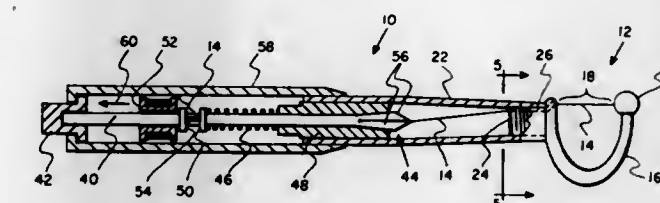
Michio Yasumoto, 3909 NE. 135th St., Portland, Oreg. 97230

Filed Mar. 17, 1975, Ser. No. 558,804

Int. Cl.² A61C 15/00

U.S. Cl. 132-91

13 Claims



1. A dental floss holder comprising, in combination: a. an elongate, partially hollow body adapted to hold a supply of dental floss interior thereto; b. bifurcated tip means attached to a front end of said body for holding a tightly stretched length of said dental floss across a gap between two portions thereof; c. an elongate shaft disposed interior to said body longitudinally relative thereto; d. releasable clasp means disposed interior to said body and attached to the front end of said shaft for fixedly grasping a portion of dental floss; and e. an end piece removably attached to the rear end of said body and to said shaft, said end piece including actuation means for causing said clasp means to release its grasp by transmitting motion through said shaft.

4,005,722

TOOL FOR FLOSSING TEETH UNDER A PERMANENT BRIDGE

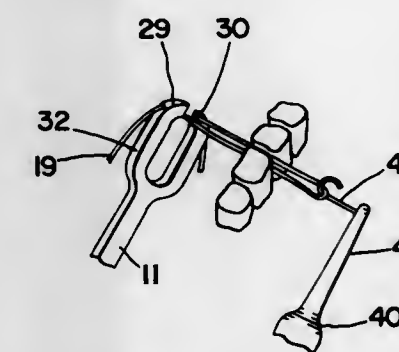
Kenneth R. Bragg, 635 Pasco De La Playd, Redondo Beach, Calif. 90274

Filed Apr. 8, 1976, Ser. No. 674,894

Int. Cl.² A61C 15/00

U.S. Cl. 132-92 R

18 Claims



1. A flossing tool comprising in combination a first member providing first and second spaced tips, means on the tips for supporting a strand of floss therebetween, a second member having a third tip with a wire extending therefrom, said wire having a hook, said wire being insertable between two adjacent teeth of a person whereby when the tips of the first member are placed on one side of said two teeth the wire may be inserted between said teeth from the other side thereof so as to hook the floss between the pair of tips so that upon withdrawal of the wire from between said teeth the floss is pulled between

said teeth where it may be manipulated by the two members for cleaning the adjacent surfaces of said teeth.

4,005,723

POOL CLEANING DEVICE

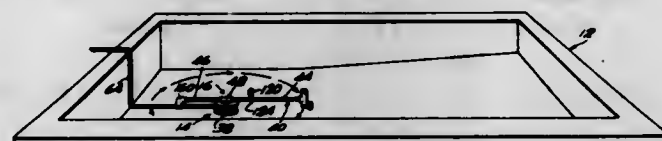
Jeffrey P. Rosenberg, 1270 Stillwater Drive, Miami Beach, Fla. 33141

Filed Aug. 4, 1975, Ser. No. 601,449

Int. Cl.² B08B 9/00, 3/02

U.S. Cl. 134-167 R

10 Claims



1. For cleaning a pool having an associated circulating pump means, a device comprising:

a housing having an upper end, a lower end and axially extending side walls and defining an interior chamber with a plurality of circumferentially spaced radially outwardly facing inlet ports in the wall and an outlet opening, means to connect the outlet to the circulating pump, a radially extending tubular arm and means rotatably connecting the arm to the housing for rotation with respect to the housing and said arm having an interior through passageway and said arm having an opening in fluid communication with a passageway through said means to connect, and means on said device for connecting a hose to flow water through said means to connect and said passageway,

a water jet assembly supported distally on the tubular arm radially spaced outwardly from the housing and defining an interior passageway with a radially inwardly facing opening to direct water flowing through the means to connect and column toward the housing and said inlet ports, and means to turn the arm.

4,005,724

TILT RESPONSIVE VALVE

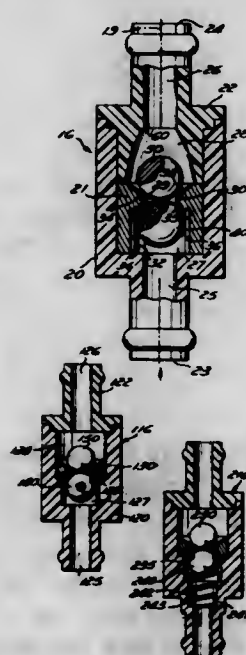
Louis B. Courtot, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Apr. 4, 1975, Ser. No. 564,876

Int. Cl.² F16K 17/36

U.S. Cl. 137-38

10 Claims



1. A tilt responsive shut-off valve comprising a valve body having an inlet passage and an outlet passage and a shut-off

passage connected between said inlet and outlet passages, said shut-off passage cooperating with tilt responsive valve means constructed and arranged to block communication between said inlet passage and said outlet passage when said valve body is tilted beyond a predetermined angle in any direction about an axis from a normal vertical position, said tilt responsive valve means including a valve seat disposed between a biased shuttle closure member and a counterbiasing member, said biased shuttle closure member being biased toward a closed position against said valve seat to close communication between said inlet passage and said outlet passage, said counterbiasing member being in engagement with said biased shuttle closure member when said valve body is tilted less than said predetermined angle from said normal position holding said biased shuttle closure member away from said valve seat for normally open communication between said inlet passage and said outlet passage, said valve body including an inlet cavity communicating with said inlet passage and an outlet cavity communicating with said outlet passage, said cavities being generally coaxial with a line defined by the direction of fluid flow through said valve body, communication between said cavities being blocked by said tilt responsive valve means when said valve body is tilted beyond said predetermined angle from said normal position, said valve means permitting communication between said cavities when said valve body is in said normal position, said counterbiasing member being a ball moveable within said outlet cavity when said valve body is tilted beyond said predetermined angle from said normal position, said outlet cavity being of generally circular cross section with a diameter larger than the diameter of said counterbiasing ball, said biased shuttle closure member being a sealing ball moveable within said inlet cavity when said valve body is tilted beyond said predetermined angle from said normal position, said inlet cavity being a cylindrical bore having a fluted wall with a minimum diameter at least as large as said sealing ball, said counterbiasing ball and said sealing ball being in contact with each other and coaxial with said line defined by the direction of fluid flow through said valve body, when said valve body is tilted less than said predetermined angle from said normal position.

4,005,725

AUTOMATIC CLOSURE VALVE FOR WATER SPRINKLER

Fusamatsu Sato, Tokyo, Japan, assignor to Fujiki Denki Kabushiki Kaisha, Tokyo, Japan

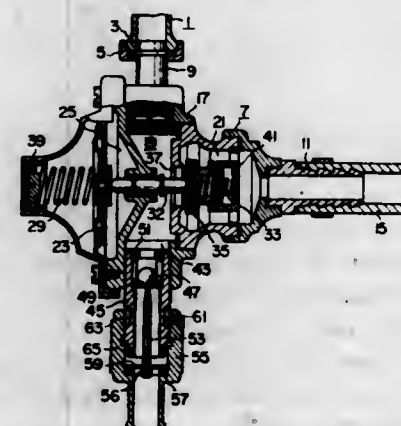
Filed Jan. 6, 1976, Ser. No. 646,768

Claims priority, application Japan, Nov. 13, 1975, 50-154632

Int. Cl.² F16K 45/00

U.S. Cl. 137-112

2 Claims



1. An automatic closure valve for water sprinkler which comprises in combination; a valve casing having inlet and outlet for water supply from a water tap; a connecting means for connecting the water tap with the inlet of said valve casing; another connecting means provided at the outlet of said valve casing; a first valve chamber defined in said valve casing at the

inlet side thereof; a second valve chamber defined in said valve casing at the outlet side thereof; a passage defined between said first and second valve chambers and for communicating said both valve chambers; means for closing said communicating passage in response to increase in water pressure in said second valve chamber; an opening or port provided in said valve casing to communicate said valve chamber at the inlet side with the external atmosphere; a communicating tube fitted at said opening; a ball valve provided in said communicating tube and which usually closes said opening under water pressure, and opens said opening when the pressure within said valve chamber becomes negative; an outlet tube fitted to said communicating tube in a manner movable back and forth; and a pushing rod to manually open said ball valve.

4,005,726

THERMOMAGNETIC VALVE

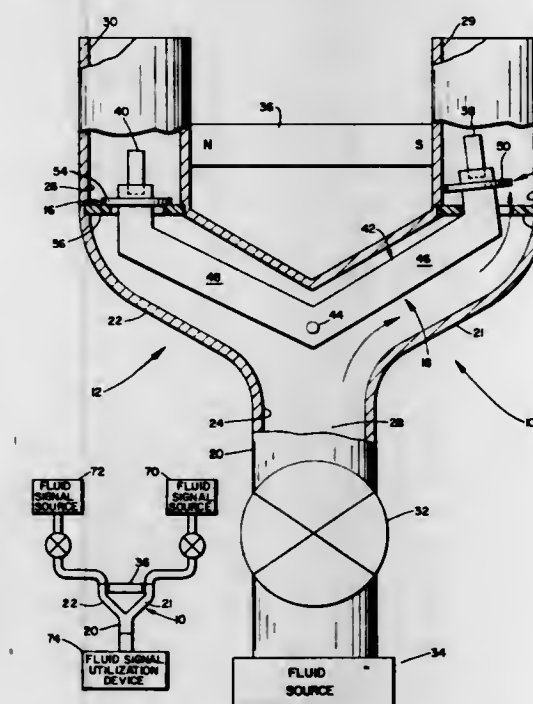
Herbert H. Fowler, Box 11431, Lexington, Ky. 40511

Filed June 24, 1975, Ser. No. 589,842

Int. Cl.² G05D 11/00

U.S. Cl. 137-119

5 Claims



5. In a fluid flow valve unit having a fluid inlet port and a fluid outlet port, passage means providing fluid communication between said inlet and outlet ports, a valve seat disposed in said passage means between said inlet and outlet ports, a valve actuator mounted for displacement between first and second operating positions, valve closure means secured to said actuator to seat on said seat and block flow of fluid through said passage means when said actuator is displaced to its first operating position and to move away from said seat to allow flow of fluid through said passage means when said actuator is displaced to its second operating position, a magnet, magnetic means disposed in said passage means to be subject to the temperature of fluid in said passage means and having a pre-selected Curie temperature which is less than the temperature of the fluid supplied to said inlet port, said magnetic means being disposed in the magnetic field developed by said magnet to be attracted thereto when its temperature is below its Curie temperature, and said magnetic means being secured to said actuator to displace said actuator to said second operating position upon being attracted by said magnet, and means effective to cause displacement of said actuator to its first position when said magnetic means is heated by the fluid to a temperature above its Curie temperature.

4,005,727

ABRASIVE CONTROL VALVE

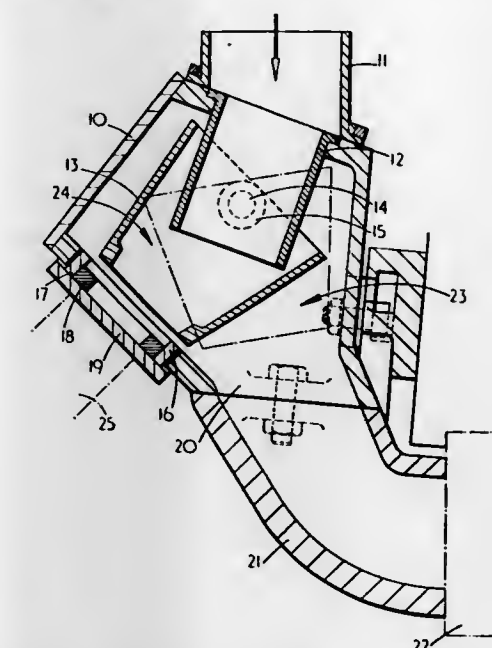
Alban Williams, Sale, England, assignor to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Jan. 30, 1976, Ser. No. 653,646

Int. Cl.² F16K 3/00

U.S. Cl. 137-269

6 Claims



1. A valve for use in controlling the flow of magnetizable abrasive from a supply to a throwing wheel via a delivery tube, the control valve comprising a casing, with inlet and outlet apertures, disposed intermediate the ends of the delivery tube, a tubular valve member pivotal about a horizontal axis in order to open or close the control valve, abrasive directing means from the inlet aperture into one end of the valve member and a magnet disposed in the casing adjacent the other end of the valve member when the valve member is in the closed position.

4,005,728

FAUCET VALVE

Ralph E. Thorp, Lafayette, Ind., assignor to Globe Valve Corporation, Delphi, Ind.

Filed Aug. 29, 1975, Ser. No. 608,523

Int. Cl.² F16K 3/10, 25/00

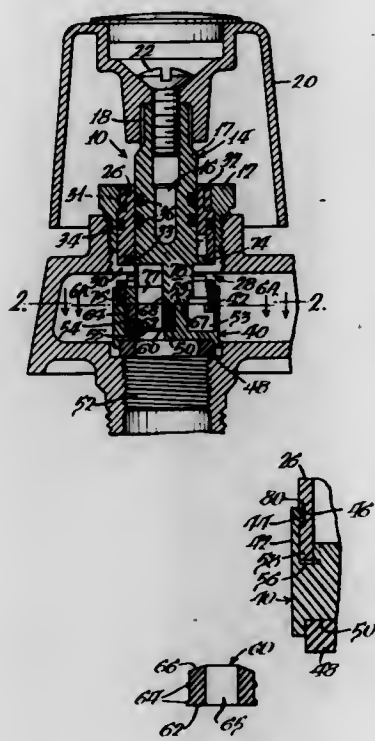
U.S. Cl. 137-270

14 Claims

14. A faucet valve to control the volume flow of fluid, comprising:

a housing having a cylindrical hollow chamber therein and having an outlet port,
a cap member concentric with and removably attached to said housing and defining a passage offset from the axis of said chamber,
a stem member rotatably disposed within said housing and having an inlet passage offset from the axis of rotation of said stem member and a discharge passage communicating with said inlet passage and with said outlet port, said stem member upon rotation thereof having its inlet passage moved between a closed position out of registry with said passage in said cap member and an open position in registry with said passage in said cap member to vary the rate of flow of fluid through the faucet, said stem member having a flat bottom surface,
a resilient grommet seal disposed in said passage in said cap member and defining a passage, and
sealing means between said stem member and said housing, the diameter of said passage through said cap member being greater than the diameter of said passage through said grommet, said grommet being continuously urged against and in sliding sealing engagement with said bottom sur-

face of said stem member, and said grommet having a bottom surface against which hydraulic pressure of said



liquid acts to urge said grommet into a floating seal with said cap member and said stem member.

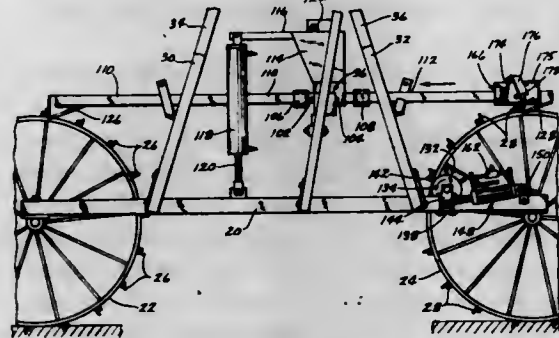
4,005,729 BRAKE MEANS FOR AN AIR-POWERED SPRINKLER SYSTEM

Loren R. Townsend, Sidney, Nebr. 69162
Continuation-in-part of Ser. No. 540,114, Jan. 10, 1975, Pat. No. 3,952,768. This application Feb. 11, 1976, Ser. No. 657,283

Int. Cl.² B05B 3/12

U.S. Cl. 137-344

4 Claims



1. A self-propelled sprinkling apparatus comprising, a water supply pipe moveable about a central pivot point, a plurality of spaced-apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled, a fluid-operated drive means on each of said towers to propel said towers and said supply pipe about said central pivot point,

means for supplying fluid under pressure to said drive means, control means on said towers for controlling the operation of said drive means so that said towers will be selectively driven to maintain said supply pipe in an aligned condition as said pipe is moved about said central pivot point, each of said drive towers comprising at least a pair of wheels, at least one of said wheels having spaced-apart drive lugs provided thereon, a brake member rotatably mounted on at least one of said towers adjacent the said one wheel, said brake member having means thereon which is in operative engagement with said drive lugs so that said brake member will be rotated by said drive lugs on said one wheel when said one wheel is rotating, a fluid cylinder mounted on said one tower and having a cylinder rod extending therefrom which is operatively connected to said brake member so that rotation of said brake member causes said cylinder rod to extend and retract relative to said fluid cylinder, said fluid cylinder normally preventing the rotation of said brake member thereby preventing the rotation of said one wheel, and brake release means operatively connected to said fluid cylinder to permit said cylinder rod to freely extend and retract when said drive means is driving said one wheel at a predetermined rate of rotation.

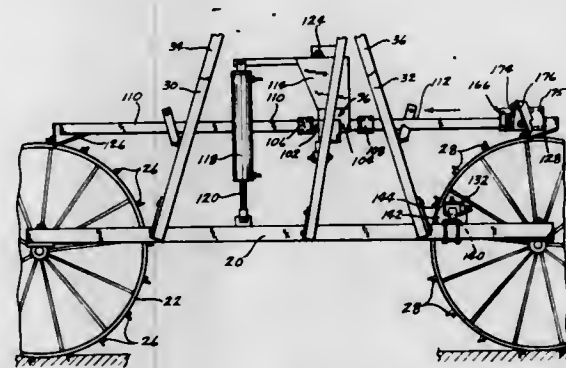
4,005,730 BRAKE MEANS FOR AN AIR-POWERED SPRINKLER SYSTEM

Loren R. Townsend, Sidney, Nebr. 69162
Continuation-in-part of Ser. No. 540,114, Jan. 10, 1975, Pat. No. 3,952,768. This application Feb. 11, 1976, Ser. No. 657,284

Int. Cl.² B05B 3/12

U.S. Cl. 137-344

4 Claims



1. A self-propelled sprinkling apparatus comprising, a water supply pipe moveable about a central pivot point, a plurality of spaced-apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled, a fluid operated drive means on each of said towers to propel said towers and said supply pipe about said central pivot point, means for supplying fluid under pressure to said drive means, control means on said towers for controlling the operation of said drive means so that said towers will be selectively driven to maintain said supply pipe in an aligned condition as said pipe is moved about said central pivot point, each of said drive towers comprising at least a pair of wheels, at least one of said wheels having spaced-apart drive lugs provided thereon, a brake member rotatably mounted on at least one of said towers adjacent the said one wheel, said brake member having a plurality of fingers extending therefrom for engagement with said drive lugs so that said brake member will be rotated by said drive lugs on said one wheel when said one wheel is rotating,

a fluid pump mounted on said one tower and having a shaft rotatably extending therefrom which is operatively connected to said brake member so that rotation of said brake member causes said shaft to rotate, said fluid pump normally preventing the rotation of said brake member thereby preventing the rotation of said one wheel, and brake release means operatively connected to said fluid pump to permit said shaft to freely rotate when said one wheel is being driven at a predetermined rate of rotation.

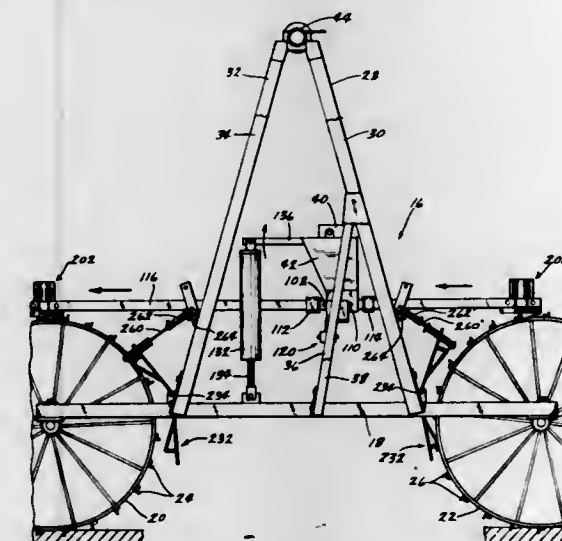
4,005,731 REVERSIBLE SELF-PROPELLED CENTER PIVOT SPRINKLER SYSTEM

Loren R. Townsend, Sidney, Nebr. 69162
Filed Mar. 5, 1976, Ser. No. 664,184

Int. Cl.² B05B 3/12

U.S. Cl. 137-344

7 Claims



1. A reversible self-propelled center pivot sprinkler system, comprising, a water supply pipe moveable about a center pivot point, a plurality of spaced-apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled, a drive means on each of said towers to propel said towers to move said towers and supply pipe about said center pivot point, each of said towers comprising a frame means having a pair of spaced-apart drive wheels rotatably mounted thereon, a trojan bar means reciprocally mounted on said frame means and movable between first and second positions, at least one double dog means on said trojan bar means for engagement with at least one of said drive wheels for selectively driving said wheel forwardly at times and for selectively driving said wheel rearwardly at other times, a power means mounted on said frame means and being operatively connected to said trojan bar means to reciprocate said trojan bar means, and a control means for controlling the operation of said power means so that the associated tower is propelled at the desired rate relative to the other towers in the system, at least one double ratchet arm brake means movably mounted on said frame means for selective engagement with one of said drive wheels for preventing the tower from rolling rearwardly when said trojan bar means is driving said tower forwardly and for preventing the tower from rolling forwardly when said trojan bar means is driving said tower rearwardly, said brake means comprising an elongated member pivotally mounted on said tower and having oppositely disposed ratchets at the opposite ends thereof, and means connected to said elongated member for selectively pivoting said elongated member to move one of said ratchets into engagement with said one wheel while moving the other ratchet out of engagement with said one wheel.

7. A reversible self-propelled center pivot sprinkler system, comprising, a water supply pipe moveable about a center pivot point, a plurality of spaced-apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled, a drive means on each of said towers to propel said towers to move said towers and supply pipe about said center pivot point, each of said towers comprising a frame means having a pair of spaced-apart drive wheels rotatably mounted thereon, a trojan bar means reciprocally mounted on said frame means and movable between first and second positions, at least one double dog means on said trojan bar means for engagement with at least one of said drive wheels for selectively driving said wheel forwardly at times and for selectively driving said wheel rearwardly at other times, a power means mounted on said frame means and being operatively connected to said trojan bar means to reciprocate said trojan bar means, and a control means for controlling the operation of said power means so that the associated tower is propelled at the desired rate relative to the other towers in the system, said double dog means comprising first and second dogs movably mounted on said trojan bar means, said first and second dogs being movable between driving and non-driving positions, and a power cylinder means operatively connected to said double dog means for moving said first and second dogs between said driving and non-driving positions.

4,005,732 FLAPPER VALVE WITH INDEPENDENT SPRING ACTION

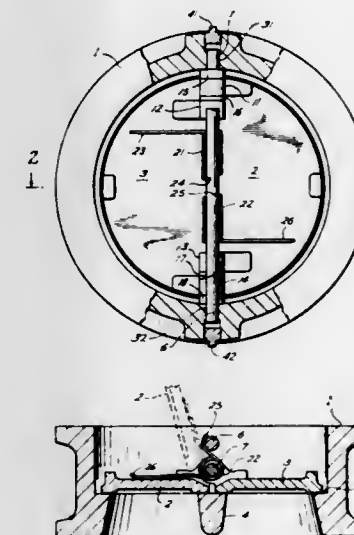
Spencer P. Buckner, Houston, Tex., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 25, 1975, Ser. No. 607,339

Int. Cl.² F16K 15/03

U.S. Cl. 137-512.1

6 Claims



1. An improved valve of the type having a body with a fluid flow conduit therethrough, a valve seat surrounding said flow conduit, valve members for sealing said fluid flow conduit, stationary shaft means extending diametrically across said flow conduit for pivotally supporting said valve members within said body, and hinges for supporting said valve members on said shaft means, wherein the improvement comprises at least one separate helical torsion spring encircling a portion of said shaft means for each valve member for biasing said valve member toward its closed position, one leg of which is in contact with said valve member and the other leg of which is in contact with a stationary stop means.

4,005,733

PRESSURE CONTROL VALVE

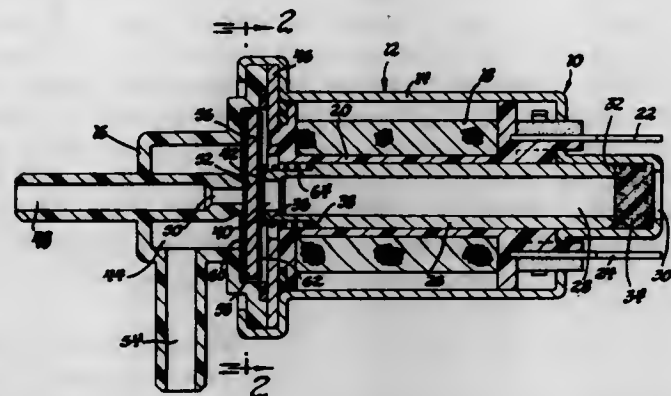
John W. Riddell, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1975, Ser. No. 632,399

Int. Cl.² F16K 31/06

U.S. Cl. 137-625.4

3 Claims



1. A control valve assembly especially for controlling low gaseous fluid pressure differential flows and pressures with a valve opening and closing in a variable duty cycle at variable frequencies, said assembly comprising:

a housing having a generally circular valve chamber therein and first and second differential gaseous fluid pressure inputs oppositely disposed therein and defining first and second valve seats in aligned spaced relation, one of said inputs extending into said valve chamber and forming therewith an annular chamber section and a gaseous fluid pressure output communicating with said annular chamber section;

a solenoid assembly including a core and a coil and an annular field plate secured to said housing, said field plate extending into said chamber and surrounding said first input;

and a valve including a valve element received in said chamber between said valve seats and movable to engage and close either one of said inputs while opening the other to said chamber, said valve including said valve seats and said solenoid core with said first input being formed by a core end, said valve element being of sandwich construction, generally rectangular so as to engage and close said inputs while providing no obstruction to fluid flow between the open one of said inputs and said output through said annular chamber section, and having a major center section of magnetically attractive low remanence material and at least one thin outer section of nonmagnetic material having high resistance to wear and engageable with one of said inputs;

said solenoid assembly when energized magnetically attracting said valve element to close said first input and open said second input and when deenergized permitting said valve element to open said first input and close said second input.

4,005,734

HYDRAULIC DIRECTIONAL MEMORY UNIT

Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich. 48010

Filed Aug. 18, 1975, Ser. No. 605,715

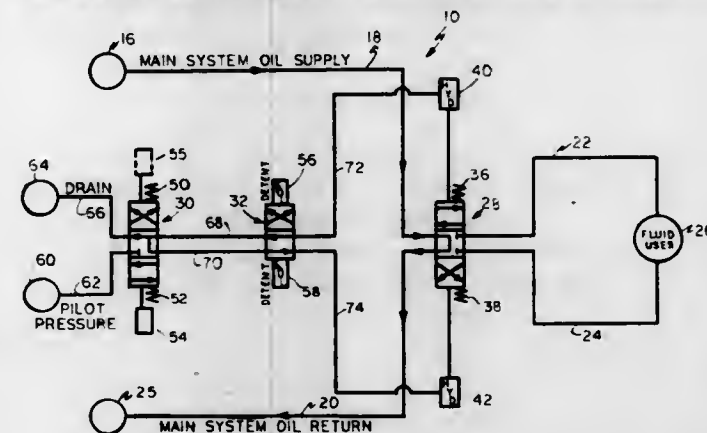
Int. Cl.² F15B 21/08

U.S. Cl. 137-625.63

1 Claim

1. A directional control valve for selectively communicating a fluid source to a fluid user, said directional control valve comprising first valve means shiftable from a first position communicating said fluid source to said fluid user to a second position wherein said fluid source and fluid user are not in fluid communication, said first valve means having pressure responsive means operable upon being communicated to a

second source of fluid pressure for communicating said fluid source to said fluid user and being operable to terminate said communication when said pressure responsive means is not in communication with said second source of fluid pressure; and second and third pilot valve means operable upon actuation to communicate said pressure responsive means to said second source of fluid pressure, first power operated means for actuating said second pilot valve means; sec-



ond power operated means for actuating said third pilot valve means; one of said pilot valve means being positioned to terminate said communication with said second source of fluid pressure when the power operated means associated therewith is de-energized; the other of said pilot valve means being positioned between two operable positions upon actuation and remaining in one of said positions when its associated power operated means is de-energized.

4,005,735

ADAPTER WITH THREAD PROTECTOR

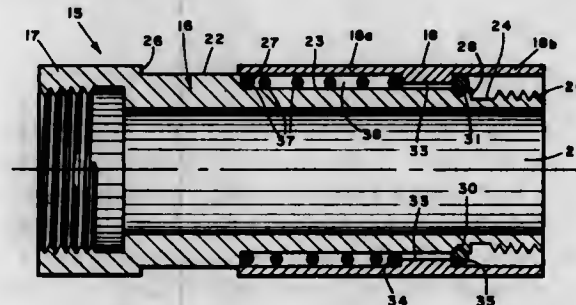
Eddie Kakuo Miyamoto, 1815 S. Bascom Ave., Campbell, Calif. 95008

Filed Dec. 1, 1975, Ser. No. 636,846

Int. Cl.² B65D 59/04; F16L 57/00

U.S. Cl. 138-96 R

2 Claims



1. A coupling device for connecting the internally threaded end of a nozzle to a hose, comprising a tubular body connectable at one end to the hose and having a smooth cylindrical bore with a diameter about equal to the hose bore diameter extending substantially the full length of the body, said body having external threads at the other end for connection to said nozzle, a sleeve mounted on said body for limited relative axial movement between a first position with one end thereof radially spaced from and fully covering said external threads and a second position fully exposing said threads, said body having first and second axially adjacent external cylindrical portions extending from said external threads for substantially the remainder of the length of the body, said first portion having a diameter approximately the same as the inside diameter of said sleeve and greater than the diameter of said second portion, said first and second portions being joined by radial shoulder means, said sleeve having a radially inwardly projecting ridge defined by axially spaced shoulders and having cylindrical

inner surfaces with the same diameter extending from opposite ends of the sleeve to opposite sides of said ridge, said body having an annular groove adjacent to the inner end of said external threads, a snap ring mounted in said groove and projecting radially outwardly therefrom for engagement with one of said shoulders when said sleeve is in said first position, and a helical compression spring coaxially disposed about said second body portion within said sleeve and having opposite ends abutting the other of said sleeve shoulders and said shoulder means, respectively.

4,005,736

ECCENTRIC MECHANISM FOR DRIVING A PLURALITY OF HEDDLE CARRYING FRAMES

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

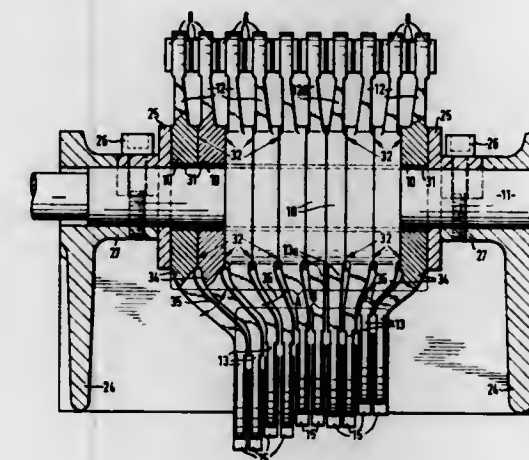
Filed July 2, 1975, Ser. No. 592,675

Claims priority, application Switzerland, July 29, 1974, 10371/74

Int. Cl.² D03D 5/02

U.S. Cl. 139-79

8 Claims



1. An eccentric mechanism for driving a plurality of heddle carrying frames in a weaving machine, said mechanism comprising

a plurality of rotatable eccentrics;

a plurality of cam follower levers, each said lever being positioned relative to a respective eccentric to be moved thereby;

a fixedly mounted spindle;

a plurality of deflecting levers rotatably mounted on said spindle, each said deflecting lever being pivotally connected to a respective cam follower lever;

a plurality of bearing elements, each said element having an annular bushing portion and a flange portion disposed between a respective pair of adjacent deflecting levers; and

means connected to each said deflecting lever to raise and lower a heddle carrying frame.

4,005,737

WINDOW SCREEN ASSEMBLY TOOL

Robert W. Nason, 2706 E. 112th St., Lynwood, Calif. 90262

Filed Jan. 2, 1976, Ser. No. 646,381

Int. Cl.² B21F 33/02

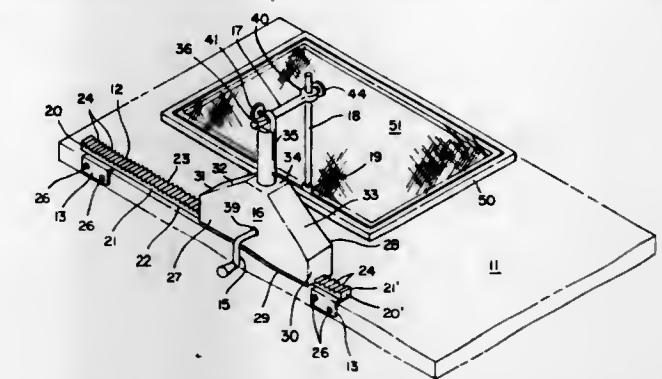
U.S. Cl. 140-109

1 Claim

1. A window or door screen assembly tool for the assembly of screens to windows or doors, the tool comprising, in combination:

a gear train with mounting brackets for securement of said gear train to the side of a bench or table top, a drive gear secured within a housing by means of a handle affixing said drive gear within the housing and said handle protruding outwardly of said housing, a round shaft securely affixed to the center of the top of said housing and pro-

vided with a round hole at the top of said shaft, vertical and horizontal adjustable shafts for positioning of a pressure roller outwardly and downwardly from said housing for proper alignment of said pressure roller to a window or door frame and so as to apply proper pressure on said pressure roller for the assembly of tubing for attachment of a screen to a screen frame; and said housing consisting of side walls with a flat elongated



bottom surface, said side walls being spaced equally distant to each other in the same plane by means of two vertical and perpendicular side walls, two side walls at an oblique angle to cover said drive gear, a short top wall being parallel to the bottom surface with a round shaft being securely affixed to the center of said top surface, and with said shaft being provided with a round hole near its top and with a through threaded hole through its circumference for assembly of a threaded bolt therethrough.

4,005,738

AUTOMATIC DADOING MACHINE

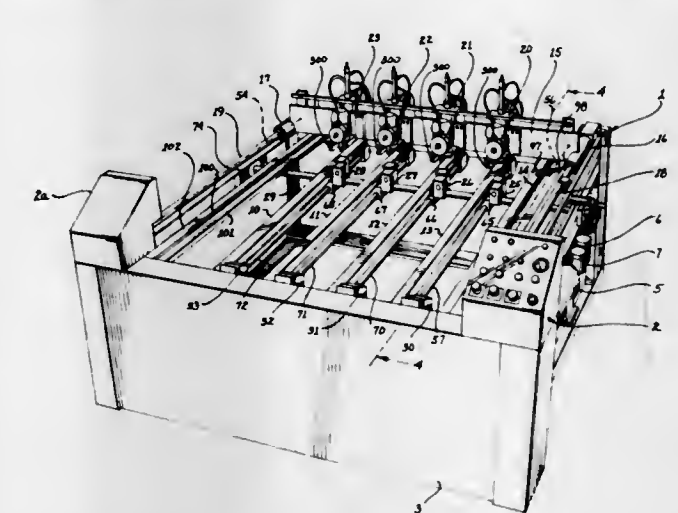
Delbert D. Strange, and Ronald M. Hunts, both of San Diego, Calif., assignors to Manufacturing Approaches & Total Concepts Inc., San Diego, Calif.

Filed July 31, 1975, Ser. No. 600,726

Int. Cl.² B27F 1/02; B26D 3/06

U.S. Cl. 144-136 R

12 Claims



1. A system for automatically cutting grooves in sheet material, said system comprising in combination:

a. a plurality of parallel rails for supporting the sheet material;

b. first clamp means for engaging one of a pair of opposed edges of the sheet material, said first clamp means including bias means for maintaining the sheet material adjacent said plurality of rails;

c. second clamp means for engaging another of the pair of opposed edges of the sheet material, said second clamp means including bias means for urging the sheet material toward said first clamp means and for maintaining the sheet material adjacent said plurality of rails;

d. cutting means for forming each of the grooves, said cut-

ting means having a rotatable bit in general vertical alignment with one of said plurality of rails and selectively positioned within the plane of the sheet material and translatable into and out of the plane of the sheet material;

e. translation means for positioning the bit of each of said cutting means within the plane of the sheet material;

f. first drive means for controllably actuating said translation means;

g. second drive means for controllably translating the bit of each said cutting means into and out of the plane of the sheet material;

h. detection means for generating feedback signals indicative of the location of said cutting means;

i. a plurality of input controls for selectively actuating said first and second clamp means and determining the number and length of the grooves; and

j. control means responsive to said plurality of input controls and to said feedback signals generated by said detection means for actuating said first and second drive means.

4,005,739

SUPPLEMENTAL MEDICATION INDICATION CAP FOR SOLUTION CONTAINERS AND THE LIKE

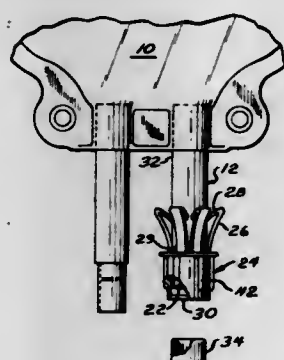
David Allen Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 20, 1975, Ser. No. 624,195

Int. Cl.² B65D 33/16

U.S. Cl. 150-8

9 Claims



1. A supplemental medication indication cap in which said cap is installed on a solution container tubular access port, said access port carrying at its outer end an elastic, needle-piercable injection site, said cap being positioned to fit about said tubular access port, said cap defining at one end thereof a plurality of gripper arms, said gripper arms being positioned to engage said injection site upon attempted removal of said cap from the access port, whereby the forced removal of the cap from the access port also causes removal of said injection site.

4,005,740

ROTATION RESISTANT NUT

Joseph P. Villa, deceased, late of Rydal, Pa.; by Jean Villo, co-executrix, Rydal; by The Fidelity Bank, co-executor, Philadelphia, both of Pa., and Charles A. Wilson, Williams-town, N.J., assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Aug. 24, 1972, Ser. No. 283,345

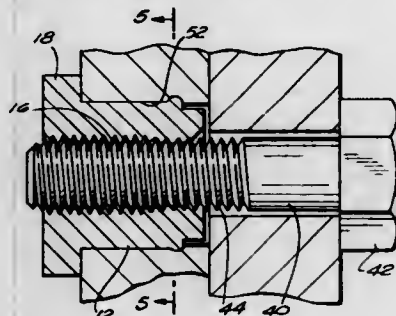
Int. Cl.² F16B 39/22

U.S. Cl. 151-41.73

5 Claims

1. A fastener assembly comprising a first workpiece having a smooth surface bore extending therethrough and an insert-type rotation resistant nut received in said bore, said nut comprising a nut body having a threaded bore extending therethrough, the exterior surface of said nut body including an intermediate segment having a generally smooth, continuous surface and an end segment, said intermediate segment

formed with a plurality of generally lobular radially outwardly extending protrusions extending throughout substantially the entire axial length of said intermediate segment, each of said protrusions being arcuate throughout substantially its entire circumferential extent and including a pair of points of minimum radial projection and a point of maximum radial projection, said intermediate segment having an interference fit with said bore in said workpiece such that said workpiece elastically deforms said threaded bore forming a plurality of radially inwardly extending protrusions, each of said inwardly extending protrusions including a point of maximum radial projection radially adjacent said points of maximum projection of



said outwardly extending protrusions, said inwardly extending protrusions being spaced apart by relatively undeformed portions of said threaded bore including a segment adjacent said points of minimum projection of said outwardly extending protrusions, said points of maximum projection of said inwardly extending protrusions being adapted to have an interference fit with a mating bolt and said relatively undeformed portions of said threaded bore being adapted to be expanded against said bore in said workpiece when engaged with a mating bolt to resist rotation of said nut relative to said workpiece, said end segment of said nut having a diameter less than that of said intermediate segment to facilitate insertion of said nut into said workpiece.

4,005,741

METHOD FOR THE FABRICATION OF TUBE PRODUCTS

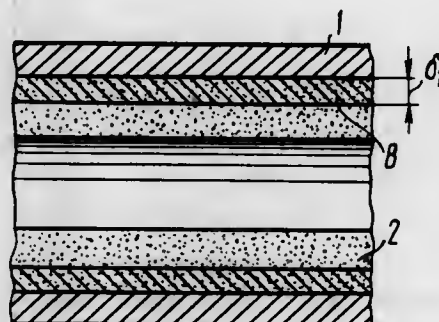
Elmar Juganovich Juganson, prospekt Lenina, 40, kv. 32; Isaak Yakovlevich Chernyavsky, ulitsa Vorovskogo, 41, kv. 10; Vladimir Yakovlevich Ivantsov, prospekt Lenina, 62, kv. 2; Jury Ivanovich Bilnov, ulitsa Tsvillinga, 31, kv. 43; Vladimir Petrovich Ustyantsev, ulitsa Vagnera, 71, kv. 112, and Igor Alexeevich Klestov, ulitsa Sani Krivol, 37, kv. 2, all of Chelyabinsk, U.S.S.R.

Filed Mar. 5, 1975, Ser. No. 555,616

Int. Cl.² B22D 23/00

U.S. Cl. 164-54

13 Claims



1. A method for the fabrication of twin-layer tube products, comprising: centrifugally spinning a hollow cylindrical part in a horizontal plane; introducing a Thermit mixture to constitute the material of the tube product, and incorporating at least one metal oxide and a reducer into the bore of the cylindrical part during said spinning step; igniting and burning the mixture, thereby to obtain a liquid melt; again centrifugally spinning the hollow centrifugal part until the now liquid mixture is separated into a metal layer and a corundum layer, uniformly distributed over the inside surface of the cylindrical

part; and crystallizing the materials so that a twin-layer tube product is obtained.

4,005,742

METHOD OF RESTORING INGOT MOLD STOOLS AND CLOSED-BOTTOM INGOT MOLD

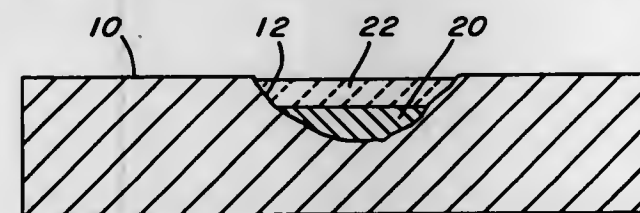
Robert H. Kachik, Washington Township, Westmoreland County; Samuel J. Manganello, Penn Hills Township, Allegheny County, and Arthur J. Pignocco, Franklin Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 517,991, Oct. 25, 1974, abandoned, which is a division of Ser. No. 332,870, Feb. 15, 1973; abandoned. This application Mar. 8, 1976, Ser. No. 664,793

Int. Cl.² B23K 23/00; B22D 19/10

U.S. Cl. 164-54

19 Claims



1. A method of repairing an erosion cavity in ingot mold stools and the bottoms of closed-bottom metal molds comprising:

placing in said cavity an exothermic reaction mixture consisting essentially of a fuel powder and a metallic oxide, the amount of said mixture having a volume no greater than one and a half times the volume of the cavity; igniting said mixture to form a superheated melt comprising a metal phase and a slag phase, such that said melt is contained entirely within said cavity, maintaining said melt in said cavity for a time sufficient to allow said melt to separate so that said metal phase is at the bottom and the slag phase thereover, permitting said melt to solidify with the metal phase securely bonded to the bottom of the cavity and said slag phase securely attached to said metal phase, and permitting said slag phase to remain in said erosion cavity during subsequent use of said mold or mold stool to thereby provide extra protection from erosion and extend the life of the repaired stool or mold.

12. A method of repairing an erosion cavity in the bottom of a closed-bottom ingot mold comprising:

placing in the bottom of said mold an exothermic reaction mixture consisting essentially of a fuel powder and a metallic oxide, the amount of said mixture having a volume greater than 1.5 times the cavity volume but less than 5 times the cavity volume, igniting said mixture to form a superheated melt comprising a metal phase and a slag phase, maintaining said melt at the bottom of said mold for a time sufficient to allow said melt to separate into a metal phase and a slag phase, said metal phase separating to the bottom and being entirely contained within said cavity, while said slag phase covers the entire bottom of the mold, permitting said melt to solidify with the metal phase securely bonded to the bottom of the cavity and said slag phase securely attached to the metal phase to provide a slag surface over the entire bottom of the mold, and permitting said slag phase to remain in on said mold bottom during subsequent use of said mold to thereby provide extra protection from erosion and extend the life of the repaired mold.

4,005,743

APPARATUS FOR THE CONTINUOUS CASTING OF METALS ESPECIALLY STEEL, AND METHOD OF CONTINUOUSLY CASTING METALS

Tetsuo Ueda, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

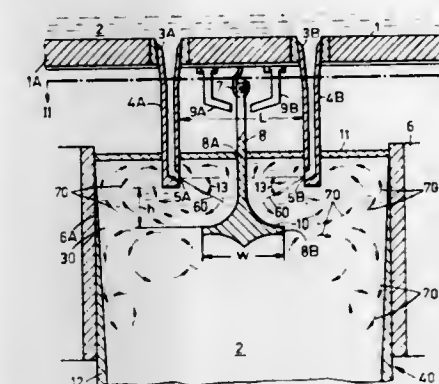
Filed Oct. 28, 1975, Ser. No. 626,558

Claims priority, application Japan, Nov. 1, 1974, 49-126328

Int. Cl.² B22D 11/10, 11/16

U.S. Cl. 164-82

15 Claims



1. An apparatus for the continuous casting of molten metal, especially steel, comprising a continuous casting mold, a multiplicity of pouring tubes each having at least one outlet opening inclined at a predetermined angle with respect to a horizontal for delivering molten metal into a molten metal bath contained within the continuous casting mold, and means arranged between the pouring tubes to prevent collision of the molten metal delivered through the outlet openings of the pouring tubes and for controlling the flow of the molten metal in the continuous casting mold.

9. A method of casting molten metal into a continuous casting mold, especially for casting steel, comprising the steps of:

a. providing a continuous casting mold;

b. providing a plurality of spaced pouring tubes for the infeed of molten metal into the continuous casting mold, each pouring tube having at least one outlet opening for the infeed of the molten metal into the continuous casting mold;

c. providing baffle means between the plurality of spaced pouring tubes;

d. feeding molten metal through the pouring tubes and delivering the molten metal in the form of casting jets into the continuous casting mold through the outlet openings of the pouring tubes; and

e. directing the outflowing metal casting jets so as to impact against the baffle means in order to prevent collision of the outflowing metal casting jets and to control the flow of metal in the continuous casting mold.

4,005,744

APPARATUS FOR CONTINUOUS PICKLING OF CAST ROD

Daniel B. Cofer; Enrique Calixta Chia; John E. Burnitt, and Theodor W. Kaltenberg, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Division of Ser. No. 446,842, Feb. 28, 1974, which is a division of Ser. No. 109,421, Jan. 25, 1971, Pat. No. 3,806,366, which is a division of Ser. No. 808,976, March 20, 1969, Pat. No. 3,623,532. This application Jan. 10, 1975, Ser. No. 540,022

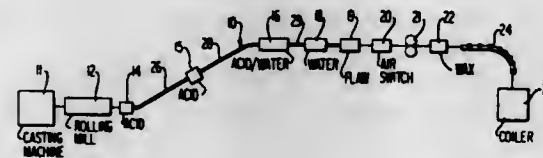
Int. Cl.² B22D 11/124

U.S. Cl. 164-270

12 Claims

1. In apparatus for continuously forming copper rod or the like including casting means for forming a copper bar, rolling means for lengthening and reducing the cross-sectional area of the bar to form rod, coiling means for coiling the rod, means for quench-pickling the rod as the rod passes from the rolling means to the coiling means, said quench-pickling means including for impinging the rod with a flow of high velocity

pickling agent; means for causing the pickling agent to flow in counterflow relation to the movement of the rod, and means



for directing a jet of air along the length of the rod to wipe the pickling agent therefrom.

4,005,745

APPARATUS FOR STORING, REFRIGERATING AND HEATING FOOD ITEMS

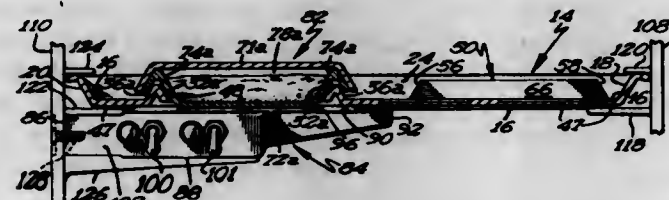
Albert E. Colato, St. Paul, and Jerome L. Formo, Roseville, both of Minn., assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Sept. 30, 1974, Ser. No. 510,746

Int. Cl.² F25B 13/00

U.S. Cl. 165—2

12 Claims



1. Apparatus for storing, refrigerating and heating food items in serving containers comprising in combination:

- serving containers containing food items
- a tray supporting the serving containers,
- at least one opening extending through the tray surface,
- means supporting and positioning one of said serving containers containing a food item to be heated within said opening,
- a cover on said serving container for said food item to be heated,
- a rack for said tray,
- said rack having means for mounting said tray thereon,
- means contacting the bottom of said serving container containing food to be heated for heating said container when the tray is mounted in the rack, said heating means being so positioned that it supports the serving container vertically above and out of contact with said container supporting and positioning means,
- means for refrigerating said rack to refrigerate all said food items in said serving containers on said tray, and
- means for actuating said heating means to heat said food item in said refrigerated serving container which is in contact with said heating means while other food items in serving containers on the tray remain refrigerated.

3. Apparatus for storing, refrigerating and heating food items in serving containers comprising in combination:

- serving containers containing food items,
- a tray supporting the serving containers,
- at least one opening extending through the tray surface,
- means supporting and positioning one of said serving containers containing a food item to be heated within said opening,
- a rack for said tray,
- said rack having means for mounting said tray thereupon,
- heating means carried by said rack in alignment with the tray opening and being in contact with the bottom of said serving container containing food to be heated when the tray is mounted on the rack, said heating means being so positioned that it supports said serving container vertically above and out of contact with said container supporting and positioning means,

- means for refrigerating said rack to refrigerate all said food items in said serving containers on said tray, and
- means for actuating said heating means to heat said food item in said refrigerated serving container which is in contact with said heating means while other food items in serving containers on the tray remain refrigerated.

4,005,746

SECTIONAL HEAT EXCHANGER

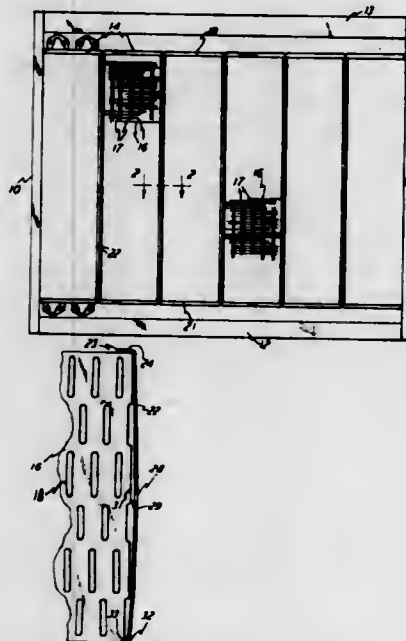
Fred M. Young, Racine, Wis., assignor to Young Radiator Company, Racine, Wis.

Filed Aug. 22, 1975, Ser. No. 606,887

Int. Cl.² F28F 7/00

U.S. Cl. 165—69

5 Claims



- In a sectional heat exchanger having a plurality of separate heat exchanger units disposed in a frame which has opposite frame sides for receiving said units in side-by-side relation, and a plate extending between two of said units, the improvement comprising said plate being yieldingly compressible and affixed along one edge of said plate to one of said two units and with the edge of said plate opposite said one edge being free of attachment to said one unit, said yieldingly compressible plate being of a spring material and compressible between the two said units and having a central portion yieldingly urging toward the other of said two units for yieldingly urging said two units away from each other and respectively toward said frame sides and thereby snugly retain said units in said frame and lessen vibration of said units in said frame.

4,005,747

MULTI-FLOW, MULTI-PATH HEAT EXCHANGER FOR PUMP-MECHANICAL SEAL ASSEMBLY

Rowland E. Ball, Long Beach, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 27, 1975, Ser. No. 590,884

Int. Cl.² F16J 15/44

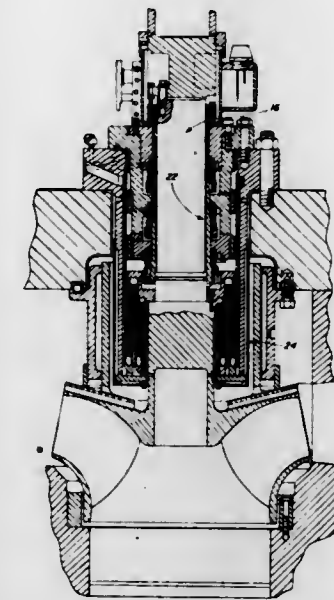
U.S. Cl. 165—134

5 Claims

1. A heat exchanger for a pump-mechanical seal assembly which comprises:

- at least a pair of generally cylindrical housing members surrounding the driving shaft from the motor to the pump impeller;
- each housing member having a plurality of concentric partitions which define with one another a plurality of concentric cylindrical openings communicating with one another, and also a plurality of circumferential grooves and axial slots, which grooves and slots communicate with one another;
- a cooling fluid inlet and a cooling fluid outlet each connected to the outermost circumferential groove;

said outermost circumferential groove being separated into two segments, one segment being connected to said inlet and the other segment being connected to said outlet; means defining a path for the flow of hot fluid from said pump into said cylindrical openings in a zig-zag path for discharge from said exchanger, and



said grooves and slots being so constructed and arranged that cooling fluid flows in a path substantially counter to said hot fluid through one segment of the outermost groove, into the outermost slots communicating therewith and thence into interior slots communicating with said outermost slots to the other segment of said outermost groove and then to said outlet.

4,005,748

ANNULAR HEAT EXCHANGER FINS

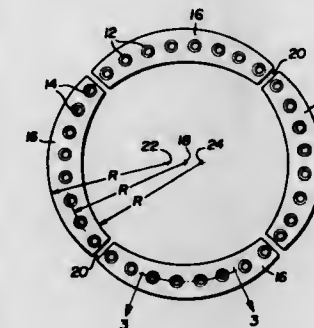
Robert D. MacDonald, Grand Blanc, Mich., and Robert K. Rose, Burnt Hills, N.Y., assignors to Champion Home Builders Co., Dryden, Mich.

Filed Mar. 14, 1975, Ser. No. 558,593

Int. Cl.² F28D 11/00

U.S. Cl. 165—151

4 Claims



- In a heat exchanger of the type characterized by a plurality of fluid-carrying tubes arranged in a laterally-spaced, generally cylindrical fashion, and a plurality of generally annular fins spaced longitudinally along said tubes, each annular fin having a plurality of angularly spaced tube-receiving holes arranged in a generally circular pattern to receive each of said tubes, the improved fin construction wherein each of said annular fins comprises a plurality of circumferentially and coplanarly arranged segments having inner and outer edges of identical but radially spaced contour.

4,005,749

OIL RECOVERY BY SURFACTANT WATERFLOODING

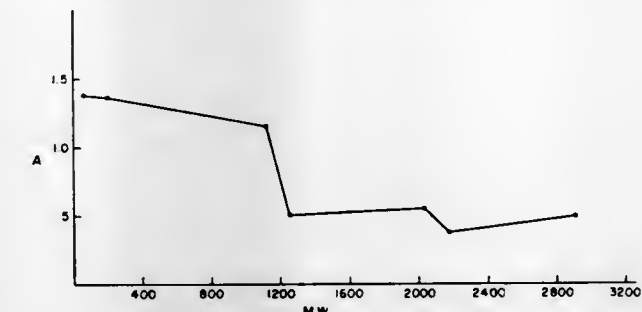
Silvia C. Birk, Fort Worth; Samuel H. Collins, Grand Prairie, and Peggy M. Wilson, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 11, 1975, Ser. No. 630,832

Int. Cl.² E21B 43/22

U.S. Cl. 166—273

5 Claims



1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

- injecting into said reservoir via said injection system an aqueous pretreatment slug containing a water-soluble polyalkylene oxide sacrificial agent having a molecular weight of at least 1200 selected from the group consisting of polyethylene glycols, polypropylene glycols, interpolymers of polypropylene glycols and polyethylene glycols, and mixtures thereof,
- thereafter introducing into said reservoir via said injection system an aqueous surfactant slug containing a surfactant having a lower molecular weight than the molecular weight of said polyalkylene oxide,
- introducing into said reservoir via said injection system an aqueous flooding medium to displace reservoir oil to said production system, and
- recovering oil from said production system.

4,005,750

METHOD FOR SELECTIVELY ORIENTING INDUCED FRACTURES IN SUBTERRANEAN EARTH FORMATIONS

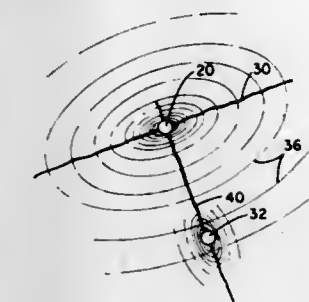
Lowell Z. Shuck, Morgantown, W. Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 1, 1975, Ser. No. 592,482

Int. Cl.² E21B 43/26

U.S. Cl. 166—308

6 Claims



- A method of providing a subterranean earth formation with a hydraulically-induced fracture disposed in a plane substantially orthogonal to the plane of the maximum tectonic compressive stress field, consisting of pressurizing fluid in the first of the first and second wellbores penetrating said earth formation at locations spaced apart from one another along a plane disposed at an angle generally perpendicular to the plane of the maximum tectonic compressive stress field for sufficiently stressing the earth formation surrounding said first wellbore to provide a maximum compressive stress field in said earth formation encompassing said second wellbore and projecting along a plane orthogonal to the plane of the maxi-

mum tectonic stress field and extending between said spaced-apart wellbores, and then pressurizing fluid in the second wellbore while maintaining said maximum compressive stress field provided by the pressurization of the fluid in the first wellbore for inducing a fracture in the earth formation adjacent to said second wellbore with said fracture extending toward said first wellbore in a direction substantially parallel to the plane of the maximum compressive stress field projecting therebetween.

4,005,751

DEEP WELL SAFETY VALVE

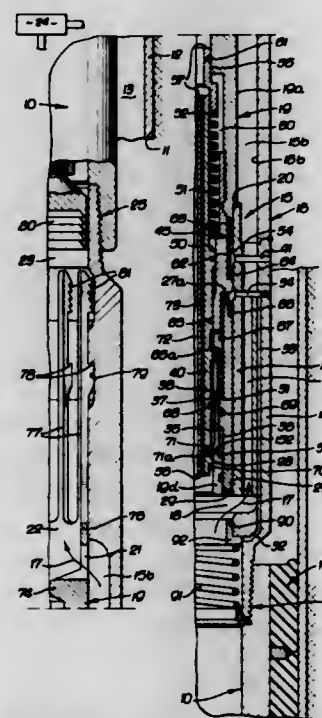
John S. Page, Jr., 10424 Echo River Court, Fountain Valley, Calif. 92708

Filed Apr. 11, 1975, Ser. No. 567,376

Int. Cl.² E21B 43/00

U.S. Cl. 166—321

19 Claims



19. In a well valve,
a. a housing connectible in a well tubing string,
b. a main valve movable in the housing between open and closed positions, the housing and main valve providing a vertically open straight bore in main valve open position,
c. a control pressure responsive main valve actuator to displace the main valve between said positions,
d. a control pressure responsive pilot valve carried by the housing outside said bore to control application of control pressure to the actuator, and
e. means to supply said control pressure for control as aforesaid by the pilot valve means.

4,005,752

METHOD OF IGNITING IN SITU OIL SHALE RETORT WITH FUEL RICH FLUE GAS

Chang Yui Cha, La Verne, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 492,253, July 26, 1974, abandoned.

This application Oct. 16, 1975, Ser. No. 622,653

Int. Cl.² E21B 43/24

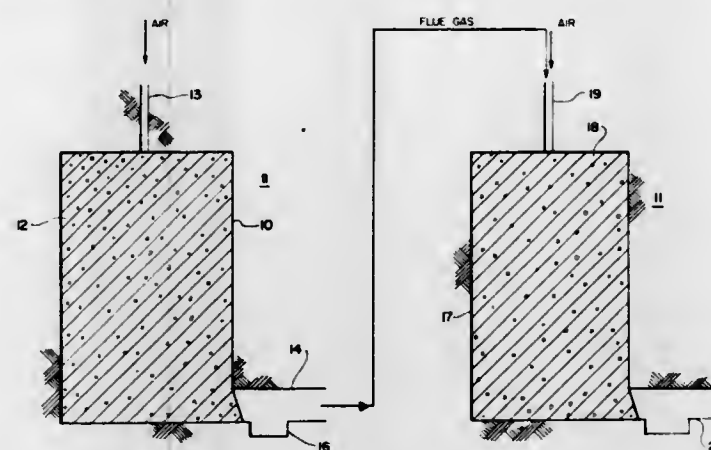
U.S. Cl. 166—260

13 Claims

1. A process for igniting an in situ oil shale retort comprising the steps of:

generating a combustible flue gas in a first in situ retort containing a bed of hot spent oil particles by introducing air at the top of the first retort, and withdrawing flue gas from the bottom of the first retort;
burning the combustible flue gas at a top entrance of a second in situ retort containing a bed of unretorted oil shale particles and passing the combustion products

downwardly through the bed for heating a portion of the top of the second bed of oil shale particles to the ignition temperature of oil shale particles in the top portion of the bed for establishing a combustion zone at the top of the second bed; and



introducing air to the top of the second bed for moving the combustion zone downwardly in the ignited second retort.

4,005,753

METHOD OF TREATING A SUBTERRANEAN FORMATION WITH A POLYMERIC DIVERTING AGENT

John W. Scheffel, Fullerton, and Paul W. Fischer, Whittier, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Division of Ser. No. 475,511, June 3, 1974, Pat. No. 3,954,629.

This application Mar. 4, 1976, Ser. No. 663,989

Int. Cl.² C09K 7/02; E21B 33/138, 43/26

U.S. Cl. 166—283

8 Claims

7. A method of completing a well bore drilled into a subterranean formation comprising circulating a completion fluid from the surface to the drilling zone in said formation during the drilling operation and returning to the surface at least a portion of said completion fluid, said completion fluid comprising a pumpable carrier medium having suspended therein particles having a mean diameter of from about 1/4 inch to about 1 micron of a homogeneous solid mixture comprising (1) about 5 to 25 weight percent of a polymer selected from the group consisting of polyethylene having a melt index of less than 100 grams in 10 minutes, ethylene-vinyl acetate copolymer containing about 15 to 30 weight percent of vinyl acetate having a melt index of from about 1 to about 500 grams per 10 minutes, and admixtures of said polymers; (2) about 8 to 50 weight percent of a polyamide having a melting point between about 400° F. and 460° F. characterized by the formula:



wherein R is an alkyl radical containing from 15 to 18 carbon atoms, x is an integer from 2 to 4, and y is an integer from 4 to 10; and (3) about 40 to 50 weight percent of a polyterpene resin having a melting point between about 230° F. and 275° F. or about 60 to 70 weight percent of an aliphatic diamide having a melting point between about 280° F. and 300° F. characterized by the formula:



wherein R' is an alkyl radical containing from 15 to 18 carbon atoms and R'' is an alkylene radical containing from 2 to 4 carbon atoms.

4,005,754

PROCESS FOR THE AUTOMATIC REPORTING AND EXTINGUISHING OF FIRES

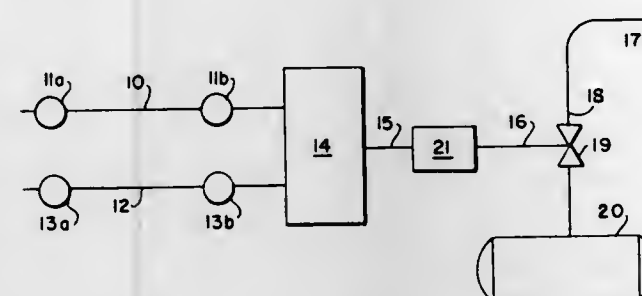
Gerhard Linden, von-Werth-Str. 5-7, 5 Cologne 1; Dierk Lay, Im Thurnerfeld 60, 5 Cologne 80, and Karl Tiedtke, Zanderstrasse 37, 5203 Much, all of Germany

Filed Mar. 6, 1975, Ser. No. 555,987

Int. Cl.² A62C 37/04

U.S. Cl. 169—46

9 Claims



1. A process having a fire reporting system which controls a locally fixed fire extinguishing installation for the automatic reporting and extinguishing of fires, said process comprising
A. receiving and storing for a first predetermined time period a first report of a fire from a first fire reporter,
B. receiving and storing a second report of the fire from a second fire reporter within the first predetermined time period,
C. operating the locally fixed fire extinguishing installation to release a first quantity of extinguishing agent in response to steps A and B,
D. after a second predetermined time period, determining whether the fire is extinguished, and
E. repeating steps C and D until the fire is extinguished.

4,005,755

MACHINE FOR ROCK REMOVAL AND SOIL CULTIVATION

Even A. Bakke, Skrenten 5, Gjøvik, Norway (2800), and Kaare W. N. Berg, c/o Jostein Berge, Ottestad, Norway (2312)

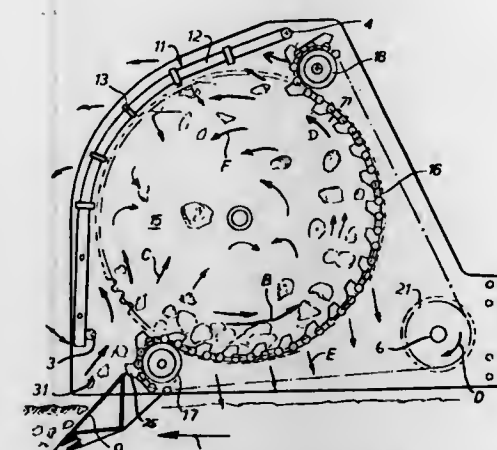
Filed Dec. 9, 1974, Ser. No. 530,950

Claims priority, application Norway, Dec. 14, 1973, 734786

Int. Cl.² A01B 17/00, 43/00

U.S. Cl. 172—32

12 Claims



1. A soil cultivating machine comprising,
horizontally disposed comminuting and classifying means formed of a pair of spaced vertically disposed side wall members,
a displaceable foraminous chain belt disposed between said side wall members adapted to move in an upwardly directed generally semicircular path and,
an arcuately shaped foraminous grid cooperatively associated with said chain belt and side wall members to form

a generally cylindrically shaped foraminous comminuting chamber,
means positioned to be displaced through and below the surface of the soil to be cultivated for introducing soil and rocks contained therein into the lower portion of said chamber intermediate the dependent end of said grid and the dependent terminus of said semicircular path of said displaceable chain belt, and
means for displacing said chain belt upwardly along said semicircular path to repetitively and rotatably recycle soil and rocks disposed within said chamber to progressively comminute the same.

4,005,756

LIGHTWEIGHT PASTURE HARROW

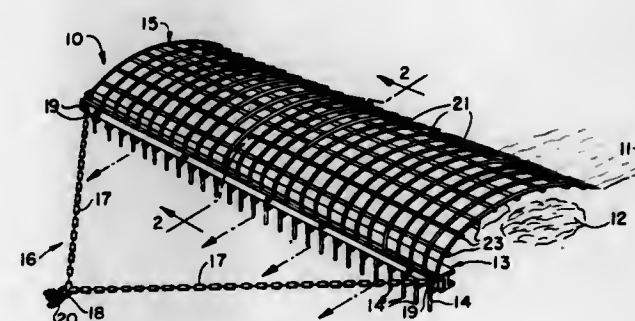
William E. Morse, Jr., 612 A Bankers Trust Bldg., Jackson, Miss. 39201

Continuation-in-part of Ser. No. 388,495, April 15, 1973, abandoned. This application Aug. 5, 1975, Ser. No. 602,063

Int. Cl.² A01B 19/02

U.S. Cl. 172—643

36 Claims



10. A lightweight harrow adapted to be pulled over the ground for breaking up piles of manure and the like in a pasture, and for light field cultivation comprising a rigid elongated front crossbar, means for connecting said front crossbar to a tractor or other draft means for towing said harrow, a row of transversely spaced front harrow teeth depending from said front crossbar, a wire mesh framework secured to said front crossbar along the length thereof and extending rearwardly from said front crossbar, said wire mesh framework including a plurality of transversely spaced resilient longitudinal wire members with trailing ends for engaging the ground and providing a row of transversely spaced rear harrow teeth, and a plurality of longitudinally spaced transverse wire members intersecting said longitudinal wire members with means securing said longitudinal and transverse wire members together where they intersect, said wire mesh framework normally maintaining a predetermined shape, and being resilient to yield to encountered objects in normal usage and to return to its predetermined shape upon disengagement with said encountered objects.

4,005,757

CLAMP SHANK DEVICE

Mitchell J. Hess, Plymouth, Utah 84330

Filed Mar. 10, 1975, Ser. No. 556,676

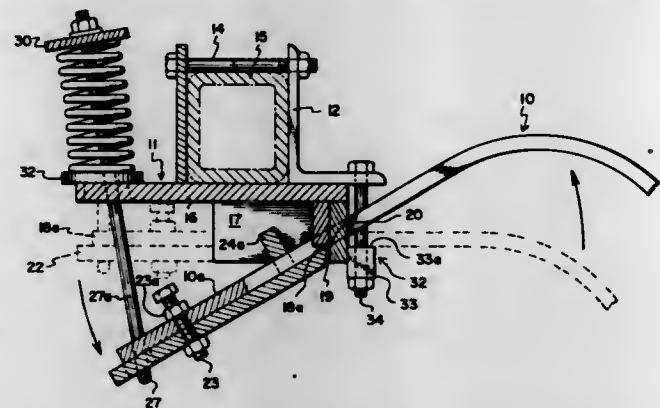
Int. Cl.² A01B 61/04

U.S. Cl. 172—710

10 Claims

1. A clamp shank device comprising a shank member rectangular in cross-section and having a substantially horizontal forward portion and a downwardly-extending rear portion; a supporting frame having a top wall and a transverse rear wall depending from said top wall across the width thereof, said rear wall being stepped upwardly from its bottom along its length on the portion thereof facing the interior of the frame to define a forwardly and downwardly facing, included angle, and being deeply notched upwardly from its bottom intermediate its length to receive said forward portion of the shank member and to accommodate upward movement thereof; a

rocker plate positioned within the supporting frame below said top wall thereof, the rearward end of said plate being a surface inclined downwardly and forwardly from the upper edge to the lower edge thereof, said upper edge forming a pivot edge across the width of the plate which abuts and pivots against the portion of said rear wall defining vertex of said included angle; means rigidly holding said forward portion of the shank member flatwise against the upper surface of the



rocker plate intermediate the width thereof; and spring means normally resiliently urging the forward end of the rocker plate and the thereto attached portion of the shank member upwardly toward the top wall of said frame, whereby excessive rearward pressure against said downwardly extending rear portion of the shank member will tend to pivot said forward end of the rocker plate and the thereto attached portion of the shank member downwardly against the urge of said spring means and about said pivot edge as an axis.

4,005,758

WEIGH SCALES

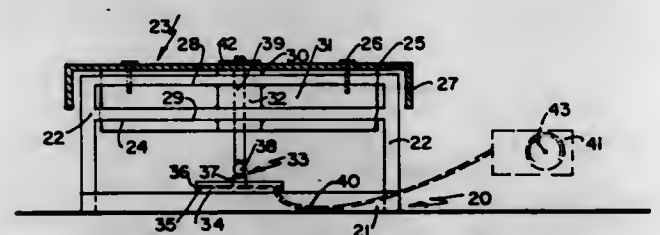
Berthold Thomas Johnson, 1551-97th St., North Battleford, Saskatchewan, Canada

Filed Apr. 4, 1975, Ser. No. 564,867

Int. Cl.³ G01G 3/08

U.S. Cl. 177-229

7 Claims



1. A weigh scale comprising in combination a base frame component, a load receiving frame component within said base frame, a torsion bar situated on each side of at least one pair of opposite sides of said scale and being fixedly and operatively connected between said base frame component and said load receiving frame component, to support said load receiving frame component relative to said base frame component, and load indicating means operatively connected between said components, each of said torsion bars being secured intermediate the ends thereof to one of said components and by each end thereof to adjacent the ends of the other of said components.

4,005,759

SOLENOID-OPERATED VALVE

Glyn Phillip Reginald Farr, Leek Wootton, England, assignor to Lucas Industries Limited, Birmingham, England

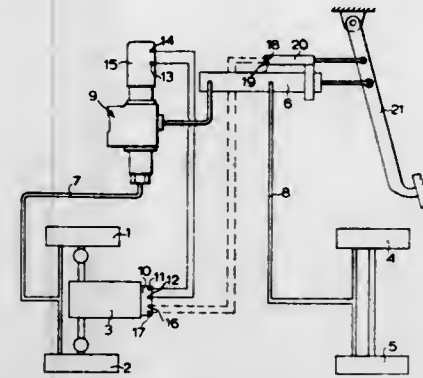
Filed Sept. 19, 1975, Ser. No. 615,127

Claims priority, application United Kingdom, Oct. 11, 1974, 44114/74

Int. Cl.³ B60T 13/00; B60K 1/00

U.S. Cl. 180-65 R

6 Claims



1. A solenoid-operated hydraulic brake pressure regulating valve assembly for use in an hydraulic braking system of an electrically driven vehicle comprising housing means having means defining an inlet for connection to an hydraulic master cylinder and means defining an outlet for connection to brakes on wheels driven by an electric motor adapted to provide regenerative braking, a solenoid-operated valve, and a pressure-responsive valve, said solenoid-operated valve and said pressure-responsive valve being located in said housing in parallel connection between said inlet and said outlet, means closing said solenoid-operated valve when regenerative braking is in operation and opening it at all other times to provide communication between said inlet and said outlet, said pressure-responsive valve incorporating pressure responsive means constructed and arranged to cause said pressure-responsive valve to remain open until a predetermined value of the pressure at said inlet is reached at which pressure the pressure at said outlet is sufficient to take up braking clearances whereafter said pressure-responsive valve closes to prevent said brakes being applied hydraulically thereby holding off a pressure equivalent to the torque generated whilst regenerative braking is in operation.

4,005,760

TRACTION CONTROL DEVICE

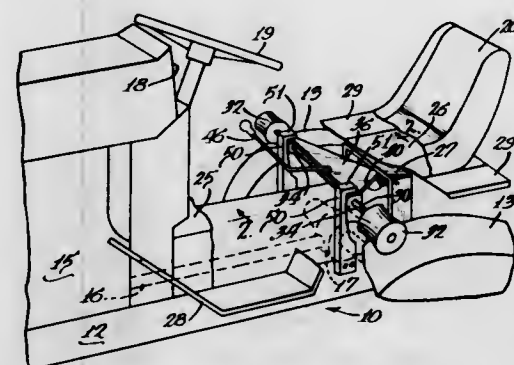
Ralph R. Gunderson, 8212 S. Homan, Chicago, Ill. 60652

Filed May 14, 1973, Ser. No. 360,300

Int. Cl.³ B60K 26/00

U.S. Cl. 180-74

10 Claims



1. In a vehicle having a chassis with propelling wheels connected by a differential, a traction control device for connecting the propelling wheels directly when the differential permits relative motion between the wheels, comprising,
a. a rotatable shaft having friction elements fixed thereon spaced apart axially to engage the propelling wheels of the vehicle.

- b. bearing means rotatably supporting the shaft at spaced positions between the friction elements thereon,
- c. lever means pivotally mounted on the chassis and supporting the bearing means, said lever means including a generally triangular wobble plate pivotally mounted adjacent one corner thereof and having the shaft bearing means supported thereon adjacent the two other corners,
- d. means normally urging the lever means in a direction to move the friction elements out of contact with the propelling wheels,
- e. means connected to the lever means to move the shaft and the friction elements toward the propelling wheels, and
- f. means limiting twisting of the lever means in the plane of the lever means and shaft while permitting differential movement of the friction elements toward the propelling wheels.

4,005,761

CAR LOUD SPEAKER

Kintaro Okamoto, Hachioji; Hirokazu Kudo, Wako; Etsuro Kadotri, and Hiroshi Soma, both of Tokyo, all of Japan, assignors to Pioneer Electronic Corporation and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

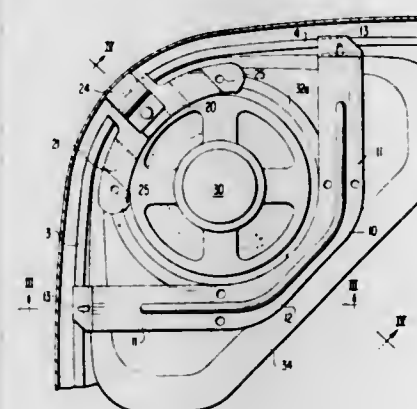
Filed Nov. 26, 1975, Ser. No. 635,545

Claims priority, application Japan, Nov. 26, 1974, 49-143245

Int. Cl.³ H05K 10/00

U.S. Cl. 181-141

4 Claims



1. A loud speaker assembly or use in a car, said car comprising a car body having a ceiling and having upwardly directed rails adjacent the ceiling at a body corner, said assembly comprising:

- a loud speaker,
- a first stay means having ends respectively secured to said rails on each side of the corner at which said rails are joined, said first stay means having at both ends thereof fitting means for engaging said rails, and
- corner stay means having fitting means for engaging said rails at the corner where said rails are joined, and a spring means for pressing against the ceiling of said car at said corner to bias said fitting means against said rail corner from a point line above said rails, and means for attaching said loud speaker to said first and corner stay means.

4,005,762

RESCUE APPARATUS

Gerard Zephinie, Paris, France, assignor to Societe Soboral S.A., Luxembourg, Luxembourg

Division of Ser. No. 477,071, June 6, 1974, Pat. No. 3,973,644.

This application July 2, 1975, Ser. No. 592,625

Claims priority, application France, June 5, 1974, 74.20410

Int. Cl.³ A62B 1/20

U.S. Cl. 182-48

3 Claims

1. An apparatus for slowing the rate of descent of a falling body being evacuated from an elevated point to a point therebelow, comprising

1. a flexible tubular device having two open ends, one end substantially at the level of the elevated point and the other end substantially at the level of the point therebelow, the tubular device extending substantially vertically from the elevated point to the point therebelow and being elastic in the transverse and circumferential but substantially inextensible on the longitudinal direction thereof,



2. means for fixing the respective open ends at said points,
a. the tubular device being maintained under longitudinal tension between the two fixed ends, and
3. an elongated pretensioned element extending through the tubular device from one end to the other.

4,005,763

LUBRICATING MEANS FOR GAS-OPERATED CYLINDERS

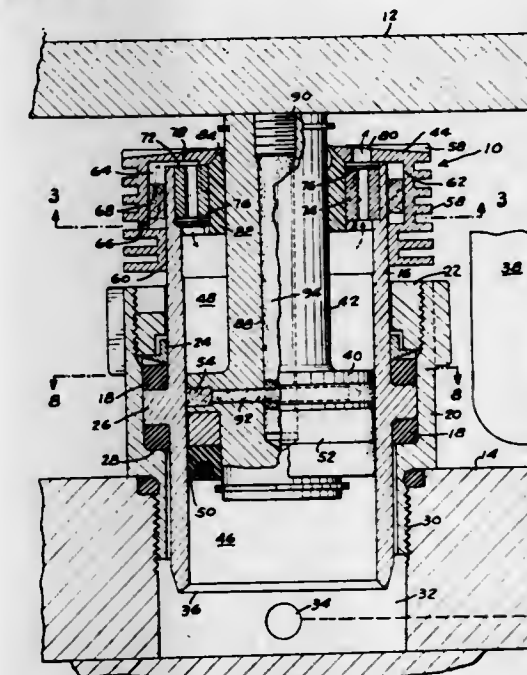
Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124

Filed Mar. 19, 1975, Ser. No. 559,660

Int. Cl.³ F16N 1/00

U.S. Cl. 184-24

30 Claims



1. In combination a cylinder, a piston movable axially in the cylinder and dividing the cylinder into a working chamber and an idle chamber which vary inversely in size in accordance with movement of the piston axially in the cylinder, means communicating said working chamber with a source of pressurized gas and permitting said gas to flow into and out of said working chamber, passageway means establishing communication between the surrounding atmosphere exteriorly of said

cylinder and said idle chamber and permitting the flow of air into and out of said idle chamber, and air permeable means in at least one section of said passageway means impregnated with a lubricant, said air permeable means being disposed so that air flowing through said one section of said passageway means into said idle chamber is directed into intimate contact with said lubricant to entrain the lubricant in said air, whereby said piston and the internal walls of said idle chamber are lubricated by the lubricant entrained in the air flowing into said idle chamber.

4,005,764

GOVERNOR MEANS FOR TOY AND GAME MOTORS OR THE LIKE

Rouben T. Terzian, Chicago; Eckehard Friederich, Niles, and Howard J. Morris, Deerfield, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

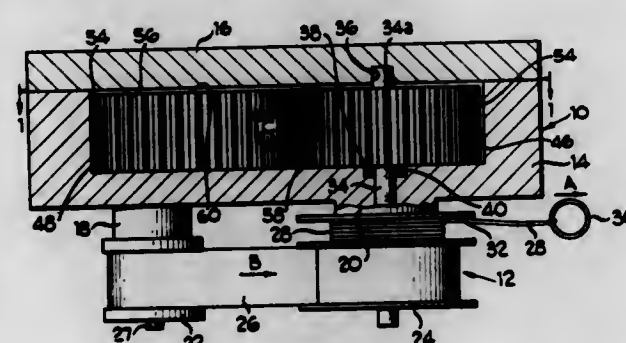
Continuation of Ser. No. 292,137, Sept. 25, 1972, abandoned.

This application Aug. 19, 1974, Ser. No. 498,577

Int. Cl.³ F03G 1/00

U.S. Cl. 185-37

6 Claims



1. Governor means for use in toys, games and the like having a frame structure, for operative connection to a motor means of the toy or game to control the operating speed of the motor means, comprising: a housing immovably fixedly positioned on the frame structure and having a closed interior cavity, a driven shaft rotatably mounted on said housing and extending from said motor means through said housing into said cavity, a first circular disc gear disposed in said cavity and drivingly connected to said shaft so as to be rotatably driven thereby, a second circular idler disc gear freely rotatable within said cavity and in mesh with said first disc gear for rotation thereby about an axis generally parallel and in fixed positional relation to the axis of rotation of the first disc gear and the housing, said cavity being comprised of a cylindrical portion concentric with and surrounding each of said disc gears, the cylindrical portions joining each other in the meshed area of said disc gears, the cylindrical walls of each of said cavity portions being spaced from the adjacent peripheral extremities of the teeth on the respective disc gear a sufficient distance to provide liquid passage means therebetween, and a relatively high viscosity liquid substantially filling said cavity and substantially surrounding said disc gears including filling said passage means to provide resistance to the driving of said disc gears.

4,005,765

CRASH LOAD ATTENUATING TROOP SEAT

Mason J. Reilly, Media, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 354,425, April 25, 1973, Pat. No. 3,868,143. This application Feb. 24, 1975, Ser. No. 552,001

Int. Cl.³ F16D 63/00

U.S. Cl. 188-1 C

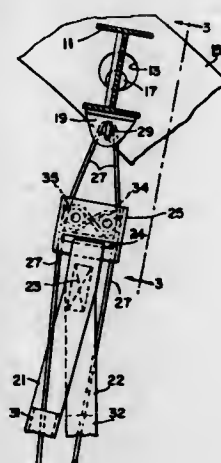
1 Claim

1. A shock absorber of the metal deforming type for use in conjunction with a strap-supported troop seat to absorb sudden impact comprising:

a hollow housing having two opposed openings thereto;

first and second rods spatially separated and laterally positioned between said openings and secured at their ends to the interior walls of said housing;

a shock absorbing wire bent back upon itself near its midpoint and formed to connect to the aircraft defining first



and second wire halves, said first and second wire halves each weaving from the midpoint into one of said openings around the distal sides of respective ones of said rods, crossing between said rods, weaving around the distal sides of the respective others of said rods and out the other of said openings.

4,005,766

WEAR INDICATOR FOR BRAKE LINING

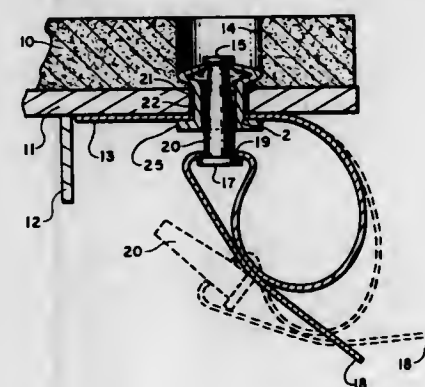
Richard Kennel, 34-10 43rd St., Long Island City, N.Y. 11101

Filed Sept. 12, 1975, Ser. No. 612,828

Int. Cl.³ F16D 66/02

U.S. Cl. 188-1 A

10 Claims



1. A device for indicating the wear of a brake lining secured on a brake shoe within a brake drum wherein the brake shoe includes at least one opening, comprising:

a stud having a central aperture for securement into the opening of said brake shoe;

said stud being constructed of a resilient material including a flange integrally formed in one end with a diameter larger than the opening of said brake shoe to prevent said stud from passing into said brake shoe and a cone-shaped tip formed at the opposite end so that said stud can be compressibly inserted into the opening to permit said cone-shaped end to expand against the brake shoe to prevent the withdrawal of the stud;

a rivet pin slidably disposed in the aperture of said stud, and having an enlarged head on one end disposed a predetermined depth below the wearing surface of the brake lining, said pin head being larger in diameter than the aperture of said stud;

spring indicating means coupled to the opposite end of said rivet pin and secured to said stud for biasing said pin with a withdrawal force with respect to said stud, said spring means including a free end disposed within the brake

drum so that when the surface level of the brake lining wears down to the level of said rivet head and the rivet head is worn off, said spring means will pull the opposite end of said pin through the central aperture of said stud so as to permit the free end of said spring means to contact the brake drum and produce an audible signal.

4,005,767

SLACK ADJUSTER MOUNTED INSIDE A BRAKE CYLINDER

Luciano Farelo, Turin, Italy, assignor to WABCO Westinghouse GmbH, Turin, Italy

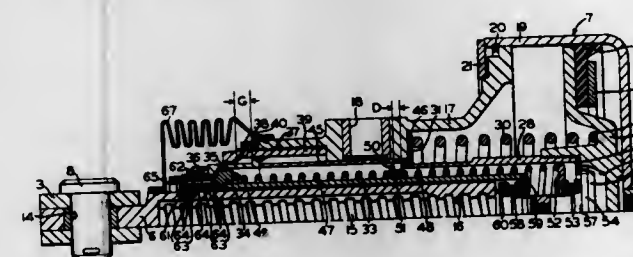
Filed Mar. 4, 1976, Ser. No. 663,676

Claims priority, application Italy, Mar. 18, 1975, 67682/75

Int. Cl.³ F16D 65/66

U.S. Cl. 188-203

7 Claims



1. A slack adjuster mechanism for a brake cylinder having a piston provided with an internal clutch face and a stop surface spaced apart from said clutch face on the piston, and a hollow piston rod that has therein internal non-self-locking screw threads, said slack adjuster mechanism comprising:

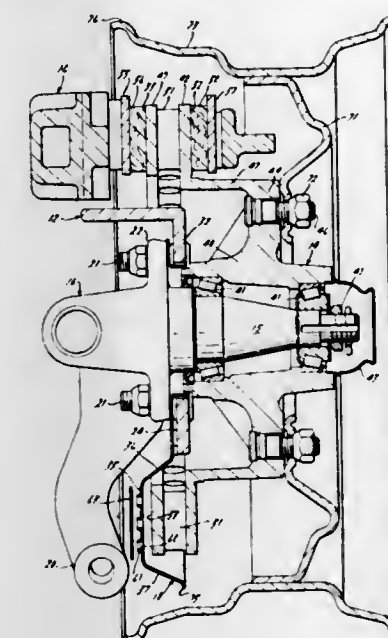
a. an external non-self-locking screw-threaded rod having thereon respectively an external clutch face and a stop surface spaced apart from said clutch face on said threaded rod for respective cooperation with the internal clutch face and stop surface on the piston,

b. a pair of spaced-apart stops carried by the brake cylinder, c. a stopping element carried by a stopping means and movable responsive to movement of the piston from engagement with one of said stops into engagement with the other of said stops,

d. seating means carried by said stopping means,

e. a pair of resilient biasing means interposed respectively between said stopping element and said seating means and between said externally threaded rod and said seating means enabling axial displacement of said stopping element by said piston upon movement thereof in said one direction, one of said resilient biasing means being compressed responsive to movement in said one direction of said piston subsequent to engagement of said stopping element with one of said pair of stops, and the other of said resilient biasing means being effective upon movement of said piston in a direction opposite said one direction, subsequent to movement in said one direction greater than the distance between said spaced-apart stops, to cause rotation of said externally threaded rod relative to said hollow internally threaded piston rod to increase the effective length of said piston rod an amount equal to said movement in said one direction of said piston subsequent to engagement of said stopping means with said one stop, and

f. resisting means connecting said stopping element and said hollow piston rod enabling movement of said piston rod by said piston in said one direction relative to said stopping element subsequent to engagement of said stopping element with said one stop and effective to maintain said stopping element and said piston rod stationary upon movement of said piston in said direction opposite said one direction until said rotation of said externally threaded rod relative to said piston rod increases the effective length of said piston rod said amount.



6. A disc brake having a brake rotor with a pair of annular braking surfaces; a brake caliper straddling said rotor; a support member supporting said caliper; a shield connected to said support member having an arcuate portion adjacent one of said braking surfaces; said arcuate portion of said shield having a plurality of ventilation holes; said arcuate portion having an axially extending lip positioned about the periphery of each of said holes.

4,005,769

SEALING ARRANGEMENT FOR A SHOCK ABSORBER HAVING AN ANNULAR RESERVOIR

Hidekuni Itoh, Kasugai, Japan, assignor to Showa Manufacturing Co., Ltd., Tokyo, Japan

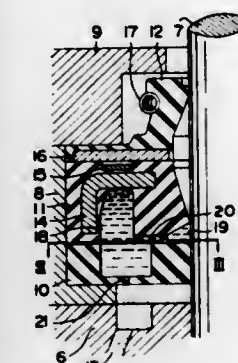
Filed May 30, 1975, Ser. No. 582,223

Claims priority, application Japan, Nov. 7, 1974, 49-127502

Int. Cl.³ F16F 9/36

U.S. Cl. 188-315

4 Claims



1. A sealing arrangement for a shock absorber comprising an inner cylinder having first and second ends and defining an inner working chamber in which a piston for generating a damping force is slidably fitted, an outer cylinder having first and second ends and spaced coaxially from said inner cylinder to define a first annular oil and high pressure gas reservoir

between said inner and outer cylinders, said inner cylinder having at least one hole therethrough near the second end thereof to allow fluid communication between said inner chamber and said first reservoir, a piston rod secured to said piston and extending outwardly of the first end of said inner and outer cylinders, said second end of said inner and outer cylinders being closed, a rod guide secured to the first end of said piston rod, an auxiliary sene and main seal arranged above said rod guide and tightly sealing the first end of said outer cylinder and in sliding contact with said piston rod, a second annular oil reservoir provided between said main and auxiliary seal, a gap defined between said main and auxiliary seals and enclosed by said piston rod, main seal, auxiliary seal, and said second reservoir to allow fluid communication between said rod and said second reservoir, and cuts formed through a bottom surface of said auxiliary seal to return oil from said second reservoir to said first reservoir when the oil pressure in said second reservoir has risen above the pressure of said high pressure gas in said first reservoir during operation of said shock absorber.

4,005,770 PRINTER

Mitsuo Hirose; Takashi Oono, both of Tokyo, and Makoto Ueno, Kodaira, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 442,222, Feb. 13, 1974, abandoned.

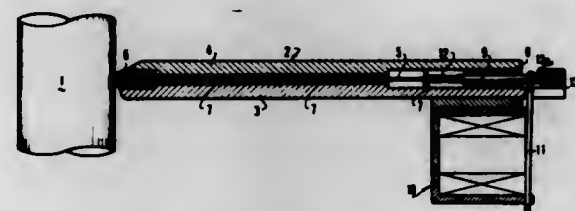
This application Oct. 20, 1975, Ser. No. 624,781

Claims priority, application Japan, Feb. 19, 1973, 48-19876; Feb. 19, 1973, 48-21303[U]; May 17, 1973, 48-58095[U]; May 17, 1973, 48-58096[U]

Int. Cl.³ B41J 3/10

U.S. Cl. 197-1 R

1 Claim



1. A dot printer having a platen and a type head and wherein:

- a said type head is flat and arranged perpendicularly to a row of character-printing positions; and
- said type head is shiftable along said platen in a direction parallel to said row to print dots in a pattern on a record layer interposed between said platen and said type head, said type head comprising:
 - a pair of head plates lying generally in a plane perpendicular to said platen and transversely of said row,
 - a fan array of rectilinear impacting wires extending between and axially slidable through said head plates, said array lying in said plane perpendicular to said platen and said row, said array converging toward said platen,
 - operating pins each having one end respectively secured on each of said wires at ends thereof remote from said platen, said operating pins having free ends remote from said wires, said pins lying in a fan array,
 - solenoids mounted on said plates in a fan array corresponding to that of said pins and having respective armatures with free ends engaging the free ends of said pins for displacing same and the wires rectilinearly upon energization of the respective solenoids,
 - stop means on said plates for engagement with said wires,
 - said head plates being provided at ends immediately proximal to said platen with front bearings formed with recesses for slidably supporting said wires at their ends proximal to said platen,

- a plurality of support members extending across said array and a plurality of tubular intermediate members mounted on said support members and slidably traversed by the respective wires.
- a plurality of wire blocks each associated with a respective one of said wires, each of said wire blocks having a base plate,
- a bracket mounted on said base plate and a bearing carried by said bracket and slidably receiving a respective pin of a respective wire, each solenoid being secured to the respective base, said blocks being detachably mounted on said head plates, said solenoids being staggered in a zigzag arrangement on said head plates, and
- respective fingers pivotally mounted at one end on the respective base plate and extending with clearance through the respective head plate to engage a respective pin, each of said fingers being attractable by one of said solenoids and forming said armatures.

4,005,771

SPEED RETARDING GOVERNOR

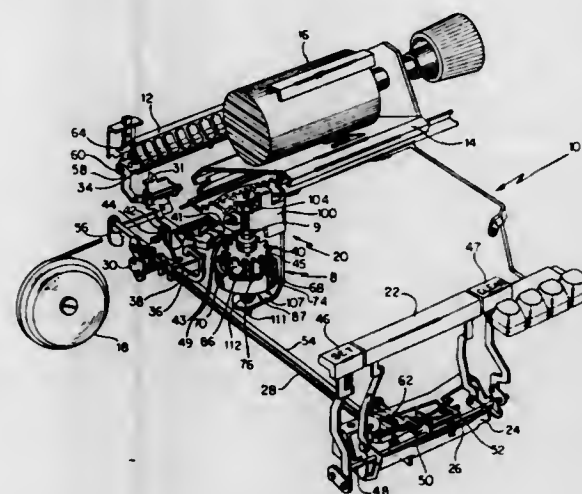
Samuel D. Cappotto, Syracuse, and John E. Dodge, Cortland, both of N.Y., assignors to SCM Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,469

Int. Cl.³ B41J 19/02

U.S. Cl. 197-64

34 Claims



- A carriage retarding governor for typewriters that includes a traversable carriage, the movement of which is regulated by an escapement mechanism that includes a rotatable toothed escapement drive wheel that is coupled to a carriage rack by an integral shaft and pinion gear, the carriage retarding governor comprising:
 - a rotatable housing having an arcuate wall;
 - a pivotless segment disposed within said housing; means on said housing for selectively rendering said housing stationary; and
 - means for engaging and urging said segment to rotate under the influence of the movement of the carriage and be centrifugally displaced and wedged against said stationary housing thereby retarding the traverse of the carriage.

4,005,772

AUTOMATIC JUSTIFYING TYPEWRITER HAVING PITCH CHANGING AND LINE SPACING APPARATUS

John B. Kieffer, Riverton, Wyo.; Gregory G. Vogel, Lewisville, Tex., and Raymond B. Larsen, Riverton, Wyo., assignors to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 296,934, Oct. 12, 1972, abandoned.

This application June 13, 1975, Ser. No. 586,758

Int. Cl.³ B41J 19/58

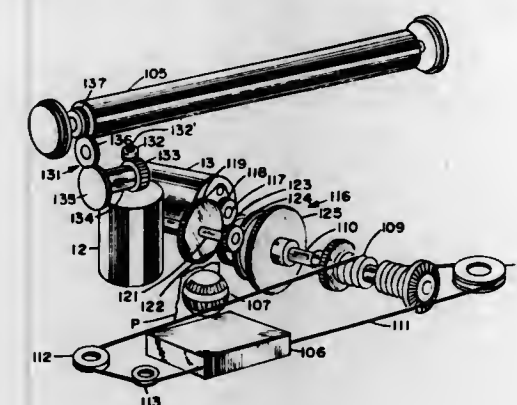
U.S. Cl. 197-84 R

12 Claims

- In an automatic justifying typewriter including a type-

writer printer having character printing means capable of printing characters of differing horizontal widths, printer control means for actuating said character printing means to impress selected characters on a print-out medium, a rotatable platen for vertical positioning of the print-out medium, and means for originating electrical signals corresponding to the character to be printed, the improvement comprising:

- incremental drive means for effecting incremental horizontal movement between said character printing means and said print-out medium,
- a data source connected to receive said character corresponding electrical signals for selectively and successively producing coded printing control signals each corresponding to a particular character to be printed and



coded spacing control signals having a count corresponding to a preselected horizontal space for each respective character to be printed, said printer control means including means responsive to each said printing control signal to actuate said character printing means to print the corresponding character on said print-out medium, means including counter means for storing said count of said coded spacing control signals, and means responsive to said spacing control signals in said storing means for causing said incremental drive means to effect relative horizontal motion between said character printing means and said print-out sheet in a number of increments corresponding to the said count of said stored spacing control signals.

4,005,773

TRANSPORTATION DEVICE HAVING MOVABLE HANDRAILS

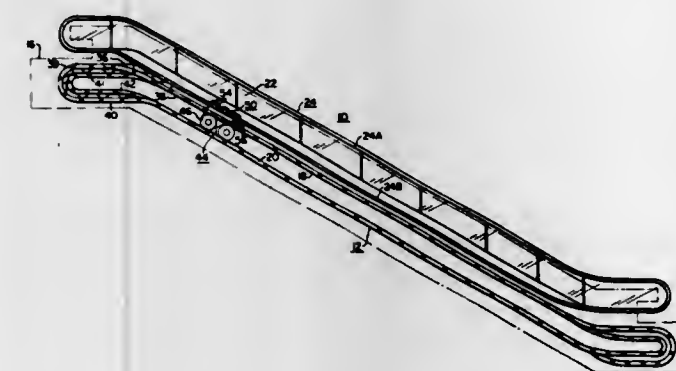
Joseph R. Bouille, Gettysburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1974, Ser. No. 531,429

Int. Cl.³ B66B 9/14

U.S. Cl. 198-335

4 Claims



- Transportation apparatus comprising:
 - an endless handrail having first and second major opposed surfaces,
 - a supporting structure for guiding said handrail in a closed loop,
 - and driving means for moving said handrail about the closed loop defined by said supporting structure,

said driving means including driven shaft members, traction rollers fixed to said driven shaft members, and pressure rollers, said traction and pressure rollers being cooperatively positioned against the first and second surfaces of said handrail, at least certain of said traction rollers including tire and hub portions formed of first and second elastomeric materials, respectively, said first and second elastomeric materials being bonded together without a sharp line of demarcation, wherein the interface between the tire and hub portion is a zone which includes a mixture of said first and second elastomeric materials, said first elastomeric material being disposed in driving contact with said handrail, said first elastomeric material being selected to provide a dynamic coefficient of friction with said handrail of at least 0.6, said second elastomeric material being a relatively harder material than said first elastomeric material, to provide a support therefor.

4,005,774

PEDUNCLED VEGETABLE AND FRUIT POSITIONING DEVICE

Jose Maria Casanova Valero, Murcia, Spain, assignor to Compania Hispano Americana de Construcciones Conserveras S.A. Chacona, Murcia, Spain

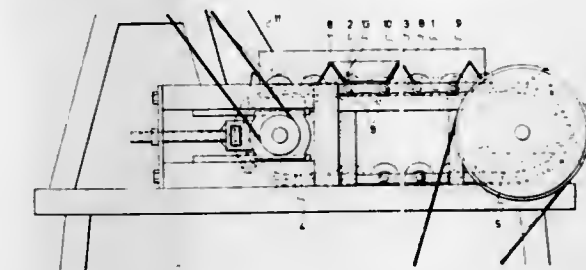
Continuation of Ser. No. 427,853, Dec. 26, 1973, abandoned.

This application July 1, 1975, Ser. No. 592,319

Int. Cl.³ B65G 47/24

U.S. Cl. 198-384

5 Claims



- A device for positioning and transporting peduncled fruits and vegetables, said device comprising:
 - a frame;
 - an endless conveyor mounted for movement along said frame;
 - said conveyor including a plurality of pairs of rollers arranged axially parallel to each other and transverse to the direction of movement of said conveyor;
 - each said pair of rollers comprising a first type roller and a second type roller, at least one of said first and second type rollers having therein means for receiving and retaining the pedicle of a peduncled fruit or vegetable, said means comprising at least one peripheral canal;
 - means operatively connected to said first and second type rollers for rotating said first and second type rollers in the same direction at the same speed, said rotating means comprising a rack fixedly mounted on said frame, and pinions fixed to said rollers and in meshing engagement with said rack;
 - said conveyor having attached thereto and positioned between adjacent pairs of rollers generally upwardly extending dihedral walls;
 - lateral plates positioned at opposite lateral sides of said conveyor and extending in said direction of movement thereof; and
 - means extending radially from said at least one roller of each said pair of rollers for moving said peduncled fruit or vegetable such that said pedicle thereof is positioned in said at least one peripheral canal and such that said pedicle faces downwardly.

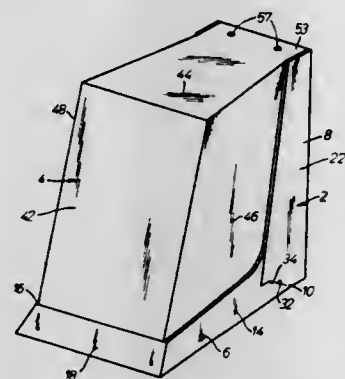
4,005,775

**DISPLAY CASE FOR USE WITH A MERCHANDISE
DISPLAY RACK**Louis John Crockett, Grafton, Wis., assignor to Frank Mayer
& Associates, Inc., Grafton, Wis.

Filed Feb. 24, 1976, Ser. No. 660,867

Int. Cl.² B65D 5/50, 1/34

U.S. Cl. 206-45.18



1. A wristwatch display case comprising: a molded one piece base and a removable cover, said one piece base including a bottom portion, a back portion, a mounting cuff attached to one of said portions and for supporting a wristwatch thereon, a hinge integrally connected to said bottom portion and to said back portion and hingedly connecting said portions for movement between an open position wherein said portions are substantially coplanar, whereby a wristwatch supported on said mounting cuff is readily accessible, and an angular display position wherein said portions are substantially transverse, and means on said base and cover enabling said base and cover to be releasably secured together.

4,005,776

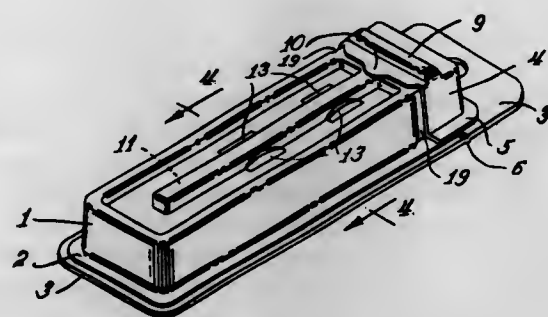
**PACKAGE FOR ORAL THERMOMETER, CATHETER OR
THE LIKE**Leonard Seeley, Palatine, Ill., assignor to Plastofilm Industries,
Inc., Wheaton, Ill.

Filed May 2, 1975, Ser. No. 573,851

Int. Cl.² B65D 85/38, 85/08, 65/16, 5/50

U.S. Cl. 206-306

10 Claims



1. In a package for tubular articles including a thermoformed plastic bubble, means for receiving and retaining a long, thin article comprising a trough formed integral with the bubble and pairs of keepers spaced along the length of said trough for holding the article in said trough, each said pair of keepers comprising two keeper elements formed integral with the bubble at the open side of said trough and extending both inwardly toward the median of said trough and outwardly away from said trough whereby each said pair of keepers restricts the lateral opening of said trough with the maximum restriction being located outwardly from said trough said keepers being thermoformed concurrently with the thermoforming of the plastic bubble and with and upon the same mold.

4,005,777

DOUBLE WRAP PACKAGEDaniel Richard Marantz, Port Washington, N.Y., assignor to
American Can Company, Greenwich, Conn.

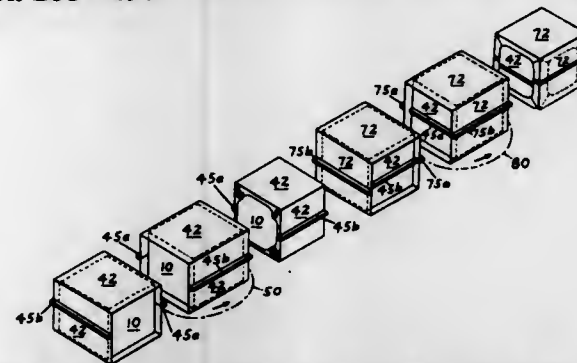
Division of Ser. No. 337,171, March 1, 1973, Pat. No.

3,896,604. This application Apr. 21, 1975, Ser. No. 569,963

Int. Cl.² B65D 75/28, 65/16, 65/00

10 Claims U.S. Cl. 206-497

5 Claims



1. A package comprising a load of rectangular prismatic shape tightly encompassed by two sleeves of heat shrunk plastic film, the sleeves being at right angles to each other, the first sleeve completely covering the top, bottom and a first pair of opposed faces and partially extending over the remaining pair of opposed faces, the second sleeve completely covering the top, bottom and said remaining pair of opposed faces and partially extending over the first pair of opposed faces, and the overlapped portions of the two sleeves being heat laminated together.

4,005,778

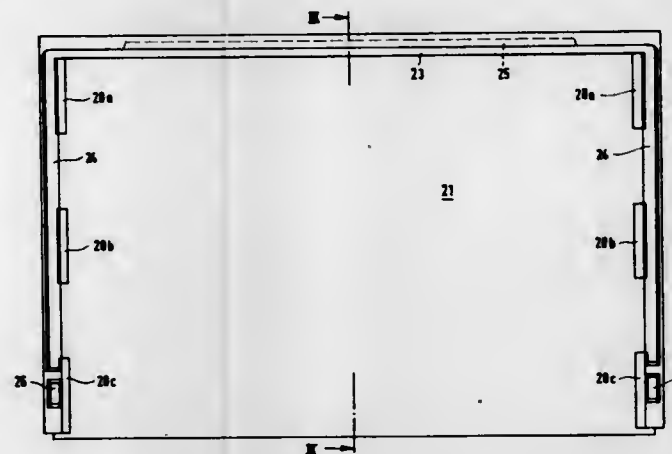
COFFER FOR STORING NUMISMATICAL COINSClaude H. Vuille, Fribourg, and Frederic T. Kropp, Cor-
pataux, both of Switzerland, assignors to Michael Pfeiffer,
Ottoeburn, Switzerland

Filed Mar. 31, 1975, Ser. No. 563,496

Claims priority, application Germany, Apr. 5, 1974,
2416752Int. Cl.² A45C 11/00; B65D 85/62

U.S. Cl. 206-.84

14 Claims



1. A coffer for storing numismatical coins comprising a bottom wall, a cover wall, a set of U-shaped frames adapted for stacking, any preselected number of which can be stacked and releasably secured in fixed relation between said cover and bottom wall such that the legs and crosspiece of the individual U-shaped frames combine to define respectively side and back walls joining said bottom and cover walls, a set of coin holding tablets adapted to slidably engage any one or more of said U-shaped frames between the legs thereof whereby any number of U-shaped frames and tablets can be chosen from said sets of frames and tablets for assembling a coffer compatible with the size of the coin collection to be stored or for adding capacity to the coffer as required, and guide means on the legs of said frames for slidably supporting said tablets.

4,005,779

TIGHTLINE LOGGING SYSTEM

Cecil L. Andrews, P.O. Box 214, Burney, Calif. 96013

Continuation of Ser. No. 472,227, May 22, 1974, abandoned,

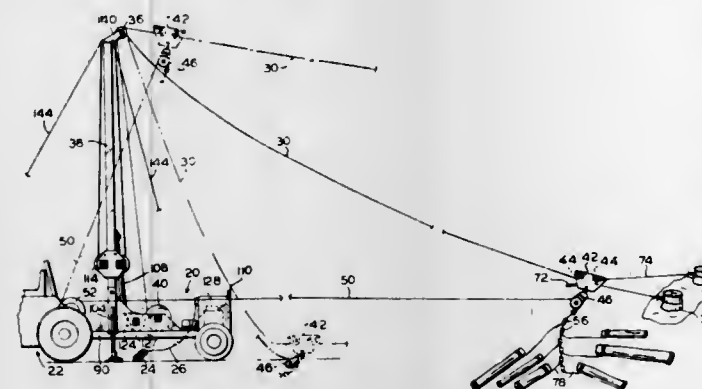
which is a continuation of Ser. No. 321,348, Jan. 15, 1973,

abandoned. This application Feb. 18, 1975, Ser. No. 550,298

Int. Cl.² B66C 17/06

U.S. Cl. 212-7

11 Claims



1. In a tightline logging system, comprising a vehicle slider, a vertical mast mounted on the vehicle slider, a mast sheave on the upper end of the mast, a tightline winch on the vehicle slider, a tightline extending from the winch and over the sheave and outwardly and downwardly to a ground anchor, a carriage on the tightline movable outwardly from the mast by gravity, an open block carried by the carriage, a skidder vehicle having means for detachably coupling said vehicle slider to said skidder vehicle, a mainline winch mounted on the skidder, and a mainline extending through the block from the mainline winch and adapted to be secured to a load and pull the carriage and the load toward the mast, the open block permitting the mainline to be removed laterally therefrom to permit the skidder to haul the load to a position remote from the slider.

4,005,780

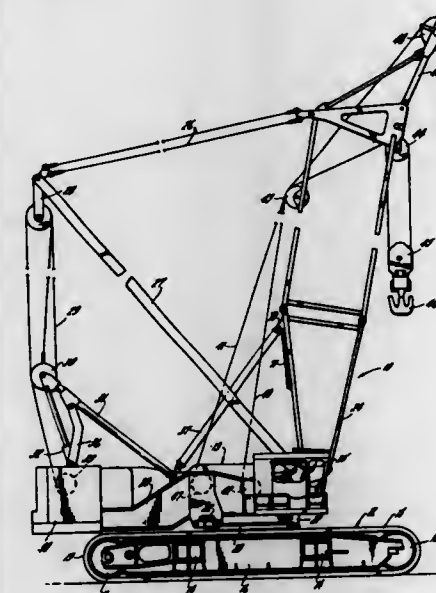
**BOOM STOP AND BACK HITCH COMPENSATING
SYSTEM**James G. Morrow, Sr., and David J. Pech, both of Manitowoc,
Wis., assignors to The Manitowoc Company, Inc., Manito-
woc, Wis.

Filed Nov. 10, 1975, Ser. No. 630,426

Int. Cl.² B66C 23/00

U.S. Cl. 212-8 R

10 Claims



1. A boom stop compensating system for a load lifting device having a power source, a boom mounted for vertically

pivoting movement, boom hoist rigging including a back hitch assembly and a boom hoist line for raising and lowering the boom and boom stop cylinder means for limiting the vertical angle to which the boom may be raised comprising, in combination, pump means for delivering fluid under pressure to the boom stop cylinder, means for sensing changes in tension in the boom hoist rigging, and regulating means interposed between said cylinders and said sensing means for increasing the fluid pressure delivered to said cylinders by said pump means as the tension in said boom hoist rigging decreases.

4,005,781

**DEVICE FOR ROTATING RAILS AND ROLLED
SECTIONS ABOUT THEIR LONGITUDINAL AXES**Rolando Filippeschi, Piombino (Leghorn), Italy, assignor to
Acciaierie Di Piombino S.p.A., Italy

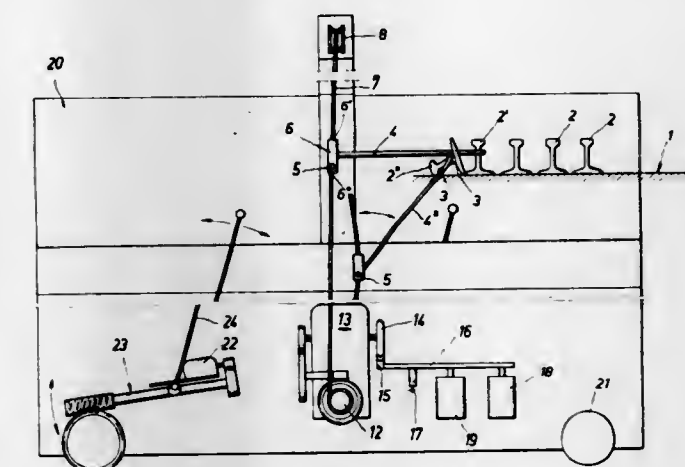
Filed July 29, 1975, Ser. No. 600,182

Claims priority, application Italy, Aug. 1, 1974, 12914/74

Int. Cl.² B65G 47/14, 47/82

U.S. Cl. 214-1 QG

5 Claims



1. A device for rotating rails and rolled sections in general about the longitudinal axis, comprising a fork suitable to be disposed around a section web, a substantially vertically disposed movable support, a bar hinged to said support, said fork being mounted perpendicularly on said bar hinged at its opposed end to the vertically movable support, power means for controlling the translation of said support along its substantially vertical path, a handling rope, two return rollers having their axes of rotation spaced, said support being connected on top and bottom to said handling rope tightened between said two return rollers, an upper and a lower one, and said power means controlling the motion of said rope in either of opposite directions.

4,005,782

PICKERRobert R. Crockett, Westfield, Mass., assignor to Engineered
Metal Products Company, Inc., Chicopee, Mass.

Continuation-in-part of Ser. No. 447,667, March 4, 1974, Pat.

No. 3,921,820. This application Oct. 31, 1975, Ser. No.

627,768

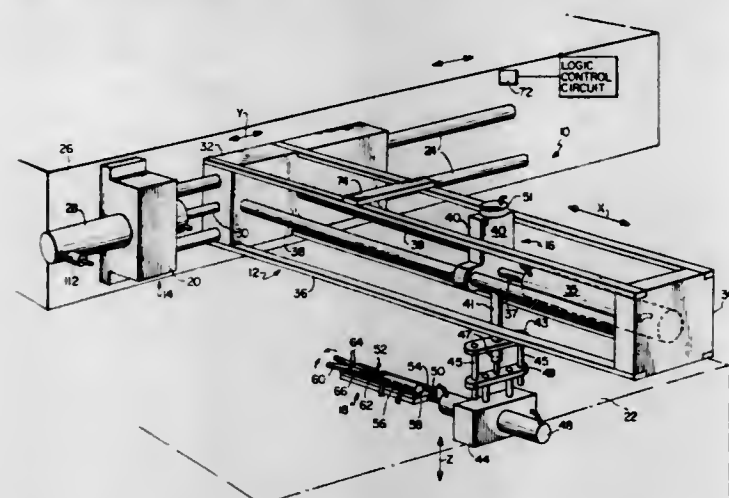
Int. Cl.² B25J 9/00

U.S. Cl. 214-1 BB

9 Claims

1. A picker for gripping and moving an article, comprising a mounting unit; a carrier carried by said mounting unit for movement along a first predetermined path; a first fluid actuated cylinder coupled between said mounting unit and said carrier for moving said carrier in opposite directions along said first predetermined path; carriage means slidably mounted on said carrier for movement along a second predetermined path perpendicular to said first predetermined path; a second fluid actuated cylinder coupled between said carrier and said carriage means for moving said carriage in opposite directions along said second predetermined path; gripping means mounted on said carriage means for movement along a third predetermined path perpendicular to said first and sec-

ond predetermined paths; a third fluid actuated cylinder coupled between said carriage and said gripping means for moving said gripping means in opposite directions along said third predetermined path; said gripping means including a pair of gripping elements for gripping said article, said gripping elements having open and closed positions, operating means for



moving said gripping elements between said open and closed positions, and a fourth fluid actuated cylinder for moving said gripping elements along a fourth predetermined path; and logic circuit means for controlling the operation of said first, second, third and fourth cylinders and said operating means, and rotating means coupled to said carriage means for rotating said gripping means about said third predetermined path.

4,005,783

MULTI-CAVITY MOLD LOADING APPARATUS

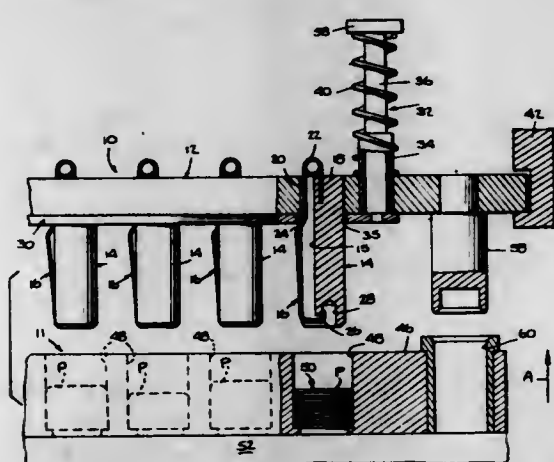
Lambert M. Pasch, Aachen-Nutheim, Germany, assignor to Uniroyal Aktiengesellschaft, Aachen, Germany
Filed Dec. 1, 1975, Ser. No. 636,782

Claims priority, application Germany, Feb. 14, 1975, 2506170

Int. Cl.³ B65G 59/02

U.S. Cl. 214-1 BB

10 Claims



1. Apparatus for inserting a plurality of molding inserts into respective mold cavities simultaneously, said apparatus comprising: insert-holding means for removably holding a plurality of generally annular inserts in spaced apart relation corresponding to the relative spacing of a plurality of cavities of a multi-cavity mold, said insert-holding means including resilient projection means for frictionally securing respective ones of said annular inserts from the interior thereof; and insert-stripping means operatively associated with said projection means and inserts for stripping the latter simultaneously from their associated projection means to effect the simultaneous insertion of said inserts into respective mold cavities of the multi cavity-mold, each of said projection means including a respective spring means for resiliently engaging the interior of an associated one of said inserts, each of said projection

means including a respective slotted finger in which is movable a respective one of said spring means generally laterally of the direction said inserts are stripped therefrom and from which the latter said spring means extends at least in part to engage the interior of a respective one of said inserts.

4,005,784

TRANSPORT VEHICLE

Leslie Henry Wilson, 28 Gould Street, Frankston, Victoria, Australia

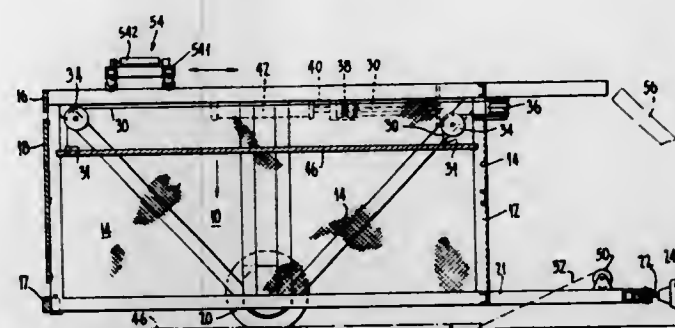
Filed Feb. 26, 1975, Ser. No. 553,163

Claims priority, application Australia, Feb. 28, 1974, 6767/74

Int. Cl.³ B65G 57/32

U.S. Cl. 214-6 B

5 Claims



1. A transport vehicle for hay bales or other articles comprising a rigid body of rectangular shape supported on transport wheels, said body comprising spaced side walls and a forward end wall and being open at its rear end and also at the bottom, movable abutment means operable to extend across said open rear end of the body, a vertically movable floor within the body, power operated raising and lowering means therefor, means detachably connecting the floor to said raising and lowering means, and a substantially longitudinally extending conveyor supported in a laterally offset position adjacent the top of one of the side walls, thereby to facilitate distribution of the articles over the floor without substantially obstructing the interior space of the body, whereby the floor, after being raised to a position adjacent said conveyor, may be progressively lowered as successive layers of articles are stacked thereon and whereby, after the vehicle has been subsequently moved to a discharge position, the floor may be lowered until it rests on the ground or other supporting surface and may then be detached from said raising and lowering means, thereby to enable the vehicle to be moved forwardly leaving the floor and stack on the supporting surface behind the body, and wherein the vehicle includes means operable to pull the floor forwardly over the supporting surface to enable it to be re-attached to said raising and lowering means whereby, when said movable abutment means is so arranged as to extend across the rear end of the body, the stack of articles is progressively pushed, by said abutment means, over the rear end of the floor and onto the said supporting surface.

4,005,785

ELEVATOR MECHANISM FOR MULTIPLE LEVEL MECHANICAL CAR PARKING STRUCTURE

Carlisle F. Managh, 522 Arbramar Ave., Pacific Palisades, Calif. 90272

Filed Aug. 11, 1975, Ser. No. 603,337

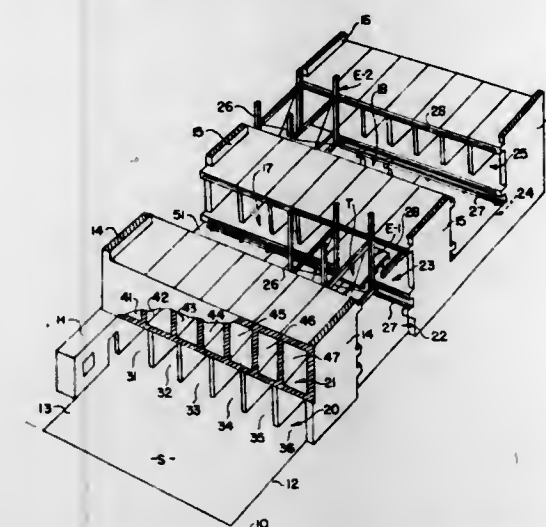
Int. Cl.³ B65G 47/00

U.S. Cl. 214-16.1 EB

3 Claims

1. In a multiple story mechanical car parking system, the combination of: a multiple story car storage structure having a crane-way adjacent the structure and extending transversely across a face of the structure and extending vertically from the ground floor level upwardly, said storage structure having on its stories above the ground level thereof rows of adjacent storage stalls opening to the crane-way; an elevator frame

mounted in the frameway entirely above the first floor of the structure and extending upwardly toward the top of the structure; elongated rail means extending along the crane-way above the ground story of the structure for supporting the elevator frame above the ground storage; and plurality of bearing units mounting the frame on the rail means to permit reciprocal horizontal movement of the frame along the crane-way, each of said bearing units comprising dual pivotally mounted angularly displaced endless idler chain assemblies in spaced line engagement with said rail means; a drive motor



coupled to the frame independent of said bearing units for imparting such reciprocal horizontal movement of the frame along the crane-way; an elevator platform mounted in the frame for vertical reciprocal movement within the frame; motor driven winch means mechanically coupled to the platform for imparting such vertical reciprocal movement to the platform; at least one vertical elongated screw member mounted in said frame; and auxiliary drive means independent of said motor driven winch means coupling said platform to the screw member for imparting vertical reciprocal movement to the platform within the frame.

4,005,786

MECHANICAL LOAD HANDLING DEVICE FOR STOREHOUSES

Jury Abramovich Adelson, prospekt Karla Marxa, 21, kv. 57, and Oleg Antonovich Tamkovich, Moskovsky prospekt, 153, kv. 141, both of Leningrad, U.S.S.R.

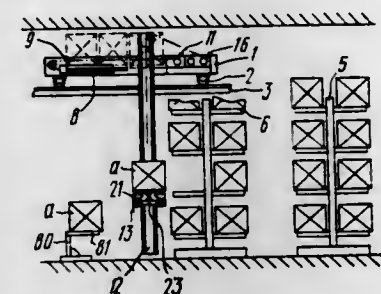
Filed Mar. 5, 1975, Ser. No. 555,618

Claims priority, application U.S.S.R., Mar. 6, 1974, 2003796

Int. Cl.³ B65G 47/00

U.S. Cl. 214-16.4 A

8 Claims



1. A mechanical load handling device for storehouses, for keeping loads on shelves (5) with cantilevered fork racks (6), for taking out the loads from the shelves and for storing them thereon, the device comprising: a frame (1, 47) for horizontal traversing across the shelves; columns (12, 48) made fast on said frame on the opposite lateral faces of the shelves at a distance thereto; transfer means (13, 49) mounted on said columns transversely therealong and incorporating: a cross-piece (17, 50) disposed between said columns along the

shelves and made up by two beams (18, 27, 36, 45, 60, 76) arranged parallel to each other in a substantially horizontal plane and so interconnected at their ends as to form a through gap therebetween; a plurality of load supporting members (21, 32, 38, 62, 74) spaced somewhat apart from one another on said beams throughout the length thereof to interact with the fork racks of the shelves in the course of taking out the loads; a carriage (23, 29, 34, 42, 52) mounting a platform (25, 30, 33, 40, 71) for selective taking out of the loads from and storing them on the fork racks; and guideways (22, 28, 35, 44, 51) adjacent to said cross-piece and serving for said carriage to traverse therealong, said guideways being so mounted that said carriage is traversable lengthwise of said gap.

4,005,787

APPARATUS AND METHOD FOR UNLOADING DRIVERLESS VEHICLES

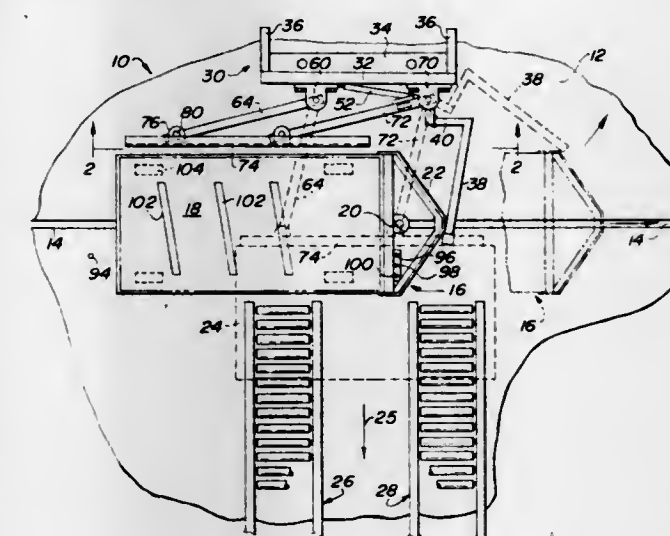
Craig F. Sleep, Bangor, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed July 3, 1975, Ser. No. 592,953

Int. Cl.³ B65G 67/24

U.S. Cl. 214-58

14 Claims



1. Apparatus for unloading driverless vehicles while they are moving and for using the propulsion force of the vehicle comprising a vertically disposed support adapted for installation alongside a guided path for driverless vehicles, a cantilever arm pivoted at one end to said support, said arm having an extended position projecting generally horizontally at an elevation for contact with a front end portion of a vehicle so that the vehicle pushes the cantilever arm out of its way thereby pivoting the cantilever arm with respect to said support to a retracted position of said arm, a sweep arm supported by said support at an elevation so that it can move from a retracted position to an extended position and push a load off the deck of a vehicle, and means connecting said cantilever arm to said sweep arm so that the sweep arm moves to its extended position when said cantilever arm is moved to its retracted position by the force imparted to the cantilever arm by the vehicle whereby a separate motive force for the sweep arm is unnecessary.

4,005,788

VEHICULAR DELIVERY RAMP APPARATUS

Roger D. Ratliff, Irving, Tex., assignor to PepsiCo Inc., Purchase, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,400

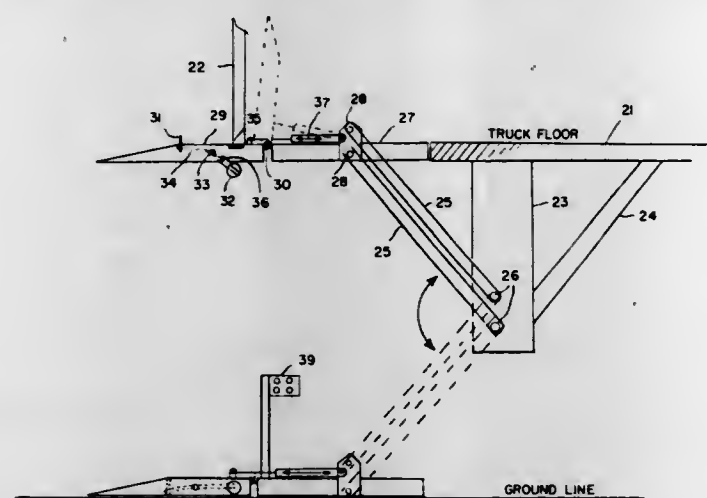
Int. Cl.³ B60P 1/48

U.S. Cl. 214-77 P

5 Claims

1. In a ramp loading apparatus for raising or lowering cargo to or from a truck floor bed by a hydraulically controlled ramp loader, the improvement which comprises a cargo restraint means including a gate disposed in the surface of said loader and capable of vertical extension relative to said surface; an integral, magnetic counterbalance, said gate and said counter-

balance being pivotally connected such that the spatial disposition of the counterbalance causes an opposite spatial disposition of the gate; electromagnetic means spatially disposed to effect an electromagnetic field on said counterbalance when



said gate assumes a recessed mode in said surface; and means for actuating said electromagnetic means, the means for said raising and lowering being de-energized when said electromagnetic means engages said counterbalance to maintain said gate in a recessed mode in said surface.

4,005,789

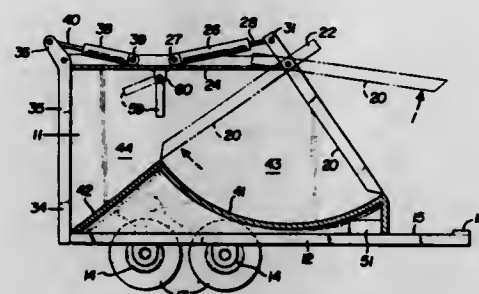
TRASH COMPACTOR TRAILER

Floyd R. Gladwin, Grosse Ile, Mich., and Robert B. Packard, Toledo, Ohio, assignors to Gladwin Corporation, Southgate, Mich.

Filed Aug. 27, 1975, Ser. No. 608,181
Int. Cl.² B65F 3/00

U.S. Cl. 214-82

2 Claims



1. In a trash compactor comprising a box-like body mounted upon wheels for forming a trailer for towing behind a vehicle, said body including a roof, a floor, and first and second open ends, first and second doors closing each of said open ends, respectively, each door being swingably mounted at its upper end to said roof for pivoting about a horizontal axis, and actuatable means for swinging said doors and for holding them in closed positions, the improvement comprising:

the first end of said body being sloped downwardly and forwardly at an acute angle and said first door normally being positioned for closing the open first end;
said first door actuated for swinging outwardly to open said first end of said body;
said second door actuated for swinging outwardly to open the second end of said body;
said floor being arcuately shaped from said body open first end to a location intermediate said body ends to define a loading compartment for trash interiorly of said body;
said floor being thereafter sloped downwardly to said body open second end to define a trash storage compartment interiorly of said body; and
said first door also actuated for swinging through said trash loading compartment to sweep and compact trash gener-

ally upwardly against said roof, said compacted trash thereafter falling into said trash storage compartment;
said arcuate floor shape corresponding to the arcuate path of movement of said first door interiorly of said trash loading compartment;
an upwardly extending member formed on each of the upper corners of the door, and each having a fluid operated cylinder having a piston rod connected to each of said frame members and each cylinder being pivotally connected within a channel extending along the upper side edges of the body, with each channel forming an upper frame member for the body at each side of the body, and each of said upwardly extending members being pivotally connected to its adjacent channel portion; wherein forces of moving the doors and for compacting the trash are transmitted through and absorbed by the channels; and
deflector means suspended from said roof interiorly of said body to preclude compacted trash from returning to said trash loading compartment.

4,005,790

PAVING MATERIAL CONVEYOR SYSTEM

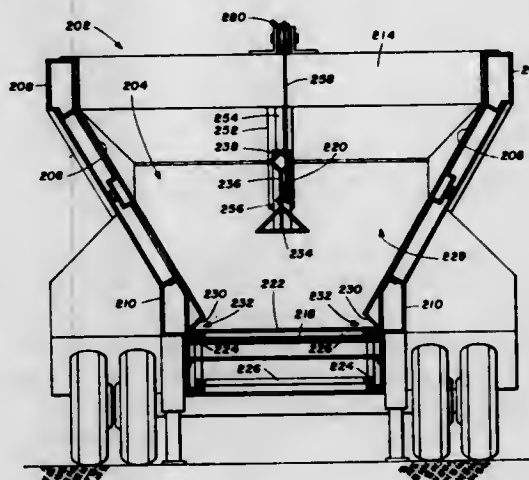
John H. Holland, Norman, Okla., assignor to Arkansas Rock and Gravel Co., Mufreesboro, Ark.

Continuation-in-part of Ser. No. 852,345, Aug. 22, 1969, Pat. No. 3,647,096. This application Aug. 20, 1971, Ser. No. 173,423

The portion of the term of this patent subsequent to Mar. 7, 1989, has been disclaimed.
Int. Cl.² B60P 1/38

U.S. Cl. 214-83.36

8 Claims



1. The system for delivering a batch of particulate material at a controlled rate which comprises:
conveyor means for transporting particulate material from a receiving zone to a delivery end spaced from the receiving zone,

hopper means disposed above the receiving zone of the conveyor means and comprising a pair of side walls disposed along the sides of the conveyor means and an end wall disposed across the end of the conveyor means remote from the delivery end,
the side walls extending beyond the receiving zone toward the delivery end of the conveyor,
the hopper means having baffle means extending through the receiving zone parallel to and spaced above the conveyor means,
said baffle means leaving a substantial portion of the conveyor means exposed vertically to the material above the baffle means,
said baffle means having surfaces which diverge downwardly from an apex for establishing increased horizontal pressures in a horizontal tube tending to cause bridging of the material in the zone and an upwardly extending web for supporting the downwardly diverging surfaces,

said baffle means further comprising a stiffening web extending substantially vertically from the apex and along substantially the entire length of the baffle means whereby the baffle means is adapted to be supported solely at its ends,
the hopper means having an open delivery end to at least the height of the horizontal zone whereby the particulate material will tend to shear longitudinally along the length of the receiving zone in said horizontal zone as a result of the bridging tendencies of the material and will be delivered from the receiving zone to the delivery end at a volumetric rate determined by the cross-sectional area of the hopper means below the horizontal zone and the speed of the conveyor means.

4,005,791

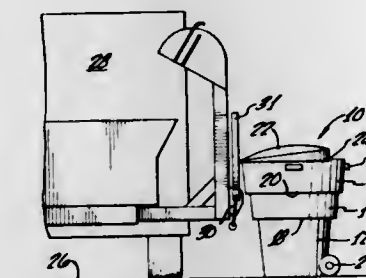
REFUSE CONTAINER

Marcel G. Stragier, and Theodore J. Peterson, both of Scottsdale, Ariz., assignors to Government Innovators, Phoenix, Ariz.

Filed Mar. 17, 1975, Ser. No. 558,669
Int. Cl.² B65F 3/02

U.S. Cl. 214-302

8 Claims



5. A flexible refuse container in combination with a refuse collection vehicle having an arm movable from a lowered position to a raised position for engaging, lifting, and inverting the container to dump its contents into the vehicle, said container comprising:

a bottom;
a lower side wall portion connected to said bottom containing refuse;
a flexible middle side wall portion connected on the upper end of said lower portion;
a first generally horizontal shoulder integrally connecting said lower and middle portion;
an upper side wall portion attached to the upper end of said middle portion; and
a second generally horizontal shoulder integrally connecting said middle and upper portions, said middle portion receiving said arm, said first and second shoulder preventing deflection in said lower and upper portions when said arm engages said middle portion during operation of said system.

4,005,792

AUTOMATIC UNLOADING APPARATUS

Charles Schulman, Paris, and Roger M. Petit, Clichy, both of France, assignors to I E R Impression Enregistrement des Resultats S.A., Paris, France

Filed Oct. 16, 1975, Ser. No. 623,255

Claims priority, application France, Oct. 22, 1974, 74.35392

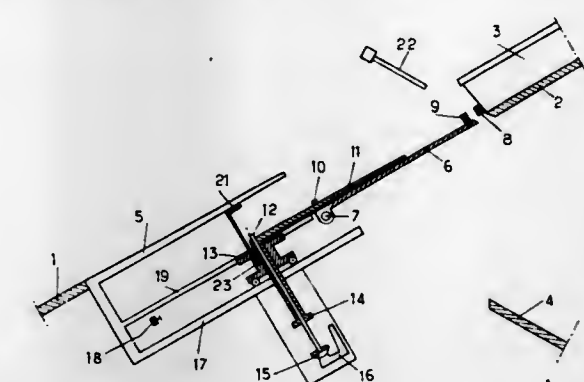
Int. Cl.² B65G 65/04

U.S. Cl. 214-309

12 Claims

1. Apparatus for automatically unloading and delivering the contents, such as a plurality of mail envelopes, from a container, comprising:
means for supplying a filled container;
said container having aperture means adjacent the bottom and one end thereof;

blade means movable parallel to the bottom of said container and being insertable through said aperture means to pass into said container;
finger means slidably mounted in said blade means and movable substantially perpendicularly to said blade means;
said finger means being insertable through said aperture means to pass into said container when said blade means is fully disposed within said container; and



means for displacing said blade means and said finger means relatively to said container to unload and deliver the contents of said container;
said displacing means including means for initially moving said finger means through said blade means and for subsequently moving said blade means away from said container bottom to lift the contents from said container.

4,005,793

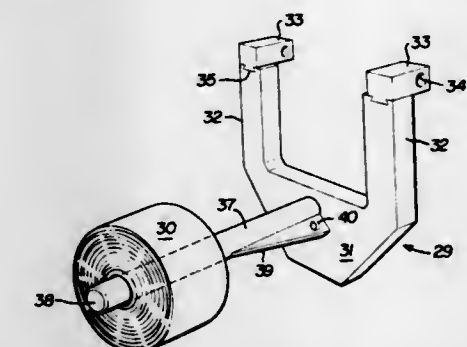
RAM FOR LIFT TRUCK

Robert L. Smith, Westland, Mich., assignor to Kasle Steel Corporation, Detroit, Mich.

Filed Oct. 10, 1975, Ser. No. 621,438
Int. Cl.² B66F 9/12

U.S. Cl. 214-620

7 Claims



1. In a lift truck of the type having a cab, a pair of vertically driven, parallel, spaced apart hangers mounted in front of the cab and a generally rectangular carriage mounted on the front of the hangers to move therewith, the improvement of a ram for engaging and lifting coiled stock, spools or the like comprising:

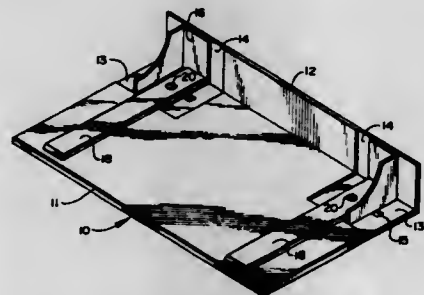
a plate having a generally U-shaped configuration including a horizontal base and two upwardly extending spaced apart legs;
said legs for mounting said ram on said rectangular carriage frame; and
an elongated bar extending from said horizontal plate base outwardly away from said rectangular frame for engaging the center of coiled stock;
said legs of said ram plate being spaced apart horizontally to be mounted outwardly of said hangers so that upon engaging stock and lifting the stock by vertically driving said hangers, the stock may be observed from the cab without the legs of said ram obstructing the view of said stock therefrom, and an extension block for each plate leg, each extension block having a hole journaled there-

through to receive the upper horizontal carriage frame member;
each extension block and its corresponding plate leg including a tongue and groove so that after suspending the extension blocks from said carriage frame, the U-shaped plate and ram may be lifted and slid onto the extension blocks with the plate legs and extension blocks mechanically interlocked by said tongues and grooves.

4,005,794

ADJUSTABLE PAPER GUIDE FOR COPYING MACHINES
Robert H. Lundquist, 172 E. 4635 North, Provo, Utah 84601
Filed Dec. 10, 1975, Ser. No. 639,355
Int. Cl.³ B65H 1/00

U.S. Cl. 271-161



1. A paper tray assembly comprising:
 - a. a flat base having a backwall extending upwardly at right angles to the base;
 - b. rectangular recesses in the corners of the base adjacent the backwall, each recess containing a longitudinal slot therein;
 - c. coinciding recesses in the backwall adjacent the rectangular base recesses;
 - d. a pair of longitudinally adjustable paper guides slidably engaged in said recesses having a floor, rearwall and end wall portions, said floor portion containing an aperture which is in alignment with the longitudinal slot, said paper guides being further characterized in that the endwalls are on the outside portion of the paper guide relative to the ends of the base and backwall;
 - e. a pair of guide strips extending transversely across the flat base, said guide strips having an aperture in one end and being adapted to fit over the floor of the paper guides in such a manner that said aperture is in alignment with the paper guide aperture and longitudinal slot;
 - f. fastening means extending through said apertures and longitudinal slots adapted to secure said paper guides and guide strips in any desired position along the longitudinal slots.

4,005,795

COLLAPSIBLE CONTAINER

Jorgen Mikkelsen, Wynberg, Cape Province; David Rennie Kingsley Groves, Constantia, Cape Province, and Peter John Herbert, Bishopscourt, Cape Province, all of South Africa, assignors to Plastipak (Proprietary) Limited, Cape Town, Cape Province, South Africa

Filed Oct. 14, 1975, Ser. No. 622,198

Claims priority, application South Africa, Oct. 18, 1974, 74/6647

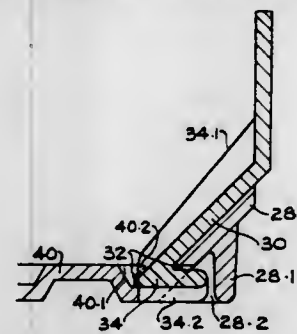
Int. Cl.³ B65D 7/24, 7/42

U.S. Cl. 220-7

15 Claims

1. A container blank comprising a base panel; wall panels joined to the base panel and each having marginal edge portions at an angle to the remainder of the respective panel for overlapping edge portions of adjacent wall panels, adjacent edge portions having free ends which point in opposite directions when the blank is erected to form a container; and a lid panel joined to one of the wall panels along an edge thereof remote from its junction with the base panel, wherein the

junctions between the panels are formed by hinges which are integral with the panels, wherein interengageable fingers and openings are provided for releasably securing the walls in their



4,005,796

MASTER CYLINDERS FOR HYDRAULIC AUTOMOTIVE BRAKE SYSTEMS

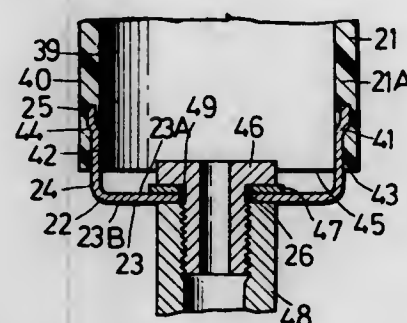
Akiyoshi Hirai, and Hiroshi Uemura, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Jan. 24, 1975, Ser. No. 543,775

Claims priority, application Japan, Feb. 14, 1974, 49-17793

Int. Cl.³ B65D 25/00; F16L 5/00

U.S. Cl. 220-85 R

7 Claims



2. In combination with a master cylinder for a hydraulic automotive brake system, wherein a horizontally disposed cylinder having an internally threaded upright tubular extension formed thereon and a vertically disposed cylindrical brake fluid reservoir made of plastic material, and positioned above said cylinder are connected with each other in a fluid-tight but mutually communicative manner by an axially bored bolt extending into said tubular extension through an annular washer associated with said bolt and a circular opening provided at the bottom of said reservoir;

the improvement which comprises:

- a metal connecting member having an outer peripheral edge secured to said bottom of said reservoir and an inner peripheral edge defining a circular bore having a diameter which is smaller than that of said circular opening of said reservoir, said circular bore of said connecting member being coaxial with said circular opening of said reservoir, said tubular extension, said bolt and said washer, said inner peripheral edge of said connecting member being interposed between said tubular extension and said washer in a fluid-tight manner, said bolt extending through said circular hole of said connecting member, said diameter of said circular hole being larger than the inner diameter of said tubular extension but smaller than the outer diameter thereof;
- said diameter of said circular opening of said reservoir being larger than the outer diameter of any of said tubular extension, said bolt and said washer;
- wherein said reservoir comprises a cylindrical side wall having a cylindrical inner surface defining an inner diameter which is equal to said diameter of said circular opening

ing, and a cylindrical outer surface encircling said inner surface; and said connecting member comprises a bowl-shaped structure made of metal having a wall thickness which is smaller than the thickness of said cylindrical side wall of said reservoir, said outer peripheral edge of said connecting member being embedded in said cylindrical side wall of said reservoir at the lower end of said cylindrical side wall, said reservoir and said bowl-shaped structure being a product of an integral molding operation.

4,005,797

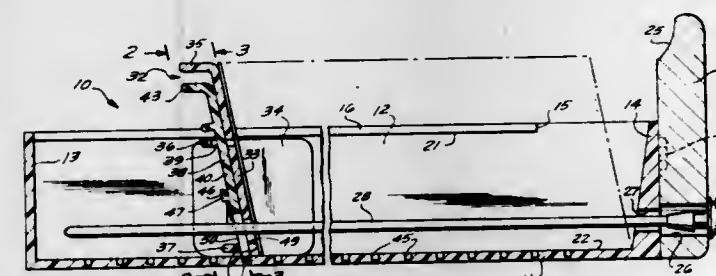
CARD FILE DRAWER FOR APERTURED INDEX CARDS
Harold M. Ingram, Williamsport, Pa., assignor to Bro-Dart Inc., Williamsport, Pa.

Filed Jan. 28, 1976, Ser. No. 653,041

Int. Cl.³ B65D 01/24; B42F 17/16

U.S. Cl. 220-22.5

6 Claims



1. A card file drawer comprising:
 - a. an elongated drawer body having a bottom wall, two side walls, a back wall, and a front wall, the top of the drawer being open,
 - b. a rib extending along the upper edge of each side wall, said ribs projecting inwardly toward each other and being spaced apart a distance equal to the length of the cards with which the drawer is used,
 - c. a support within said drawer body for supporting the rear end of a group of cards in the drawer, said support including a member extending crosswise of the drawer body and an end piece at each end of said member, each end piece being a plate-like element having parallel upper and lower edges, the distance between the outer faces of said end pieces being equal to the distance between the inner faces of said drawer side walls, and the distance between the upper and lower edges of each end piece being equal to the distance between each rib and the drawer bottom wall, whereby said upper and lower edges are slidably and non-rotatably arranged against said rib and bottom wall, respectively, and
 - d. aligned holes in the drawer front wall and in said support, and a rod passing through both of said holes, said rod also passing through aligned holes in any cards which may be in the drawer so as to prevent removal of the cards from the drawer.

4,005,798

LID MOUNT

Norman C. Minsky, West Bend, Wis., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Sept. 19, 1975, Ser. No. 615,014

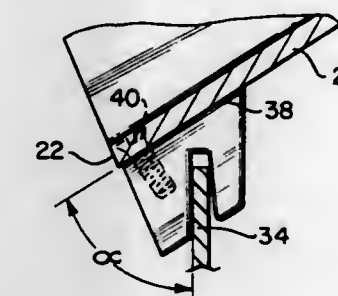
Int. Cl.³ B65D 25/00

U.S. Cl. 220-85 CH

4 Claims

1. A cooking utensil comprising a pan and cover therefor, wherein the improvement comprises:
 - an elongated block having a first surface in contact with said cover along a peripheral edge thereof, said block having a second surface comprising the opposite side of the block relative to said just surface, said second surface containing an open-ended slot extending across the longitudinal extent thereof for engaging a portion of the rim of

said pan, the lateral extent of said slot disposed in said block at an acute angle with respect to said first surface to



orient said cover in an inclined position above said pan when said block is in engagement with the rim of said pan.

4,005,799

CONTAINER AND CLOSURE WITH SEALING THREADS

Livinus E. M. J. Mannaerts, Kapellen, Belgium, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Continuation of Ser. No. 425,821, Dec. 18, 1973, abandoned.
This application Dec. 11, 1975, Ser. No. 639,978

Claims priority, application Germany, Dec. 18, 1972, 2261982

Int. Cl.³ B65D 41/04

U.S. Cl. 220-288

6 Claims



1. A container with a closure, said container comprising a cylindrical neck having internal screw threads, a closure plug having external screw threads, each of said external threads including an inclined face, a horizontal face and a cylindrical core face connecting said inclined face and said horizontal face, said plug being screwable with its external screw threads into or out of respectively the internal screw threads of the neck, a sealing ring between said neck and an outer end of the plug, said internal and external screw threads being in direct engagement over one part of the horizontal face and having play between the internal screw threads and the inclined face, the core face and the other part of the horizontal face of the external screw threads, said external screw threads near an inner end of the plug being provided with a first radially directed flexible bar which extends over the full width of faces which have play with the internal screw threads so as to completely seal the play.

4,005,800

PLASTIC CONTAINER HINGE AND LATCH

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Division of Ser. No. 288,707, Sept. 13, 1972, Pat. No.

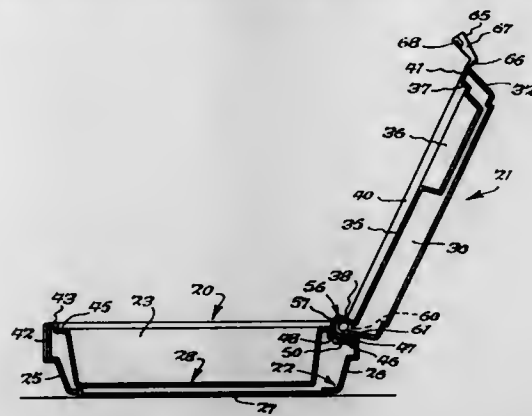
3,902,628. This application Jan. 29, 1975, Ser. No. 545,142
Int. Cl.³ B65D 51/04, 25/18

U.S. Cl. 220-337

6 Claims

1. A container comprising a body portion being of double wall thermoplastic material having a pair of hinge pin receiv-

ing means, each said hinge pin receiving means being integrally formed with said body portion into a hollow journal bearing, and a trough formation being integrally formed with said body and including a lower channel extending between said hinge pin receiving means in a continuous manner, a cover portion of thermoplastic material, said cover portion being of double wall construction and having formed as an integral part thereof a pair of hinge pin journals, and a joint



formation extending between said hinge pin journals, said joint formation including a portion received in said trough formation with said hinge pin journals being correspondingly received in said journal bearings whereby said joint formation of said cover portion co-acts with said lower channel of said trough formation to provide a hinge joint, said hinge joint being closed in all open positions of said cover portion as viewed from within said open positions.

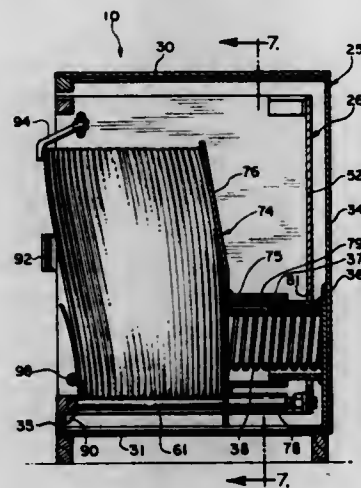
4,005,801

BAG STORING AND DISPENSING APPARATUS
Malcolm E. Musser, P.O. Box 386, Jackson Center, Ohio 45334

Filed Jan. 14, 1976, Ser. No. 648,891
Int. Cl.³ B65H 1/08

U.S. Cl. 221-56

17 Claims



1. Apparatus for storing and successively dispensing paper bags in opened condition, wherein each bag includes opposite side walls and opposite end walls connected by a bottom wall and being foldable between an open condition and a collapsed condition with the end walls folded between the side walls and the bottom wall folded against one of the side walls, said apparatus comprising a box-like structure defining a bag storing chamber and having a rectangular front opening and means for supporting a stack of substantially vertically arranged collapsed bags in said chamber with the upper end portion of said one side wall of the front-most bag in the stack exposed for manual gripping, restraining means adjacent the front opening for normally restraining the stack of bags in the chamber and for restraining the other side wall of the front-most bag when said one side wall is pulled from said restrain-

ing means, a transversely extending opening bar across the front opening and near the bottom thereof against which the entire lower half of the bottom wall of the bag engages, said opening bar being positioned below the restraining means and spaced inward of the restraining means such that the upper portion of the bags extends forward through the opening, a pusher member supported within said structure and engaging the back of the stack of bags, and means resiliently biasing said pusher member toward the front opening to continually maintain the front-most bag against the opening bar and the restraining means, whereby pulling upward on the one side wall of the bag causes unfolding of the bottom wall and opening of the bag as the bag is removed from the stack.

4,005,802

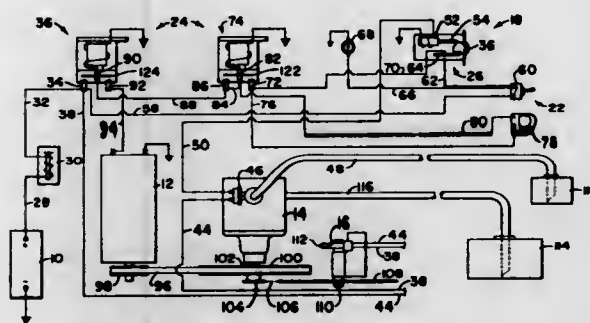
APPARATUS FOR TRANSFERRING AND METERING FLUIDS

Robert Eugene Fox, Minburn, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 7, 1975, Ser. No. 629,972
Int. Cl.³ B67D 5/30

U.S. Cl. 222-14

7 Claims



1. Apparatus for conveying and metering a desired volume of fluid from a fluid supply to a fluid deposit comprising: an electrical source; a motor; a fluid displacing pump driven by the motor and having an inlet in communication with the fluid supply and an outlet in communication with the fluid deposit, means responsive to pump action, including switch means effective to close in a predetermined relationship to pump fluid displacement; counter means, including for indicating a desired fluid displacement, said counter means being responsive to closing of the switch means for indicating the cumulative volume displaced by the pump; relay means including a first and second relay, said second relay responsive to activation of the first relay to connect the electrical source with the motor, source control means including a manually activated power switch and start means, said power switch movable between a first activated and second deactivated position, and when in the first position effective to connect the electrical source and start means, and said start means responsive to manual activation and effective when activated and when the power switch is in the activated position to connect the source with said first relay; and reset means responsive to indicated volume displaced and effective to disconnect the first relay and electrical source when said volume displaced is equivalent to the indicated desired volume displacement whereby said second relay is deactivated to thereby disconnect the electrical source and motor.

4,005,803

CHEMICAL CONCENTRATE INJECTION SYSTEM
Brian Elwood Kent, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

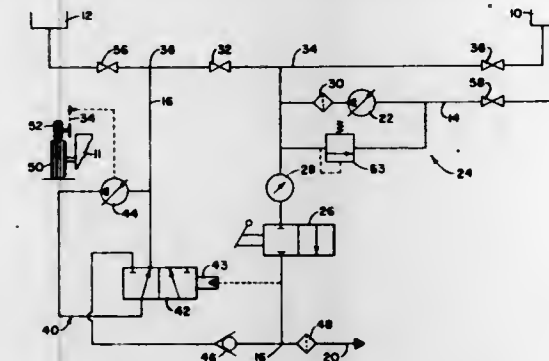
Filed Aug. 22, 1975, Ser. No. 606,522
Int. Cl.³ A01C 15/00

U.S. Cl. 222-57

6 Claims

1. An apparatus for use in spraying fluids from a vehicle comprising: a diluent supply supported on the vehicle; at least one container for a concentrate formulation supported on the vehicle; a diluent line connected to said diluent supply;

means in said diluent line for creating a pressure in said diluent line; a concentrate line connected between said container and said diluent line downstream of said pressure creating means; variable flow means in said concentrate line for creating a variable flow rate therein having a pressure greater than the pressure in said diluent line; means coupled with said variable flow means for causing said flow means to vary the concentrate flow rate in proportion to the speed of



the vehicle; diverting means in said concentrate line between the variable flow means and diluent line for directing all concentrate flow to either the diluent line or variable flow means; and control means between the diluent line and diverting means including pressure sensing means for causing the diverting means to divert the concentrate flow to the variable flow means when the diluent line pressure is not greater than a specific value.

4,005,804

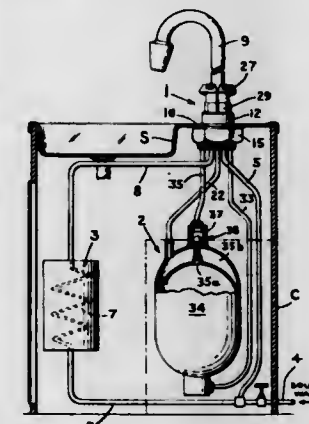
MULTI-CONTROL VALVE DISPENSING HEAD AND HEATED AND CHILLED WATER DISPENSING SYSTEM UTILIZING THE SAME

Richard C. Dreihelbs, Fair Lawn, N.J., assignor to Emerson Electric Co. (H & H Thermostats Div.), St. Louis, Mo.

Filed Dec. 15, 1975, Ser. No. 640,408
Int. Cl.³ B67D 5/60

U.S. Cl. 222-144.5

23 Claims



1. A dispensing head for use in a heated fluid and chilled fluid dispensing system.
a. a valve body having connecting means for attaching the dispensing head at a point generally remote from the dispensing system,
b. said valve body having a common discharge spout for heated water and chilled water delivered thereto,
c. a first normally closed control valve assembly and a second normally closed control valve assembly disposed in said valve body in spaced relation to each other and respectively to the discharge spout,
d. a first cross-over passage in said valve body in communication with the discharge spout for delivering heated fluid thereto to be dispensed,
e. said first control valve assembly operatively associated with the first cross-over passage to control the flow of

heated fluid thereto from said dispensing system when said first control valve assembly is actuated from closed to open position and to terminate dispensing of said heated fluid when actuated from open to closed position,
f. a second cross-over passage in said valve body connecting the second control valve assembly to the discharge spout for delivering chilled water thereto to be dispensed,
g. said second control valve assembly operatively associated with the second cross-over passage to control the flow of chilled fluid thereto from said dispensing system when said second control valve assembly is actuated from closed to open position and to terminate dispensing of said chilled water when actuated from open to closed position, and
h. check valve means connected to the valve body operative to prevent unwanted intermixing of heated water and chilled water during the delivery of chilled water and mixtures thereof.

4,005,805

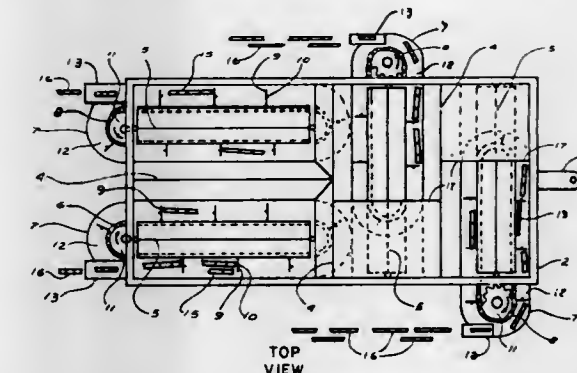
SINGLE OR MULTIPLE FURROW SUGAR CANE PLANTING MACHINE

Juan Sebastian Faxas, P.O. Box 1122, Clewiston, Fla. 33440
Filed Aug. 19, 1975, Ser. No. 600,610

Int. Cl.³ A01C 15/00

U.S. Cl. 222-178

6 Claims



1. A seed cane planter comprising a wheeled frame, having an upper container for canes to be planted and a lower compartment containing a plurality of conveyors, each of said conveyors being mounted for movement between a first position within the outline of the frame and second position extending from a feed end below the container to a discharge end beyond the frame and above an adjacent furrow, and spaced bars at the bottom of said container at the feed ends of said conveyors in the second position, said bars being aligned with the conveyors, so that the seed cane falls on each of said conveyors with their axes parallel to the axis of the conveyor.

4,005,806

APPARATUS FOR INJECTION OF HYGROSCOPIC POWDERS INTO A HIGH PRESSURE LIQUID STREAM
Bruce B. Baldwin, Grand Rapids, Mich., assignor to Belknap Corporation, Grand Rapids, Mich.

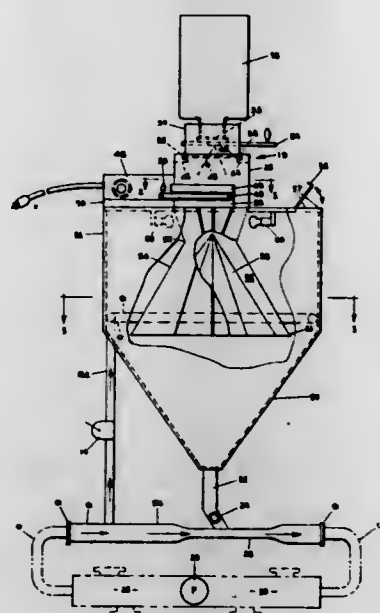
Filed Nov. 3, 1975, Ser. No. 627,970
Int. Cl.³ B67D 5/54

U.S. Cl. 222-193

16 Claims

1. An apparatus for injecting fine hygroscopic powder into a flowing high pressure stream of liquid, said apparatus comprising:
a mixing receptacle having a collector surface near a bottom portion thereof and an outlet opening at the bottom of the receptacle;
a flared dispersing surface mounted within the receptacle above the outlet such that the surface spreads outwardly and downwardly and the powder dispensed from the dispersing surface falls on the collector portion of the mixing receptacle;
means for dispensing powder to an upper portion of the

dispersing surface so that the powder is dispersed as it flows down the dispersing surface and onto the collector portion of the receptacle;
means for supplying a film of water to the collector portion



of the mixing receptacle so that the powder is washed down by the film into the outlet opening of the receptacle; and
means for passing the powder and liquid from the receptacle outlet to the high pressure water stream.

4,005,807

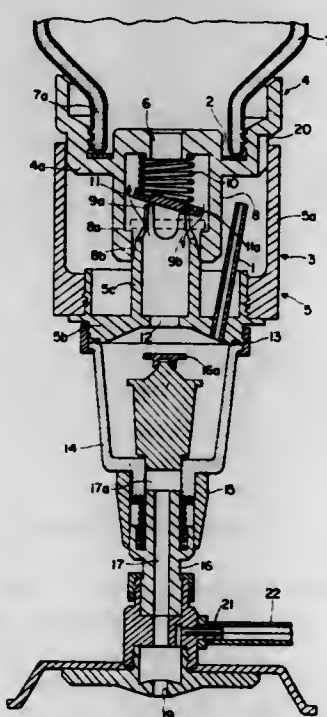
METERING-DISTRIBUTOR OF THICK LIQUIDS, IN PARTICULAR, SYRUPS

Alfredo Wiesner, Via O. Beccari, 23, Rome, Italy (00100)
Filed June 10, 1975, Ser. No. 585,498

Claims priority, application Italy, June 19, 1974, 51606/74
Int. Cl.² G01F 11/28

U.S. Cl. 222-442

2 Claims



1. An improved metering-distributor for thick liquids contained in a bottle mounted on said metering-distributor in overturned position and comprising a support member through which a vertical conduit is arranged to put the bottle, mounted thereon, in communication with a cup placed therebelow and provided with an air intake from the atmosphere, in

this cup reciprocating the upper shaped portion of a coaxial piston, the upper head of which is shaped to form a disc valve body adapted to close the outlet orifice of said conduit while at the lower portion of said piston a vertical conduit is arranged which opens at its lower end on the outside and its upper portion opens into the cup only in the upper limit position of the piston which is returned to its lower position by spring means, characterized by the fact that said support member is an assembly constituted of two parts connected to one another by releasable means and in which an axial conduit is arranged to put the bottle in communication with the cup, a second disc valve disposed at the entrance orifice of said conduit, a compression spring contacting said second disc valve, and means to maintain said second disc valve in an inclined position against the bias of said compression spring when said support assembly is assembled to define a wider passage on one side of said second disc valve and a narrower passage on the other side thereof, whereby said entrance orifice is permanently open during operation with the wider passage allowing air bubbles to rise and with the narrower passage permitting thick liquid to flow downwardly.

4,005,808

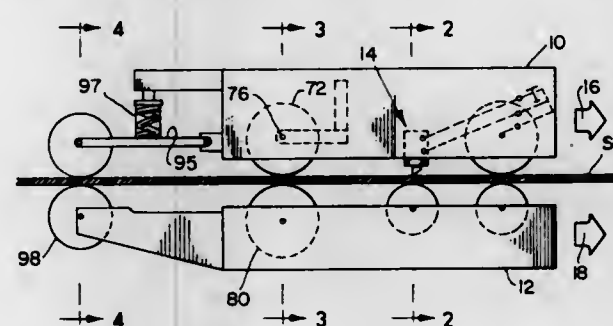
PLASTIC CUTTING METHOD

Thomas A. Insolo, Bristol, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.

Continuation-in-part of Ser. No. 437,982, Jan. 30, 1974, abandoned. This application May 2, 1975, Ser. No. 573,813
Int. Cl.² B26F 3/02

U.S. Cl. 225-2

6 Claims



1. A method for scoring and breaking plastic sheet material and comprising:
a. placing the sheet on a generally flat surface at a first location, and providing the intended line of cut over a raised bead in said table,
b. scoring the upper surface of the sheet opposite the bead,
c. deflecting said sheet on both sides of the resulting score line through a critical bend angle in the range between 4° and 6° as measured from the plane defined by the initially flat upper surface of the plastic sheet,
d. further deflecting said sheet past said critical bend angle at a second location and only after said first mentioned deflecting step, and
e. heating said scoring tool to a temperature in the range between 750° and 1500° F prior to said scoring step.

4,005,809

DISPENSER CARTON

William W. Finn, 303 N. Kalamazoo Ave., Marshall, Mich. 49068

Continuation-in-part of Ser. No. 441,880, Feb. 12, 1974, Pat. No. 3,942,417. This application Apr. 11, 1975, Ser. No. 567,399

Int. Cl.² B26F 3/02

U.S. Cl. 225-49

6 Claims

1. A dispensing carton adapted for the dispensing of a length of material from a roll thereof, said carton being formed of sheet material and having a bottom wall, a pair of substantially parallel, upstanding, spaced apart front and rear

4,005,811

ROOF BOLT INJECTION MAST

John Francis Garaty, Fairy Meadow, Australia, assignor to Australian Iron & Steel Works Proprietary Limited, Port Kembla, Australia

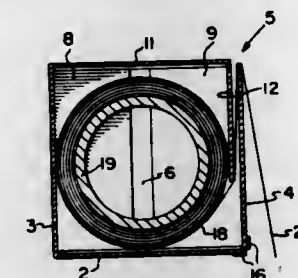
Filed May 27, 1975, Ser. No. 581,183

Claims priority, application Australia, May 30, 1974, 7714/74

Int. Cl.² B25C 5/10

U.S. Cl. 227-124

10 Claims



thickness of said sheet material to provide at said juncture a gap, and an abrasive material carried by each of said front and bottom walls and bordering said gap to provide a pair of tearing edges on opposite sides of said gap.

4,005,810

CONTINUOUS LIBRARY CATALOG CARD

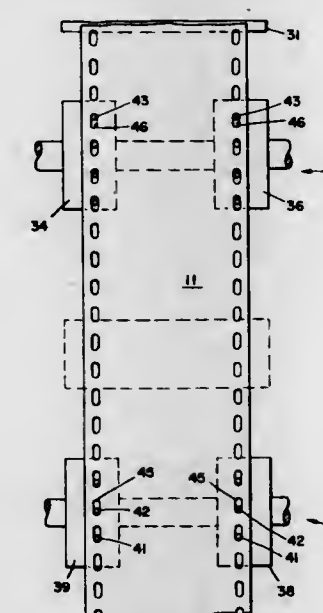
Virgil V. Porter, 95-255 Hoen Place, Milliani, Hawaii 96789

Continuation-in-part of Ser. No. 326,063, Jan. 23, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 664,980

Int. Cl.² B65H 17/38

U.S. Cl. 226-6

4 Claims



3. The method of feeding a continuous web, marginally punched, metrically dimensioned form on a machine having an endless array of driven feed pins with a one-half inch spacing between pins, comprising the steps of: providing a form having at least one margin with spaced feed perforations, the perforations being elongated in the longitudinal direction of feed to provide a longitudinal perforation dimension substantially greater than the transverse perforation dimension and substantially greater than the pin longitudinal dimension; engaging one perforation driving edge with one feed pin; driving the one feed pin and thereby the continuous length web material in the driving direction; thereafter releasing the one feed pin from its driving engagement with the one perforation driving edge; thereafter moving the feed pins to engage the next feed pin with the corresponding next feed perforation driving edge while simultaneously holding continuous web stationary; thereafter advancing said next feed pin and continuous length web; and thereafter indefinitely repeating the above three preceding steps for successive pin feeds and feed perforations.

4,005,812

ELECTRIC FASTENER DRIVING TOOL

Richard H. Doyle, Mount Prospect; Salvatore L. Morabito, Northlake; Andrew I. Yohana, Des Plaines, and Raymond F. Novak, Schiller Park, all of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed June 4, 1975, Ser. No. 583,847

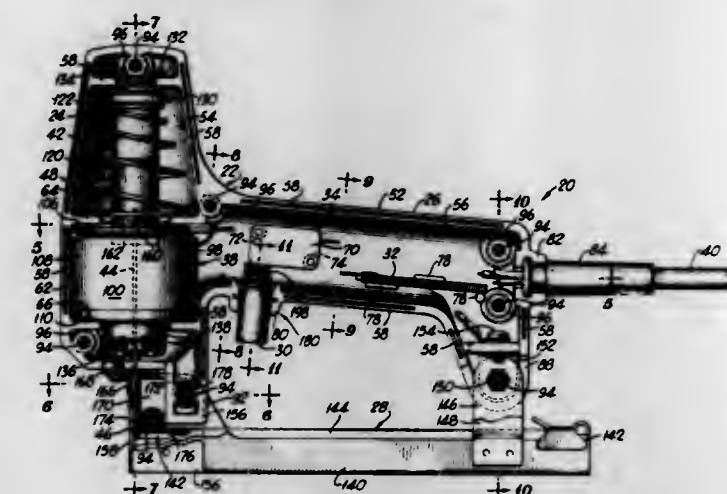
Int. Cl.² B25C 1/06

U.S. Cl. 227-131

18 Claims

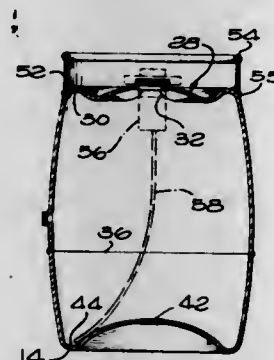
1. An electric fastener driving tool comprising:
a clamshell body including first and second similar molded plastic body parts abutting one another along a plane coinciding with the vertical plane of symmetry of the body, said body including a head portion enclosing a cavity and a handle portion integral with and extending from said head portion;
wall means integral with said body parts extending into said cavity and defining a solenoid chamber;
a solenoid winding having a central axial opening supported within said solenoid chamber by said wall means;
an armature slidable in said central axial opening in drive and return strokes;
a driver blade supported by said armature;
a magazine assembly supported by said body at the base of

said head portion and at said handle portion, said magazine assembly defining a drive track for said driver blade and including means for introducing fasteners into said drive track;
circuit means including a switch supported within said handle portion for selectively controlling the energization of said solenoid winding;



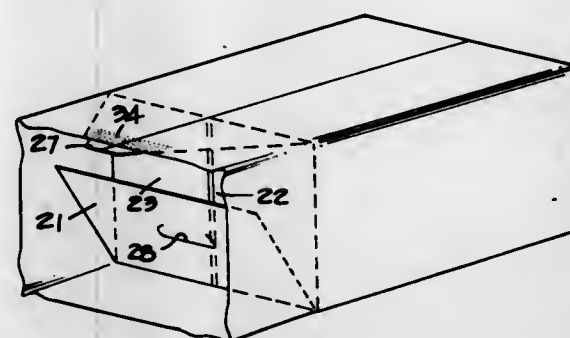
said armature including a first segment formed of magnetic material and a second segment formed of electrically insulating material; and electrically insulating connection means supporting said driver blade on said first segment of said armature.

4,005,813
SINGLE-OPENING BEER KEG AND METHOD OF PRODUCING FROM CONVENTIONAL KEG
Mack S. Johnston, 1065 Lomita Blvd., No. 220, Harbor City, Calif. 90710
Filed Oct. 6, 1975, Ser. No. 620,146
Int. Cl.² B23K 31/02; B21D 51/00
U.S. Cl. 228-184 4 Claims



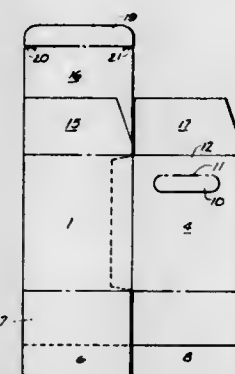
1. The method of modifying a keg which has a side wall with an upper end and a lower end, and which further includes a top wall containing a dispensing opening, and a recessed bottom wall containing an internal, peripheral chine with a radially-extending trough interconnecting said chine with the center portion of the bottom wall, including the steps of:
moving the center portion of the bottom wall outwardly until the center portion thereof is in substantial horizontal alignment with the lower end of the side wall;
providing an opening in the center portion of the bottom wall for receiving a valve assembly;
closing the dispensing opening in the top wall; and
moving the center portion of the top wall inwardly to provide a generally spherical portion with an inner peripheral chine.

4,005,814
CARTON WITH INTEGRAL OVERWRAP
Thomas W. Foster, Palo Alto, Calif., assignor to Fibreboard Corporation, San Francisco, Calif.
Filed June 3, 1976, Ser. No. 692,498
Int. Cl.² B65D 5/10, 65/12, 65/14
U.S. Cl. 229-39 R 4 Claims



1. An overwrapped carton structure of tubular shape adapted to be end-loaded with a product and thereafter have the ends sealed, and formed from a cut and scored paperboard blank integrally combined with a flexible overwrap which completely covers carton structure;
said carton structure comprising a bottom panel, side panels and a top panel, bottom ends flaps and top ends flaps hinged respectively to each end of said panels and an end extension of said overwrap at each of said carton structure;
said top end flaps being of trapezoidal shape and said end extension of overwrap being adhered to said top end flaps but free of adherence of other flaps, and end closures at each end of said carton structure, said end closures comprising, in sequence,
a. an infolded pair of side end flaps in closure position at 90° angles to said side panels,
b. an infolded bottom end flap in face contacting relationship with said side end flaps,
c. infolded sides areas of said overwrap extensions in face contacting relationship with said bottom end flap,
d. an infolded top end flap with the adhered position of the overwrap extension, and
e. an infolded bottom portion of the overwrap extension.

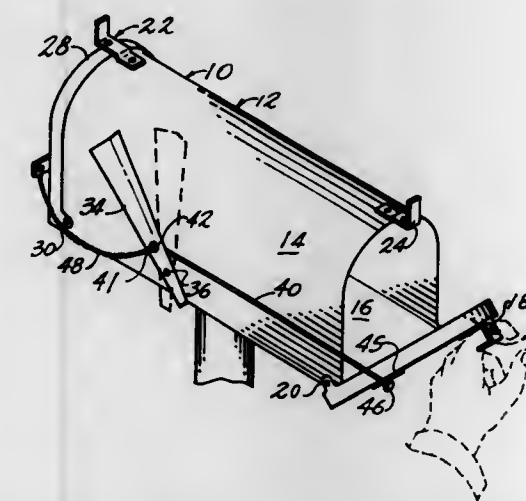
4,005,815
CARTON WITH SELF-CONTAINED REINFORCED HANDLE
Robert W. Nerenberg, Middletown, and Frank B. Herzog, Cincinnati, both of Ohio, assignors to The Interstate Folding Box Company, Middletown, Ohio
Filed Feb. 19, 1976, Ser. No. 659,375
Int. Cl.² B65D 5/46, 25/28
U.S. Cl. 229-52 B 7 Claims



1. In a one-piece paperboard carton having four enclosing body walls and end closures at the opposite ends of said body walls, a hand hole defining tab formed in a first of said body wall spaced downwardly from the upper edge thereof to define

a handle portion therebetween, said tab being hingedly connected to said first body wall along a line of articulation defining the upper side edge of said tab, the top closure of said carton comprising a pair of flap members hingedly connected to the upper edges of the body walls adjacent said first body wall and a full width closure flap hingedly connected to the upper edge of the carton body wall opposite said first body wall, a tuck extension on the outermost side edge of said full width closure flap, said tuck extension having a width substantially equal to the width of the handle defining portion of said first body wall, whereby when said full width flap is fully closed and the tuck extension juxtaposed to the inner surface of said first body wall, said tuck extension will reinforce the handle defining portion thereof, said tab being foldable inwardly and upwardly to contact the inner surface of said tuck extension to provide further reinforcement for said handle defining portion, and releasable locking means for maintaining said full width closure flap and said tuck extension in their fully closed position.

4,005,816
MAILBOX HAVING DUAL ACCESS CLOSURES AND SIGNAL MEANS
Joseph M. Malik, 818 S. Big A Road, Toccoa, Ga. 30577
Filed May 12, 1976, Ser. No. 685,765
Int. Cl.² B65D 91/00
U.S. Cl. 232-35 14 Claims

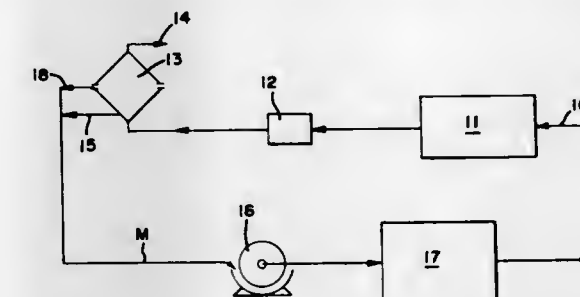


1. In a mailbox construction: an elongated mailbox housing, a front closure movably mounted on one end of said housing for depositing articles therein, a rear, closure movably mounted on the other end of said housing for removing articles placed in said mailbox, a signal device on said mailbox movable from a non-signaling position to a signaling position, and means connected to said front closure for moving said signal means from a non-signaling to a signaling position upon movement of said front closure and other means connected to said second closure for returning said signal means to non-signaling position upon the opening of said second closure.

4,005,817
NOZZLE TYPE CENTRIFUGE
Andrew Paul Charlton, Stamford; Kenneth Dan Lewis, Wilton; Charles Arthur Willis, Bethel, and Per Nyrop, Norwalk, all of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.
Filed Sept. 18, 1975, Ser. No. 614,565
Int. Cl.² B04B 11/12, 11/08
U.S. Cl. 233-22 24 Claims

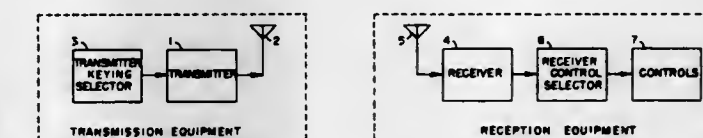
1. A nozzle type centrifugal machine with a vertical axis of rotation, operable for effecting the separation of a feed mixture into a light and a heavy fraction and a nozzle discharge product, comprising
a rotor having an upper open end, and a rotor shaft extending upwardly through said upper end, said rotor con-

structed and arranged for delivery of a light fraction from said upper end, and for overflow discharge of a heavy fraction at the lower end, and provided with nozzles spaced along the periphery intermediate said upper and lower ends for delivery of a nozzle product, and furthermore having a bottom feed opening for the introduction of said feed mixture into the rotor centrally from below, a stationary housing surrounding said rotor, having a top opening, separate means for separately collecting and discharging said heavy fraction overflow and the nozzle discharge product respectively, and a supply connection at the bottom for introducing said feed mixture upwardly into said bottom feed opening of the rotor, and a light fraction take off scoop device comprising a take off conduit member extending through said top opening of the housing into said rotor, and formed with a lateral scoop portion at the lower end, arranged for skimming off



an inner layer of said light fraction, while allowing the kinetic energy resulting from angular velocity to push such skimmed off light fraction material upwardly through said conduit member to discharge,
an elongate slide block fixed to the intermediate portion of said take off conduit member, and slidable longitudinally atop said housing, each end portion of said slide block having a longitudinally elongate vertical guide opening, a pair of upright bolts extending upwardly from said housing through respective elongate guide openings in guiding relationship therewith incident to longitudinal sliding movement of said block, said bolts having head portions preventing upward displacement of said block, said conduit member being unitary with said block thus being movable bodily on said housing parallel to itself in a horizontal plane, for adjustment of the skimming position of said scoop portion relative to said light fraction.

4,005,818
PULSE SIGNALING SYSTEM
Ernst H. Krause, and Claud E. Cleeton, c/o Naval Research Laboratory, Anacostia Station, Washington, D.C. 20020
Filed May 11, 1945, Ser. No. 593,174
Int. Cl.² H04B 1/00
U.S. Cl. 325-38 R 6 Claims



1. A radio pulse signalling system comprising, in combination:
means for generating a first time base consisting of a finite number of regularly time-spaced pulse signals;
first means for forming a pulse code group from said time base signal in accordance with a preselected pattern, said pulse code group always including an initial starting pulse;
means for transmitting a pulsed radio wave corresponding to said pulse code group;

means for receiving said pulsed radio wave at a remote point;
means, actuated by the initial starting pulse in said received wave, for generating a second time base corresponding to said first time base; and
second means for forming a pulse code group corresponding to the transmitted pulse code group from said second time base signal.

4,005,819

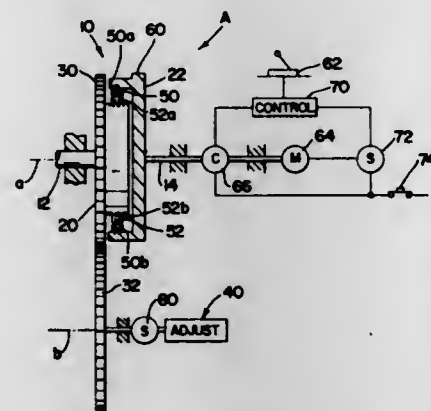
MAGNETIC RETURN MECHANISM

Richard A. DeLille, East Moline, Ill.; William A. Curran, Eldridge, Iowa, and Gentiel M. DeGryse, East Moline, Ill., assignors to Gulf & Western Industries, Inc., New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,512
Int. Cl.² G06C 15/42

U.S. Cl. 235-144 ME

9 Claims



1. In a counting device including a means for driving a member about a given axis and from a selected angular position; means for indicating when said member has been driven a given angular amount corresponding to a counting cycle; means for releasing said member for free rotation about said given axis back to said selected angular position; and return means for rotating said member from a position angularly spaced from said selected position to said selected position; said return means including a first set of permanent magnets, means for supporting said first set of magnets on said member, a second set of permanent magnets, means for supporting said second set of magnets in a generally fixed position to create a magnetic return force on said first set of magnets and a magnetic reaction force on said second set of magnets, said forces combining to return magnetically said member to said selected position when said member is spaced from said selected position and is free to rotate, the improvement comprising: each of said magnets having a given normal position with respect to its supporting means, shifting means for allowing a preselected substantial amount of movement from its normal position of at least one of said magnets in said first and second sets of magnets in response to one of said magnetic forces, said allowed movement being generally arcuate of said given axis and with respect to the supporting means of the magnet allowed to move, and said preselected amount being an angular distance of at least about 3° in at least one of two angular directions with respect to said given axis.

4,005,820

FURNACE APPARATUS AND PROCESS FOR CONTROL THEREOF

Howard D. Cress, New Haven, Ind., assignor to Wm. E. Burford, New Haven, Ind., a part interest

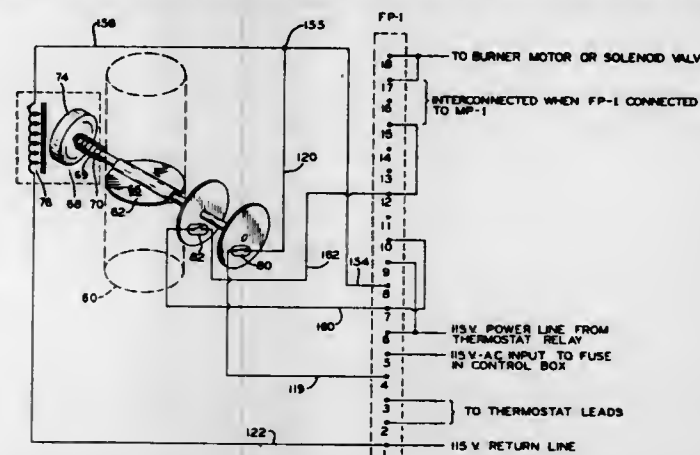
Filed May 21, 1975, Ser. No. 579,384
Int. Cl.² F23N 3/00

U.S. Cl. 236-1 G

9 Claims

1. In a process for controlling the heat losses in a heating system, the steps comprising monitoring the temperature within a given area with a temperature responsive element,

communicating to a check valve within an exhaust stack below demanded temperature conditions to effect opening of such check valve to a position preliminary to operating a burner switch energizing a burner within a furnace to develop temperature to a preferred level, thereafter maintaining the burning until the temperature reaches a preferred value and is sensed by said temperature responsive element to effect an unswitching action which terminates burner operation, and then communicating to a check valve motor through a time



delay device, said check valve including two oppositely acting position responsive switch means, each operatively associated with said check valve to effect closing of said valve after a predetermined time to a closed position and wherein said valve is closed to define a switch action which actuates a control system wherein said check valve remains closed and will maintain such position to conserve heat within said furnace following sensing by the temperature responsive element of the preferred temperature.

4,005,821

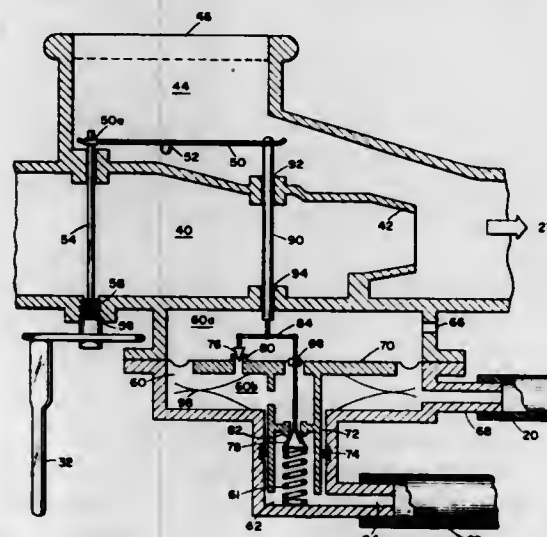
THERMOMECHANICAL VACUUM REGULATOR USING BIMETALLIC POSITION SENSING

Michael Slavin, Gloucester Point; George T. Bata, Grafton; Raymen F. Emery, Yorktown, all of Va., and George C. Ludwig, Troy, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 10, 1975, Ser. No. 566,869
Int. Cl.² G05D 23/275; B60H 1/02

U.S. Cl. 236-87

14 Claims



1. A vacuum regulator for producing a controlled vacuum related to the deviation of an actual temperature from a selected temperature comprising:

- a source of vacuum;
- a first pressure source;
- a chamber, the vacuum within which comprises said controlled vacuum;
- first valve means for communicating said chamber with said pressure source when open;

second valve means for communicating said chamber with said source of vacuum when open;
a beam having at least three approximately colinear spaced apart pivots, said first valve means cooperating with said beam at a first pivot and said second valve means cooperating with said beam at a second pivot to open and close said valve means, said beam having an equilibrium condition wherein said first and second valve means are closed; bimetal means responsive to temperatures higher than said selected temperature and cooperating with said beam at a third pivot for urging said beam into a second condition to open one of said valve means while maintaining the other of said valve means closed, and responsive to temperatures lower than said selected temperature for urging said beam into a third condition to open the other of said valve means while maintaining said one of said valve means closed; and,
a vacuum feedback diaphragm means comprising at least a portion of at least one of said first and second valve means and responsive to pressure difference thereacross for displacing said diaphragm means and cooperating through at least one of said first and second valve means with said beam to return to said equilibrium condition, one side of said diaphragm means being communicated with said chamber and the other side of said diaphragm means being communicated with a second pressure source.

4,005,822

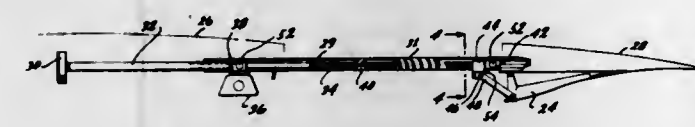
FAN DUCT THRUST REVERSER

Richard H. Timms, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Dec. 22, 1975, Ser. No. 643,492
Int. Cl.² B64C 15/06

U.S. Cl. 239-265.31

4 Claims



1. A thrust reverser for a fan type jet propulsion engine having an outer wall and a fan concentric therewith and extending radially beyond said wall comprising:

- a cowl surrounding said fan and extending coaxially along the central axis of said engine in a spaced relationship from said engine outer wall to form a bypass duct, said cowl being separated into forward and downstream portions, said downstream portion translatable rearward to form a gap spacing in said cowl between said portions;
- a translatable sleeve with selected openings peripherally disposed therethrough, said openings having cascades therein;
- a plurality of blocker doors adjacent said cascades pivotally secured to said downstream portions and rotatably about the forward edge thereof, said doors arranged to rotate into said bypass duct thereby blocking flow through said duct and diverting said flow through said cascades; and translating means supported by said portions and disposed within said cowl for translating said aft portion, said sleeve portion and rotating said doors during the terminal motion of said downstream portion, whereby said cascades are positioned in said gap before said doors divert flow from said duct;
- said translating means comprising a plurality of rotating drive means, each of said drive means driving a tube member having longitudinal splineways therein, a jack screw having splines at one end thereof for engaging said splineways, said jack screw translatable longitudinally within said tube member by rotation of said tube member, a first and second threaded nut engaging said jack screw, said first threaded nut fixedly attached to said forward

4,005,823

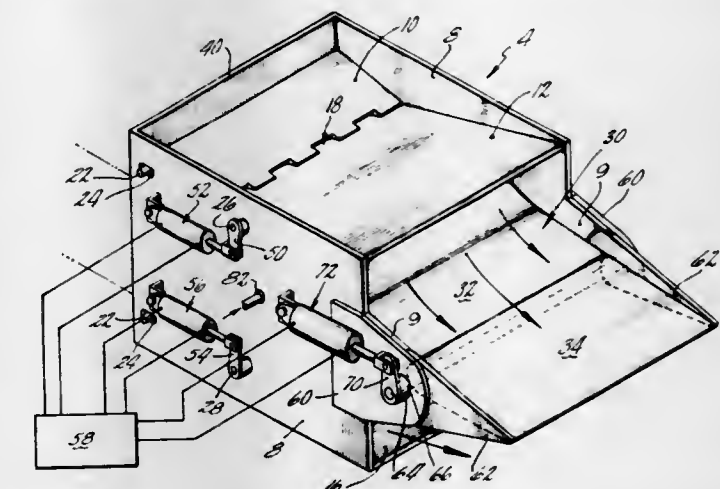
FLAP-TYPE TWO-DIMENSIONAL NOZZLE HAVING A PLUG

Edward B. Thayer, Hobe Sound, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 30, 1975, Ser. No. 618,093
Int. Cl.² B64C 9/38

U.S. Cl. 239-265.37

9 Claims



1. A flap-type two-dimensional plug nozzle having a rectangular inlet, fixed sides extending rearwardly from each side of said inlet, a pivotally mounted top flap, said pivotally mounted top flap being pivotally mounted between its ends about a first fixed pivotal axis extending between said fixed sides, a pivotally mounted bottom flap, said pivotally mounted bottom flap being pivotally mounted between its ends about a second fixed pivotal axis extending between said fixed sides, the rear ends of said top and bottom flaps along with said fixed sides forming the exit area, plug means centered between said pivotally mounted top flap and said pivotally mounted bottom flap, a first throat plane being formed between said plug means and said top flap, a second throat plane being formed between said plug means and said bottom flap, said top flap forming a convergent-divergent passage with said plug means, said bottom flap forming a convergent-divergent passage with said plug means, said first and second throat planes being located downstream of said first and second pivotal axes, respectively, to provide an increase in nozzle area ratio as throat area at the throat plane increases.

4,005,824

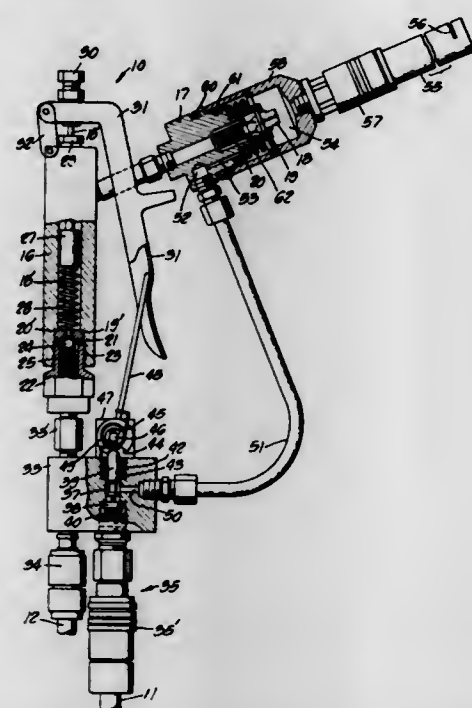
SPRAY GUN QUICKLY CONVERTIBLE BETWEEN AIR AND AIRLESS OPERATING MODES

Robert D. Becker, Arcadia, and Freddie S. Kaderka, Covina, both of Calif., assignors to Grover Smith Mfg. Co., Montebello, Calif.

Filed Aug. 21, 1975, Ser. No. 606,653
Int. Cl.² B05B 15/10

U.S. Cl. 239—289

18 Claims



1. A liquid spray gun quickly convertible for use selectively in an air mode with a spray distributing wand and in an airless non-fogging mode, said spray gun comprising: a hollow main body having separate valve-controlled pressurized liquid and pressurized air passages, valveless spray nozzle means fixedly supported at the discharge end of said liquid passage and having a housing which is exposed and accessible for inspection when said gun is being used in said airless mode, a fogging wand accessory comprising a long tubular fog distributing wand having a tubular coupling at the inlet end thereof adapted to be telescoped over and embracing said spray nozzle means and cooperating therewith to form a fogging chamber for liquid discharging from said nozzle means, means for supplying pressurized air from said pressurized air passage into said fogging chamber and into liquid spray issuing from said nozzle means in a manner to convert said liquid spray into a fog for flow through and discharge from said wand, means for deactivating the supply of air about said nozzle means when said wand accessory is detached therefrom, and manually regulatable means for operating said valve controlled liquid and air passages to supply properly proportioned pressurized liquid to said nozzle and pressurized air to said fogging chamber when said fogging wand accessory is assembled over said nozzle means.

4,005,825

MIXING MANIFOLD FOR AIR ATOMIZING SPRAY APPARATUS

Duane C. Schowink, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

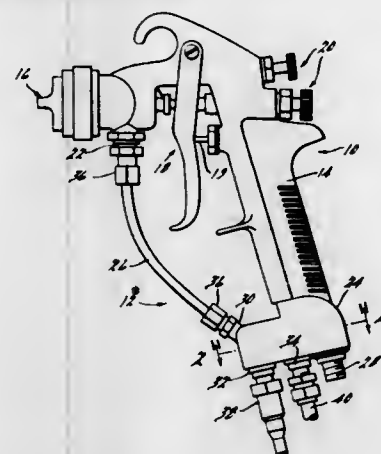
Division of Ser. No. 525,596, Nov. 20, 1974, Pat. No. 3,924,906. This application Nov. 24, 1975, Ser. No. 634,971
Int. Cl.² B05B 7/12, 7/04

U.S. Cl. 239—413

7 Claims

1. Apparatus for mixing the components of a multiple component sprayable fluid, attachable to an air atomizing spray gun of the type having a spray nozzle, an air passage communicating with the spray nozzle and arranged for communication with a source of pressurized gas and a sprayable fluid passage communicating with the air passage, comprising in combination:

a manifold member having a through passage and means for attachment to the air passage inlet to place said through passage in fluid tight communication with the air passage; passage means extending through said manifold and having at least three fluid ports;



at least two of said manifold passage ports being adapted for fluid communication with separate reservoirs of the components of the sprayable fluid; and a static mixer means intercommunicating one of said fluid ports and the spray gun sprayable fluid passage port operative to intimately intermix the components of the sprayable fluid.

4,005,826

INJECTORS FOR THE FUEL INJECTION SYSTEMS OF INTERNAL COMBUSTION ENGINES

Henry Edwin Woodward, Bourne End, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 368,991, June 11, 1973, abandoned.

This application Jan. 16, 1975, Ser. No. 541,501

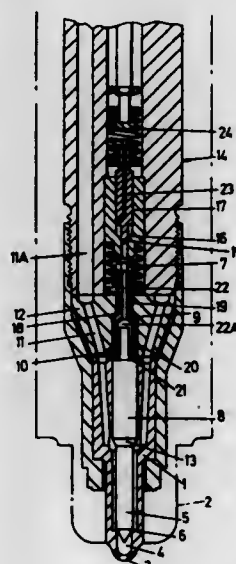
Claims priority, application United Kingdom, June 12, 1972, 27449/72

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² B05B 1/30

U.S. Cl. 239—533.8

9 Claims



1. An injector including a fuel supply passage for a fuel injection system of an internal combustion engine which comprises:

- a nozzle body formed with a compartment and including a valve seat;
- a nozzle needle positioned within said compartment of said nozzle body and cooperating with said valve seat to form an injection valve;
- guide means for guiding said nozzle needle within said nozzle body, one end of said guide means forming a first

chamber including part at least of said compartment, the other end of said guide means forming a second chamber within said injector, said first and second chambers being in fluid communication with said fuel supply passage, the cross-sectional area bounded by the other edge of contact between said nozzle needle and said valve seat being smaller than the cross-sectional area of said guide means; d. spring means for biasing said nozzle needle against said valve seat; and e. trigger valve means for opening said second chamber at a first predetermined pressure within said second chamber and for closing said second chamber at a second lower predetermined pressure within said second chamber whereby (i) an increase in fuel supply pressure causes said trigger valve means to open when the pressure in said second chamber reaches a value substantially equal to or greater than said first predetermined pressure, thereby relieving the pressure in said second chamber so that the resultant force on said nozzle needle causes the nozzle needle to lift from said valve seat for the injection of fuel and (ii) said trigger valve means recloses said second chamber when the pressure in said second chamber reduces to a value substantially equal to or lower than said second predetermined pressure, said nozzle needle being returned into contact with said valve seat under the influence of said spring means.

4,005,827

REFINER DISK

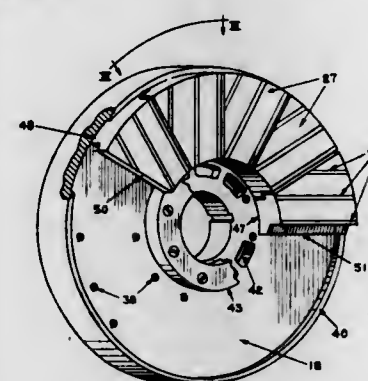
William J. Frair, Pittsfield, and Robert P. Langdon, Savoy, both of Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Apr. 30, 1975, Ser. No. 572,970

Int. Cl.² B02C 7/12

U.S. Cl. 241—261.3

13 Claims



1. A plurality of disk shaped segments for refining material within a refiner, said segments being arranged in an annular array within said refiner, said segments having inner and outer peripheral edges connected by two opposed side edges, each of said side edges having offset portions thereon, each of the adjacent segments being positioned within said refiner so that said offset portions of one of said side edges cooperates with the offset portions of the adjacent side edge in an overlapping and spaced apart relation.

4,005,828

METHOD AND APPARATUS FOR STRESSING A TENDON AND BANDING A STRUCTURE

Eandre F. Peszeszer, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed May 6, 1975, Ser. No. 574,900

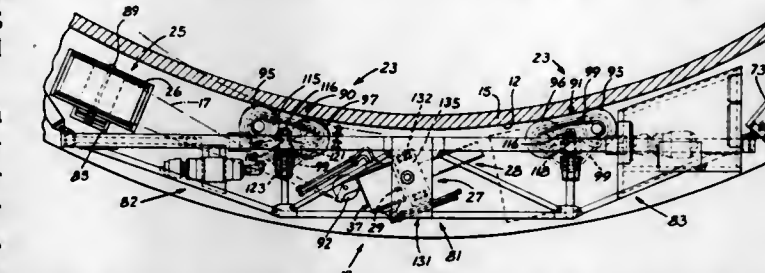
Int. Cl.² B21F 17/00, 45/00

U.S. Cl. 242—7.21

35 Claims

1. An apparatus for applying a circumferential prestressing tendon to a structure comprising a carriage movable about the peripheral wall of the structure, tendon tensioning means on said carriage for tensioning and paying out the tendon to the

wall as said carriage travels in a forward direction, traction drive means for engaging the peripheral wall of the structure and for driving said carriage in a forward direction, restraining means connected to said carriage to form a band about said structure and applying to said carriage a force urging said



traction drive means against the wall of the structure, said traction drive means comprising a plurality of hydraulic motors having a rotatable portion thereon, and an annular tire means mounted on each of said rotatable portions for engaging the wall and for acting as traction wheels for driving said carriage while tensioning said tendon.

4,005,829

TAPE ROLL AND CORE

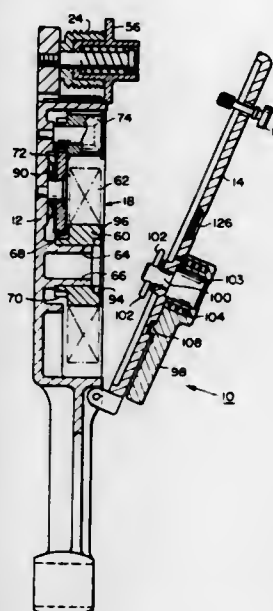
Walter R. Wise, Pittsford; Ellsworth J. Allen, Newark, and Donald K. Fisher, Palmyra, all of N.Y., assignors to Garlock Inc., Palmyra, N.Y.

Division of Ser. No. 402,482, Oct. 1, 1973, abandoned. This application May 21, 1975, Ser. No. 579,473

Int. Cl.² B65H 17/02, 81/00

U.S. Cl. 242—68.5

21 Claims



1. A tape roll including a core and a length of tape wound on said core, said core having a length greater than the width of the tape and drive means on the external surface of said core not covered by said tape and including a plurality of grooves in an end surface of said core.

4,005,830

MANDRELLESS DOWNCOILER FOR COIL BOX

William Smith, Burlington, Canada, assignor to The Steel Company of Canada, Limited, Hamilton, Canada

Filed May 6, 1975, Ser. No. 574,901

Claims priority, application United Kingdom, May 6, 1974, 19917

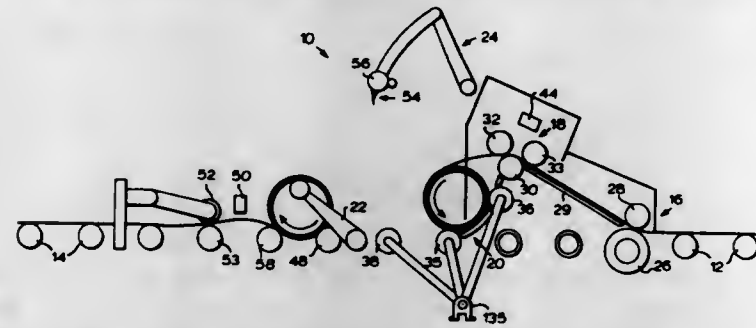
Int. Cl.² B21C 47/08, 47/22

U.S. Cl. 242—78.1

16 Claims

1. In combination: coiling means for a transfer bar, including bend rollers adapted to curl the transfer bar and first cradle rolls on which the transfer bar can be supported as it coils itself into a coil with an open center core,

second cradle rolls adjacent the first cradle rolls, the second rolls being adapted to receive a coil for uncoiling, and transfer means for transferring a coil from said first cradle rolls to said second cradle rolls, said transfer means including a pair of spaced-apart transfer arms coaxially pivoted at a position between the first cradle



rolls and the second cradle rolls, each transfer arm having a stub mandrel and being movable toward and away from the other transfer arm, the stub mandrels being adapted to enter the open center core of a coil from opposite sides, and means for pivoting the transfer arms in tandem to swing the coil from said first cradle rolls to said second cradle rolls.

4,005,831

WIRE TAKE-UP ASSEMBLY

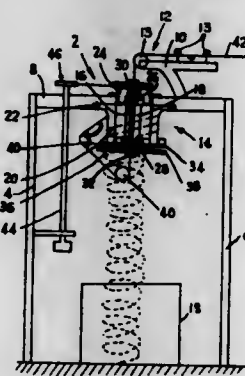
Indrajit Chaliha, 5 Mission Row, Calcutta - 1, West Bengal, India

Filed Nov. 3, 1975, Ser. No. 628,239

Int. Cl.² B21C 47/00

U.S. Cl. 242-82

6 Claims



1. A wire take-up assembly comprising a frame provided with a block fixedly mounted thereto, said block having an open end and a retaining lip disposed at said open end, a hollow rotatable drive shaft located coaxially with respect to said block and formed with a bore, guide means for enabling a wire to be drawn through the bore of said rotatable shaft on to said block, and lead-off means for enabling the drawn wire to be led away helically.

4,005,832

STRUCTURE RELATING TO BAIL ARM OF SPINNING REEL FOR FISHING

Tatsuya Yamazaki, Fuchu, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed July 14, 1975, Ser. No. 595,854

Claims priority, application Japan, Sept. 9, 1974, 49-108979[U]

Int. Cl.² A01K 89/02

U.S. Cl. 242-84.21 R

3 Claims

1. A spinning reel for fishing having a body and a rotor with a bail arm structure comprising:
a bail arm;
a bail arm cam and an arm supporting plate supporting respective upper and lower ends of said bail arm on the peripheral wall of said rotor, said cam and plate being

mounted on opposite sides of the peripheral wall of said rotor;

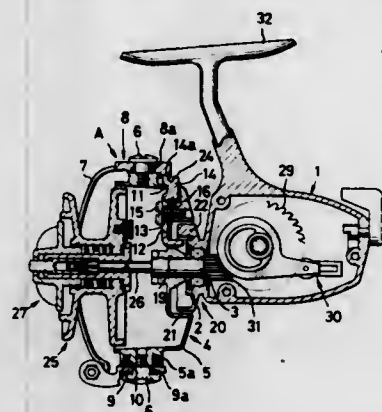
a first spring coupled between said rotor and one end of said bail arm and applying a torque to force said bail arm to move toward a folded position adjacent the body of the spinning reel;

means defining an opening formed in the peripheral wall of said rotor under said bail arm cam, said bail arm cam having a cam surface facing inwardly of said rotor;

a kick lever having a longitudinally elongated slot in its main body and a fastener extending through said slot and connected to said rotor;

said slot and fastener slidably supporting said kick lever on said rotor, said kick lever having its outer end extending through said opening and having a butting portion at the upper end of said kick lever and an operating button portion at its outer end;

a second spring urging said end of said kick lever to project outwardly through said opening and against the cam face of said bail arm cam, said cam face having a recess at its



peripheral edge and a protuberance circumferentially spaced from said recess, said kick lever outer portion latching in said recess when said bail arm is in a line detaching position, said kick lever outer portion engaging said protuberance when said bail arm is in an operating position, said kick lever outer portion being releasable from engagement in said recess and with said protuberance by actuation of said kick lever against the biasing force of said second spring to thereby return said bail arm to the folded position upon depression of said operating button portion; and

wherein said kick lever has a cam follower portion extending sideways from the lower end thereof and engageable with a release cam on the body of the spinning reel, said cam follower engaging said release cam on the main body of the spinning reel to thereby effect movement of said kick lever against the bias of said second spring sufficient to release said outer end portion from said recess and thus effect movement of said bail arm from said line detaching position to said operating position.

4,005,833

YARN TENSIONING DEVICE

Otto Zollinger, 120 Pine Acres Drive, Spartanburg, S.C. 29301

Filed Sept. 11, 1975, Ser. No. 612,379

Int. Cl.² B65H 59/30

U.S. Cl. 242-152.1

8 Claims

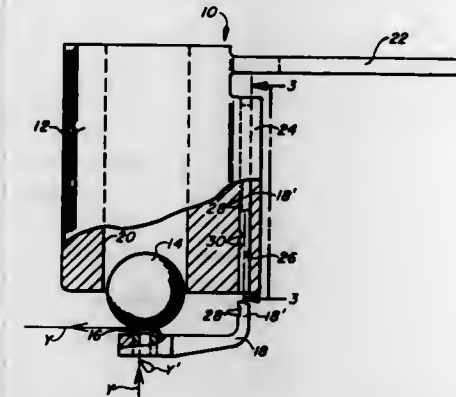
1. A yarn tensioning device of the seated-ball type, comprising:

an elongate ball receiving member having a bore extending completely therethrough and opening from opposite ends thereof;

means connected to said elongate member for mounting the same in a generally upright position with one end thereof lowermost;

an annular ball seating member disposed beneath said one end of said elongate member in vertically spaced and axially-aligned relationship to said bore thereof; .

a ball element supported upon said seating member for in conjunction therewith imposing a tensioning force upon a running yarn passing during operation of said device first upwardly through said seating member and then laterally outwardly from between said seating member and said ball element below said one end of said elongate member; said ball element projecting upwardly from said seating member into said bore of said elongate member and being thereby constrained from excessive lateral displacement



relative to said seating member during operation of said device;

said elongate member having a length sufficient to receive therein, when desired, a plurality of additional ball elements in superimposed relationship to said ball element supported by said seating member;

and adjustable interconnecting means interconnecting said seating member and said elongate member for adjustment of the vertical spacing between said members.

4,005,834

WINDING CABLES AND THE LIKE ON TO STORAGE DRUMS

Jean Florent François Marcel Robert Landreau, Auzay, France, assignor to Societe Anonyme Francalse du Ferodo, Paris, France

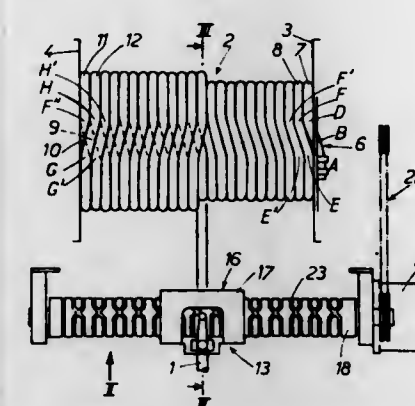
Filed June 9, 1975, Ser. No. 584,856

Claims priority, application France, June 11, 1974, 74.20111; Oct. 28, 1974, 74.36031

Int. Cl.² B65H 57/28

U.S. Cl. 242-158.3

8 Claims



1. A device for winding a cable onto a rotating drum, comprising a cable guide member, and control means comprising a cylinder having a guide track formed in the peripheral surface thereof, said guide track having portions of circular arc form connected by short oblique portions, means mounting the cylinder rotatably, means for rotating the cylinder at a speed proportional to the speed of rotation of the drum, a power operated reader having a reading head carrying a feeler engaging the guide track and compelled to follow the same, means for driving the cable guide member, and means for actuation of the driving means from the reading head.

4,005,835

AUTOMATIC FLIGHT CONTROL MEANS FOR ROTARY WING AIRCRAFT HAVING ATTITUDE-AIR SPEED CONTROL

Milton I. Gerstine, Wilmington, Del.; Joshua I. Goldberg, Ridgefield, Conn.; Setsuo Futatsugi, Kogamigahara, Japan; Kazuo Ueda, Kogamigahara, Japan; Ryoze Seo, Kogamigahara, Japan; Koji Iwasaki, Kogamigahara, Japan, and Makoto Uemura, Kogamigahara, Japan, assignors to The Boeing Company, Seattle, Wash.

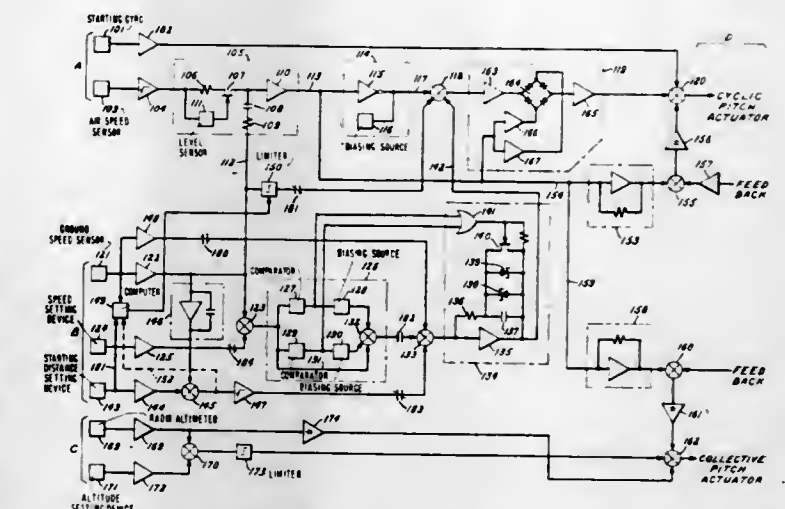
Filed Nov. 24, 1975, Ser. No. 634,383

Claims priority, application Japan, Nov. 22, 1974, 49-134515

Int. Cl.² B64C 11/44, 27/70

U.S. Cl. 244-17.13

2 Claims



1. Automatic flight control means for rotary wing aircraft comprising ground speed detecting means for detecting the ground speed of a rotary wing aircraft and difference signal generating means for generating a signal representing the difference between a set speed and the ground speed obtained from said ground speed detecting means so that flight control is performed by the difference signal, characterized in that the control means comprises means for detecting the air speed of the aircraft and generating an air speed signal, biasing means for adding to said air speed signal, a bias signal corresponding to the attitude of the aircraft in a hovering condition and generating a trim value signal representing the attitude in a balanced relation to the air speed at every instance, means for generating an attitude signal, and means for generating an attitude/speed error signal from the difference between said trim value signal and said attitude signal, said attitude/speed error signal being utilized to control a flight condition.

4,005,836

TARGET THRUST REVERSER

Henry Mutch, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Dec. 22, 1975, Ser. No. 643,493

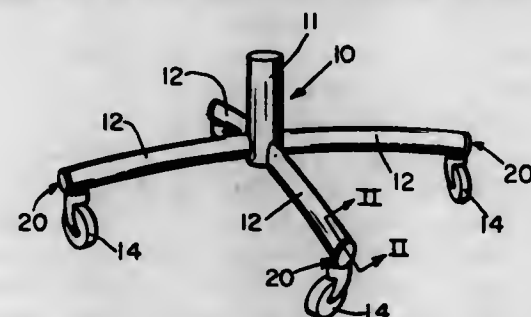
Int. Cl.² B64C 15/04; B63H 11/10

U.S. Cl. 244-110 B

3 Claims

1. A thrust reversal system for an aircraft jet engine enclosed in a nacelle having an aerodynamic profile comprising, a thrust reverser door formed of thin flexible sheet material moveable between a stowed and a deployed position and

covering the opening of said first socket and a plug portion extending from said cover portion; said plug extending into said first socket and over and beyond said detent member; said plug including a barb extending downwardly therefrom behind



and adjacent said detent member; said barb being sufficiently flexible relative to said plug to allow it to slide over said detent member and being sufficiently resilient to slip down behind said detent member after it has slid over it, whereby insertion of said plug is facilitated whereas removal is not.

4,005,842

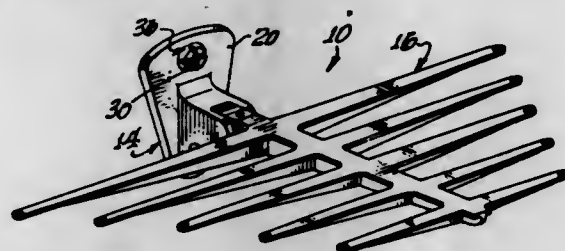
TWIST-OFF, BREAK-AWAY OPENING COVER

William B. Lane, West Covina, Calif., assignor to Deccofoet Corporation, Glendora, Calif.

Filed July 31, 1975, Ser. No. 600,569
Int. Cl.² A47B 96/06

U.S. Cl. 248—200

4 Claims



I. A fixture for attachment to a mounting surface comprising:

- a mounting base having a rear side for seating against said mounting surface, an opposite, normally exposed front side, and a hole to receive a fastener for securing the base to said surface;
- a removable cap integrally formed at the front side of said base concealing said hole, said cap being shaped to simulate the head of a screw fastener having at least one closed recess formed therein to receive a screw driver;
- said cap projects beyond the front side of said mounting base to simulate a fastener head seating against said front side; and
- means releasably securing said cap to said base comprising an adhesive bonding material disposed on said rear side of said mounting base, whereby said base may be adhesively bonded to said mounting surface without exposing said hole by leaving said cap on the base, or the cap may be removed to permit attachment of the base to said mounting surface by insertion of a fastener through said hole.

4,005,843

HANGING DISPLAY ROTATOR

Sheldon M. Wengel, Reedburg, Wis., assignor to Gerber Products Company, Fremont, Mich.

Filed Oct. 31, 1975, Ser. No. 627,815
Int. Cl.² G09F 11/00

U.S. Cl. 248—220.2

4 Claims

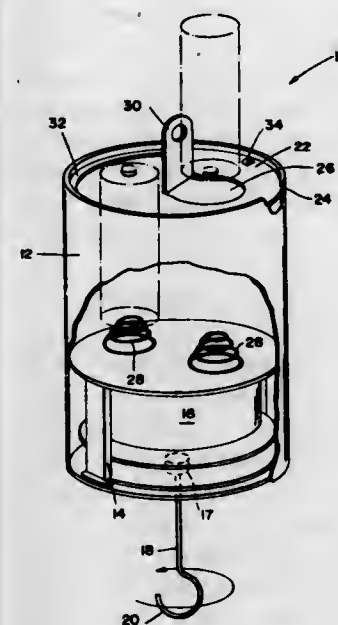
1. A rotator for a hanging display having a self-contained power supply comprising:

- a circular cylindrical body enclosing motor means having a shaft extending therefrom in axial orientation to said

body, said shaft having hook means for hanging an object therefrom, said motor means being operative to rotate said shaft;

slot means defining an inwardly facing annulus along the inner wall of said body adjacent the end of said body opposite said motor means;

a rotatable, electrically conductive circular top plate with a rim slidably within said slot means, said top plate, cylindrical body and motor means comprising a battery chamber for enclosing batteries sidewise adjacent one another;



said top plate including an opening therein for the insertion or removal of batteries and further being operative to rotate with respect of said cylinder body to effect series electrical connection between sidewise adjacent batteries confronting said top plate actuating said motor means and to permit insertion and removal of batteries; and electrode spring means operative to establish electrical connection between batteries and terminals of said motor means for urging batteries into electrical contact with said top plate.

4,005,844

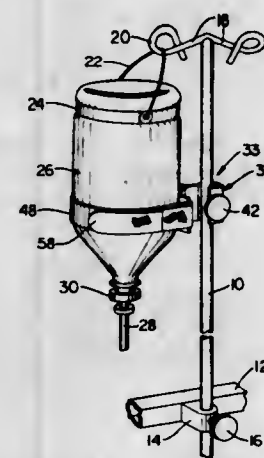
SOLUTION BOTTLE HOLDER

James W. Richmond, Comstock Township, Kalamazoo County, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed Aug. 25, 1975, Ser. No. 607,202
Int. Cl.² B42F 13/00

U.S. Cl. 248—311.3

5 Claims



1. An apparatus removably attachable to a wheeled patient carrier for supporting on said carrier a bottle of solution being

delivered to a patient, the bottle having a suspending element associated therein for permitting it to be suspended in an inverted position, the combination comprising:

an elongated rigid rodlike support member;

means releasably attaching said support member to the carrier in an upright position wherein said support member projects upwardly from the carrier;

hanger means fixed on the upper end of said elongated member

and engageable with said suspending element for suspending said bottle in an inverted position;

bracket means releasably secured to said elongated support member at a location spaced downwardly from said hanger means and being adjustable lengthwise of said support member, said bracket means including an angled bar having two flat plate-like parts which extend at an angle relative to one another and define a shallow V-shaped recess for receiving said bottle;

flexible strap means connected at one end to said bar adjacent an outer edge of one of said flat parts, said strap means being extendible around said bottle and connectible with said bar adjacent an outer edge of the other flat part whereby said bottle is held firmly within said V-shaped recess against said bar, said strap means being flat and having two sections connected end-to-end, said sections having coacting and interengageable fastening means on the same sides thereof; and

said bracket means having a slot in one end of said bar whereby said strap means may be passed through said slot and folded back onto itself to adjustably selectively engage said fastening means at various positions to maintain said bottle snugly against said bar.

4,005,845

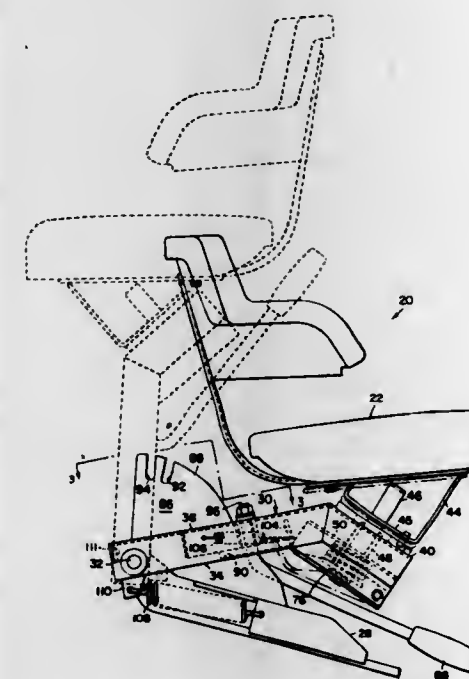
SEAT ASSEMBLY INCLUDING A TURNAROUND-TYPE SEAT

Carlos Enrique Luppi; Marino Antonio Tavolini, and Juan Carlos Roberto Travaini, all of Rosario, Argentina, assignors to Deere & Company, Moline, Ill.

Filed Mar. 15, 1976, Ser. No. 667,165
Int. Cl.² F16M 13/00

U.S. Cl. 248—419

8 Claims



1. A turn-around seat assembly, comprising: a seat support mounted for vertical movement about a first axis between first and second working positions; a latch release lever pivotally mounted on the seat support for movement about a second axis between a normal lock position and a release position; a first latch element fixed to the lever for movement therewith between lock and release positions corresponding to the lock and release positions of the lever, said first latch element

including a cam surface means; a member fixed adjacent to the seat support and defining latch surface means arranged for cooperating with the first latch element for releasably retaining the seat support in a selected one of its working positions when the lever is in its normal lock position; a seat mounted on the seat support for swivelling about a third axis between first and second working positions disposed 180° from each other and corresponding to the first and second working positions of the seat support; a second latch element carried by the seat and being movable toward and away from the seat support between lock and release positions; said seat support including second latch surface means arranged for cooperating with the second latch element for releasably retaining the seat in a selected one of its operating positions when the second latch element is in its lock position; and link means being engaged with said cam surface means and kinematically connected between the cam surface means and the second latch element for effecting movement of the second latch element to its release position in response to movement of the first latch element to its release position by the lever; and means biasing the link means against the cam surface means and normally acting to retain the lever in its lock position.

4,005,846

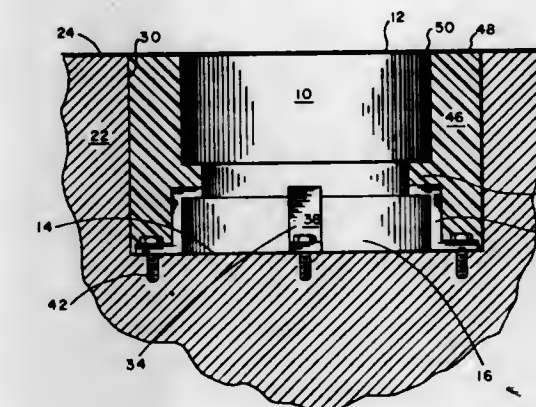
INGOT MOLD BASE MEMBER

Kenneth A. Gebler, Munster, Ind., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 19, 1975, Ser. No. 633,359
Int. Cl.² B22D 7/06, 19/10

U.S. Cl. 249—204

5 Claims



1. A method for preparing metal ingots comprising:

- A. casting an iron base with a cavity within its top, said cavity having a bottom and a side running along its perimeter;
- B. disposing a refractory insert with a side running along its perimeter within the insert cavity, said refractory insert of approximately the same shape as said cavity but of substantially less dimension thereby defining a hollow between the side of said cavity and the side of said insert, said refractory insert containing a groove in its side, said groove having a bottom surface positioned approximately parallel to the bottom surface of said refractory insert;
- C. anchoring said refractory insert within said cavity with at least two Z-shaped anchors, said anchors having a top horizontal member, a vertical member and a bottom horizontal member, said anchors positioned with said top horizontal members in contact with said bottom face of said groove, with said vertical members contacting the edge of said insert and with said bottom horizontal members fastened to the bottom of said cavity; and
- D. substantially filling the hollow with a plastic refractory.

4,005,847

CONNECTION VALVE

Björ Thure Fridolf Ekman, Slalamvagen 12, 54100 Skovde, Sweden

Continuation of Ser. No. 210,483, Dec. 21, 1971, abandoned.

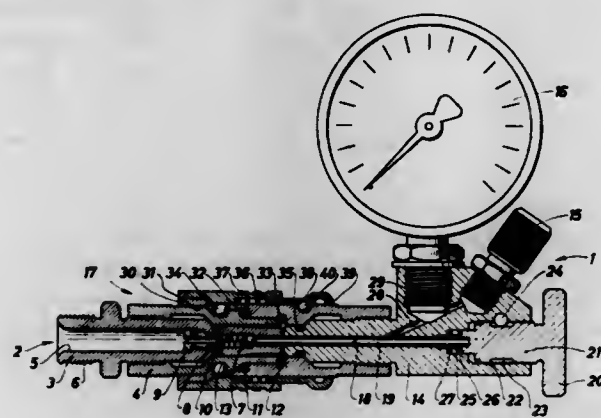
This application July 9, 1974, Ser. No. 486,753

Claims priority, application Sweden, Dec. 23, 1970, 17529/70

Int. Cl.³ F16K 51/00; F16L 29/00

U.S. Cl. 251-148

2 Claims



1. Connection valve for the temporary connection of equipment to a conduit system for pressure fluids comprising at least one terminal valve attachable to the conduit system and having an axial bore, a check valve being positioned in said bore and having a normally closed spring pressed valve member capable of being opened only when said valve member is moved towards the conduit system, a control valve having an end portion detachably positioned and connected against said terminal valve and having a bore in line with said terminal valve bore, said control valve having a second bore extending on a slant from said first control valve bore, a pin slideably mounted along most of its length in said first control valve bore and extending from said control valve end portion into said terminal valve bore to said check valve member, adjustable means closing the other end of said control valve and being connected to said pin for moving the same longitudinally for at times opening said valve member, said pin being prismatic, the walls defining said control valve first bore being cylindrical and tightly encircling the edges of said prismatic pin along its length at least between said control valve end portion and said control valve second bore with a space of small volume extending between the sides of said pin and said walls, quick coupling means mounted on said terminal valve and said control valve detachably connecting said valves, said control valve other end having a stepped recess with the outer portion of said recess being threaded and inner portions of successively smaller diameters, said adjustable means having a stepped periphery with a portion being in threaded engagement with said recess threaded portion and further portions slideably extending in said recess inner portions, an annular elastic sealing element being positioned around an inner portion of said adjustable means periphery between a step thereof and a step of said stepped recess whereby movement of said adjustable means inwardly of said stepped recess causes a squeezing of said sealing element and outward movement of said adjustable means allows said sealing element to provide a radial sealing between said adjustable means and said control valve.

4,005,848

BIDIRECTIONAL PRESSURE-ASSISTED VALVE SEAL

Philip W. Eggleston, Marshalltown, Iowa, assignor to Fisher Controls Company, Inc., Marshalltown, Iowa

Filed Feb. 11, 1975, Ser. No. 548,935

Int. Cl.³ F16K 25/00

U.S. Cl. 251-173

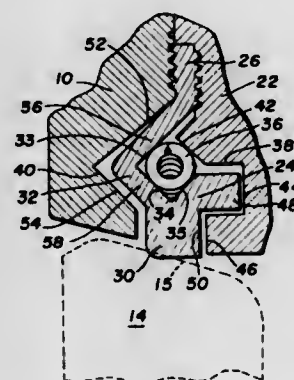
9 Claims

1. A valve structure, comprising a valve body having a central bore therethrough;

a valve closure member mounted in said bore and movable between an open and closed position about an axis substantially transverse to said bore, and having a peripheral sealing surface;

said valve body including an annular recess circumscribing said bore and disposed in radial alignment with said sealing surface when said closure member is closed and having a first sidewall and a second sidewall, said first sidewall including a converging tapered surface;

a seal member including a peripheral portion in sealing engagement with said valve body, an inner annular sealing portion disposed to engage said sealing surface of said closure member when closed, and an intermediate flexible portion joining said peripheral portion and said inner sealing portion, the junction of said flexible portion and said inner sealing portion defining a channel having first and second side walls; resilient annular means disposed against said walls of said channel and between said annu-



lar sealing portion of said seal member and said converging surface of said first body recess sidewall for sliding on said converging surface to provide a moveable fulcrum about which said flexible portion bends for limiting movement of said sealing portion toward said first body recess sidewall and for deflecting and urging said sealing portion radially inward; and

second fulcrum means on said second body recess sidewall; said annular sealing portion and said intermediate flexible portion of said seal member being substantially completely exposed to fluid pressure acting from either direction in said bore;

whereby by coaction of one of said fulcrum means and said fluid pressure, sealing engagement between said seal member and said peripheral sealing surface of said closure member is improved when said fluid pressure acts on said seal member from either direction and said closure member is in a closed position.

4,005,849

BUTTERFLY VALVE

Thierry Antoine Lorthiois, Nancy, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Mar. 26, 1975, Ser. No. 562,273

Claims priority, application France, Apr. 30, 1974, 74.15090

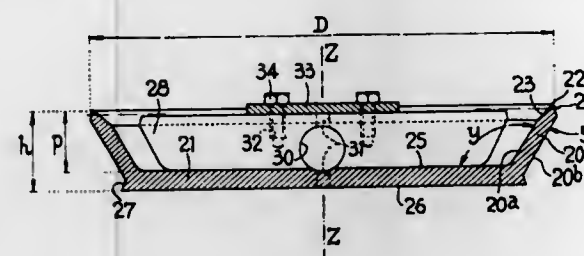
Int. Cl.³ F16K 1/22

U.S. Cl. 251-305

12 Claims

1. A butterfly valve comprising a body defining a through-way passage having an inlet end for connection to a supply of fluid and an outlet end, a closure member mounted on the body to be rotatable about an axis of rotation transverse to the passage between a passage closing position and a maximum passage opening position which opening position is substantially perpendicular to the closing position, the closure member having the shape of a dish which has an end wall extending transversely of said passage in said closing position and a peripheral annular lateral wall which defines with said end wall a concave side of the dish-shaped closure member which concave side faces said inlet end in said closed position, the

lateral wall having an inner peripherally extending surface which includes two surface portions on opposite sides of said axis, in a major part of the width of the closure member in a direction parallel to said axis, which are divergent in the direction of said inlet end in said closed position and make an angle of between 100° and 130° with the general plane of the end



wall and an outer peripherally extending surface which defines the periphery of the closure member and is substantially wholly divergent in the direction of said inlet in said closed position and said axis of rotation of the closure member being located on the side of said end wall adjacent said inlet end in said closed position.

4,005,850

FLOOR JACK

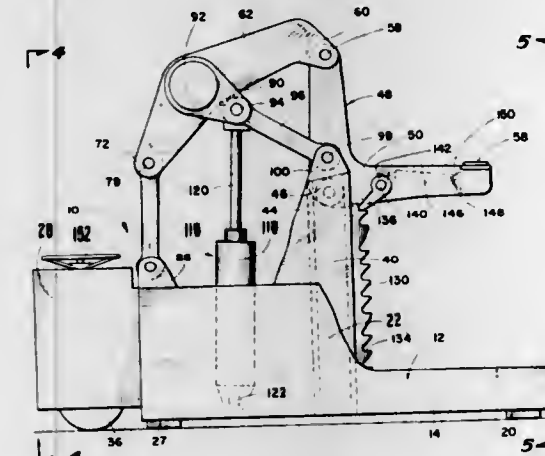
Walter I. Myers, Tulsa; Edgar R. Goodbary, Cardin; Richard L. Thomas, Tulsa; Billy W. Lewis, Cardin, and Francis A. Bartley, Cardin, all of Okla., assignors to Goodbary Engineering Co., Tulsa, Okla.

Continuation-in-part of Ser. No. 458,504, April 8, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,928

Int. Cl.³ B60P 1/00

U.S. Cl. 254-2 R

4 Claims



1. A floor jack apparatus comprising pneumatic motor means adapted for connection with an outside source of air pressure, hydraulic pump means operably connected with the pneumatic motor means and in communication with a fluid reservoir, hydraulic wheel motor means operably connected with the hydraulic pump means for receiving fluid therefrom to provide forward and reverse directions of movement for the floor jack apparatus, hydraulic lift cylinder means operably connected with the hydraulic pump means for actuation thereby to alternate extended and contracted positions, first shuttle valve means operably connected with the hydraulic pump means for selectively directing the fluid to the wheel motor means and/or the lift cylinder means, second shuttle valve means interposed between the first shuttle valve means and the wheel motor means for selective application of the fluid to the wheel motor means to provide said forward and reverse actuation thereof, third shuttle valve means interposed between the first shuttle valve means and the lift cylinder means for selective actuation thereof, safety valve means operably connected with the lift cylinder means, cross-over

relief valve means operably connected with the wheel motor means, and intensifier means operably connected with the lift cylinder means for application of auxiliary fluid under load conditions of the lift cylinder.

4,005,851

HYDRAULICALLY OPERATED DRILLING APPARATUS

Hans-Otto Plote, Vohrum, Germany, assignor to Werner Nordmeyer Ing. Erben KG, Peine-Handorf, Germany

Filed Nov. 26, 1974, Ser. No. 527,361

Claims priority, application Germany, Dec. 7, 1973, 2361050

Int. Cl.³ B66C 23/60

U.S. Cl. 254-139

12 Claims



1. Drilling apparatus comprising an elongated hollow mast formed of a plurality of axially arranged steel pipe sections of circular cross-section secured together in tandem at their abutting ends to form a vertical mast with one section above the other, cover means located at each end of said mast to enclose the same, a drill head moveably mounted on the exterior of said mast, an elongated cable attached to said drill head extending along the length of said mast, and means located within said mast to pull said cable moving said drill head along the length of said mast, said pulling means comprising a pressure operated cylinder/piston motor located within a central one of said steel pipe sections and having a moveable member attached to said cable, first sheave means secured to said moveable member, and second sheave means located respectively within the end sections of said mast, each of said second sheave means being journaled in a bearing secured to the respective cover means, and said cable being entrained over said first and second sheave means and anchored at its ends to the respective bearing means whereby the forces exerted by the movement thereof are absorbed within said mast.

4,005,852

TRACTION SHEAVE WARNING FOR HELICOPTER RESCUE HOIST SYSTEMS

Steven H. Schmittmeyer, Tipp City, and James W. Strayer, New Carlisle, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 27, 1975, Ser. No. 590,881

Int. Cl.³ B66D 1/48

U.S. Cl. 254-173 R

1 Claim

1. In a hoist employing a winch and cable, a traction sheave mechanism for maintaining tautness in the cable at the winch, particularly in the absence of a cable load, said mechanism

ible medium upon application of said impact being compressed, said plastic mass and said compressible medium being disposed in layers extending transversely to the given direction in said chamber, said partly elastic walls on cessation of said impact rebounding from said expanded position, said compressible medium on cessation of said impact returning to a non-compressed state, and said lastingly plastic mass on said rebounding of said elastic walls and said return to a non-compressed state of said compressible medium moving from the direction of said expanded area into said chamber.

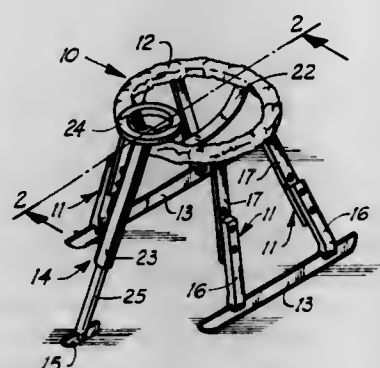
4,005,859

TRAINING DEVICE FOR ICE SKATERS

William Tait, Chelmsford, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y.; a part interest
Filed Apr. 15, 1975, Ser. No. 568,307
Int. Cl.² A61H 3/00

U.S. Cl. 272-70.3

5 Claims



1. A training device for child ice skaters, comprising a plurality of generally vertical support legs, a horizontal body-enclosing rigid member secured to the upper ends of said support legs, a pair of horizontally-extending runners disposed in spaced parallel relation and secured fixedly to the lower ends of selected ones of said support legs, and a steering column secured to said body-enclosing member between said runners extending downwardly and forwardly, said steering column including a hollow longitudinally-extending housing and a rotatable steering element slidably mounted within said housing, a front runner secured to the lower extremity of said steering element which projects outwardly of the lower end of said housing, and spring means positioned within said housing adapted to bias said steering element outwardly from said lower end of said housing, whereby said steering column is longitudinally resilient and rotation of said steering element selectively orients said front runner and establishes the direction of travel for the training device.

4,005,860

BASKETBALL BACKBOARD AND SUPPORT

John W. Ebstein, Roslyn Heights, and Mario Cambardella, Manhasset, both of N.Y., assignors to Diversified Products Corporation, Opelika, Ala.

Filed Mar. 17, 1975, Ser. No. 559,190

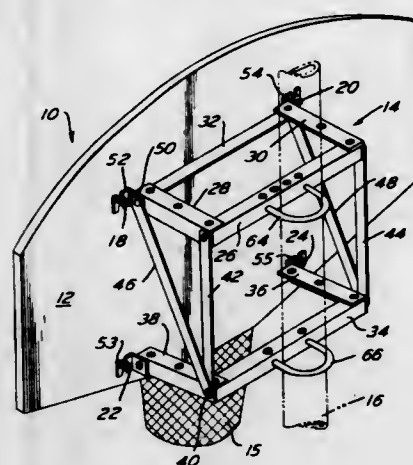
Int. Cl.² A63B 63/04

U.S. Cl. 273-1.5 R

6 Claims

1. Apparatus comprising a basketball backboard having a net on one side thereof, a mounting bracket for mounting said backboard on a support at a desired elevation above a playing surface, said backboard having a pair of fastener members generally perpendicular thereto and projecting from an upper portion of said other side of said backboard, said mounting bracket having a pair of saddle brackets, each saddle bracket having a notch on its upper edge, each notch lying in a generally vertical plane which is generally parallel to said backboard, said notches being spaced apart by a distance corresponding to the distance between said pair of bolts so that each notch may receive one of said bolts, said mounting bracket having at least one more saddle bracket below the

elevation of said first mentioned saddle brackets, said third mentioned saddle bracket having a notch lying in the same plane as said first and second mentioned saddle bracket notches, said backboard having at least one more bolt projecting from said other surface and generally perpendicular thereto in a location so that it may be received in the notch on



said third saddle bracket, said mounting bracket including a vertically disposed strap having a length corresponding generally to the vertical distance between the location of said third bolt and a line extending between said first and second bolts, and said mounting bracket including at least one brace having means thereon for securing the mounting bracket to a support.

4,005,861

POCKET-BILLIARD TRICK SHOT RACKING DEVICE

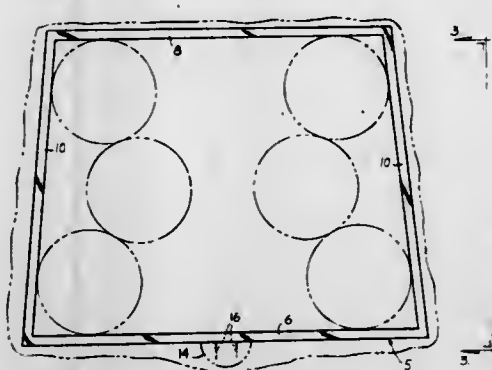
Kenneth R. Tomczak, 12053 Brougham, Sterling Heights, Mich. 48077

Filed June 12, 1975, Ser. No. 586,221

Int. Cl.² A63D 15/00

U.S. Cl. 273-22

3 Claims



1. Improved pocket-billiard trick shot racking device, whereby to facilitate making pocket-billiard trick shots, said racking device being a four-sided racking device having four walls and a trapezoidal shape in plan view so that it can rack six billiard balls at a time so that four thereof are disposed in the corners of said racking device each touching two walls of said device and the other two thereof are inside of said corner balls, said two innermost balls touching two of said corner balls and being spaced apart from each other so that the space between them is less than the diameter of the cue ball said walls having inside dimensions of length for any given diameter of billiard balls as follows: the front; rear; and side walls, respectively, being 3.717 diameters; 3.171 diameters; and 2.846 diameters.

4,005,862

GAME RACKET STRING SUSPENSION

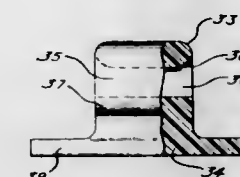
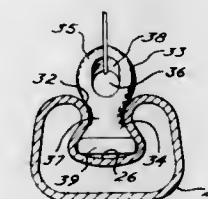
William E. Portz, and Eugene W. Fieger, both of Geneva, Ohio, assignors to True Temper Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 86,042, Nov. 2, 1970, Pat. No. 3,751,034. This application Jan. 22, 1973, Ser. No. 325,253

Int. Cl.² A63B 51/00

U.S. Cl. 273-73 D

2 Claims



1. A game racket comprising a loop portion defined by elongated frame means; said loop portion having a handle; said frame means having a recess formed longitudinally of said frame means at the inner periphery of said loop portion; said frame means having retaining shoulders partially closing said recess at said inner periphery; a plurality of string mounting insert members formed of semirigid material disposed in said recess and arranged around said loop portion; each said insert member integrally comprising a base portion disposed beneath said retaining shoulders and retained within said recess thereby, a relatively narrow neck portion connected to the base portion and disposed between said shoulders, and an enlarged holding portion connected to said neck portion and extending over said shoulders and disposed beyond said recess inwardly of said loop portion; each said holding portion having a string receiving through opening therein disposed entirely inwardly of said frame means; at least certain of said insert members having integral base extensions projecting from said base portions and disposed on either side of said base portions in the recess in the longitudinal direction thereof and abutting adjacent insert members around said loop portion, said base extensions being adapted to be cut to desired lengths for adjusting the spacing of said insert members around said loop portion, and said base extensions having longitudinal reinforcing ribs projecting therefrom.

4,005,863

TENNIS RACKETS

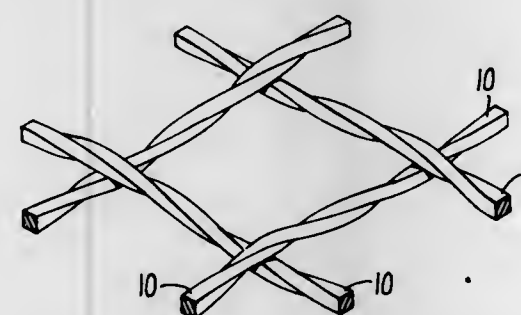
Dana R. Henry, 200 W. Mason St., Apt. 14, Santa Barbara, Calif. 93101

Filed Oct. 4, 1974, Ser. No. 512,095

Int. Cl.² A63B 51/02

U.S. Cl. 273-73 D

3 Claims



1. A tennis racket comprising a frame and a racket string

grid face attached to the frame, said grid face consisting of two mutually perpendicular sets of equally spaced, interlaced, alike, extruded strings, said strings having angular cross-sections and peripheral surfaces formed by alike, intersecting surface portions defining at least two edges, said surface portions and edges being helically shaped by extrusion to thereby be free of internal strain tending to return them to a non-helical condition.

4,005,864

RACKET WEIGHTING MEANS

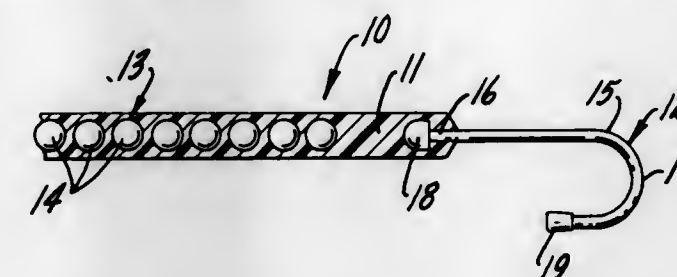
Samuel F. Stewart, 616 Sherwood Drive, Carlisle, Pa. 17013

Continuation-in-part of Ser. No. 521,177, Nov. 6, 1974, abandoned. This application July 11, 1975, Ser. No. 596,038

Int. Cl.² A63B 49/04

U.S. Cl. 273-73 K

8 Claims



1. An improved racket weighting means for use with a racket having a shaft with a throat connected to a frame comprising:

- a non-continuous flexible elongated member adapted to be wrapped at least one time around the throat of said racket, said member being molded,
- a supplemental weight integrally associated with said member, said supplemental weight being internally disposed in said member and including a plurality of longitudinally spaced weight members which are integrally molded within said elongated member, and
- means for attaching said member to said racket.

4,005,865

THREE-DIMENSIONAL AMUSEMENT DEVICE

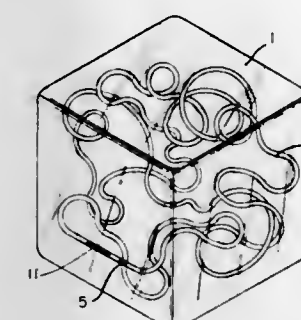
David Conrad Klidder, Box 902, Pointe Aux Pins, Mich. 49775

Filed Sept. 29, 1975, Ser. No. 617,900

Int. Cl.² A63F 9/06

U.S. Cl. 273-109

5 Claims



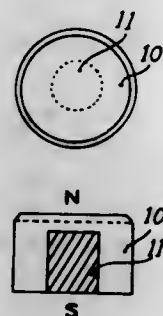
1. A device comprising a container having therein a hollow and transparent tube, said tube being joined at its ends and provided with a plurality of bends in different planar directions to form a three-dimensional passageway network, an indicator means within said passageway capable of moving freely through said passageway by force of gravity, and a barrier means located within said passageway past which said indicator means cannot move and being indicatively marked to signify start and finish, said container being sufficiently transparent to allow viewing of said indicator means in any location within said passageway.

4,005,866

MAGNETIC GAME

Jean Pierre Marcil, 22 Mac Donald St., Maple Grove, Beauharnois, Quebec, Canada (J6N 1N9)
 Filed Sept. 15, 1975, Ser. No. 613,403
 Int. Cl.² A63F 3/00
 U.S. Cl. 273-131 A

1 Claim



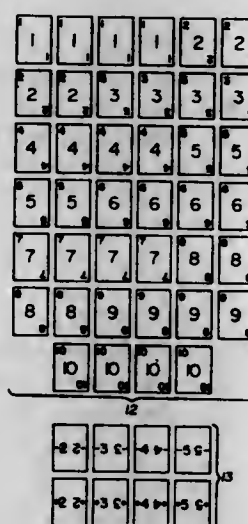
1. A magnetic skill game for two players where the magnetic properties of attraction, repulsion, or magnetic null are used as a means of secret guidance for the players in their attempt to capture each other's pieces; consisting of a board made of a material that is not magnetic or ferro-magnetic except for at least one case which is magnetic and a set of pieces for each player which includes at least one piece which is not magnetic or ferro-magnetic and at least one piece that is magnetic; the latter being visually distinguishable from all other pieces, and at least one piece that is magnetic, the polarity of the latter being opposite for opposite players; the pieces of a player appearing identical except for the magnetic piece.

4,005,867

CARD GAME

Michael Joseph Yaeger, Apartado 97, Altea, Alicante, Spain
 Filed June 12, 1975, Ser. No. 586,187
 Int. Cl.² A63F 3/00, 1/00
 U.S. Cl. 273-135 R

3 Claims



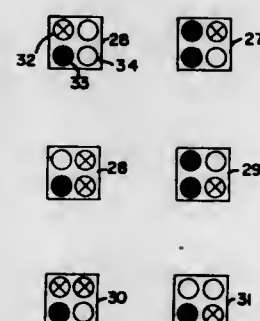
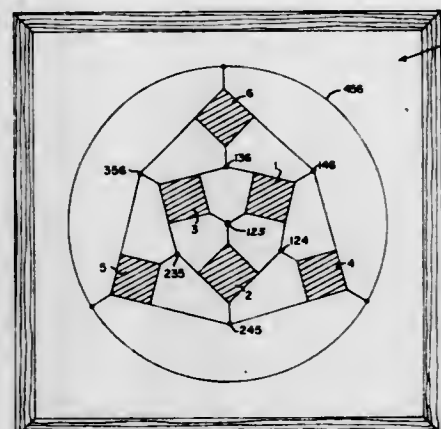
1. In combination, a playing board and a pack of cards, the pack of cards including a set of first cards, each carrying a different numeral thereon, a set of second cards having a "minus" point scoring value indicated thereon, a set of third cards having a "plus" point scoring value indicated thereon, the board being divided into differently numbered spaces into which the cards may be played, there being one space for each different numeral on the cards of the pack, said first set of cards carrying no point scoring value thereon, and a fourth set of cards in said pack of cards, each having at least two numerals thereon, one of said numerals on the cards of said fourth set indicating a point scoring value.

4,005,868

PUZZLE

Piet Hein, Stoke Poges, England, assignor to Stiftung Fuer Humaniora und Wissenschaft
 Filed June 23, 1975, Ser. No. 589,635
 Claims priority, application Denmark, June 24, 1974, 3391/74
 Int. Cl.² A63F 9/06
 U.S. Cl. 273-156

10 Claims



1. A puzzle comprising:

- a game board having geometrical areas thereon which are representations of the surfaces of a three-dimensional polyhedron, said areas being mutually spaced from each other, said board having a plurality of common points depicted thereon corresponding in number to the number of corners which the polyhedron has that are defined by the vertexes of adjoining surfaces, a set of lines on said board for each of said common points, each set connecting one said common point to the vertexes of those geometrical areas which represent a particular group of corner-defining adjoining surfaces of the polyhedron; and
- a set of playing pieces, corresponding in number and in shape to said areas, each said playing piece having on one said an indicium at each vertex, each indicium being one of a number of different indicia which number corresponds to the number of surfaces meeting at one of the corners of the polyhedron, the indicia on each said piece being so combined that none of the pieces are identical.

4,005,869

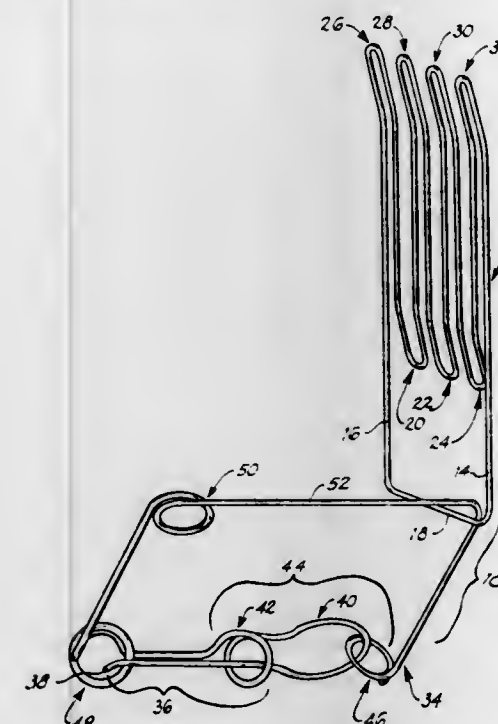
WIRE PUZZLE

Francisco Maldonado, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
 Filed June 9, 1975, Ser. No. 585,364
 Int. Cl.² A63F 9/08
 U.S. Cl. 273-158

5 Claims

1. A wire puzzle comprising a first element formed of a first length of wire having opposed external reaches extending to terminate in a union at one end thereof and in a plurality of inwardly extending serpentine loops at the other end thereof, said opposed external reaches forming respectively the outer side of each of the outermost of said serpentine loops, the inner closed ends of said serpentine loops terminating in

spaced relation to said union, and a second element formed of a second length of wire which includes a first segment extending from a free end of said wire a predetermined distance to a location at which the wire is bent about itself to form a first loop, the wire being configured in spaced relation to said first segment to form a second loop thereabout adjacent the end of said first loop closest to said free end, a second segment of said



wire extending from said second loop in spaced generally parallel relation to said first segment beyond said free end and peripherally in a closed circuit to terminate in a third loop configured about the wire which forms said first loop and spaced therefrom, the width of said serpentine loops being smaller in dimension than the inner diameter of said first, second and third loops.

4,005,870

GOLF PUTTING TRAINING METHOD

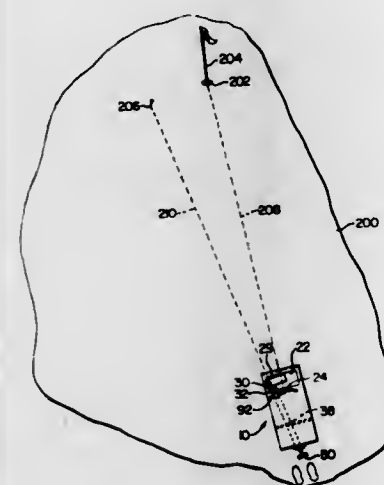
Henry A. Grace, 3412 Pennsylvania St., Hyattsville, Md. 20783, and Robert G. Conrad, 1600 Dillon Road, Maple Glen, Pa. 19002

Division of Ser. No. 411,028, Oct. 30, 1973, Pat. No. 3,917,280, which is a continuation-in-part of Ser. No. 313,352, Dec. 8, 1972, abandoned. This application Oct. 7, 1975, Ser. No. 620,373

Int. Cl.² A63B 69/36

U.S. Cl. 273-183 R

4 Claims



1. A method for learning to accurately putt a golf ball comprising:
 the step of providing a machine which is capable of repeatedly projecting a golf ball from a first area on a putting

green to a second area on said putting green for a given disposition of said machine;
 the step of estimating the distance between said first and said second areas;
 the step of estimating the direction a golf ball should follow to roll on said putting green from said first and to said second area;
 the step of setting said machine at said first area in accordance with said estimates of distance and direction;
 the step of positioning a golf ball to be projected by said machine from said first area to said second area;
 the step of projecting said positioned golf ball by said machine to said second area;
 repeating, if necessary, the two steps of estimating, the step of setting said machine and the steps of positioning and projecting said golf ball until said golf ball is projected by said machine into said second area;
 the step of marking the putting plane through which said golf ball was projected by said machine into said second area;
 the step of placing a golf ball in proximity to said putting plane;
 and the step of stroking said golf ball placed in proximity to said putting plane with a putter using said putting plane as a guide.

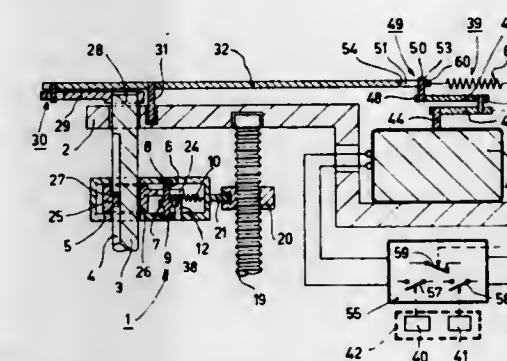
4,005,871

MARKING DEVICE FOR A RECORDING APPARATUS

Gerhard Habelt, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
 Filed July 17, 1975, Ser. No. 596,952
 Claims priority, application Austria, July 26, 1974, 6166/74
 Int. Cl.² G11B 27/00

U.S. Cl. 274-1 R

3 Claims



1. A marking device for making marks at a selected one of two marking zones extending adjacent each other in the longitudinal direction of an index strip, comprising a frame, a spindle mounted in the frame, an actuating lever mounted for pivotal movement about the spindle, means for making a mark in a respective one of said two zones in response to pivoting of said lever in one of two opposite directions from a rest position, said means comprising a marking element and a linkage means for moving the element in a respective one of two directions in response to pivoting of said lever in opposite directions, and a control device for pivoting said lever in a selected one of said two opposite directions,

wherein said control device comprises a crank, means for rotating the crank one full revolution about an axis in a selected one of two opposite directions of rotation from a rest position, said means comprising a motor and a motor control, and a connecting link connected to said crank at a first pivotal connection and connected to said actuating lever at a second pivotal connection, one of said pivotal connections being a pin-slot connection; in said rest position said pivoting spindle, said axis and said first pivotal connection being disposed substantially in a straight line, a longitudinal direction of said slot being aligned with said straight line and the pin being at an end of said slot such that upon initial rotation of said crank from said rest position said pin and slot undergo relative movement until the pin engages an opposite end of the slot.

4,005,872

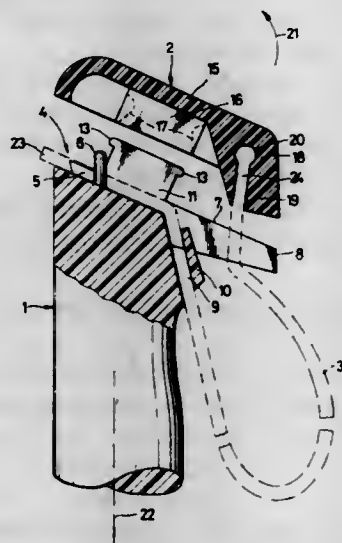
SKI-POLE GRIP HAVING RELEASABLE STRAP ATTACHMENT

Karl Rischert, Alpsternweg 12, D-7750 Konstanz, and Peter Drossler, Uhlandstr. 1, D 7972 Immy, both of Germany
 Filed Nov. 11, 1975, Ser. No. 630,855
 Claims priority, application Germany, Feb. 14, 1975, 2506221

Int. Cl.² A63C 11/22

U.S. Cl. 280—11.37 H

15 Claims



1. A ski-pole grip comprising a grip portion having an end-face, a cap portion adapted to cover said end-face, a strap connected at one end to said grip portion and at the other end to said cap portion, and means on said end-face and on said cap portion to effect a releasable snap-on connection of said cap portion to said end face, said releasable connection means comprising a locking plate covering said end-face and two locking elements arranged parallel to and in spaced relationship with each other on said locking plate, said locking elements including lugs which, in the snapped-on condition of the connection, engage with projections in corresponding locking recesses in said cap portion.

4,005,873

PORTABLE CUTTING AND SEWING WORK STATION

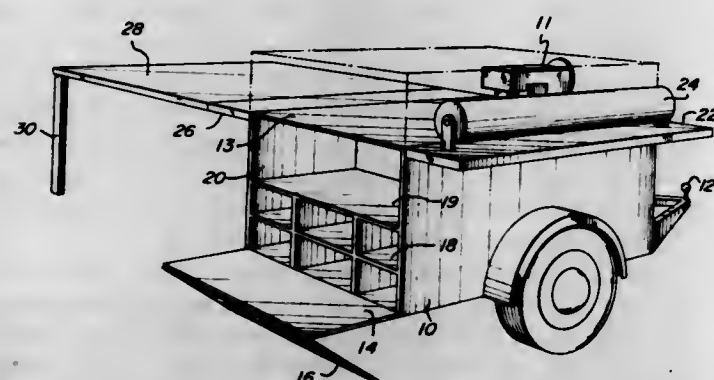
Theodore H. Jacobsen, Rockaway Township, Morris County, and Anthony J. Russo, Clifton, both of N.J., assignors to F.P.M. Corporation, Paterson, N.J.

Filed Nov. 14, 1975, Ser. No. 631,897

Int. Cl.² B60P 3/10

U.S. Cl. 280—63

3 Claims



1. A portable cutting and sewing work station comprising a trailer comprising a base and a plurality of vertical walls, said trailer adapted to be towed by a motor vehicle, a sewing machine supported on said trailer, a recessed work seat proximately disposed adjacent to said sewing machine, said work seat supported by said trailer whereby a portion thereof is integral with one of said vertical walls, and a collapsibly foldable rolled fabric storage and dispensing area located behind said work seat.

4,005,874

MEANS FOR SUPPORTING A REFLECTOR ATTACHING BRACKET FOR A BICYCLE

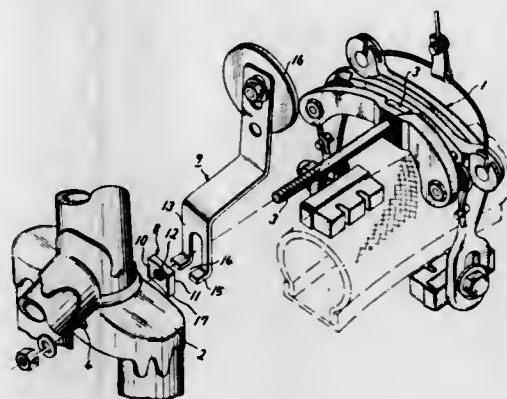
Tadakatsu Ohtani, Sagami-hara, Japan, assignor to Nichibei Fuji Cycle Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1975, Ser. No. 549,744

Int. Cl.² B62J 5/20

U.S. Cl. 280—289 H

3 Claims



1. A means for supporting a reflector on a bicycle comprising a bicycle frame part having a convexly curved surface, a brake unit including a center bolt for mounting the brake unit on said bicycle frame part, a special washer provided with a hole for allowing the center bolt to penetrate therethrough, one face of said washer having a concave surface corresponding to the convexly curved surface of the bicycle frame part; and a reflector attaching bracket having a lapping portion which is brought into contact with said special washer and provided with a cut-out space for allowing the center bolt to penetrate therethrough, said reflector attaching bracket including a folded fork at its lower end adapted to engage with the lower edge of the special washer, wherein said reflector attaching bracket and said special washer are held between the brake unit and the bicycle frame part.

4,005,875

SKI CONSTRUCTION OF THE TORSION BOX TYPE

Gunnar Bjertnaes, 2820 Biri, Norway

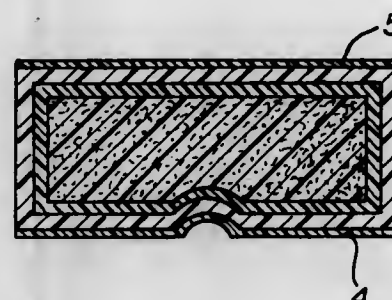
Filed Dec. 5, 1975, Ser. No. 638,280

Claims priority, application Norway, Dec. 13, 1974, 744504

Int. Cl.² A63C 5/00

U.S. Cl. 280—610

4 Claims



1. A ski construction comprising:
 a foam core extending longitudinally of the ski;
 a first unitary torsion box surrounding said core in secured relationship therewith over the entire periphery of the core;
 a second unitary torsion box surrounding said first box in secured relationship therewith over the entire periphery of the first box, said second box having higher tensile strength properties than said first box.

4,005,876

GAS GENERATOR FOR AUTOMOBILE SAFETY CUSHIONS

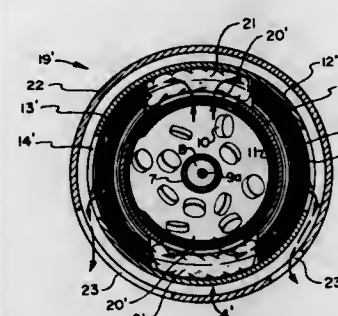
Howard E. Jorgensen, Hyrum; George F. Kirchoff, Brigham City, and Fred E. Schmeiter, North Ogden, all of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Apr. 10, 1975, Ser. No. 566,871

Int. Cl.² B60R 21/10

U.S. Cl. 280—741

2 Claims



1. A gas generator comprising:
 a combustion cartridge comprising a closed tube, a gas generant material and igniter therefore in the tube, filtering screens inside the tube surrounding the gas generant, and two diametrically opposite openings in the tube through which combustion gases may flow;
 an outer case surrounding the combustion cartridge and having two diametrically opposite openings that are angularly spaced 90° from those in the combustion cartridge;
 two long, plastic-film packages of pH neutralizing material, one located at each opening of the combustion cartridge and confined between the combustion cartridge and the outer case; and
 layers of wire screen oriented circumferentially about the combustion cartridge and confined between the combustion cartridge and the outer case, and between the two packages of pH neutralizing material, whereby combustion gases from the combustion cartridge must flow through the screens, substantially parallel to the layers thereof, before being discharged through the openings in the outer case, thereby providing a long path for the gases through a minimal volume of screen.

4,005,877

VEHICLE PASSENGER RESTRAINT MECHANISM

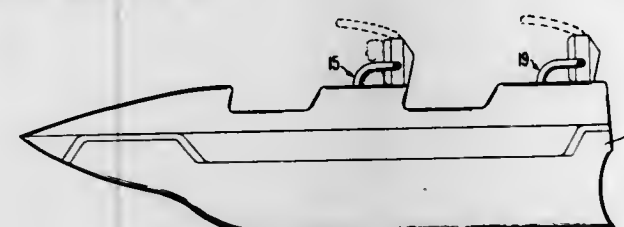
Thomas Milton Humphries, Cupertino, Calif., assignor to Arrow Development Co., Inc., Mountain View, Calif.

Filed Feb. 24, 1975, Ser. No. 552,769

Int. Cl.² B60R 21/08

U.S. Cl. 280—748

15 Claims



1. A mechanism for retaining a passenger in a seat attached to a moving vehicle, comprising:
 means carried by said vehicle and operable by hand for movement between a passenger restraint position near said seat and a passenger loading position away from said seat,
 a hydraulic cylinder having a piston movable therealong between opposite ends thereof and a shaft attached to said piston and extending completely through said cylinder and through said opposite ends in a liquid tight manner for all positions of said piston therebetween, one of

said cylinder and one end of said shaft being fixed with respect to said vehicle and the other of said cylinder and said one end of said shaft being attached to said movable restraint mechanism, whereby movement of the restraint mechanism between its extreme passenger restraint and loading positions causes said piston to move between its said opposite ends of the cylinder,
 a fluid path external of said cylinder and connected to carry fluid between said opposite ends of said cylinder,
 fluid control means operably connected as part of said fluid path for permitting fluid to flow in only one direction when actuated into a first mode, that direction being such as to permit said passenger restraint means to move toward said seat but not away from the seat, said fluid control means allowing fluid to flow in an opposite direction when actuated into a second mode,
 a mechanical control operable between two positions relative to said vehicle and connected to actuate said fluid control means into its first and second modes when the mechanical control is, respectively in its first and second position, and
 means cooperatively connectable with another end of said shaft for mechanically preventing relative movement between said cylinder and said shaft in a direction permitting the restraint mechanism to move beyond a fixed position in the direction toward its said loading position when said mechanical control is in its first position, thereby providing a mechanical backup to the hydraulic restraint of the passenger.

4,005,878

METHOD AND DEVICE FOR THE ASSESSMENT OF SIGNATURES FOR FORGERIES

Willem van Leer, Haifa, Israel, assignor to Hydrophilics International, Inc., New York, N.Y.

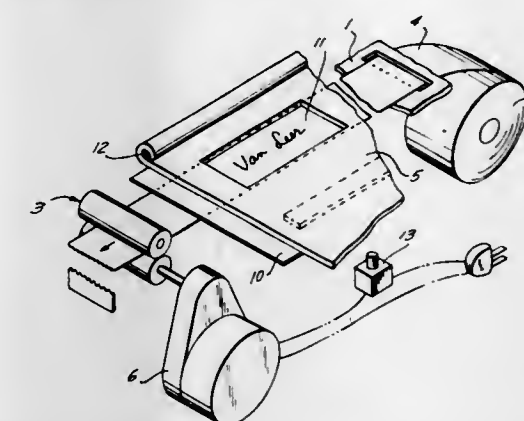
Filed Dec. 10, 1975, Ser. No. 639,286

Claims priority, application United Kingdom, July 28, 1975, 31556/75; Sept. 26, 1975, 39578/75

Int. Cl.² B42D 15/00, 19/00

U.S. Cl. 283—8 R

10 Claims

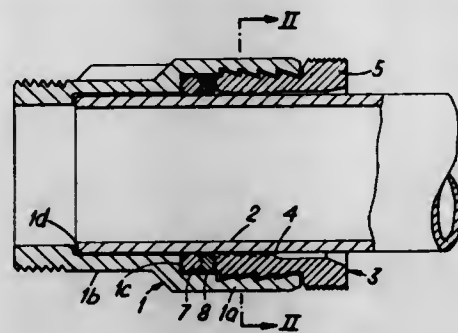


1. An apparatus for use in forming a distorted signature so as to prevent forgery comprising:
 a. a moving surface on which a visible image can be formed;
 b. means to provide a visible image on said moving surface in response to application of pressure;
 c. means to move said moving surface relative to a document being signed during the process of signing; and
 d. means for positioning a document to be signed over said moving surface and said visible image forming means.

also having a manipulatable trailing portion to be disposed external to the collar to enable screwing the leading portion of the sleeve into the collar, at least the leading portion of the sleeve being axially split to permit the radial contraction thereof and being formed on its inner surface with inwardly directed protrusions;

C. and a resilient sealing ring of a diameter to be loosely received around the pipe and to be disposed between said internal shoulder of the collar and the end face of the leading portion of the sleeve when the latter is threaded into the collar;

the screw-threads of the collar and sleeve being formed in cylindrical surfaces of substantially uniform diameter throughout the length of their respective screw-threaded portions and having a sloping back face facing the trailing portion of the sleeve and said open end of the collar, respectively, such that when the pipe is disposed within the collar and the sleeve, with the screw-threads of the leading portion of the sleeve inter-



engaging those of the collar and the manipulatable trailing portion of the sleeve projecting from the collar, and with the sealing ring interposed between the internal shoulder of the collar and said end face of the sleeve; rotating the sleeve by means of its manipulatable trailing portion to displace the sleeve axially of the collar;

i. first effects the seal by causing the said end face of the sleeve to apply an axial force to the sealing ring to axially compress it and thereby to radially expand it into sealing engagement with the pipe and collar;

ii. and then, by virtue of the sealing ring and shoulder thereafter serving as an abutment limiting the further axial displacement of the sleeve within the collar, causes the sloping faces of their interengaging screw-threads to effect the radial contraction of the threaded portion of the sleeve for the complete length of the interengaging threads to force the sleeve protrusions into the pipe throughout the length of the said interengaging threads.

4,005,885

REMOTE CONTROLLED DOOR AND WINDOW

George K. Austin, Jr., P.O. Box 209, Rte. 2, Box 254, Newberg, Oreg. 97132

Filed Feb. 11, 1976, Ser. No. 657,145

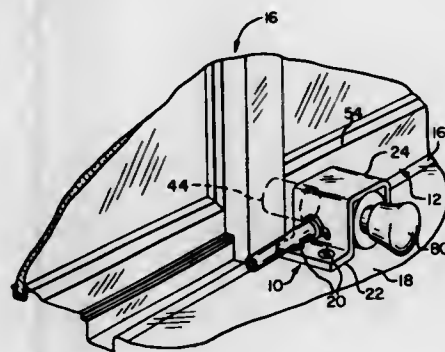
Int. Cl.² E05B 51/02

U.S. Cl. 292-144

6 Claims

1. In a remote controllable lock, bracket means mountable on a casement frame, a plunger having a dead bolt portion, and mounted movably on the bracket means, motive means carried by the bracket means for moving the plunger between a locking position and an unlocking position, the plunger having a handle portion adapted to be manually grasped for manually moving the plunger between its locked and unlocked positions, the motive means comprising a piston on the plunger and a cylinder adapted to receive air under pressure, indicator means,

and switch means fixed relative to the bracket means and operable by the plunger to indicate the position of the plunger, the switch means including a pair of contacts mounted on the cylinder in spaced apart positions and electrically insulated from each other,



the switch means also including a conductive contactor carried by the plunger and movable by the plunger between a first position spaced from the contacts and a second position positioned between and contacting both the contacts.

4,005,886

FLUSH BOLT MECHANISMS

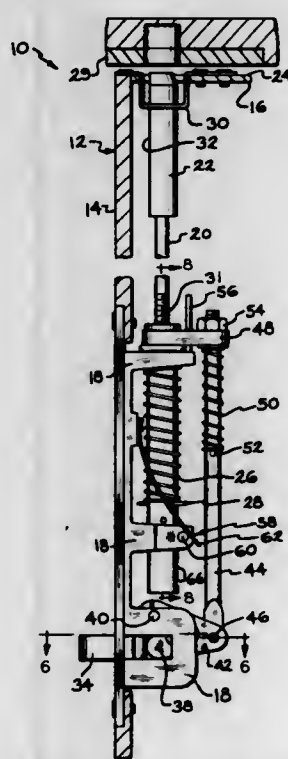
Douglas E. Lirette, Ann Arbor, Mich., assignor to Door Controls Incorporated, Ann Arbor, Mich.

Filed Dec. 18, 1975, Ser. No. 642,183

Int. Cl.² E05C 7/06

U.S. Cl. 292-177

9 Claims



1. For use in conjunction with a pair of swinging doors, a bolt mechanism comprising a support member having a surface adapted to be mounted essentially flush with the free edge of one of the pair of swinging doors, shaft support means extending from said support member on the side thereof opposite said surface, a first shaft slidably carried adjacent to said surface by said support means and including a latch bolt at one end thereof adapted to be extended beyond a horizontal edge of the door, spring means normally biasing said first shaft to a retracted position, a cam pivotally carried by said support member on an axis parallel to said first shaft and extending beyond the surface thereof and adapted to be engaged by the other of the swinging doors, a cam follower engaged by said cam, said cam follower being pivotally carried by said support member on an axis parallel to said surface and in a plane perpendicular to said first shaft and having a lever arm extend-

ing inward beyond said first shaft for movement about the cam follower axis, a second shaft parallel to said first shaft and pivotally carried at one end by the inward distal end of said lever arm and carried at the other end by a said first shaft so that linear movement can be imparted to said first shaft against the bias of said spring means upon generally axial movement of said second shaft in response to pivoting of said cam when engaged by the other of the swinging doors, said second shaft being carried in parallel relationship by said first shaft by a slide connection, and an override spring means normally biasing said second shaft to an extended position relative to said first shaft, the first-named spring means and said over-ride spring means having spring characteristics so that said first-named spring means can be displaced axially by a lesser load than is required to displace said override spring means.

4,005,887

DOOR LOCKING MECHANISM

Shoji Itakura, Kariya, Japan, assignor to Aisin Selki Kabushiki Kaisha, Japan

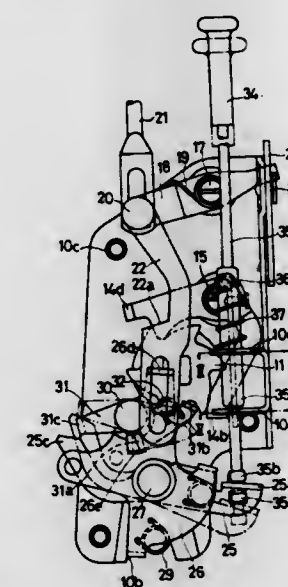
Filed Feb. 3, 1975, Ser. No. 546,690

Claims priority, application Japan, Feb. 8, 1974, 49-16539

Int. Cl.² E05B 65/32; E05C 3/06, 3/36

U.S. Cl. 292-216

5 Claims



1. A door locking mechanism for a vehicle comprising: a latch member; a detent operatively engageable with said latch member for maintaining said latch in a latched position; a release member operatively engaged with said detent at an unlocked position during an unlocked operation of said mechanism for releasing said engagement of said detent with said latch member, and operatively disengaged from said detent at a locked position during a locked operation of said mechanism for preventing release of said detent from said latch member; inside and outside opening means respectively connected to said release member for controlling the engagement of said release member with said detent; a locking lever operably connected to said release member and shiftable between an unlocked position thereof and a locked position thereof for shifting said release member between said unlocked and locked positions thereof; a cancelling lever pivotally mounted on said locking lever and shiftable between an unlocked position thereof wherein said locking lever is in said unlocked position thereof, and a keyless locked position thereof wherein said locking lever is in said locked position thereof, and through a locked position thereof wherein said locking lever is in said locked position thereof, said cancelling lever being engageable with said detent only during said locked position thereof so as to thereby return said locking lever to said unlocked position thereof;

first means for shifting said cancelling lever between said unlocked and locked positions thereof together with said locking lever, and for permitting said cancelling lever to be shifted between said locked and keyless locked positions thereof independently of said locking lever; a keyless locking lever shiftable between an unlocked position thereof, wherein said locking lever is in said unlocked position thereof, and a keyless locked position thereof, wherein said locking lever is in said locked position thereof, and through a locked position thereof, wherein said locking lever is in said locked position thereof;

second means for shifting said locking lever between said unlocked and locked positions thereof together with said keyless locking lever and for maintaining said locking lever at said locked position thereof when said keyless locking lever is shifted to said keyless locked position thereof for shifting said cancelling lever to said keyless locked position thereof; and a rod means connected to said keyless locking lever and movable between first, second and third positions thereof for shifting said keyless locking lever between said unlocked, locked and keyless locked positions thereof, respectively.

4,005,888

SECURING MEANS FOR PANELS

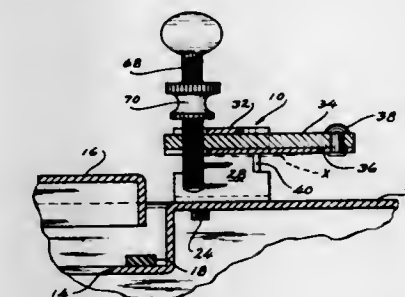
Axel Moeller, St. Petersburg Beach, Fla., assignor to The Ludwig Mfg. Company, Inc., Racine, Wis.

Filed May 12, 1975, Ser. No. 576,375

Int. Cl.² E05C 5/04

U.S. Cl. 292-256.71

3 Claims



1. A means of securing a panel in an opening in a wall, said means comprising a body portion, a sliding member embraced by said body, said sliding member having upper and lower plane surfaces and laterally-opposed edges, and being slidably confined within said body; said sliding member having a forward end and a rear end, said body having upright, laterally-spaced walls embracing said laterally-opposed edges of said sliding member, a planar friction-inducing member initially formed non-planar and in contact with said lower surface of said sliding member and mutually slidable with said sliding member, a plurality of support lugs in said body and integral with said upright walls and directed mutually inwardly and substantially normal to said walls, and engaging the lower surface of said friction-inducing member, a threaded member threadedly engaged to said sliding member at said forward end and substantially normal thereto, said threaded member positionable over said panel upon shifting of said sliding member relative to said body, and to be brought rotatively into positive engagement with the surface of said panel.

4,005,889

SECURITY DEVICE FOR WINDOWS

Cecil W. Patrick, 6920 N. 16th, Lot 156, Omaha, Nebr. 68112

Filed Dec. 12, 1975, Ser. No. 640,237

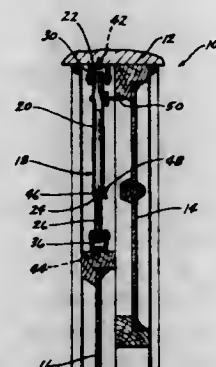
Int. Cl.² E05C 17/30

U.S. Cl. 292-262

1 Claim

1. A security device for windows including at least a vertically movable lower window unit mounted in a window frame, comprising,

a first upstanding tube means secured at its lower end to the upper end of the lower window unit,
 a second upstanding tube means slidably embracing the upper end of said first tube means and being secured at its upper end to said window frame,
 said first tube means having at least one opening formed therein between its lower end and the lower end of said second tube means,
 and a stop means in said opening adapted to engage the lower end of said second tube means when said lower



window unit is raised thereby limiting the upward movement of said lower window unit,
 said first tube means being pivotally secured to said lower window unit,
 said second tube means being pivotally secured to said window frame,
 first and second U-shaped brackets being secured to said lower window unit and said window frame respectively by screws, said first tube means being pivotally secured to said first bracket, said second tube means being pivotally secured to said second bracket.

4,005,890

DOOR LOCK STRIKE GUARD

Robert F. Murch, Woodside, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

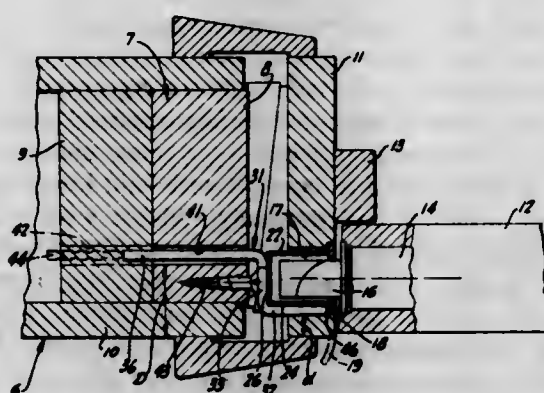
Continuation of Ser. No. 495,851, Aug. 8, 1974, abandoned.

This application Oct. 15, 1975, Ser. No. 622,738

Int. Cl.² E05C 21/00

U.S. Cl. 292-346

1 Claim



1. In a door lock strike guard arrangement having a frame member and a door jamb adjacent and overlying the same to define an edge of a door opening; an opening through said jamb having a side thereof adjacent one edge of said jamb and defining a strike pocket facing said door opening; an elongated opening in said frame member generally parallel to said side of said pocket but spaced therefrom in a direction away from said one edge of said jamb and being aligned with a portion of said pocket; a strike guard comprising a unitary substantially rigid strike guard member having a panel portion lying adjacent said one side of said pocket, an offset portion substantially perpendicular to said panel portion at the edge thereof nearest said frame member and spaced from said

frame member, and a leg portion generally parallel to said panel portion extending from said offset portion at the edge thereof farthest from said one edge into said elongated opening and interengaging said frame member with a force fit whereby any force applied to said panel portion in a direction toward said one edge of said jamb is transmitted to and resisted by said frame member, and including abutment means on said frame member engaging and buttressing said offset portion.

4,005,891

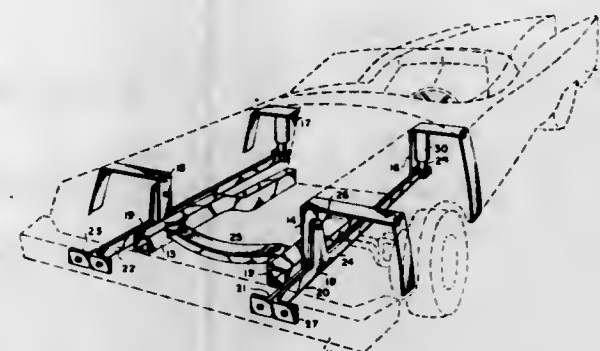
BUMPER IMPACT DIVERTOR

Theodore T. Michals, Box 71, Lyons, Ill. 60534
 Filed Nov. 18, 1974, Ser. No. 524,795

Int. Cl.² B60R 19/00

U.S. Cl. 293-84

2 Claims



1. A shock absorbing device for a vehicle or the like provided with a bumper and with spaced frame members, said device comprising at least one tee-shaped thrust member having a substantially horizontally disposed cross bar and a stem extending outwardly from the cross bar, means pivotally mounting the free end of the stem to a frame member for swinging movement about said pivot, means securing one end of the cross bar to the vehicle bumper, a fluid shock absorber, means securing the other end of the cross bar to one end of the shock absorber and means securing the other end of the shock absorber to the frame, said tee-shaped thrust member comprising a pair of forgings secured together and having diverging flanges at one end thereof for securement to the vehicle bumper, and diverging offsets at the other end and pivot means for securing one end of said fluid shock absorber to the thrust member between said diverging offsets.

4,005,892

DEBRIS-RETRIEVING CANE

Walter L. Williams, 5739 Camerford Ave., Los Angeles, Calif. 90038

Filed June 11, 1975, Ser. No. 586,089

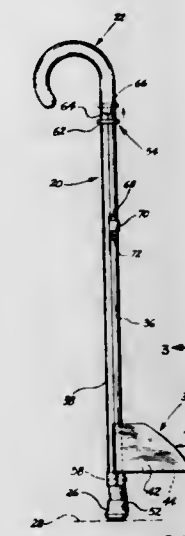
Int. Cl.² A01K 29/00; A47L 13/52

U.S. Cl. 294-1 R

5 Claims

1. A debris-retrieving cane, comprising: a longitudinal cane shaft member effectively provided at an upper end thereof with a handle member portion and effectively provided at a bottom end thereof with a ground-surface-engageable cane tip member portion, said longitudinal cane shaft member being provided adjacent to said bottom end thereof with a hollow debris-receiving receptacle means having a ground-surface-engageable entry lip portion movable into engagement with a ground surface for positioning adjacent to a quantity of debris which is to be removed and, in such position, defining at least a portion of a receiving entry opening provided in said debris-receiving receptacle means and effectively communicating the exterior and the hollow interior thereof, said debris-receiving receptacle means being effectively positioned with respect to a lower portion of said cane shaft member in a manner capable of being placed with said ground-surface-engageable entry lip portion projecting from said cane shaft member in a direction such as to be capable of engagement with a ground surface and with said entry opening effectively open for the reception

of a quantity of debris which is to be removed; and debris movement and manipulation means for effectively moving and manipulating a quantity of debris which is to be removed along a ground surface initially supporting such debris toward the ground-surface-engaged entry lip portion for forced movement thereover and through said entry opening into said hollow interior of said debris-receiving receptacle means said debris-movement-and-manipulation means comprising a longitudinal handle portion and an effective debris-engaging spatula portion at the bottom end of said longitudinal handle portion normally mounted in longitudinal, laterally adjacent, substantially parallel relationship with respect to a corresponding longitudinal part of said longitudinal cane shaft member and provided with controllably openable and close-



able fastening means for normally fastening and retaining said longitudinal handle portion and said debris-engaging spatula portion at the bottom thereof immediately adjacent to and in longitudinal contiguous relationship with respect to said part of said cane shaft member until controllable manual unfastening thereof, said fastening means, when controllably unfastened, effectively releasing said longitudinal handle portion of said debris-movement-and-manipulation means whereby to allow said lower debris-engaging spatula portion thereof to move into a position spaced from but adjacent to and movable toward said ground-surface-engageable entry lip portion of said debris-receiving receptacle means and said entry opening defined thereabove when in the debris-receiving operative position.

4,005,893

ARTICLE GRIPPING TONGS

George Tash, 15155 Stagg St., Van Nuys, Calif. 91405

Filed Dec. 10, 1975, Ser. No. 639,292

Int. Cl.² A47J 29/06

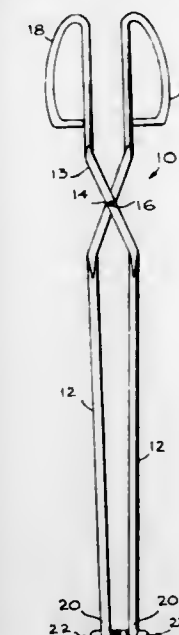
U.S. Cl. 294-28

10 Claims

1. Improved article-gripping tongs, said tongs comprising, in combination:

a pair of elongated pincer members pivotably interconnected and each having handle means adjacent one end thereof and an article-gripping arm depending from the opposite end thereof,
 said arms consisting of a lower portion and an upper portion;
 said upper and lower portions of said arms being integral with one another;
 said lower portion of said arms and said handle means substantially lying in a first plane;
 said upper portion of each of said arms lying in a second plane which is at an angle to said first plane;
 one of said arms and its associated handle means lying in a third plane;

the remaining arm and its associated handle means lying in a fourth plane;
 said third and fourth plane lying at an angle with respect to one another;
 whereby one end of the upper portions of said arms generally converge towards one another and the opposite end of the upper portions of said arms generally diverge away from one another, such that upon closing of said tongs,



the said one ends initially contact one another while said opposite ends initially are simultaneously displaced from one another;
 said arms being made from a flexible, elastic material whereby said opposite ends can be moved closer to one another while said one ends are maintained in contact with one another; and,
 grip increasing means disposed on each of said upper arm portions.

4,005,894

LOG GRAPPLING APPARATUS

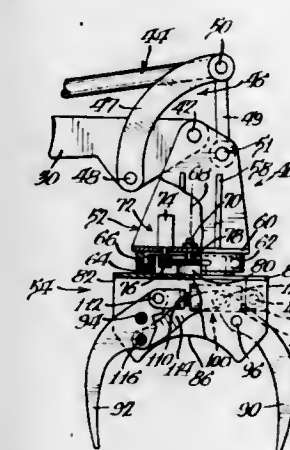
Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 16, 1975, Ser. No. 623,009

Int. Cl.² B66C 3/16

U.S. Cl. 294-88

1 Claim



1. A heel boom log grapple apparatus comprising an upper frame adapted to be attached to a boom on a vehicle, a lower frame rotatably supported about an axis on said upper frame, drive means between said frames for rotating said frames relative to each other, a pair of grapple heels fixed to said lower frame at spaced locations on opposite sides of said axis, first and second rods extending between said heels and located on opposite sides of said axis, first and second grapple arms respectively pivoted on said first and second rods be-

tween said spaced grapple heels, and power means between said lower frame and grapple arms for pivoting said arms so that a log may be gripped between said arms and held in engagement with said grapple heels, said power means including a rigid synchronizing link having opposite ends respectively connected to said arms at locations spaced from the pivotal connections for said arms on said lower frame, and a fluid motor including a cylinder and piston rod with one of said cylinder and piston rod connected to one of said arms and the other of said cylinder and piston rod connected to said lower frame.

4,005,895

ROTATIONAL GRAPPLE

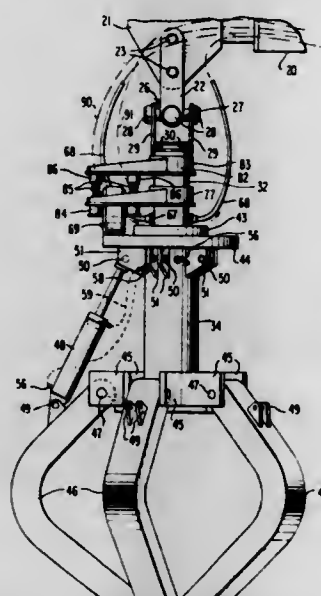
Harold L. Cullings, R.D. 1, Box 66, McConnellsburg, Pa. 17233

Filed Nov. 17, 1975, Ser. No. 632,667

Int. Cl.² B66C 3/16; E02F 3/44; B66C 1/04

U.S. Cl. 294—65.5

20 Claims



1. A rotational drive assembly comprising a relatively stationary member and a rotational member having swiveled engagement with said relatively stationary member, a drive flange on the rotational member, a first suspension arm on said relatively stationary member above the drive flange of the rotational member and held against rotation around the axis of the relatively stationary member while being free to shift longitudinally thereof, a pressure fluid operated motor wheel journaled on said first suspension arm and having a tire in frictional contact with said drive flange, a second suspension arm fixed on the relatively stationary member in spaced opposing relation to the first suspension arm, and adjustable tension spring means interconnecting said first and second suspension arms and biasing the first suspension arm with said motor wheel toward said drive flange.

4,005,896

METHOD AND APPARATUS FOR HANDLING LARGE, FRAGILE OBJECTS

Glen A. Ball, Peoria; Keith E. Koch, Tremont; Ivan R. Lampert, Peoria, and Robert W. Untz, Hanna City, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 434,983, Jan. 21, 1974, Pat. No. 3,915,311. This application Oct. 6, 1975, Ser. No. 620,074

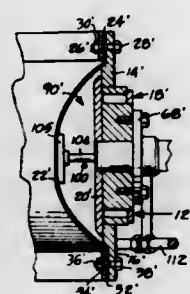
Int. Cl.² B66C 1/00

U.S. Cl. 294—67 BA

3 Claims

1. Apparatus for selectively gripping an object comprising: wall means positionable generally about the object; means associated with said wall means and movable inwardly thereof to engage a portion of the outer surface of said object to thereby grip the object, with the wall means so positioned; and means for selectively moving said movable means inwardly of

said wall means; wherein said movable means comprise diaphragm means, wherein the means for selectively moving the diaphragm means inwardly of the wall means comprise plunger means associated with the wall means and movable inwardly of the object to move a portion of the diaphragm



4,005,897

FISH CLAW

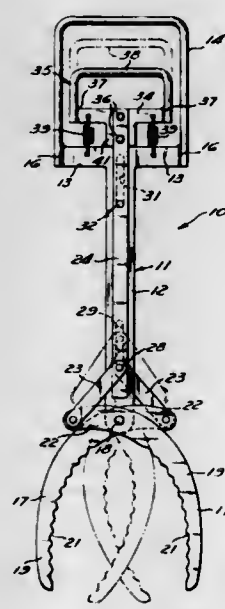
Joel E. Smith, Reidsville, Ga., assignor to Joel E. Smith, Reidsville, Ga.

Filed July 21, 1975, Ser. No. 597,365

Int. Cl.² A01K 97/14

U.S. Cl. 294—115

1 Claim



1. A hand-operated device for handling a captured fish comprising an elongated flat shank, a pair of opposed jaws pivotally mounted at a common point on a forward end of the shank, the jaws each having a main gripping portion extending generally forwardly of the pivot point and an integral lever arm extending parallel to the plane of the shank generally transversely of the forward gripping portion, said jaws being mounted on opposite sides of the shank, each in abutting contact with the adjacent face of the shank, a pair of flat control rods on opposite sides of the shank, said control rods each being in abutting contact with an adjacent face of the shank and being coplanar with an associated jaw, a flat link pivotally connected between the forward end of each control rod and the distal end of the adjacent jaw lever arm, each link being disposed in a plane overlying the plane of the associated jaw and control rod, a hand grip carried on the rearward ends of the control rods, said hand grip including a portion inter-

posed between the rearward control rod ends and coplanar with the shank, a pair of longitudinally spaced pins retaining said control rods in fixed relation therewith with a clearance spacing permitting said control rods to slide longitudinally of the shank, said shank having a pair of spaced longitudinal slots for movement of said pins during movement of said control rods, a forward one of said pins providing the pivotal connection of said links to their associated control rods, a pair of tension springs connected between said hand grip and said shank and symmetrically spaced about the line of movement of said control rods, said springs biasing said jaws to their open position, a portion of said hand grip being in abutting engagement with said shank when said jaws are in their open position, the main gripping portion of said jaws having an arcuate configuration and being arranged to overlap when said jaws are closed.

4,005,898

CONVERTIBLE SEAT/BED STRUCTURE AND ASSOCIATED FOLDABLE TABLE FOR PICKUP TRUCKS AND THE LIKE

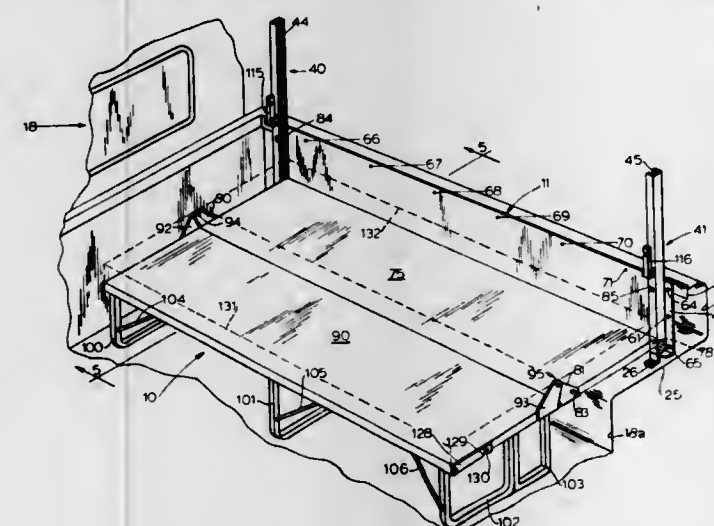
Lee V. Way, Rte. 3, Box 333C, Wilmington, N.C. 28401

Filed Mar. 18, 1975, Ser. No. 559,568

Int. Cl.² B60P 3/34

U.S. Cl. 296—23 R

11 Claims



1. A seat/bed assembly usable singly and in pairs and selectively foldable for use as a seat or bed in a pickup truck, camper, and like vehicle having opposed upright sidewalls and a floor between the sidewalls, each such assembly comprising:

- support means providing a pair of laterally spaced, vertical tubular guide members secured to a selected sidewall of the vehicle;
- a first rectangular frame member having a supportive surface and having mounted adjacent one side edge thereof a pair of guide connectors adapted to travel on said guide members adapting the said side edge of said first frame member to be retained and move vertically thereon and said frame member to pivot thereon for assuming selected stored and seat back positions in which said first frame member side edge is elevated on said guide members and said supportive surface is brought to an upright, outwardly facing position and when desired a bed position in which said first frame member side edge is lowered on said guide members and said supportive surface is upwardly facing and disposed horizontally;
- a second rectangular frame member having a supportive surface and hinge means hingedly connecting one of its side edges to the other side edge of said first frame member for pivoting between an unfolded position in which the supportive surface thereof is horizontal and facing upwardly for use as a seat or bed surface and another folded position in which the supportive surface thereof is brought to an upright position facing the supportive surface of the first frame member for storage; and

d. folding leg means connected to said second frame member to support the same on the floor of the vehicle when in its said unfolded seat and bed positions, said folding leg means including at least one pair of leg means extending perpendicular to the side and each member of the pair of being at the same distance longitudinally from an end of the floor and having one member of the pair adapted to be folded to accommodate to tire well intrusions, and the like, when said second frame member assumes its seat position and adapted to be unfolded adjacent the other member of the pair to supplement the support provided thereby when said second frame member is in its bed position.

4,005,899

AUTOMOBILE ANTI-GLARE SHIELD

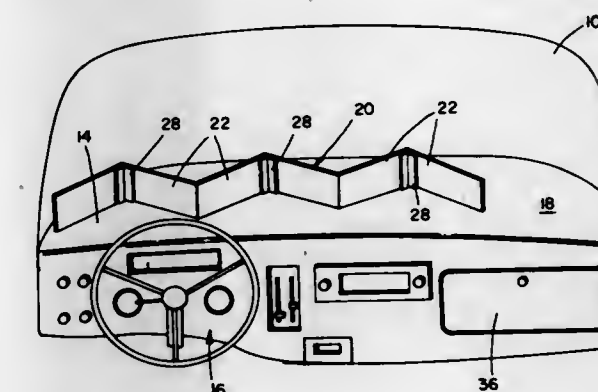
John T. Rigney, 6548 Parkdale Plaza, Martinez, Calif. 94553

Filed July 28, 1975, Ser. No. 599,515

Int. Cl.² B60J 3/00

U.S. Cl. 296—97 E

11 Claims



11. In combination, an automobile having a passenger compartment; a windshield separating the compartment from an exterior of the automobile; and dashboard disposed in the compartment beneath the windshield and including a generally horizontal surface extending over a major portion of the length of the windshield; and an anti-glare shield carried by and loosely positioned on the horizontal dashboard surface, the anti-glare shield having a height substantially less than a height of the windshield, an overall length many times greater than its height, and a longitudinally undulating configuration so that the glare shield is self-supporting on and freely removable from the horizontal dashboard surface.

4,005,900

VEHICLE ROOF WITH MOVEABLE PANEL

Axel Rauthmann, Dansweiler, and Erwin Spiegel, Quadrath-Ichendorf, both of Germany, assignors to Ford Motor Company, Dearborn, Mich.

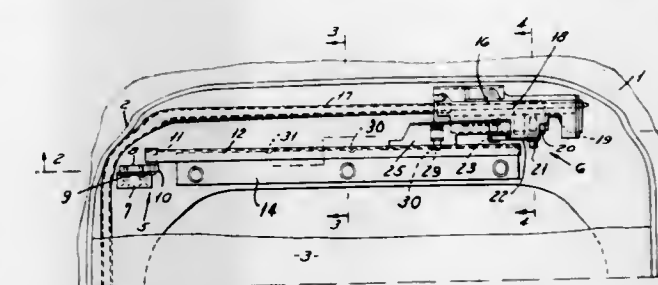
Filed Feb. 3, 1976, Ser. No. 654,813

Claims priority, application Germany, Mar. 21, 1975, 2512426

Int. Cl.² B60J 7/04

U.S. Cl. 296—137 B

8 Claims



1. A vehicle roof having a panel arranged inside a roof aperture, which panel can be upwardly deployed at its rear edge and can, if required, be detached completely, a roof frame framing the aperture,

the panel being attached to the roof frame at its forward edge through at least two hinge devices and at its rear edge through deploying mechanisms comprising two lateral lever arms movable to deploy the rear edge of the panel out of the aperture, wherein the improvement comprises: connecting means coupling the hinge devices and the deploying mechanisms to lateral locating components extending parallel to lateral edges of the aperture, the locating components receiving guides attached to the panel, the guides being disconnectable from the locating components to permit removal of the panel from the roof aperture.

4,005,901

VEHICLE ROOF WITH A MOVABLE PANEL

Helmut Lutke, Buttgen-Driesch, and Willi Schalude, Geyen, both of Germany, assignors to Ford Motor Company, Dearborn, Mich.

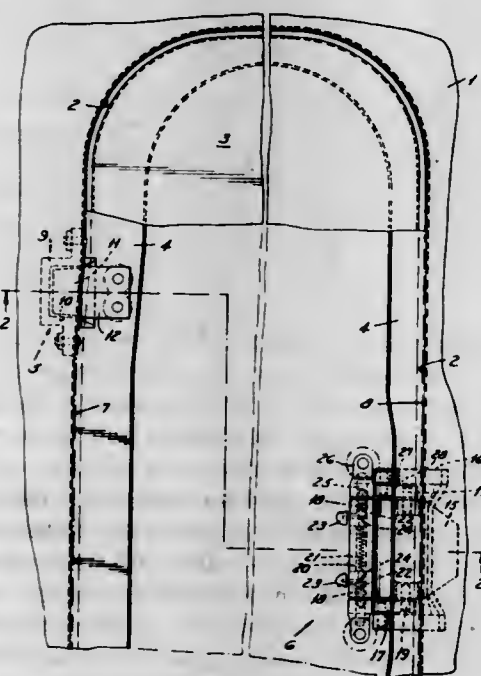
Filed Jan. 23, 1976, Ser. No. 651,879

Claims priority, application Germany, Feb. 27, 1975, 2508487

Int. Cl.² B60J 7/18

U.S. Cl. 296—137 B

9 Claims



1. A vehicle roof having a movable panel arranged in a framed roof aperture, the rear edge of the panel being deployable outwardly of the aperture and facility being provided for the complete detachment of the panel from the roof frame, the front edge of the panel being attached to the roof frame through spaced hinge components and the rear edge through a detachable deploying mechanism, wherein the improvement comprises the detachable hinge components constituting fixed hinge-housings attached to the roof frame, each housing containing a circular arcuate passage, flexible hinge tongues attached to the panel received within the respective passages in the housing, the tongues providing common hinge axes about which the panel is pivotally moveable, the hinge axes being located in front of and above the forward edge of the panel, and the detachable deploying mechanism constituting a handle articulated to the panel by a first pivot means journaled in a support attached to the panel, a deploying lever attached to the handle to form a toggle link, the deploying lever being articulated by a second pivot means to the roof frame through a support forming a bearing therefor,

one of the pivot means being disengageable from its support to provide for disconnection of the detachable deploying mechanism.

4,005,902

LOAD CARRYING PALLET

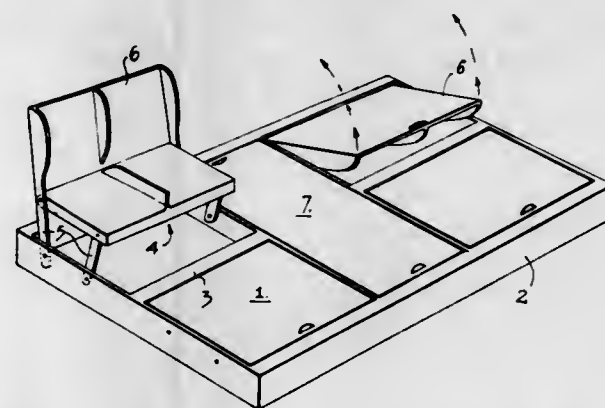
Chaim Balin, 7 Harel St., Ramat Chen, Israel

Filed Feb. 28, 1975, Ser. No. 554,109

Int. Cl.² A47C 4/00; A65D 19/00

U.S. Cl. 297—129

5 Claims



1. A load-carrying pallet for use in transporting cargo in aircraft, trucks or railroad carriages, said pallet comprising a plate having an upwardly facing planar support surface onto which cargo can be stacked and an oppositely directed downwardly facing surface, a substantially rectangularly shaped upstanding closed rim extending completely around and downwardly from the peripheral edge of the planar support surface and defining the lateral exterior of said pallet, said rim having an upper edge in the plane of said planar support surface of said plate and a lower edge spaced downwardly below said upper edge and below said downwardly facing surface of said plate with said rim presenting a continuous surface between its upper and lower edges with the upper edge of said rim extending continuously around said rectangular shaped rim, said rim defining a shallow depression below the downwardly facing surface of said plate, said plate comprising upstanding ribs located within the shallow depression and extending interiorly of and across said rim with the upper edges of said ribs being flush with the upper edge of said rim, and said plate also including panels having an upper surface and a lower surface with the upper surface of said panels being flush with and disposed between the upper edges of said rim and said ribs and the lower surface being spaced downwardly from said upper surface, hinge means connecting said panels to at least one of said rim and said ribs so that said panels can be displaced between a folded position with the upper surface of said panels being flush with the upper edges of said rim and ribs and an open position with said panels extending upwardly from the upper edges of said rim and ribs, seat members hinged to said panels and displaceable therewith between the folded and open positions so that in the folded position said seat members are located in said shallow depression below said panels and the surface forming the lower surface of said panels in the folded position forms the back of a seat in the open position and said seat members in the open position extend generally normal to the lower surface of said panels forming a seating surface with said seat members in the open position spaced above the upper edges of said rim and ribs.

4,005,903

SEAT WITH AN ADJUSTABLE BACK

Albert Jeuni, Schaftmattweg 92, Binningen, Switzerland (CH-4102)

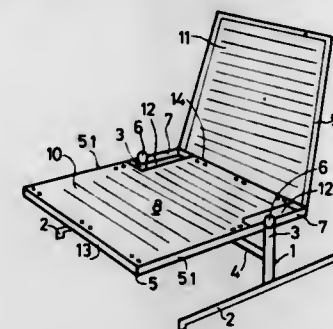
Filed Sept. 4, 1975, Ser. No. 610,490

Claims priority, application Switzerland, Sept. 6, 1974, 12182/74

Int. Cl.² A47C 1/02

U.S. Cl. 297—328

2 Claims



1. An adjustable seat comprising a supporting structure, a thigh supporting frame which is rigidly connected to said supporting structure, a buttocks support which is pivotally connected to said supporting structure by laterally spaced pivotal connections, a back frame rigidly affixed to said buttocks support at an angle thereto, said buttocks support being connected to the thigh supporting frame by a means for adjusting the inclination of the buttocks support relative to the thigh supporting frame, a unitary, taut resilient covering which is disposed upon and interconnects with both the thigh supporting frame and the buttocks support, said covering having cut out portions in the area of the buttocks support adjacent each pivotal connection and extending from the back frame to a portion of the thigh supporting frame adjacent each pivotal connection whereby said buttocks support is in its lowermost position said resilient covering is less taut than when said buttocks support is in its uppermost position.

4,005,904

RUN THROUGH BRACKET

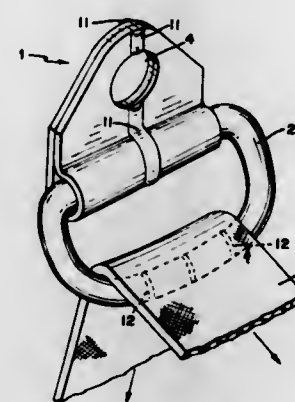
Per Olof Weman, Haslehol, and Harald Martin Schmelow, El-lersau, Krs. Segeberg, both of Germany, assignors to Sig-matex A.G., Geneva, Switzerland

Filed June 24, 1975, Ser. No. 589,989

Int. Cl.² B60R 21/10

U.S. Cl. 297—389

4 Claims



1. Guide for a safety belt for a vehicle, comprising a lashing, a ring held by the lashing, said ring having an opening through which the belt runs and being provided with a plurality of guide surfaces at least over a portion thereof which engages the belt running therethrough, said lashing having a hole therein for attachment to the vehicle, and protuberance means located adjacent said hole on at least the side of said lashing which lies against said vehicle, said protuberance means comprising elongated detent means protruding from

the surface of said side and extending generally from adjacent said hole toward said ring.

4,005,905

EXCAVATING MACHINE

Michel Dubois, Iltre, Belgium, assignor to Linden-Alimak AB, Skelleftea, Sweden

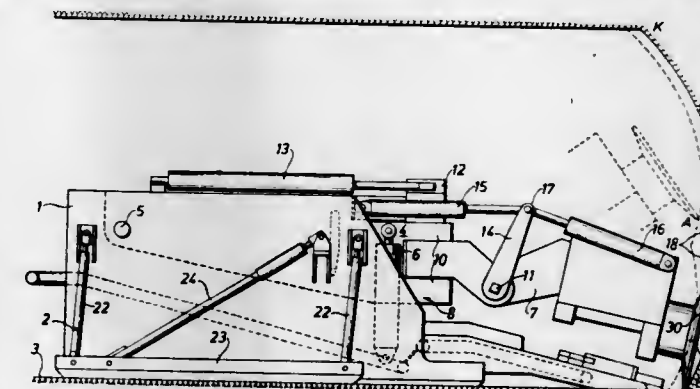
Filed Aug. 21, 1974, Ser. No. 499,578

Claims priority, application Luxembourg, Aug. 22, 1973, 68289

Int. Cl.² E21D 9/10

U.S. Cl. 299—31

50 Claims



1. A machine for excavating underground galleries comprising a frame movable to advance in a forward movement generally along an axis in the direction of excavation within a gallery which is being excavated, tool carrying arm means, pivotal connecting means for connecting said arm means to said frame for vertical swinging movement, means for adjusting the orientation of said arm in a plurality of directions with respect to a vertical plane, said arm means including a rotary tool carrier supported thereon and provided with cutting tools distributed over the periphery thereof and positioned to operate in a plane perpendicular to the direction of said arm, means for rotating said rotary tool carrier, means for moving said pivotal connecting means to occupy at least two alternative positions above the floor of the gallery being excavated having different displacements transverse to said axis in the direction of excavation to thereby provide for excavation at different ranges of transverse displacement, said pivotal connecting means including operable for imparting said vertical swinging movement to said arm means during excavation rotation of said rotary tool carrier in each of said alternative positions of said pivotal connecting means to thereby provide a vertical swinging excavating movement from each of said positions.

4,005,906

IMPACT OR DEMOLITION TOOL

Robert J. McKenry, Windber, and Michael A. College, Everett, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Dec. 15, 1975, Ser. No. 640,686

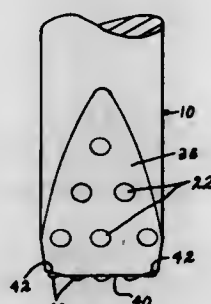
Int. Cl.² E21C 13/00

U.S. Cl. 299—91

5 Claims

1. An impact or demolition tool comprising: a steel rod having a working portion at one end and a portion at the other end adapted for being gripped by a driver, said working portion tapering inwardly on opposite sides toward the outer end to form a wedge, and a flat outer end at the small end of said

wedge, and a plurality of hard wear resistant inserts extending into said working portion in spaced distributed relation and



having the outer ends disposed for engagement with work being impacted by the tool.

4,005,907

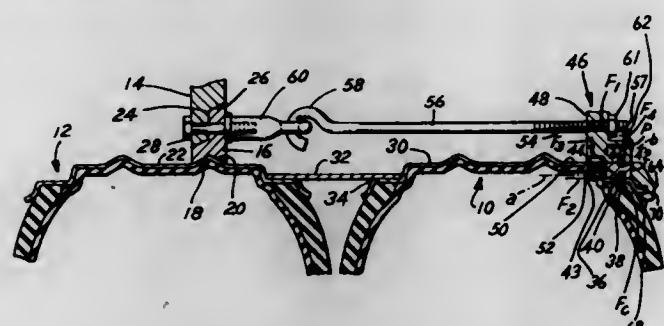
DUAL WHEEL MOUNTING ASSEMBLIES

Meivm E. Bonomo, Sandusky, Ohio, assignor to Unverferth Manufacturing Company, Inc., Kalida, Ohio
Filed Feb. 7, 1973, Ser. No. 330,195

Int. Cl.² B60B 11/02

U.S. Cl. 301-36 R

5 Claims



1. A wheel mounting assembly for mounting an auxiliary wheel to a vehicle-mounted wheel, said assembly comprising, a rim on the auxiliary wheel, an annular stepped groove adjacent an edge of said rim opposite the vehicle-mounted wheel, wheel securing means including an annular ring positioned in said stepped groove, and a plurality of spaced lug members and rim contacting means secured to and spaced about the inner circumference of said annular ring, each of said rim contacting means having a portion thereof extending beyond said ring and in overlying and contacting relationship with the rim of said auxiliary wheel between said stepped groove and the vehicle-mounted wheel, connecting means adapted to be attached at one end to the vehicle-mounted wheel and at its other end to said lug members, and tension means for drawing tension on said connecting means to firmly attach the wheels together, wherein the improvement in said assembly includes means in combination therewith for relieving stresses on said auxiliary wheel rim and said ring, said stress relieving means including:

means for exerting a counterbalancing force on said securing means in a direction toward the rim of said auxiliary wheel, said force counterbalancing the forces exerted upon the rim by said rim contacting means and upon the ring and which tend to deform said rim and ring in opposed directions when said auxiliary wheel is attached to said vehicle-mounted wheel, said means for exerting said counterbalancing force comprising a plurality of spokes in the annular opening of the rim of said auxiliary wheel, said spokes bracing said securing means between first points adjacent said lug members and second points angularly displaced from said first points about the rim of said auxiliary wheel.

4,005,908

BATCH TRANSFER SYSTEM

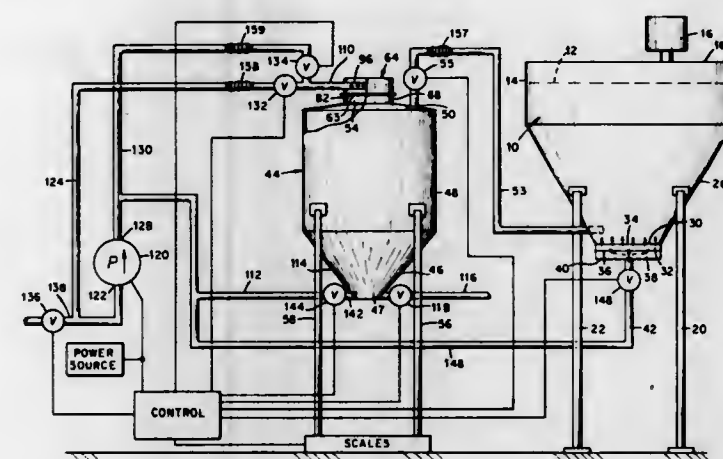
Billy P. Freeman, P.O. Box 245, Blaine, Tenn. 37709

Filed Feb. 3, 1975, Ser. No. 546,422

Int. Cl.² B65G 53/28

U.S. Cl. 302-3

7 Claims



1. In a system for pneumatically transferring particulate material in batches from a first location to a second and remote location the combination comprising

a first vessel for containing a quantity of said particulate material, said first vessel including a substantially conical bottom section having its apex directed downwardly and defining an opening therein,

a porous member covering said opening and defining a plurality of passageways therethrough,

a second vessel chargeable with and dischargeable of said particulate material and having a top section and a substantially conical bottom section having its apex directed downwardly,

first conduit means connecting said bottom section of said first vessel with said top section of said second vessel, said first conduit directing the flow of pneumatically entrained particulate material therethrough from said first vessel to said second vessel,

first valve means interposed in said first conduit means for regulating the flow of particulate material through said first conduit means,

filter means mounted on and in fluid communication with said top section of said second vessel and substantially prohibiting the movement of said particulate material therepast,

gas pump means having an input side and an output side, second conduit means connecting said input side of said pump means in fluid communication with said filter means and including a portion connecting said input side of the pump means in fluid communication with ambient atmosphere,

second valve means interposed in said second conduit means for regulating the flow of fluid between said input side of said pump means and said filter means,

third valve means interposed in said second conduit means at a location between said input side of said pump means and that portion of said second conduit means that opens to ambient atmosphere for regulating the flow of ambient atmosphere to said input side of said pump means,

third conduit means connecting said output side of said pump means in fluid communication with said filter means,

fourth valve means interposed in said third conduit means for regulating the flow of fluid through said third conduit means,

fourth conduit means connecting said output side of said pump means in fluid communication with said porous member covering said bottom opening in said first vessel,

fifth valve means interposed in said fourth conduit means for regulating the flow of fluid through said fourth conduit means,

a fifth conduit directly connecting said output side of said pump means in fluid communication with one side of said conical bottom section of said second vessel adjacent the lowermost portion thereof for injecting pressurized fluid from said output side of said pump means into said bottom section of said second vessel in said fluid and conveying the same from said bottom section at a location substantially diametrically opposed to the location of the connection of said fifth conduit to said bottom section of said second vessel to a location remote from said second vessel,

sixth valve means interposed in said fifth conduit and adapted to regulate the flow of fluid through said fifth conduit,

means controlling the functioning of each of said valve means in a sequence providing cyclical withdrawal of fluid from said second vessel by said pump means with concomitant withdrawal of particulate material from said first vessel into said second vessel with at least a substantial portion of said withdrawn fluid being conveyed under pressure through said fourth conduit means and said porous member into the bottom section of said first vessel, and subsequent flow of fluid under pressure from said output side of said pump means to said top of said second vessel to provide a volume of pressurized fluid above the level of particulate material within said second vessel and flow of fluid under pressure through said fifth conduit into said bottom section of said second vessel to entrain particulate material from said second vessel and transfer the same out of said second vessel.

4,005,909

DC LEVEL DETECTOR AND ZERO VELOCITY GATE CIRCUIT FOR USE IN A VEHICLE SKID CONTROL BRAKING SYSTEM

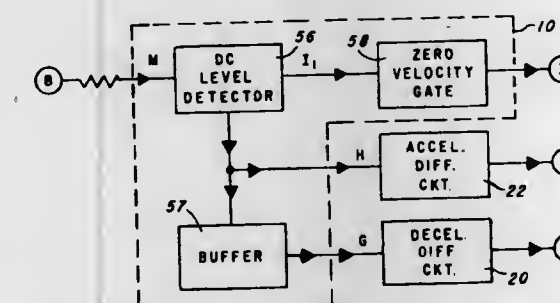
James J. Jones, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 3, 1972, Ser. No. 268,398

Int. Cl.² B60T 8/08

U.S. Cl. 303-91

8 Claims



1. In a vehicle skid control braking system of the type that selectively controls the engagement and disengagement of the braking system of a vehicle in accordance with selected braking conditions, a DC level detector and zero velocity gate circuit comprising in combination:

first signal means responsive to a first signal in the form of a varying DC signal representing the wheel speed of the vehicle for generating second and third signals proportional to said first signal, said first signal means including detector means for eliminating undesirable ripple characteristics of said first signal;

second signal means responsive to said third signal for generating a fourth signal when said first signal reaches a selected value;

third and fourth signal means respectively responsive to first and second conditions of said second signal for generating fifth and sixth signals respectively representing first and second conditions of the wheel speed of the vehicle; buffer circuit means for eliminating undesirable characteristics of said second signal to provide a seventh signal which is coupled to said fourth signal means;

said first signal means comprising a differential amplifier having first and second transistors with commonly connected emitter regions, said first transistor having a base region coupled to said first varying DC signal and said second transistor having a base region coupled to an input signal having a magnitude of said selected value, and said common emitter regions being coupled to circuit ground and to said buffer circuit means.

4,005,910

ANTILOCKING CONTROL SYSTEM

Heinz Leiber, Leimen, and Werner Weber, Nussloch, both of Germany, assignors to Teldix G.m.b.H., Heidelberg, Germany

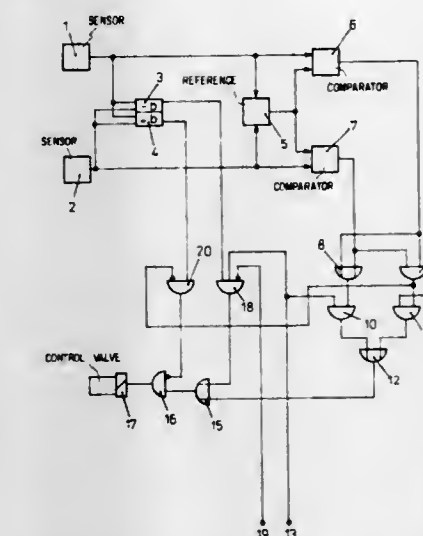
Filed Apr. 23, 1976, Ser. No. 679,877

Claims priority, application Germany, Apr. 24, 1975, 2518196

Int. Cl.² B60T 8/02, 8/10

U.S. Cl. 303-96

28 Claims



1. In an anti-locking control system for the wheel brakes of a vehicle including a pressure regulating unit for commonly regulating the pressure in the brakes of at least two wheels of the vehicle, sensor means for producing output signals corresponding to the rotational behavior of the wheels whose brakes are being regulated, and evaluation and control circuit means responsive to the output signals from said sensor means for producing control signals for said pressure regulating means to cause same to regulate the pressure, said control signals being selectively based either on the rotational behavior of the wheel first tending to lock (select-low) or on the rotational behavior of the wheel which is the last to show a tendency to lock (select-high), the improvement wherein said evaluation and control circuit means includes: first means effective during the select-low mode of operation for measuring the time duration (T_1) of the pressure buildup phase following a pressure reduction phase until there again occurs a tendency to lock at at least one wheel; switching means responsive to the occurrence of a signal indicating a tendency to lock for switching the mode of operation to select-high; second means for measuring the time duration (T_2) of the pressure increase period during said select-high mode of operation and for continuously comparing the result with the measured time duration (T_1) of the pressure buildup phase during select-low operation; control means responsive to the measured time duration T_2 having reached a given relationship to the previously measured time duration T_1 for effecting continuation of the select-high mode of operation for a given time duration T_3 and then switching the mode of operation back to the select-low mode of operation; and switch-back means responsive to an indication, during select-high operation, that the second wheel also shows a tendency to lock before a given time duration T_2 has been reached for effecting a switch-back to the select-low mode of operation.

4,005,911

INDIVIDUAL WHEEL ANTISKID BRAKE CONTROL SYSTEM ARRANGED TO PREVENT EXCESSIVE BRAKE PRESSURE DIFFERENCES

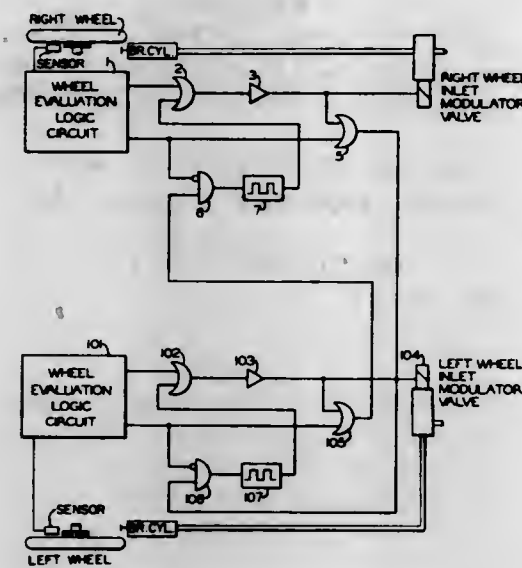
Alfred Klatt, Wathlingen; Klaus Lindemann; Dieter Lohdorff, both of Hannover, and Erich Reinecke, Beinhorn, all of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

Filed Oct. 6, 1975, Ser. No. 619,693

Int. Cl.² B60T 8/02, 8/26

U.S. Cl. 303-111

3 Claims



1. A vehicle antiskid brake control system comprising for each wheel:

- a fluid pressure operated brake unit;
- an inlet modulator valve having a solenoid operator for operating said modulator valve to establish operator controlled fluid brake pressure communication with said brake unit when deenergized and to cut-off said communication when energized;
- wheel sensing means for monitoring the dynamic condition of the wheel to provide at least one wheel behavior signal when the wheel exhibits a skidding tendency;
- logic means subject to said at least one wheel behavior signal for evaluating the dynamic condition of the respective wheel and for providing first and second output signals accordingly;
- a pulse generator for emitting a pulsed output signal, said first output signal or said pulsed output signal providing a control signal that is connected to said modulator valve solenoid operator to control energization thereof, said pulse generator of each one of a pair of wheels being activated responsive to said control signal being present at the other one of the pair of wheels only when said second output signal at said one of the pair of wheels is absent.

4,005,912

LOW GROUND PRESSURE TRACK SHOE

Danny J. Becker, Peoria; Roger L. Boggs, East Peoria; Kenneth E. Vaughn, Creve Coeur, and James Richard Shuler, Eureka, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 517,495, Oct. 24, 1974, Pat. No. 3,937,529. This application Aug. 18, 1975, Ser. No. 605,693

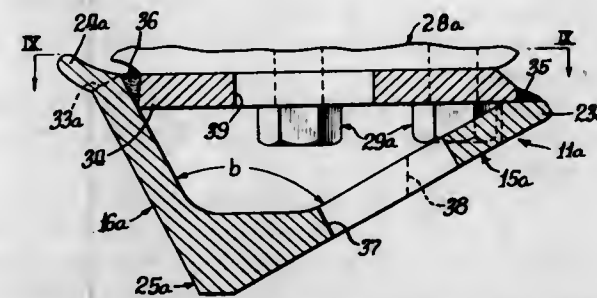
Int. Cl.² B62D 55/28

U.S. Cl. 305-13

8 Claims

- The combination comprising
 - a track shoe including a pair of downwardly converging sidewalls forming a trough-like construction having a V-shaped cross section at least substantially throughout the entire width thereof,
 - a common grouser portion formed at lower apex ends of said sidewalls to extend the entire width of said track shoe,

generally horizontally disposed first and second lugs each formed on an upper end of a respective one of said sidewalls to extend the entire width of said track shoe, the first lug of said track shoe adapted to overlap a second lug of another adjacent track shoe, link means disposed between lateral ends of said track shoe and straddling the sidewalls thereof between said first and second lugs,



attachment means, attaching said link means to said track shoes, comprising a separate support member disposed in straddling relationship between said sidewalls and secured thereto, at least one bolt means releasably attaching said link means solely to said support member and an access opening formed through at least one of said sidewalls to expose said bolt means.

4,005,913

LINEAR MOTION BEARING BLOCK

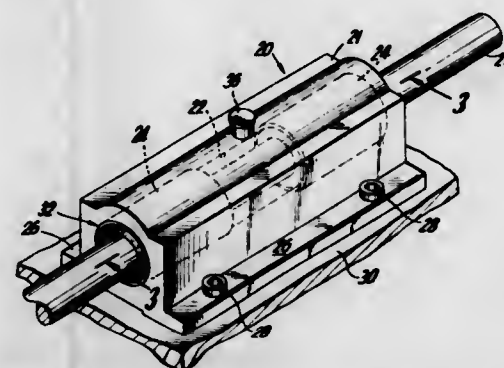
John B. Thomson, Jr., Sands Point, N.Y., assignor to Thomson Industries, Inc., Manhasset, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,389

Int. Cl.² F16C 17/00

U.S. Cl. 308-6 C

17 Claims



1. A linear motion bearing block, adapted for relative axial movement on a shaft, which comprises: an elongated housing mount having a longitudinally extending bore adapted to receive said shaft; a plurality of linear motion ball bearings positioned coaxially within the bore of said housing mount in spaced-apart relationship, said bearings being adapted to slidably engage said shaft; each of said linear motion ball bearings including a ball retainer defining a plurality of raceways, each of said raceways having a load-bearing portion and a load-free portion and substantially filled with balls which recirculate in said raceways; load-carrying plates positioned adjacent each of said load-bearing portions of each of said raceways; means for permitting relative angular movement between each of said bearings and said housing mount; means for radially preloading said load-carrying plates; and, sealing means cooperating with said bearings and housing mount to form a lubricant reservoir in said bore between said spaced-apart bearings, whereby said bearings are lubricated and said shaft is wiped as it moves through said bore.

4,005,914

SURFACE COATING FOR MACHINE ELEMENTS HAVING RUBBING SURFACES

Paul Newman, Bristol, England, assignor to Rolls-Royce (1971) Limited, England

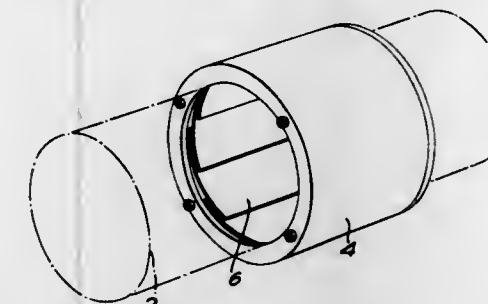
Filed Aug. 11, 1975, Ser. No. 603,604

Claims priority, application United Kingdom, Aug. 20, 1974, 36637/74

Int. Cl.² F16C 35/00

U.S. Cl. 308-9

7 Claims



1. A machine element comprising a relatively rigid component and a relatively flexible component adapted for relative rotation and wherein the relatively rigid component is provided with a surface layer of a glaze-forming oxide between 0.003 ins. and 0.020 ins. thick, and the relatively flexible component is provided with a surface layer of a glaze-forming oxide between 0.0001 ins. and 0.0005 ins. thick.

4,005,916

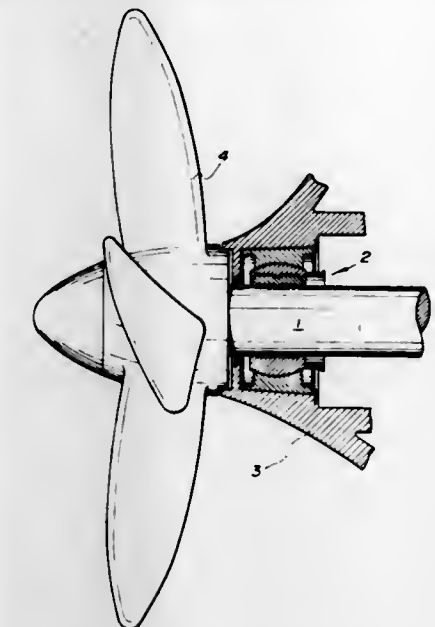
JACKED HYDROSTATIC BEARING

Richard H. F. Dillon, 257 Lisgar St., Apt. 1001, Ottawa, Ontario, Canada (K2P 0C7)

Filed Nov. 7, 1975, Ser. No. 629,886

Int. Cl.² F16C 1/24

14 Claims



1. A bearing assembly for a generally horizontal shaft which comprises, a cylindrically faced lower bearing shell for cooperating with and supporting said shaft, a pair of cylindrically faced upper bearing shells for cooperating with this shaft, lower bearing shell support means cooperating with and supporting said lower bearing shell, upper bearing shell support means cooperating with said upper bearing shells, means for leading bearing fluid under pressure to the cylindrical faces of said lower and upper bearing shells respectively, said upper bearing shell support means comprising means for urging the cylindrical faces of said upper bearing shells against said shaft and for urging said shaft against said lower bearing shell, said urging means comprising cooperating piston and cylinder means on said upper bearing support means and said upper bearing shells, and means for introducing liquid under pressure into said cylinder means.

4,005,917

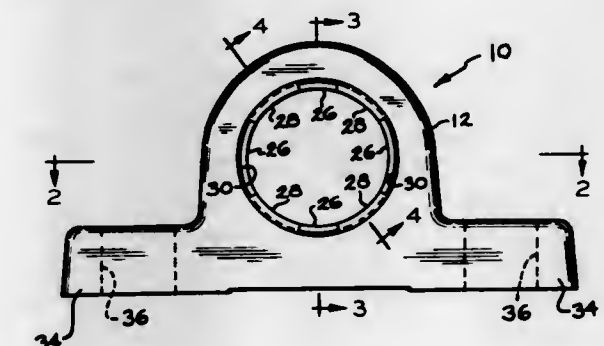
PILLOW BLOCK AND APPARATUS FOR MAKING SAME
Ralph G. Richardson, and William J. Vitron, both of Fairview, Pa., assignors to Hoover Ball and Bearing Company, Salline, Mich.

Filed Oct. 22, 1975, Ser. No. 624,917

Int. Cl.² F16C 9/06

U.S. Cl. 308-72

7 Claims



1. A plain bearing assembly comprised of a steel bearing member and a steel rotatable member in sliding contact with the bearing member, said assembly constructed to operate at low speed and under heavy load with little or no lubrication, each said plain bearing member having a surface of revolution that slidably engages a surface of revolution of the other for relative rotation, each said surface of revolution having an oxide surface layer on a nitrided case, said oxide layer of each member being formed by steam tempering said surfaces of revolution of the members subsequent to nitriding.

1. A pillow block for supporting a bearing which has an

outer race with a truncated spherical outer wall, said pillow block comprising a one-piece rigid foam plastic body member having a bearing seat of a generally spherical shape for receiving the outer wall of said bearing and for retaining the bearing against radial and axial displacement, said bearing seat having a first series of intermittent spherical segments facing in one axial direction and a second series of intermittent spherical segments facing in the other axial direction, the segments of the first and second series being out of phase with one another.

4,005,918

VERTICALLY ADJUSTABLE SEWING MACHINE MOUNTING

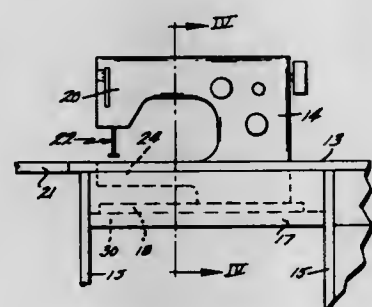
James Smith, and Arthur L. Van Ryn, both of Grand Rapids, Mich., assignors to Smith Brothers Wood Products Inc., Grand Rapids, Mich.

Filed Sept. 15, 1975, Ser. No. 613,248

Int. Cl.² A47B 81/00; A47F 5/08

U.S. Cl. 312-27

38 Claims



1. In a storage cabinet having means for mounting a sewing machine for positioning between working positions and a storage position the improvement comprising: said mounting means being shiftable from a sewing machine storage position to first and second sewing machine working positions, said mounting means including: a first member positionable at a first elevational position relative to the top surface of the cabinet and a second position below the top surface of the cabinet; said first member being disposed substantially parallel to said cabinet top surface in both such positions and sufficiently close to such surface to dispose at least the upper portion of a sewing machine carried on said member above the said surface in both of said first and second positions, a second member hingedly affixed to said first member; means pivotally mounting said second member in said cabinet, said second member being pivotal between a first generally vertical position, a second position relatively parallel to said first member when said first member is in said second position, and a third position angularly disposed with respect to said first member when said first member is in said first position; and means associated with said first and second members for releasably retaining said first and second members in their said respective first and second positions.

4,005,919

REFRIGERATOR CONSTRUCTION

A. Russell Hoge, and Robert A. Myers, both of Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 535,548, Dec. 23, 1974,

abandoned. This application Feb. 27, 1976, Ser. No. 661,908

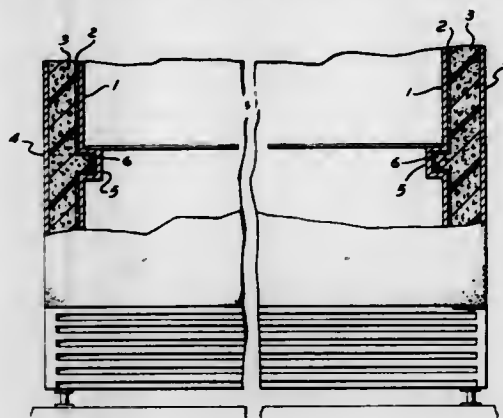
Int. Cl.² F25D 11/00; B32B 3/26

U.S. Cl. 312-214

14 Claims

1. In a refrigerator cabinet comprising an exterior surface, a sheet of ABS which forms the interior surface of the refrigerator, and a layer of a gas filled cellular insulation material which is interposed between the exterior surface and the ABS sheet, said insulation material having a major amount of its cells filled with a halogenated aliphatic or cycloaliphatic hydrocarbon, the improvement which comprises using an ABS

sheet which has bonded thereto a coextensive sheet of a rubber-modified high nitrile polymer wherein the rubber-modified high nitrile polymer is facing the exterior surface and is in laminated contact with the foam in the refrigerator cabinet



wherein the rubber-modified high nitrile polymer contains from 45 to 85 percent by weight, based on the total polymer weight, of a nitrile monomer unit and from 5 to 30 percent by weight of a synthetic or natural rubber component.

4,005,920

VACUUM-TIGHT METAL-TO-METAL SEAL

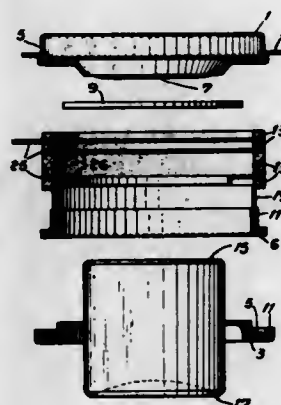
Jack D. Wimmer, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 9, 1975, Ser. No. 594,376

Int. Cl.² H01J 9/18

U.S. Cl. 316-19

12 Claims



1. A method of processing a vacuum tube assembly comprising the steps of: enclosing an open-ended vacuum tube body member containing a microchannel plate electron multiplier in a vacuum chamber; positioning a phosphor coated first faceplate in said vacuum chamber proximate one end of said tube body; placing a second faceplate in said vacuum chamber proximate another end of said tube body; evacuating said vacuum chamber and heating said body member, said microchannel plate, and said faceplate to remove adsorbed gases from said body, microchannel plate and said faceplates; moving said first faceplate into contact with said one end of said tube body; sealing said first faceplate to said one end of said tube body; moving said second faceplate into contact with said other end of said tube body; sealing said second faceplate to said other end of said tube body to provide a vacuum-tight assembly; and removing said vacuum tube assembly from said vacuum chamber.

4,005,921

TRANSMISSION CABLE CONNECTOR AND TERMINATION METHOD

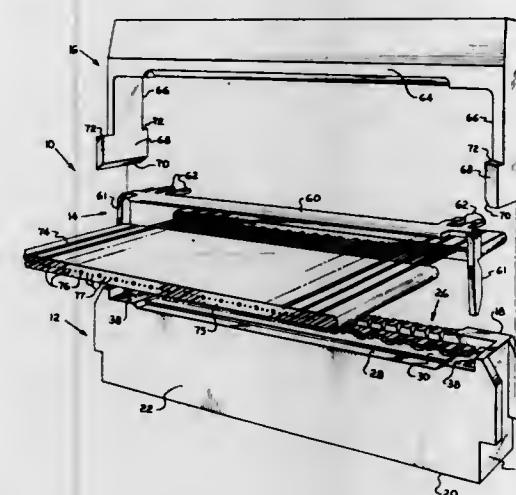
Edward Leal Hadden, Mechanicsburg, and Robert Franklin Evans, New Cumberland, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 23, 1976, Ser. No. 660,180

Int. Cl.² H01R 3/06

U.S. Cl. 339-14 R

13 Claims



7. An electrical connector assembly comprising a flat, insulated, multi-conductor transmission cable having a plurality of signal conductors and one or more shield conductors for each signal conductor, an insulating body having a cable terminating end and a mating end, a plurality of terminals mounted in said body extending from said cable terminating end to said mating end, a bus strip engaged with said cable terminating end over an insulated end of said cable, and a cover engaged with said insulating body; said conductor terminating end of said body having a face including a central ribbed section and a tail of each terminal extending between adjacent ribs, a parapet extending from said face adjacent said central ribbed section, said parapet including a plurality of V-shaped grooves, each V-shaped groove having a signal conductor positioned therein and a scalloped top for separating the shield conductors from the signal conductors, each signal conductor bent back along the cable in engagement with the bus strip and soldered to said bus strip, and each signal conductor soldered to a terminal tail along said face of said insulating body.

4,005,922

REPLACEABLE ELECTRICAL CONNECTOR PLUG ASSEMBLY

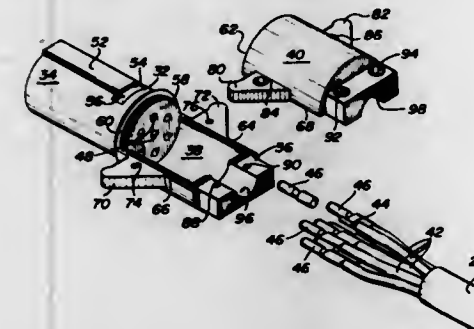
James G. Burkhardt, Dallas; Montgomery P. Burkhardt, and James D. Coley, both of Rockwall, all of Tex., assignors to Alr-Tex Wire Harness, Inc., Mesquite, Tex.

Filed June 2, 1975, Ser. No. 582,975

Int. Cl.² H01R 13/10

U.S. Cl. 339-59 M

1 Claim



1. A replaceable electrical connector plug assembly for use in a tractor cab-trailer electrical connector system comprising: a rigid unitary housing having a front plug portion and a rear cable attachment portion;

said rear cable attachment portion including a semicircular hollow cavity having a semicircular aperture extending through the rear end thereof and edge projections extending along the top edges of said cavity, said rear cable attachment portion further including a rear rectangular extension, having a semicircular aperture extending therethrough in alignment with said hollow cavity semicircular apertures, and side wings extending from and integral with said rear cable attachment portion; a first set of female terminals having first and second ends, disposed in an array in the front of said front plug portion wherein said first ends of said first set of female terminals receive male terminals extending from a mating socket; a second set of female terminals having first and second ends, disposed in an array in the rear of said front plug portion; said first ends of said second set of female terminals being electrically connected to said second ends of said first set of female terminals and said second ends of said second set of female terminals being accessible from said hollow cavity, and elastomeric material completely surrounding said first and second sets of female terminals within said front plug portion; a detachable plug cable having a plurality of wires freely extending from the end thereof; male terminals attached to each of said wires; an end portion of said detachable plug cable dimensioned to extend through said semicircular apertures in said hollow cavity and said rear rectangular extension for direct mechanical connection of said male terminals to said second ends of said second set of female terminals, said detachable plug cable being detachable for replacement thereof and being linearly aligned with said first and second sets of female terminals; and a removable semicircular cover portion for said hollow cavity of said rear cable attachment portion, said cover having a semicircular aperture and edges for mating with said semicircular aperture of said hollow cavity to enclose said detachable plug cable end portion; said cover further including a rear rectangular extension having a semicircular aperture extending therethrough in alignment with said cover semicircular aperture for mating with said semicircular aperture in said rear cable attachment rear rectangular extension to provide a strain relief for said end portion of said detachable plug cable, side wings extending from and integral with said cover for mating with said side wings of said rear cable attachment portion, and said edges of said cover including grooves for interfitting with said cavity edge projections, said cover being attached to said rear cable attachment portion by screws and being selectively removable to permit assembly and disassembly of said plug cable to said second ends of said second set of female terminals and providing protection for the connection between said plug cable end portion and said second set of female terminals when said cover is assembled to said rear cable attachment portion of said housing.

4,005,923

CHRISTMAS TREE LIGHTING SERIES

George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034

Filed Feb. 20, 1976, Ser. No. 659,900

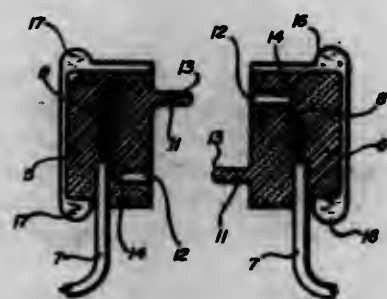
Int. Cl.² H01R 11/02

U.S. Cl. 339-157 C

5 Claims

1. A two prong electrical connector for connecting electrical apparatus to a two conductor electrical outlet comprising, an insulating housing of two separable halves, a connector prong mounted in and extending from each half of said housing and to which may be connected said apparatus and with

the longitudinal axes of said prongs disposed substantially parallel with each other when said connector halves are attached together, means forming at least one recess in one half of said housing, means forming at least one projection extending from the other half of said housing with the axes of said recess and projection disposed substantially transverse to the longitudinal axes of said connector prongs and with said recess



and projection positioned to engage in a manner to secure said connector halves together by movement of said connector halves in a direction substantially transverse to the longitudinal axes of said connector prongs and prevent separation of said connector halves except by movement of said connector halves along a plane lying substantially transverse to the longitudinal axes of said connector prongs.

4,005,924

UNIVERSAL WEDGE BASE LAMP SOCKET

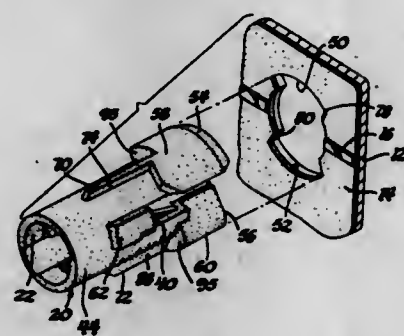
Charles R. Nestor, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1975, Ser. No. 622,095

Int. Cl.³ H05K 1/18

U.S. Cl. 339-17 D

3 Claims



1. A printed circuit bulb socket and panel mounting assembly for connecting a bulb socket to a circuit board from either side of the board comprising: a mounting board having a circular opening with radially outer guide slots defining arcuately located index surfaces thereon, a socket housing having an outer surface for insertion through said circular opening, a first pair of locator means on said housing extending axially at only one end thereof, a second pair of locator means on the housing extending axially at only the opposite end thereof, stop surfaces formed on said first pair of axial locator means, said first pair of locator means being located in axially guided engagement with the index surfaces when said housing is inserted from one side of the board, said stop surfaces on said second pairs of locator means being engageable with the board to limit axial insertion of the housing from the one side of the board and to locate the housing for rotation with respect to the board to a locked position where the board is held between said first and second pairs of locator means, said second pair of locator means being locatable in alignment with said guide slots for axially guided insertion of the housing from the opposite side of the board with said stop surfaces on said first pair of locator means locating the housing for rotation into the aforesaid locked position with the board held between said first and second pair of locator means, terminals on said

housing located in electrical contact with said board when said housing is in its rotatably locked position, said first and second pair of locator means and the stop surfaces thereon preventing movement of the housing totally through said hole upon insertion of the housing from opposite sides thereof.

4,005,925

MULTIPLE CONNECTOR

Jean-Louis Sudre, Cluses, France, assignor to Etablissements Carpano & Pons S.A., France

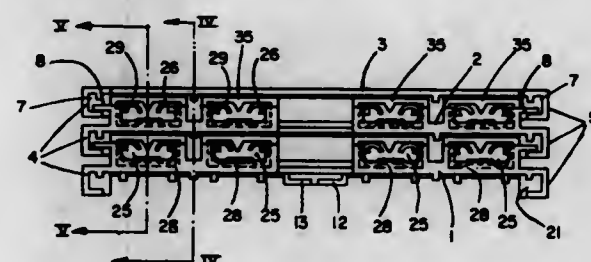
Filed Feb. 18, 1975, Ser. No. 550,593

Claims priority, application France, Mar. 1, 1974, 74.08411

Int. Cl.³ H01R 13/40

U.S. Cl. 339-198 H

3 Claims



1. A multiple connector comprising a plurality of modular housing sections of insulating material and each containing at least one electrical connector, each housing section including first means cooperating with complementary second means of an adjacent housing section for slidably interconnecting the housing sections for relative sliding movement along a direction for connection and disconnection of the connectors therein with complementary connectors disposed in a corresponding array, each housing section further comprising a first stop and a second stop, the first stop being positioned relative to and cooperating with the second stop of an adjacent section to allow relative sliding of the sections between a first position with all the sections positioned for simultaneous connection of all the connectors therein with said array of complementary connectors and a second position defined by contacting coaction of said first and second stops at which one housing section remains at its first connection position and an adjacent section is displaced relative to said one housing section by an amount sufficient to ensure disconnection of the at least one connector therein from the array of corresponding complementary connectors.

4,005,926

SCANNING DEVICE

Denis Manktelow Neale, and Michael Gordon Throssell, both of Ilford, England, assignors to Ilford Limited, Ilford, England

Filed May 10, 1974, Ser. No. 469,036

Claims priority, application United Kingdom, May 16, 1973, 23349/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

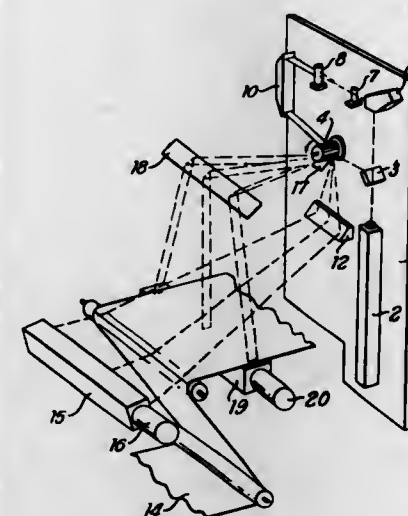
Int. Cl.³ G02B 27/17

U.S. Cl. 350-7

17 Claims

1. A method of scanning surface areas, said method comprising: providing two substantially parallel beams of radiant energy of different cross-sectional area; directing said two beams to strike individually a like number of different faces of a rotating mirror polygon, thereby deflecting the reflected paths of said beams through angles equal to twice the angular subtense of each polygon face at the polygon center; and

directing said two parallel beams of radiant energy after reflection from said faces of said mirror polygon onto at



least one surface, thereby scanning with both said beams at least one path across said at least one surface.

4,005,927

BROAD BANDWIDTH OPTICAL MODULATOR AND SWITCH

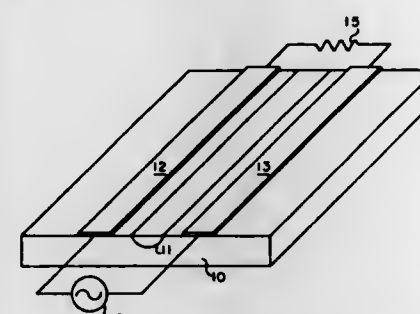
William M. Caton, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1975, Ser. No. 557,216

Int. Cl.³ G02B 5/14

U.S. Cl. 350-96 WG

7 Claims



1. An optical waveguide modulator and switch comprising: an optical waveguide defining a path for the propagation of optical energy; a source of microwave energy; at least one strip transmission line disposed in co-directional proximity relative to said optical waveguide and connected to said source of microwave energy, said strip transmission line having dimensions and dielectric constants for producing a propagation velocity of the flow of said microwave energy substantially equal to the propagation velocity of said optical energy in said optical waveguide, causing a resultant traveling wave interaction therebetween; and a microwave load means connected through electrical conductors to said strip transmission line for completing a closed electrical circuit with said source of microwave energy to absorb substantially all said microwave energy without any reflected wave energy;

4,005,928

NEMATIC LIQUID CRYSTAL DISPLAYS FOR LOW VOLTAGE DIRECT CURRENT OPERATION

Allan Robert Kmetz, Richardson, and Linda Truitt Creagh, Argyle, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

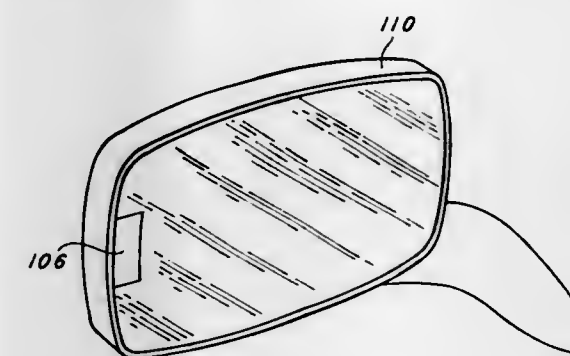
Continuation of Ser. No. 148,763, June 1, 1971, abandoned.

This application Aug. 1, 1973, Ser. No. 384,651

Int. Cl.³ G02F 1/13

U.S. Cl. 350-160 LC

1 Claim



1. An electro-optic display device comprising in combination:

- a first optically transmissive substrate having an optically transmissive and electrically conductive region on one surface thereof,
- a second substrate having an electrically conductive region on one surface thereof,
- said first and second substrates spaced apart in a substantially parallel relationship such that said conductive regions face one another,
- a body of a mesomorphic liquid crystal composition substantially filling the space between said first and second substrates, said mesomorphic liquid crystal composition comprising liquid crystalline material in an amount from 98.0 to 99.5% by weight and electrical conductivity modifiers dispersed in said liquid crystalline material in an amount from 0.5 to 2.0% by weight of said mesomorphic liquid crystal composition, said mesomorphic liquid crystal composition being effective to scatter incident light in response to an electric field applied thereacross, and said conductivity modifiers dispersed in said liquid crystalline material cooperating therewith to effect a current density in said mesomorphic liquid crystal composition in the range of from 0.5 to 3.0 $\mu\text{A}/\text{cm}^2$ at 15 volts d.c., and an adsorbed layer of ion donor material formed on said conductive regions for enhancing electrical charge injection in said mesomorphic liquid crystal composition.

4,005,929

REFLECTIVE IMAGING MEMBER

James E. Adams, Ontario, and Werner E. L. Haas, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1975, Ser. No. 572,373

Int. Cl.³ G02F 1/13

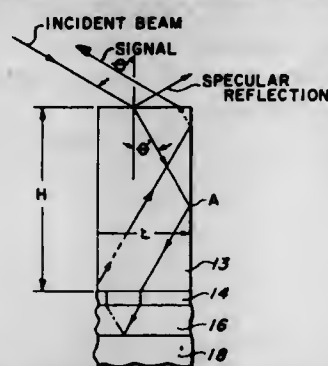
U.S. Cl. 350-160 LC

15 Claims

1. A reflection viewing system, comprising:

- a. an imaging member comprising a layer of material capable of undergoing a change in light scattering or light absorption properties in imagewise configuration and, on one side of said layer of material, a planar reflecting layer;
- b. illumination means for directing radiation upon said imaging member at an angle of incidence, θ and located on the other side of said layer of material; and
- c. in contact with said imaging member on said other side of said layer of material, a reflection rejection layer comprising at least one transparent block in rectangular configuration and having the dimensions of height H, and

base L, characterized by the relationship $H = 3/2L \tan \theta' + 2nL \tan \theta$, wherein n is selected from the group con-



sisting of 0 and positive integers and wherein θ' is the refraction angle of light into said transparent block for an incidence angle of light upon said transparent block of θ .

4,005,930

ELASTIC HINGE FOR A PAIR OF SPECTACLES

Andre Guenin, Petit-Lancy, Switzerland, assignor to La Nationale S.A., Geneva, Switzerland

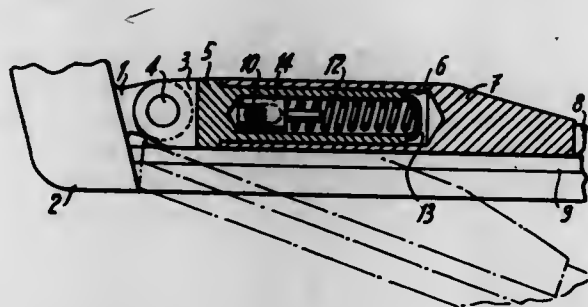
Filed Jan. 13, 1975, Ser. No. 540,592

Claims priority, application Switzerland, Jan. 19, 1974, 534/74

Int. Cl.² G02C 5/16, 5/20, 5/22

U.S. Cl. 351-113

4 Claims



1. In a resilient hinge for a pair of spectacles, comprising a first part rigidly fixed to a spectacle frame, a second part hinged to the first part and resiliently connected to an arm of the pair of spectacles, a casing fixed to said arm, said second part including an integral extension slidably mounted in said casing, a spring disposed in said casing and acting on said extension to bias said second part towards the free end of said arm, the improvement wherein said casing includes a longitudinal cylindrical housing, said extension comprising a tube of circular cross-section slidably mounted in said housing, a stop at the end of said tube, said tube having two longitudinal slots disposed along two diametrically opposed generatrices thereof, a transverse pin in said housing and engaged in said slots, said pin having a median portion and two end portions of greater diameter than said median portion, a yoke-shaped stud interposed between said spring and said pin, said yoke-shaped stud engaging said median portion of said pin between said pin end portions of greater diameter, said spring lodged within said tube and bearing on the one hand against said stud and on the other hand against said stop at the end of said tube, whereby said pin angularly fixes the position of said circular tube in said cylindrical housing to prevent said tube from rotating.

4,005,931

SEALED CASSETTE FOR OPTICAL SOUND PROJECTION

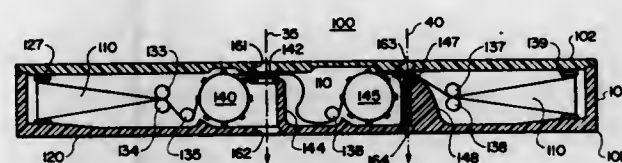
Seth Leroy Everett, Jr., Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 15, 1974, Ser. No. 433,590

Int. Cl.² G03B 23/06

U.S. Cl. 352-78 R

3 Claims



1. A film cassette comprising an envelope completely sealed from harmful environmental conditions and containing therein a moveable light-permeable film and two rotatable hubs for receiving said film, said envelope including spaced major members having sealed therein transparent elements forming aligned windows to form an optically transparent film projection gate through which passes a film projection beam emanating from a source external to said envelope, intermittently driven means sealed within said envelope and engaging said film for providing intermittent movement of said film past said film projection gate when engaging corresponding intermittently controlled driving means external to said sealed envelope, said envelope further includes an optically transparent optical sound projection gate for permitting transmission therethrough of an optical sound projection beam emanating from a source external to said envelope, continuously driven means sealed within said envelope and engaging said film for providing continuous movement of said film past said optical sound projection gate when engaging corresponding continuously driven means external to said sealed envelope.

4,005,932

PHOTOGRAMMETRIC APPARATUS, METHODS OF USE, AND PRODUCTS PRODUCED THEREBY

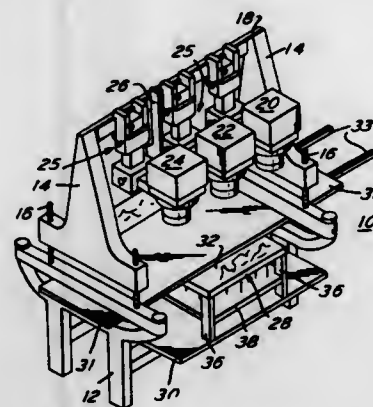
Jackson Gates, P.O. Box 145, Kylertown, Pa. 16847

Filed Mar. 12, 1975, Ser. No. 557,612

Int. Cl.² G03B 21/00, 21/56; G01C 11/12

U.S. Cl. 353-6

14 Claims



1. Photogrammetric apparatus which provides a receiving surface upon which distortion free images may be created thus enabling the production of work products in which distortion has been eliminated comprising:
image projection means;
a flexible stretchable platen of a size sufficient to receive images projected thereon by said image projection means;
means of adjusting the level of a plurality of surface points of said flexible platen responsive to said images achieving a predetermined condition; and
means of retaining the achieved level of adjustment of a plurality of surface points of said flexible platen to pro-

duce a stereo model onto which distortion free images are being projected.

4,005,933

COPYING AND TELECOPYING DEVICE

Martin de Loye, Paris, and Michel Bédouchaud, Villebon-sur-Yvette, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

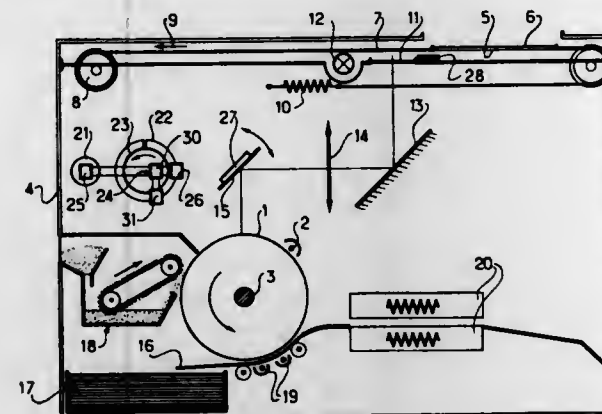
Filed Aug. 6, 1975, Ser. No. 602,523

Claims priority, application France, Aug. 9, 1974, 74.27732

Int. Cl.² G03B 27/70, 27/48

U.S. Cl. 355-66

5 Claims



1. Copying and telecopying device for the analysis and reproduction of a document comprising a first light source ensuring the scanning of the document for the analysis thereof during relative movement of the document and the said first source, photosensitive means for ensuring the reproduction of the document, first optical means for the deviation and projection of the light transmitted by the document, during the analysis thereof, on the photosensitive means, a second light source, a modulator controlled by a signal coming from the analysis of a document, second optical means for linear deviation for sending out, from the said second source, a first thin beam received by the said optical means for ensuring the line-by-line scanning of the document, or a second thin beam modulated for ensuring the reproduction of the document analyzed on the said photosensitive means, a third retractable optical element belonging to the said first optical means positioned for directing the light coming from the analysis of the document from the first source to the said photosensitive means and for directing the said deviated beam coming from the said second source to the document for the analyzing thereof and a photosensitive detector collecting the light transmitted by the document from the second source, a cylindrical lens combined with the said second optical means to constitute the optical input element of the said first deviated beam, said cylindrical lens having a plane input face with a length substantially equal to the deviation of the said first beam and arranged perpendicular to the said first beam.

4,005,934

APPARATUS FOR EXECUTING LIGHT CONTROL OPERATIONS IN A BIDIRECTIONAL FILM PRINTER

Hans Chr Wohlrab, North Hollywood, Calif., assignor to PSC Technology Inc., Glendale, Calif.

Filed Mar. 14, 1975, Ser. No. 558,536

Int. Cl.² G03B 27/04

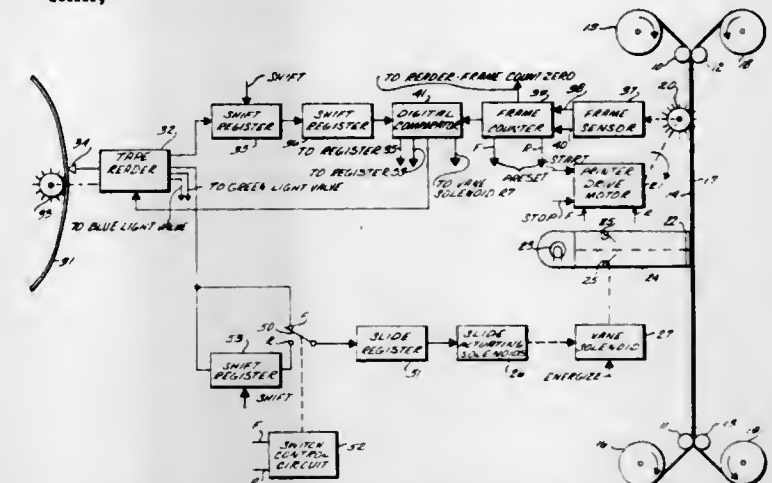
U.S. Cl. 355-88

14 Claims

1. A bidirectional film printer comprising:
means for selectively transporting a length of master film and a length of raw film past a point of exposure in either a forward or a reverse direction;
means for projecting light through the master film onto the raw film at the point of exposure;
means for counting the frames of the master film during transport;
tape storage means along which units of light control infor-

mation and units of frame count information indicating the frame count of the master film where such light control information is to be used are stored in the sequence in which the units of light control information are to be used during film transport;

means for selectively transporting the tape storage means in a forward direction to retrieve the units of information in the order that they are to be used in the forward direction of film transport and for transporting the tape storage means in a reverse direction to retrieve the units of information in the order in which they are to be used in the reverse direction of film transport;
means for controlling the light projected through the master film;



means for retrieving from the tape storage means one unit of light control information and one unit of frame count information in the same pairs in both directions of tape transport;
first means for transmitting the units of light control information to the light controlling means;
a comparator;
second means for transmitting the frame count indicated by the frame counting means to the comparator; and
third means for transmitting the units of frame count information to the comparator for comparison with the frame count indicated by the frame counting means, one of the transmitting means including means for delaying the units transmitted thereby in one direction of film transport one light control operation relative to the units transmitted thereby in the other direction of film transport.

4,005,935

METHOD AND APPARATUS FOR PROVIDING A PHASE COMPENSATED OPTICAL BEAM

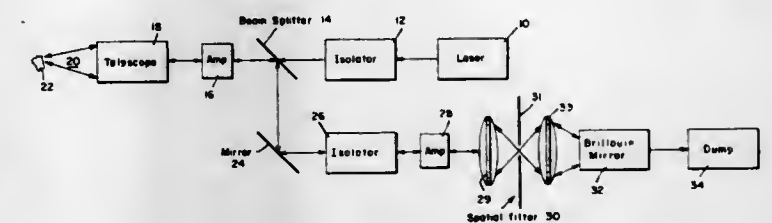
Victor Wang, Oxnard Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 31, 1975, Ser. No. 601,123

Int. Cl.² G01C 3/08

U.S. Cl. 356-5

14 Claims



1. A system for applying energy to a remotely located target such that the energy beam is compensated for the effects of phase perturbations encountered along the path to the target, said system comprising:

first transmission means for transmitting a beam of electromagnetic energy to the target;
means for receiving energy which is returned from the target along a given path;
optical processing means for backscattering said received energy so as to produce therefrom energy which is the complex phase conjugate of the received energy; and

second transmission means for transmitting said complex phase conjugate energy along said given path to the target;

whereby said complex phase conjugate energy beam is compensated for the effects of phase perturbations encountered along said given path and is therefore substantially focused at the target.

4,005,936

INTERFEROMETRIC METHODS AND APPARATUS FOR MEASURING DISTANCE TO A SURFACE

John David Redman, Newbury, and Michael Richard Wall, Reading, both of England, assignors to National Research Development Corporation, London, England

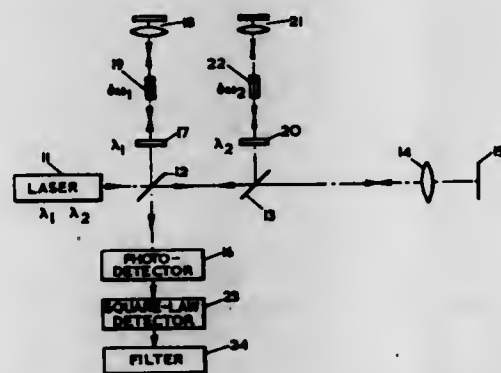
Filed Mar. 14, 1975, Ser. No. 558,444

Claims priority, application United Kingdom, Mar. 15, 1974, 11606/74

Int. Cl.² G01C 3/08

U.S. Cl. 356—5

22 Claims



21. An interferometric method of measuring the distance to a surface comprising:

providing a first pair of coherent light outputs of frequencies ω_1 and $\omega_1 + \delta\omega_1$, and a second pair of coherent light outputs of frequencies ω_2 and $\omega_2 + \delta\omega_2$;

directing one of said first pair of outputs and one of said second pair of outputs on to said surface;

receiving on photosensitive detector means the one of each said pair of outputs which is directed to and reflected from said surface and the one of each pair of outputs which is not thus directed and reflected from said surface such that the part of frequency ω_1 interferes coherently with at least the part of frequency $\omega_1 + \delta\omega_1$, and the part of frequency ω_2 interferes coherently with at least the part of frequency $\omega_2 + \delta\omega_2$ at said detector means;

and deriving from said detector means a signal at a difference frequency ($\delta\omega_1 - \delta\omega_2$) whereof the phase is a measure of said distance.

4,005,937

SIMULTANEOUS INTERFEROMETRIC TRANSMISSION OF PERIODIC SPECTRAL COMPONENTS

Joseph J. Barrett, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 527,465, Nov. 26, 1974, which is a continuation-in-part of Ser. No. 373,576, June 25, 1973, Pat. No. 3,853,404, which is a continuation-in-part of Ser. No. 280,378, Aug. 12, 1972, abandoned. This application June 6, 1975, Ser. No. 584,434

The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.² G01J 3/44; G01B 9/02

U.S. Cl. 356—106 S

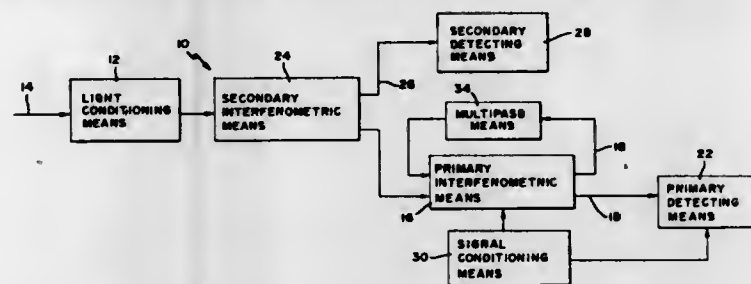
28 Claims

1. Apparatus for analyzing light having spectral components periodic in frequency comprising:

a. light conditioning means for collecting, collimating and transmitting said light; and

b. primary interferometric means adapted to receive said light and transmit said periodic spectral components in

the form of a detectable signal, said primary interferometric means having interference-producing means for providing a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being adjusted to equal substantially the product of half the frequency difference between adjacent spectral components of the same periodic spec-



trum and the factor k/k' where k is an integer of at least two, k' is equal to an odd integer greater than one, k is not equal to k' and k/k' is not equal to two, and scanning means for causing the transmission peaks for adjacent k' th orders to coincide with the spectral lines of the components, whereby said detectable signal is a fringe derived in part from the combined intensities of said periodic spectral lines.

4,005,938

HORIZON INDICATING DEVICE FOR MARINE SEXTANT

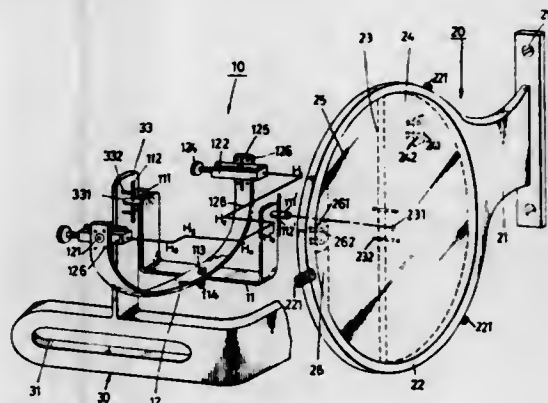
Shiaw-Lei Ho, No. 32, Lane 40, Tai Sheng St., Taipei, China /Taiwan

Filed Sept. 5, 1975, Ser. No. 610,866

Int. Cl.² G01C 15/14

U.S. Cl. 356—149

5 Claims



1. In a marine sextant having a main frame carrying a telescope and a horizon glass, the improvement comprising means between said telescope and horizon glass for simulating a real horizon to compensate for poor visibility and rough seas, said horizon simulating means comprising:

a first U-shaped bracket having upwardly extending arms,

a second U-shaped bracket having upwardly extending arms,

the bottom portions of said first and second brackets being secured together, with said brackets arranged at 90° relative to one another;

said first U-shaped bracket having one of its arms pivotally mounted to the center of the horizon glass, and the other of its arms pivotally mounted to a vertically upstanding support on the main frame of the sextant, to define a first axis of rotation;

a pair of bubble level assemblies pivotally mounted to the arms of said second U-shaped bracket to define a second axis of rotation;

each bubble level assembly including a counterbalancing screw at one end;

a luminous wire of zig-zag shape having its ends mounted on said bubble level assemblies;

said wire being oriented to simulate a real horizon on said horizon glass when viewed through said telescope;

said wire being rotatable about said first and second axes of rotation to compensate for pitching and rolling movements of a ship.

4,005,939

OPTICAL COMPARATOR FOR TESTING PRINTED CIRCUIT BOARDS

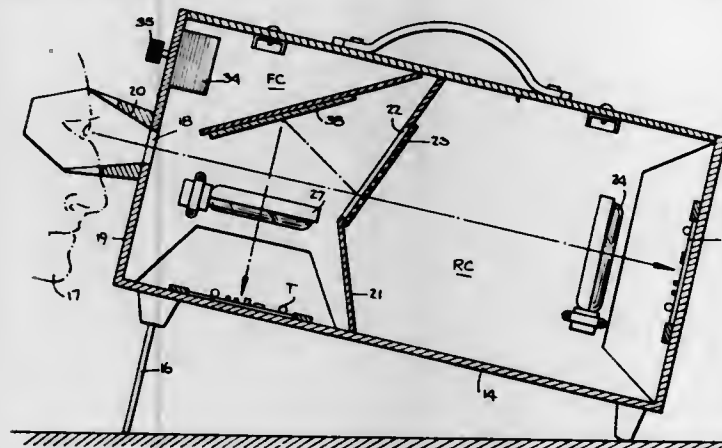
Lawrence S. Stavalone, 7 Salmon Creek Drive, Hilton, N.Y. 14468

Filed Oct. 9, 1975, Ser. No. 621,249

Int. Cl.² G01B 9/08, 11/24

U.S. Cl. 356—165

9 Claims



1. An optical comparator for testing a printed circuit board or other complex assembly to determine whether it matches a master printed circuit board, said comparator comprising:

A. a casing divided by a partition into a normally-dark front chamber and a normally-dark rear chamber, the front wall of the casing having an observation port therein, the partition having an inclined see-through mirror therein in alignment with said port, said see-through mirror being effectively transparent when only the normally-dark rear chamber is illuminated and being effectively reflective when only the normally-dark front chamber is illuminated;

B. means alternately to illuminate said normally-dark front and rear chambers at a periodic rate whereby in a first state in which the rear chamber is illuminated while the front chamber is dark, one may from said port look in a direct optical path through said see-through mirror which is then transparent into said rear chamber to see said master board which is disposed therein;

C. means to support said master board in said rear chamber at a predetermined position therein where it is fully visible from said port in said first state;

D. a reflecting mirror disposed in said front chamber at an angle to said see-through mirror, said see-through mirror being so disposed with respect to said reflecting mirror to provide an optical path in which the line from the eye of the observer to the see-through mirror is normal to the line from the reflecting mirror to the test board, whereby in a second state in which the front chamber is illuminated while the rear chamber is dark, the see-through mirror is then reflective and cooperates with said reflecting mirror so that one may from said port look by way of an indirect optical path into said front chamber to see said test board which is disposed therein; and

E. means to support said test board in said front chamber at a position therein where it can be seen from said port in said second state at a position which appears to be coincident with the predetermined position at which the master board is seen in said first state, whereby when the test board matches the master board, the visual impression is that of a continuously-illuminated image, but if a disparity exists therebetween, light pulses are produced at said periodic rate indicating a disparity therebetween.

4,005,940

OPTICAL SYSTEM ALIGNMENT APPARATUS

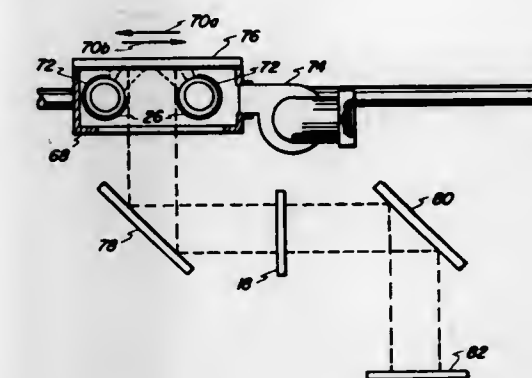
Wayne L. Kidd, and Stephen C. Corona, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn. Division of Ser. No. 439,172, Feb. 4, 1974, Pat. No. 3,904,290.

This application Feb. 27, 1975, Ser. No. 553,774

Int. Cl.² G03G 15/00

U.S. Cl. 356—172

4 Claims



1. A method of aligning a movable optical system arranged to illuminate successive incremental areas of an original document being reproduced by an electrophotographic printing machine, including the steps of:

placing an alignment member on the movable frame member supporting the scan lamps of the optical system in a light receiving relationship with the light rays transmitted from the scan lamps;

transmitting the light rays reflected from the alignment member through the lens of the optical system forming a sample light image thereof;

directing the sample light image onto an indicator having a calibration mark thereon;

moving the carriage of the optical system from the start of travel position to the end of travel position; and

comparing the movement of the sample light image on the indicator relative to the calibration mark thereon to determine the alignment of the optical system.

4,005,941

STRUCTURAL CONNECTION

Joseph N. Laborde, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

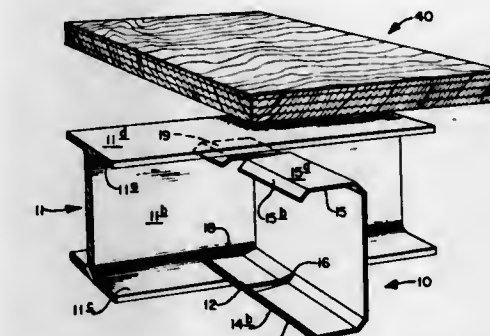
Continuation of Ser. No. 173,029, Aug. 19, 1971, abandoned.

This application Dec. 2, 1974, Ser. No. 528,633

Int. Cl.² F16B 7/00

U.S. Cl. 403—247

4 Claims



1. A structural connection comprising, a special channel member and a special receiving structural member joined thereto; said special channel member having a pair of vertical legs extending substantially the length thereof and each joined to the base of the channel by an inclined corner wall, said channel member legs having bendable leg portions formed on one end thereof by opposing cuts extending through said channel member vertical legs and said inclined walls, said cuts

extending the height of said channel member vertical legs; said leg portions being bent toward each other; said special receiving structural member having a pair of legs extending substantially the length thereof, said structural member legs being spaced apart and having an opening therebetween, said opening being of a size sufficiently large for receiving said bent toward each other leg portions but sufficiently small for rejecting said channel member legs; said bendable leg portions of said special channel member being inserted in said opening between said legs of said special structural member in a tight frictional relationship without distortion in said structural receiving member; and, the external surfaces of said vertical legs of said special channel member being substantially flush with the external surfaces of said legs of said special structural receiving member, thereby providing a substantially flat surface for receiving a decking or sheathing member.

4,005,942

METAL HANGER

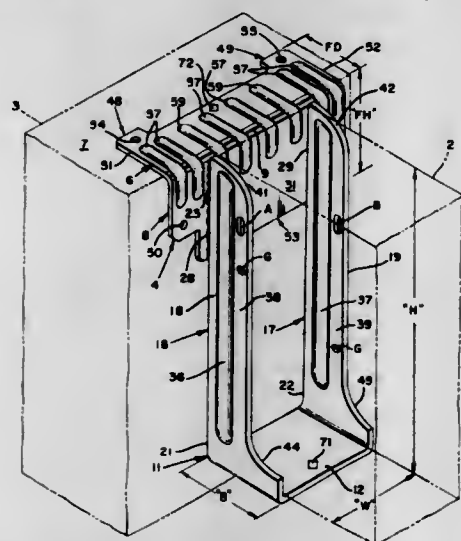
Tyrell Glib, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Mar. 22, 1976, Ser. No. 668,821

Int. Cl.² F16B 5/00

U.S. Cl. 403-189

6 Claims



1. A purlin hanger comprising:

- a. an angle element having a top flange adapted for connection to the top side of a wood member and having a lower depending flange formed at substantially a right angle to said top flange;
- b. a stirrup element adapted for receiving a wood member including a seat and a pair of integral right angularly related side flanges;
- c. said side flanges include an upper portion having a width equal to one half the depth of said seat and a lower minor portion having a dimension gradually increasing in width until it is equal to the depth of said seat;
- d. weld means attaching a portion of the back edge of said stirrup element to the front face of the lower depending flange of said angle element; and
- e. an embossment in the side of each of said side flanges of said stirrup extending substantially the length of said upper portion increasing the effective thickness of said flanges for increasing the resistance of said flanges to torsion and bending forces.

4,005,943

RESILIENT STRUCTURES

Graham Frampton Devenish, and Peter Christopher Dickson, both of Liverpool, England, assignors to Dunlop Limited, London, England

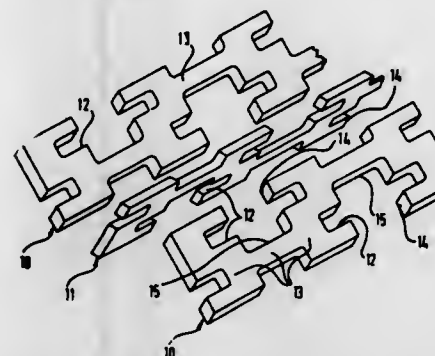
Filed Dec. 2, 1974, Ser. No. 528,626

Claims priority, application United Kingdom, Feb. 19, 1974, 7592/74

Int. Cl.² E01C 5/00

U.S. Cl. 404-41

11 Claims



1. A resilient open-compartmented three-dimensional structure comprising an interlocked assembly of a plurality of resilient deformable strips of polymeric material extending parallel to each other, the strips being formed with apertures and projections in the resilient material thereof such that at least one strip of the plurality links at intervals along its length between two other strips of the plurality by inter-engagement of projections and apertures, each strip being inclined relative to the plane of the structure.

4,005,944

TAMPING APPARATUS

Marvin K. Harris, Sheldahl, Iowa 50243

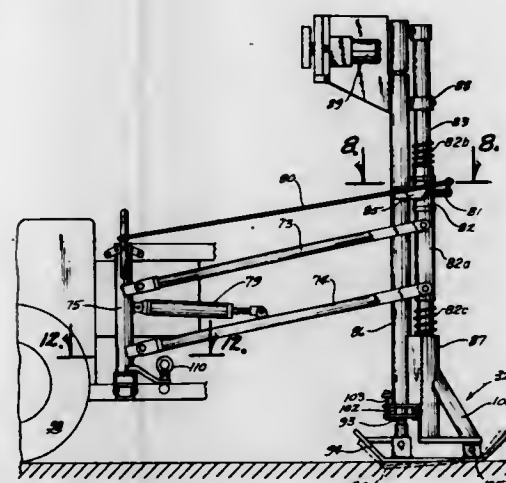
Division of Ser. No. 369,891, June 14, 1973, Pat. No.

3,908,292. This application Aug. 6, 1975, Ser. No. 602,256

Int. Cl.² E01C 19/34

U.S. Cl. 404-133

8 Claims



1. A device for tamping a trench comprising:

- a supporting means;
- a housing attached to said supporting means;
- means for providing lost motion along a substantially vertical axis between the supporting means and the housing;
- an elongated tamping shoe having an upturned portion on the forward end thereof, said tamping shoe being hingedly connected to said housing near the forward end thereof rearwardly of said upturned portion;
- a drive shaft adapted for reciprocal movement within said housing, said drive shaft extending below said housing and being pivotally connected to a rearward portion of said tamping shoe; and
- reciprocating drive means resiliently connected to said drive shaft for imparting reciprocal movement thereto.

4,005,945

DRILL GUIDE

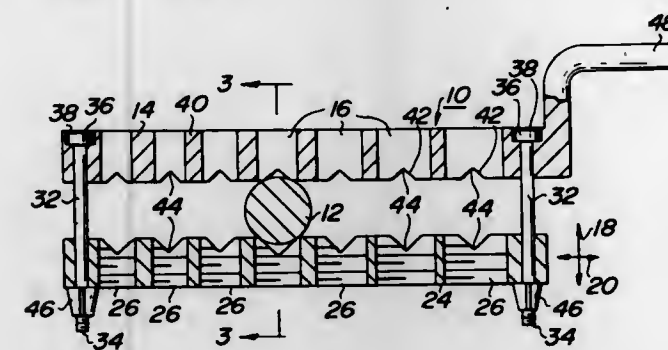
David Gutman, 503 Reed St., Philadelphia, Pa. 19147

Filed Sept. 25, 1975, Ser. No. 616,895

Int. Cl.² B23B 47/28, 49/02; B25B 1/00

U.S. Cl. 408-115 B

9 Claims



1. A parallel clamp and drill jig apparatus for drilling holes in work pieces having an arcuate contour comprising:

- a. a first clamping member having a plurality of through openings axially passing in a vertical direction;
- b. a second clamping member having a plurality of threaded through openings axially passing in said vertical direction, each of said threaded through openings being axially alignable with each of said through openings in said first clamping member;
- c. means for releasably clamping said first member to said second member when said work piece is inserted therebetween; and,
- d. means for axially aligning said work piece between said first member through openings and said second member threaded through openings.

4,005,946

METHOD AND APPARATUS FOR CONTROLLING STATOR THERMAL GROWTH

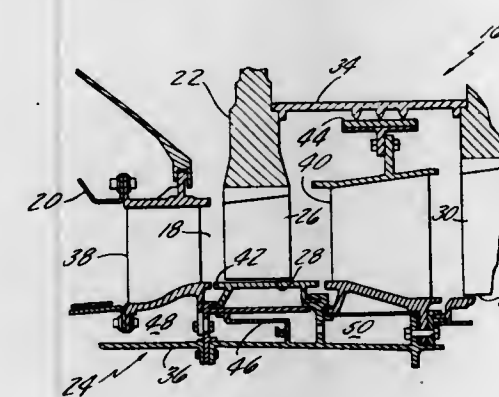
Bertrand Hirsch Brown, Glastonbury; Francis Louis DeTolla, Vernon, and Dale Robert Rellly, Marlborough, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 20, 1975, Ser. No. 588,916

Int. Cl.² F01D 25/24

U.S. Cl. 415-136

4 Claims



1. In a gas turbine engine having a rotor and a stator having elements which radially surrounds the rotor, apparatus for controlling the radial clearance between the rotor and the stator, including:

- a turbine case which is coolable and which supports said elements of the stator which radially oppose the rotor; and
- an air valve operatively disposed with respect to said case to control the flow of cooling air adjacent thereto, said valve comprising
- a deflecting ring which is directly affixed to said turbine case, and

a base ring supported by said elements which is spaced radially inward of said deflecting ring and is in interference contact with said base ring, wherein the base ring is fabricated from a material having a coefficient of thermal expansion which is less than the coefficient of thermal expansion of the material from which the deflecting ring is fabricated such that the base ring and deflecting ring are separable in operative response to the attainment of a predetermined threshold temperature allowing cooling air to flow between said rings.

4,005,947

FLUID OPERATED ROTOR

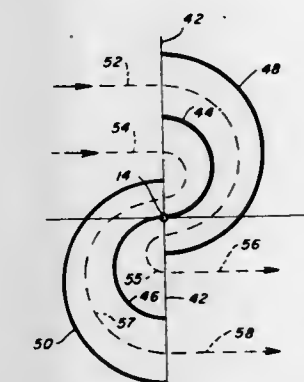
Joseph R. Norton, 724 Skyline Place, Stillwater, Okla. 74074, and Sidney E. Scisson, 2835 E. 58th, Tulsa, Okla. 74105

Filed Feb. 10, 1975, Ser. No. 548,243

Int. Cl.² F03D 3/06

U.S. Cl. 416-197 A

6 Claims



1. A moving-fluid-operated rotor for utilization of a portion of the kinetic energy of a moving fluid, comprising:

- a. four rectangular structures of equal length;
- b. the width of a first and second structure equal to each other, the width of the third and fourth structures equal to each other and wider than the width of the first and second structures;
- c. all four structures curved about an axis parallel to the length of said structures, in the general shape of wings;
- d. the planes of the first and second structures, or wings, as defined by their two edges, being coincident, with one edge of the first wing joined to the opposite edge of the second wing, the first wing being convex while the second wing is concave with respect to their mutual plane;
- e. the third and fourth structures, or wings, positioned substantially coaxial with the first and second wings respectively;
- f. end plates attached to and supporting said wings in their relative positions to form a rigid assembly; and
- g. shaft and bearing means for supporting said assembly for rotation about an axis coincident with the joint between said first and second wings.

4,005,948

LUBRICATION SYSTEM FOR COMPRESSOR UNIT

Masaharu Hiraga, Isesaki, and Shigemitsu Shimizu, Sakai, both of Japan, assignors to Sankyo Electric Co., Ltd., Isesaki, Japan

Filed Sept. 8, 1975, Ser. No. 611,161

Claims priority, application Japan, Oct. 9, 1974, 49-117547; Mar. 15, 1975, 50-31562

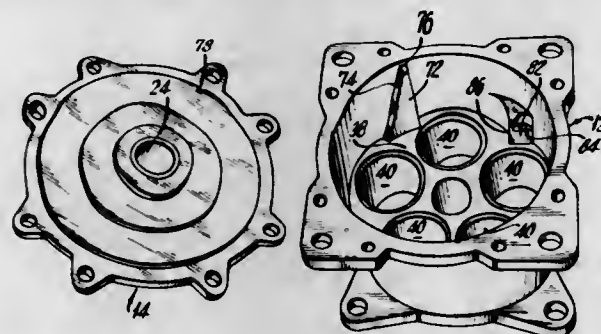
Int. Cl.² F04B 1/12; F01M 1/00

U.S. Cl. 417-269

16 Claims

1. A compressor including a compressor housing having a discharge chamber which includes an inlet and an outlet, means for controlling the flow of fluid between the inlet and outlet of said discharge chamber a plurality of cylinders in said housing piston means including a shaft for imparting reciprocating motion of said piston means in said cylinders to compress a refrigerant fluid therein, a front housing on said com-

pressor housing including an opening for receiving said shaft, means being provided to effect fluid communication between said shaft seal cavity and the interior of said compressor housing, an oil deflector depending from the inner wall of said compressor housing, said front housing including an oil opening disposed adjacent said oil deflector and a passageway formed therein effecting communication between said oil opening and said shaft seal cavity, whereby oil on the inner



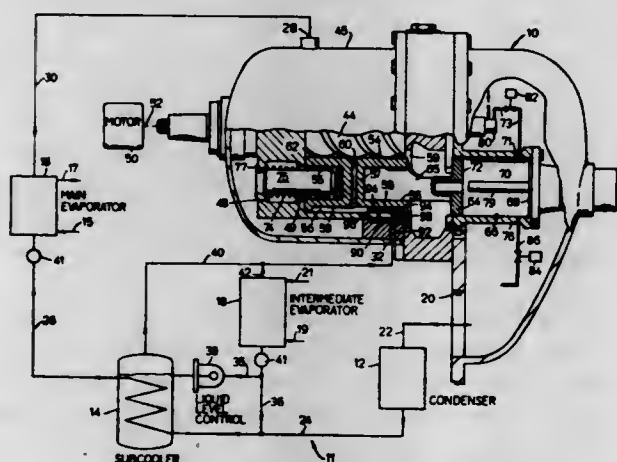
wall of said housing is directed by said deflector through said oil opening and into said shaft seal cavity, an oil bypass opening for allowing blow-by gas to be discharged from the interior of said housing, and a protective member circumferentially spaced along said housing inner wall from said oil deflector and projecting from said inner wall beyond said bypass opening, thereby to prevent oil from entering into said bypass opening.

4,005,949

VARIABLE CAPACITY ROTARY SCREW COMPRESSOR
Whitney I. Grant, Muskego, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 513,542, Oct. 10, 1974, abandoned, which is a division of Ser. No. 403,195, Oct. 3, 1973, Pat. No. 3,859,814. This application Sept. 29, 1975, Ser. No. 617,692

Int. Cl.² F01C 1/16, 21/12; F04C 17/12, 29/08
U.S. Cl. 418-15 3 Claims



1. A variable capacity multiple inlet rotary screw compressor comprising:

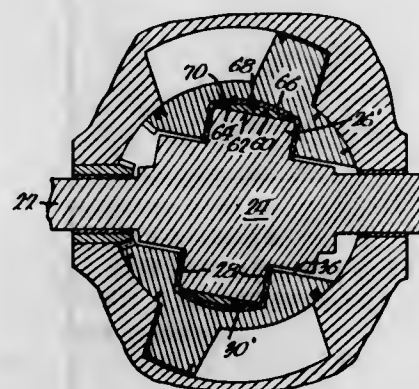
- a housing having a low pressure suction inlet port for admission of refrigerant vapor at relatively low pressure, a high pressure suction inlet port for admission of refrigerant vapor at relatively high pressure, and a discharge port for discharge of compressed refrigerant vapor;
- a pair of oppositely rotating constant mesh rotors defining chambers, said rotors being positioned within said housing to provide pumping and compressing action within said chambers, said chambers being connected at one end to the low pressure suction inlet port and at the other end to the discharge port; and
- means for regulating the point of cut-off of admission of low pressure refrigerant vapor into the compression chambers and for introducing relatively high pressure refrigerant

vapor into the compression chambers at a constant distance from the point of cut-off whereby the amount of compression of said low pressure refrigerant vapor between said point of cut-off and the compression chambers where high pressure vapor is introduced is constant; said regulating means including a slide valve positioned for axial movement within said housing and including cut-off means for controlling the point of cut-off of admission of low pressure refrigerant vapor to said chambers from said low pressure suction inlet port, at which point compression begins, a passage for connecting said high pressure suction inlet port to said chambers, said passage being located at a fixed distance from said cut-off means whereby relatively high pressure refrigerant vapor is admitted into said chambers at a constant distance from said cut-off means, and means for varying the position of said slide valve with respect to the rotors to vary the point of cut-off and thereby vary the capacity of the compressor.

4,005,950

BEARINGS FOR SLANT AXIS ROTARY MECHANISMS
Alexander Goloff, East Peoria, and Roger O. Bjerk, Edelstein, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 5, 1975, Ser. No. 629,198

Int. Cl.² F01C 1/02, 17/00; F03C 3/00; F04C 17/02
U.S. Cl. 418-53 3 Claims



1. A slant axis rotary mechanism comprising:
 - a housing defining a chamber including an operating cavity;
 - a shaft journaled in said housing and including an angularly offset portion within said chamber, said angularly offset portion including a peripheral, generally radially outwardly extending thrust collar;
 - a rotor in said chamber and surrounding said angularly offset portion;
 - thrust bearings sandwiching said thrust collar and engaging said rotor; and
 - a journal bearing disposed on the radially outer portion of said thrust collar and journaling said rotor on said shaft, said journal bearing having a cross section with a spherical outer surface extending about the entire periphery of said radially outer portion of said thrust collar.

4,005,951

ROTARY VANE ENGINE WITH ORBITING INNER AND OUTER MEMBERS

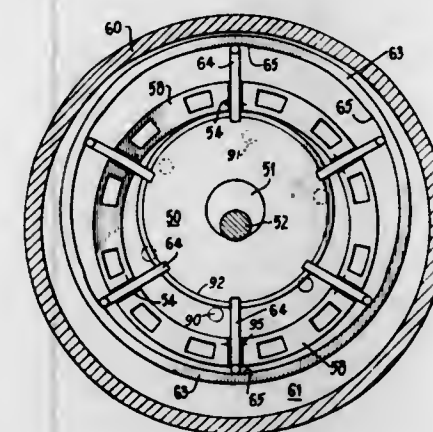
Dominicus Adrianus Johannes Swinkels, Trigg, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Feb. 27, 1974, Ser. No. 446,478
Claims priority, application Australia, Mar. 1, 1973, 2450/73

Int. Cl.² F01C 1/02; F03C 3/00
U.S. Cl. 418-61 R 6 Claims

1. An engine comprising a housing including an internal peripheral wall and opposed end walls, a shaft rotatably supported in the housing, a piston member journaled eccentrically

on said shaft to describe an orbital path within said housing upon relative rotation between said shaft and said housing, said piston member defining with said internal peripheral wall and said end walls a working cavity, a plurality of vanes disposed generally radially to the axis of said shaft and supported in said housing for reciprocal movement radially with respect to the axis of said shaft, and for lateral movement between a first position in radial alignment with a radius of said piston member and a plurality of second positions on either side of said first position and wherein said vanes are parallel to said first position, said vanes being mechanically controlled between two sets of parallel control surfaces to prevent radial movement of said vanes relative to said parallel control surfaces while allowing lateral movement of said vanes along said control surfaces between said first position and said



second positions, one set of said parallel control surfaces being located on the periphery of said orbiting piston member, the other set of said parallel control surfaces being located on vane controlling member or members located outside said working cavity, said vane controlling member or members moving in an orbital path about said shaft axis as said piston orbits, sealing means operatively disposed between each said vane and said piston member, said housing peripheral wall and said housing end walls to divide said working cavity into a plurality of chambers, the volume of each said chamber varying as said piston member orbits, and means to regulate the admission to and exhausting from each said chamber in sequence of a working fluid to induce orbiting of said piston member and the resultant relative rotation between said shaft and said housing.

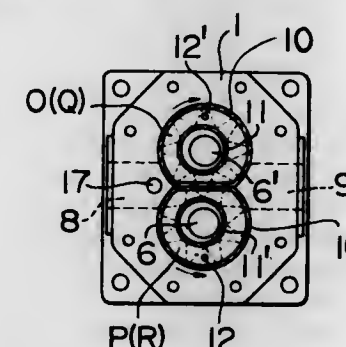
4,005,952

GEAR PUMP

Nobukazu Morisaki, Aichi, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Filed Mar. 18, 1975, Ser. No. 559,648
Claims priority, application Japan, Nov. 8, 1974, 49-128636
Int. Cl.² F04C 15/00

U.S. Cl. 418-131 3 Claims



1. A gear pump comprising a pair of intermeshing gears, a driving shaft operatively connected to one of said gears and driven shaft operatively connected to the other of said gears and a seal arrangement for maintaining axial pressure fields of

said gear pump, said seal arrangement including bearing bushes disposed at least on one side of said gears with said bearing bushes extending around one of said shafts in bearing relationship therewith, each of said bearing bushes having on one end a first annular groove surrounding a bore through which a respective one of said shafts extends and a second annular groove at the periphery thereof, a first annular or ring seal seated in said first annular groove to define a first pressure field encompassing a bearing bore through which one of said shafts extend, a second annular or ring seal seated in said second annular groove to define a second pressure field, said pump including a housing with an end wall cooperating with said seals said pressure fields, said bearing bushes each including a flattened portion on its periphery extending beside a coextensive similarly flattened portion on the periphery of an adjacent one of said bearing bushes, each of said second ring seals following the contour of said flattened portions of its respective bearing bushing whereby each of said flattened portions and the second ring seal seated thereon is in abutting relationship against the flattened portion of the bearing bushing coextensive therewith to define said second pressure field, wherein said second pressure field is of relatively high pressure compared to that of said first pressure field.

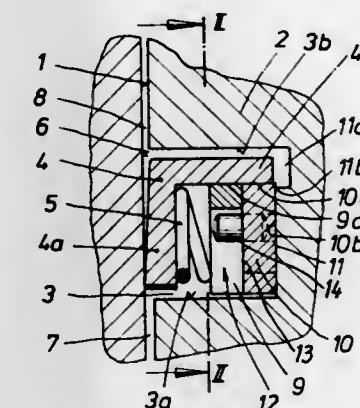
4,005,953

PISTON OF A ROTARY PISTON ENGINE OF TROCHOID TYPE, HAVING AN INTERNAL SEAL

Max Ruf, Obereiseheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Wurt, Germany

Filed Oct. 16, 1975, Ser. No. 622,962
Claims priority, application Germany, Oct. 18, 1974, 2449619

Int. Cl.² F04C 27/00
U.S. Cl. 418-142 3 Claims



1. Piston of a rotary piston engine of trochoid type having a housing, comprising: an internal seal with a scraper ring of L-shaped cross section arranged axially movable in a concentric annular groove in one end wall of the piston and pressed with spring action against the adjacent end wall of the housing, the scraper ring being sealed off inside the annular groove by an elastic sealing ring arranged between the axial flange of the scraper ring and at least one wall of the groove, the elastic sealing ring consists of two closed metal rings immediately adjacent to each other and having their outer periphery in sealing and axially displaceable contact with the axial flange of the scraper ring, and inserted with a radial play between their inner periphery and the radially inner wall of the annular groove smaller than the radial play between the axial flange and the radially outer wall of the groove, a spring ring arranged between the radial flange of the scraper ring and the metal rings, pressing the scraping edge of the scraper ring axially against the end wall of the housing and the metal rings axially against each other and sealingly against the bottom of the annular groove.

4,005,954

PRODUCTION OF PLASTER FLOORS BY THE FLOODING PROCESS

Friedrich Hinsche, Leverkusen-Kueppersteg, and Kurt Schaupp, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 10, 1974, Ser. No. 459,821

Claims priority, application Germany, Apr. 16, 1973, 2319069

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.³ E04B 5/00

U.S. Cl. 428-537

7 Claims

1. In the process for producing a plaster flooring having a flat and smooth surface by mixing an inorganic binder with water to form a fluid paste and applying said fluid paste to a surface to be covered so that said paste flows freely thereover, the improvements which comprise coating the surface to be covered with a water-absorbent layer prior to application of said fluid paste, said water-absorbent layer comprising at least one material selected from the group consisting of gypsum, natural anhydrite, synthetic anhydrite and cement and being used in 2.5 to 42% by weight of the solids in the fluid paste, said binder being an anhydrite which has a water-binder factor of about 0.38 to 0.75.

4,005,955

ROTARY INTERNAL COMBUSTION ENGINE WITH LIQUID COOLED PISTON

Roland Pamlin, Handen, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

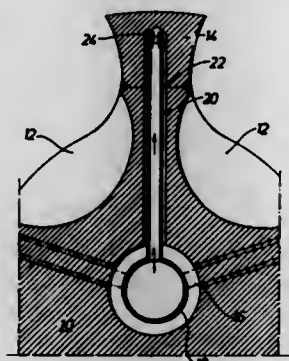
Filed Oct. 28, 1975, Ser. No. 625,909

Claims priority, application United Kingdom, Oct. 29, 1974, 46838/74

Int. Cl.³ F01C 21/06

U.S. Cl. 418-94

8 Claims



1. In a rotary positive displacement internal combustion engine of the type comprising:

two intermeshing rotors, each provided with a central hub portion and a number of axially and radially extending spoke-like lobes with intervening grooves;

at least one of the rotors within its hub portion being provided with a central channel system comprising an axially extending supply channel and an axially extending discharge channel, and within each lobe at least one radially extending supply channel communicating with said axial supply channel and at least one radial return passage communicating with said radial supply channel and said axial discharge channel for passage of a cooling liquid therethrough to cool the respective rotor;

the improvement wherein:

said radially extending supply channel and return passage of each lobe comprise a substantially radial bore in said lobe and a supply pipe, said pipe being radially inserted in the bore and in communication with said axial supply channel, the interior of said supply pipe comprising the radially extending supply channel, said radially extending return passage being a space surrounding at least a portion of said supply pipe and being in communication with

the interior of said supply pipe and with said axial discharge channel.

4,005,956

POWDER ACTIVATION AND INTEGRATED POWDER METALLURGY SYSTEM

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japan Research Inc., Yokohama, Japan

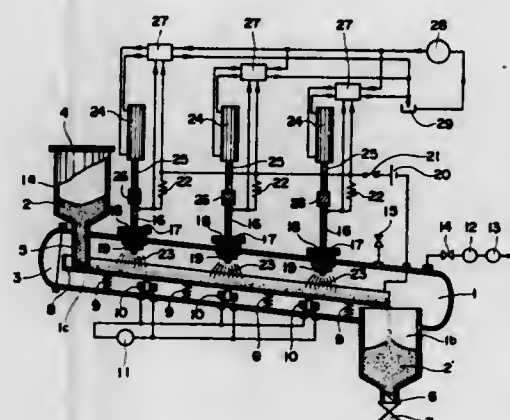
Continuation-in-part of Ser. No. 350,162, April 11, 1973, Pat. No. 3,932,760, which is a division of Ser. No. 60,070, July 31, 1970, Pat. No. 3,738,828, which is a continuation-in-part of Ser. No. 692,960, Dec. 22, 1967, Pat. No. 3,598,566. This application Oct. 21, 1975, Ser. No. 624,431

Claims priority, application Japan, Oct. 22, 1974, 49-121710; Nov. 30, 1974, 49-137857; Dec. 2, 1974, 49-139229

Int. Cl.³ B30B 11/02

U.S. Cl. 425-78

22 Claims



4. An activated sintering apparatus comprising: an evacuable gas-tight chamber for receiving a rarefied gas non-oxidizing atmosphere therein, conveyer means for receiving a supply of metallic powder thereon and passing the same in a fluidized state through and beyond a treatment zone, at least a pair of electrodes in said chamber for producing a glow discharge at said treatment zone so as to subject said powder to bombardment with energistic ions in said discharge thereby cleaning and activating said powder, means for maintaining the distance between said pair of electrodes at a value such that the product of the pressure of said atmosphere and said value, in mm Hg times cm, is in a range between 10^{-3} and 10, support means downstream of said treatment zone for receiving the activated powder in the form of a mass from said conveyer means, associated with said support means for compacting said activated means powder and means for heating the compacted mass to sinter it into a coherent body.

4,005,957

APPARATUS FOR FORMING FIBROUS PADS

Peter P. Savich, Longmeadow, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 470,548, May 16, 1974, Pat. No. 3,939,240. This application Oct. 6, 1975, Ser. No. 619,575

Int. Cl.³ B29J 5/00

U.S. Cl. 425-80

7 Claims

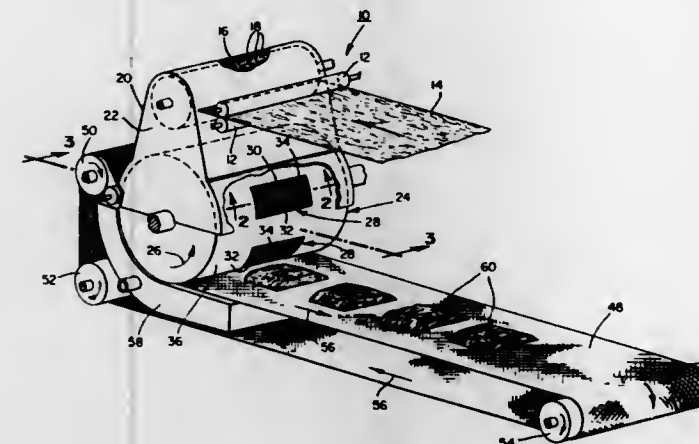
1. An apparatus for forming a fibrous pad from a gaseous suspension of fibers, said apparatus comprising:

A. a fiberizing means for separating fibers from a fibrous feed mat and entraining said fibers in a gaseous medium within a pad formation zone to form the gaseous suspension of fibers therein;

B. a forming member positioned downstream of the fiberizing roll and intercepting the pad formation zone, said forming member including a cavity having a foraminous forming surface and an upper margin defining an opening into said cavity, the area of the foraminous forming surface of said cavity being greater than the area of the opening defined by the upper margins of said cavity;

C. means for moving said forming member to move the cavity past the pad-formation zone;

D. a gas-directing vacuum means disposed beneath the foraminous forming surface of said cavity as it passes the pad-formation zone for establishing a pressure drop across said forming surface to direct the gas of the suspension through the forming surface, and to condense the fibers of the suspension onto said forming surface in the form of a fibrous layer;



E. a transfer conveyer positioned adjacent the forming member, a portion of said transfer conveyer being in close proximity to the forming member downstream of the pad-formation zone for overlying the cavity opening after the fibrous layer has been formed therein; and

F. means for transferring allegiance of the fibrous layer in the cavity to the transfer conveyer in the form of a fibrous pad having a greater basis weight than the basis weight of the fibrous layer formed in the cavity.

4,005,958

APPARATUS FOR CONTINUOUS PRODUCTION OF RECTANGULAR CROSS-SECTIONED FOAMED PLASTIC BUNSTOCK

Lawrence C. Porter, Palos Verdes Peninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 381,923, July 23, 1973, Pat. No. 3,887,670. This application Mar. 21, 1975, Ser. No. 560,713

Int. Cl.³ B29D 27/04

U.S. Cl. 425-89

14 Claims

1. Apparatus for producing longitudinally continuous foamed bun stock from a reactive liquid polymer mix to produce a bun of substantially rectangular cross-section, uniform density and cell isotropicity, which comprises

conveyor means comprising a frame, a continuously advancing lower supporting portion and separate vertically disposed continuously advancing side portions associated with said lower portion, both said lower and side portions being supported on said frame to define an open-topped mold of generally U-shaped cross-section, and means driving said lower and side portions synchronously but independently along a path of travel defined by said frame;

means including said frame for supporting said lower conveyor portion to define a path of travel from a first to a second point on the path and disposing said conveyor portion at a slight declination in the direction of conveyor travel sufficient only to prevent float back of the developing foam thereon, including means on said frame for adjusting said supporting means to vary the declination of the path of travel between said first and second points; means adjacent said conveyor for depositing said liquid polymer mix on said lower conveyor portion at said first point;

weir-forming means extending across said lower conveyor portion between said first and second points to elevate the surface of said lower conveyor portion as it is advanced thereover, said weir-forming means having provi-

sion for adjusting it longitudinally of the direction of conveyor travel and being of such low height only as to provide a shallow pool of liquid polymer mix across said conveyor upstream of said second point and avoiding build-up to a level which would produce any substantial hydrostatic head in the foam;

other means supporting said lower conveyor portion on said frame between said second point and a third point in its path of travel, including means operatively associated with said last named supporting means for adjusting said last-named supporting means to define a path of travel from said second to said third point which causes the surface of said lower conveyor portion to be shifted downwardly relative to said side conveyor portions along a line approximating the mirror image of the characteristic rise profile of the polymer mix during its interval of travel between said second and third

additional means on said frame supporting said lower conveyor portion between said third point and a point of discharge of the finished bunstock.

4,005,959

APPARATUS FOR PRODUCING SHAPED GLASS FIBER REINFORCED GYPSUM ARTICLES

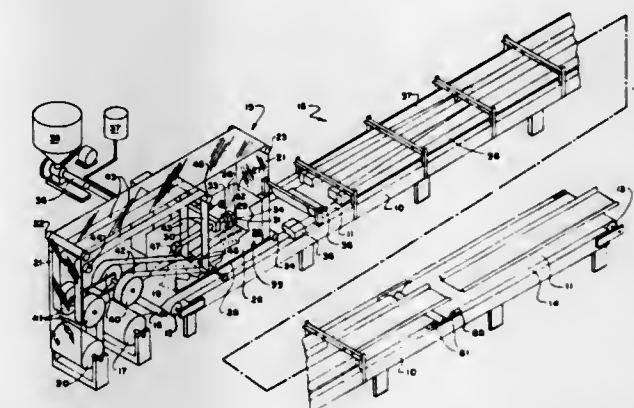
Glenn E. Kautz, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 484,304, June 28, 1974, abandoned. This application Feb. 27, 1976, Ser. No. 661,867

Int. Cl.³ B29C 3/00, 17/00

U.S. Cl. 425-112

4 Claims



1. Apparatus for forming glass-fiber reinforced gypsum products comprising:

- an assembly table;
- means for delivering a first continuous, water-impervious membrane to the top of the said assembly table;
- means for delivering a ribbon a mixture of aqueous calcium sulfate hemihydrate and glass fibers to the top of the said first membrane, said mixture having a weight ratio of water to hemihydrate of 0.22 to 0.45;
- means for delivering a second continuous water-impervious membrane above the said first membrane and above the said ribbon;
- means for sealing together continuously the side edges of the said first membrane and the said second membrane to produce a continuous sandwich having a continuous water-impervious periphery about the said ribbon;
- means for shaping the said sandwich into a desired profile;
- means for retaining the said sandwich in the desired profile until the said ribbon has set; and
- means for cutting the said sandwich transversely across its width into sections of desired length.

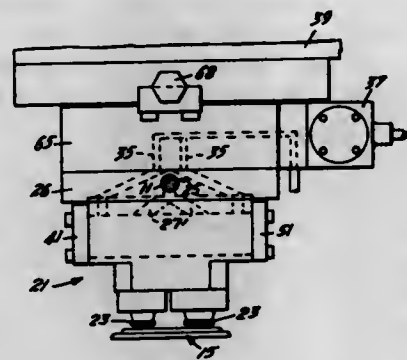
4,005,960

APPARATUS FOR APPLYING PLASTIC TO A PLANAR SURFACE

Frank John Herdzina, Jr., Schaumburg, Ill., assignor to American Can Company, Greenwich, Conn.
Division of Ser. No. 401,143, Sept. 27, 1973. This application Oct. 14, 1975, Ser. No. 622,225
Int. Cl.³ B29C 13/02

U.S. Cl. 425-113

8 Claims



1. An applicator for applying plastic to a planar surface comprising:

- a housing comprising a pair of nozzle assemblies, each containing an annular orifice and a channel through which plastic is conveyed to the orifice;
- means for supplying plastic to the assemblies comprising a pair of connecting channels;
- a valve sleeve positioned between the plastic supply and nozzles comprising a plurality of paired connecting channels in axial alignment with the nozzle and plastic supply channels and having fixed end members, said sleeve housing a spool having paired connecting channels in axial alignment with the valve sleeve channels, said spool being movable to a position of non-alignment relative to the aligned channels of the sleeve;
- means for effecting movement of the channeled spool to a position of non-alignment or alignment relative to said sleeve channels comprising an electronic solenoid pilot valve and ports conducting pressurized air to said spool; and
- means for effecting movement of the applicator toward and away from said planar surface.

4,005,961

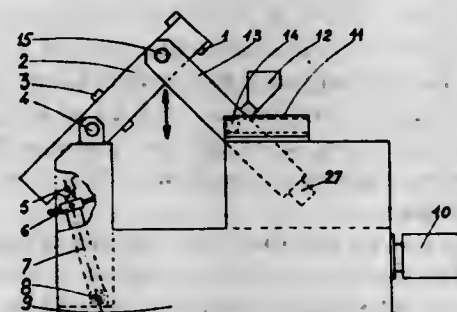
PIVOTALLY MOUNTED INJECTION MOLDING APPARATUS

Marcel Manceau, Montlbery, France, assignor to Creusot-Loire, Paris, France
Filed Aug. 26, 1975, Ser. No. 608,008
Claims priority, application France, Aug. 26, 1974, 74.29160

Int. Cl.³ B29F 1/00

U.S. Cl. 425-190

5 Claims



1. An injection moulding machine comprising:
a frame;
a closure unit including a mould comprising two mould parts interengaging in a joint plane;
an injection unit; and

means associated with and supplying material for injection to said injection unit;
means operatively associated with said arms for controlling mould closure and injection;
a pair of arms articulated about a central pivot and each supported on said frame at a bearing point, means associated with said frame for varying the spacing of said bearing points;
means mounting said injection unit on one of said arms;
means mounting said closure unit on the other of said arms; and
means associated with said arms for relatively moving said arms in a compass-like manner between a first position for injection centrally of said mould, in which first position said arms are in extension of each other, and a second position for injection in said joint plane of said mould, in which second position said arms are substantially perpendicular to each other, said joint plane including said central pivot axis.

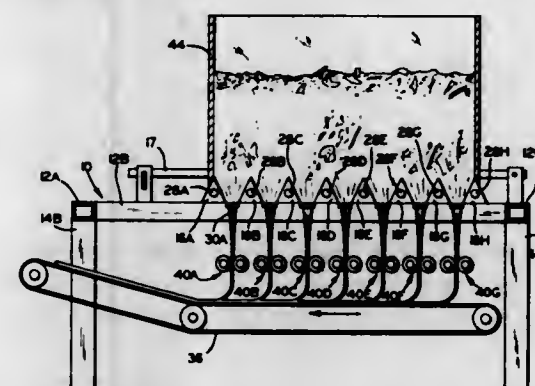
4,005,962

EXTRUDER FOR PLASTIC MATERIALS

Frank R. Kober, 1839 Macomber St., Toledo, Ohio 43606
Filed Dec. 4, 1974, Ser. No. 529,271
Int. Cl.³ B29F 3/08

U.S. Cl. 425-197

3 Claims



1. A plastic extrusion machine for heating and extruding plastic material comprising in combination:

- a. a base support member having an upper support surface;
- b. a plurality of heating bar members disposed on the upper support surface of the base support member, said heating bar members being movable relative to one another over the upper surface of the upper support member;
- c. heating means disposed in the internal areas of the heating bar members, said heating means serving to furnish the heat to radiate from the bar members and heat the plastic material placed on top of the heating bar members;
- d. means located beneath the base support member to receive the heated plastic;
- e. means affixed to said base support member for locking said movable heating bar members into position;
- f. perforated plate means located immediately between the receiving means and the base support means, said perforated plate means having a plurality of holes disposed uniformly over the entire surface of said perforated plate means for purposes of receiving the amorphous plastic material and rendering said plastic material into strands.

4,005,963

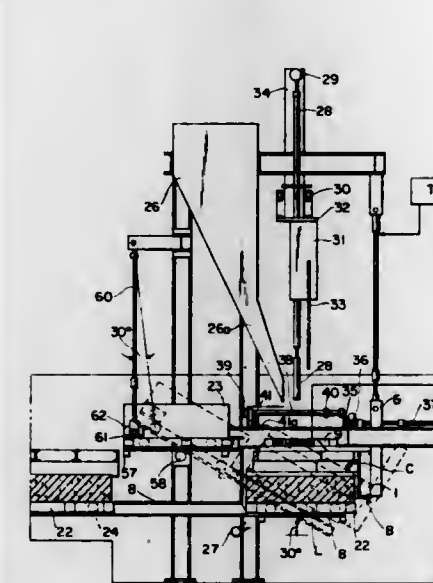
PRODUCTION LINE FOR FORMING CONCRETE ELEMENTS

Mircea Borcoman, 7 rue de l'Etoile, Paris, France
Filed Oct. 18, 1974, Ser. No. 516,127
Claims priority, application France, Oct. 23, 1973, 73.37715

Int. Cl.³ B28B 1/08, 7/10

U.S. Cl. 425-218

15 Claims U.S. Cl. 425-242 R



1. Apparatus for the production of concrete elements comprising in combination:

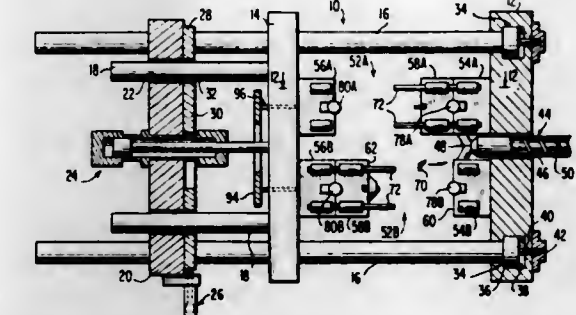
- a tiltable frame adapted to tilt around a horizontal axis;
- at least one mold comprising a shell and a cover adapted to be coupled and uncoupled, the mold obtained by coupling a cover and a shell being open at one end;
- means operatively associated with said shell and cover of each mold for coupling and uncoupling the shell and cover thereof;
- means securing at least one shell on said tiltable frame such that said mold is moveable with said frame between a vertical casting position for a concrete casting operation, and a horizontal unmolding position for uncoupling said shell from said cover;
- means operatively associated with said mold for casting concrete into the vertically oriented mold with its open end located at its upper part, the casting of the concrete being done through said open end and resulting in providing a cast concrete element in said mold;
- means operatively connected to the frame for tilting the frame to place the mold in said horizontal position with said cover being at the lower part of the mold;
- means operatively connected to said coupling and uncoupling means for actuating the coupling means to separate the cover from the shell by a relative downward movement of said cover while the mold is in said horizontal position, the cast concrete element remaining in position on said cover;
- a hardening zone operatively associated with said mold for hardening the concrete element;
- means operatively connected to said cover for advancing said cover supporting said concrete element to said hardening zone;
- means operatively associated with said cover for separating a hardened concrete element from said cover; and
- means operatively associated with said cover for reintroduction of a cover separated from said hardened concrete element into said frame to permit coupling of said cover with a shell secured to said frame for a subsequent concrete casting operation.

4,005,964

INJECTION-MOLD CLAMPING UNIT HAVING ALTERNATELY EJECTING DIE ASSEMBLIES

Thomas G. Bishop, Mount Gilead, Ohio, assignor to Koehring Company, Milwaukee, Wis.
Division of Ser. No. 372,955, June 25, 1973, Pat. No. 3,898,030. This application Feb. 10, 1975, Ser. No. 548,768
Int. Cl.³ B29F 1/022

17 Claims



1. In molding apparatus of the type in which material is injected into die cavity means and allowed to remain in said die cavity means for an interval, and then the molded material is removed from the die cavity means, the improvement comprising:

- a stationary platen;
- a movable platen movable toward and away from said stationary platen;
- a plurality of die assemblies each including a floating die section and an associated stationary die section, the proximate faces of which being configured so as to define therebetween a mold cavity;
- said stationary die sections being mounted on said stationary platen;
- connecting means releasably connecting said floating die sections to said movable platen, and releasably connecting said floating die sections to said associated stationary die sections;
- power means operatively associated with said movable platens for moving said movable platen away from said stationary platen to:
- separate the die sections of one of said die assemblies whose floating die section is released from its associated stationary die section and connected to said movable platen, and
- move away from another of said die assemblies whose floating die section is disconnected from said movable platen and connected to its associated stationary die section, and
- injector means common to a plurality of die cavities of said die assemblies so as to be selectively communicable therewith for selectively injecting material therein;
- said injector means including a stationary barrel having an outlet, and conduits communicating said outlet with said stationary die sections of said plurality of die cavities.

4,005,965

RECORD PRODUCING APPARATUS

Joseph P. Roczynski, Branford, and Chester P. Roczynski, Guilford, both of Conn., assignors to Valley Metallurgical Processing Co., Inc., New York, N.Y.

Filed May 27, 1975, Ser. No. 580,817

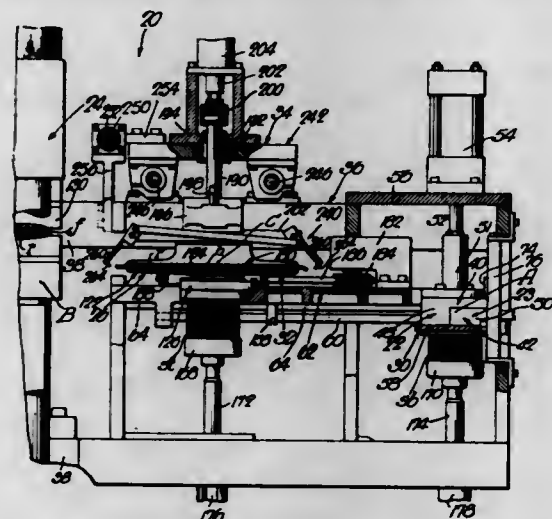
Int. Cl.³ B29D 17/00; B29C 3/00

U.S. Cl. 425-315

4 Claims

1. In record producing apparatus, the combination of a turntable at a first station having a vertical axis and a center pin and being adapted to receive a pressed record with peripheral flash and a center hole located on said center pin; a top disc at said first station having a bottom face and being rotatable about a vertical axis in line with said turntable axis and movable axially into upper and lower positions in which its bottom

face is retracted from and pressed against a record on said turntable, respectively, with said turntable and top disc constituting companion drive elements of which one is power-driven for the friction drive of a record pressed between said elements; means at said first station operative to trim the flash from a record on its friction drive to leave the trimmed record with a uniform peripheral margin outside the turntable periphery; a stacker at a second station; and means to transfer a trimmed record from said turntable to said stacker, including said top disc, and further providing a carriage mounting said top disc for said rotation and axial movement thereof, and being guided for movement into first and second positions in which said top disc is at said first and second stations, respectively, a record holder providing a carrier mounted on and movable with said top disc but independently turntable about said disc axis, a spline connection between said carriage and carrier to hold the latter against rotation in any axial position of said top disc, hangers having bottom ledges and being supported on said carrier for movement into record support and release positions in which said bottom ledges are, in relation to said top disc in said lower position at said first station,



outside the outer periphery of said turntable and spaced below, but in vertical alignment with, peripheral portions of said peripheral margin of a trimmed record on the turntable, and outside the peripheral flash of a pressed record on the turntable, respectively, with said spacing of said bottom ledges of the hangers below said peripheral margin of a trimmed record on the turntable being such that the ensuing gap between the resting record on the bottom ledges and the bottom face of the top disc on its rise into said upper position is sufficient to interrupt any attraction between top disc and record due to static electricity generated in the top disc on the friction drive of the record, and means operative to shift said hangers simultaneously into said support and release positions, respectively, whereby on the rise of the top disc at said first station from said lower position the bottom ledges on the hangers in their record support positions lift a trimmed record from the turntable and support it on continued rise of the top disc to said upper position and during movement of said carriage from said first position into said second position in which the supported record is above and in receiving alignment with said stacker for its drop thereon on shifting said hangers to said release positions.

4,005,966

BLOW MOLDING MACHINE

Robert G. Nutting, Glenview, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 16, 1975, Ser. No. 578,020

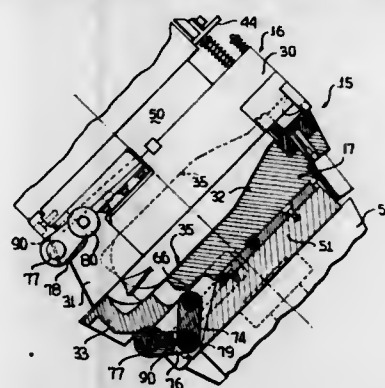
Int. Cl.² B29C 17/07

U.S. Cl. 425—326 B

15 Claims

1. Apparatus for blow molding articles comprising a plurality of molds, means for moving said molds along a continuous path of travel, each mold being defined by a pair of mold bodies which define a mold chamber of a predetermined configuration, means for relatively moving each pair of mold bodies between open and closed positions thereof, means for

extruding a tubular parison between each pair of mold bodies while in the open position thereof, means for expanding each tubular parison to the configuration of its associated chamber when the mold bodies are in their closed position, each mold being defined by first and second mold sections, means coupling each first and second mold section for movement relative to each other, means for imparting movement to one of said first and second mold sections of each pair of mold bodies



to increase the size of said mold chamber thereby facilitating the discharge of the blown parisons therefrom, and said movement imparting means successively moves a first of said mold sections relative to its associated second mold section of a first of said mold bodies while said mold bodies are in their closed position, thereafter moving said mold bodies away from each other, and thereafter moving a first of said mold sections relative to its associated second mold section of a second of said mold bodies.

4,005,967

SCRAPLESS FORMING OF PLASTIC ARTICLES

Ralph E. Ayres; Kenneth J. Cleereman, both of Midland, and Walter J. Schrenk, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 433,320, Jan. 14, 1974, Pat. No.

3,947,204, which is a continuation-in-part of Ser. No.

295,092, Oct. 2, 1972, abandoned, which is a division of Ser.

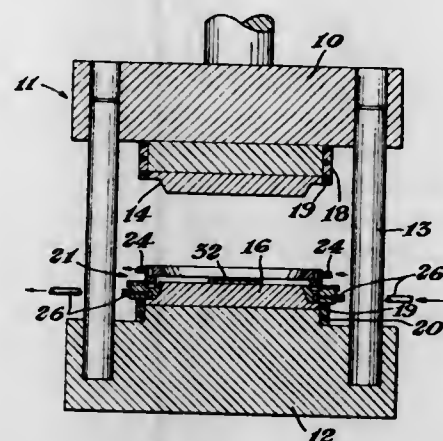
No. 62,969, Aug. 11, 1970, Pat. No. 3,739,052. This application

Jan. 21, 1976, Ser. No. 650,833

Int. Cl.² B29C 3/00, 17/04

U.S. Cl. 425—326 R

4 Claims



1. An apparatus for scrapless forming of thermoplastic articles comprising a ring-like forming fixture adapted to receive a measured amount of thermoplastic material to be forged into a preform which can subsequently be thermoformed into an article, said forming fixture comprising an upper ring with a central opening the lower extent of which defines a peripheral dimension about the same as that of said preform less its rim area, a lower ring including a central opening the upper extent of which defines a peripheral dimension about the same as that of said preform less its rim area, a lip opening contoured out of at least one of said rings around the entire extent thereof and presenting a face angled from the horizontal sufficient to resist the retraction stress of the thermoplastic material of the preform, the inner surfaces of said rings adjacent their respective central openings being spaced

from one another a distance no greater than the thickness of said preform and presenting opposed shoulders which together with said face secure the peripheral rim area of said preform, including its lip, in clamped fashion within said fixture prior to and during subsequent thermoforming of the preform into a container, cooling channels extending through at least one of said rings adjacent the rim receiving portion thereof sufficient to cool rapidly the rim area while leaving the central portion of said preform at a thermoformable temperature, the peripheral edges of said central openings being chamfered outwardly from their inner extent to their outer extent, the inner extent of said central openings being in open communication with one another, a vacuum thermoforming mold including a cavity generally in the shape of a desired container located in open communication with the central openings, means within said mold for evacuating fluid under vacuum therefrom, and means for cooling the container thermoformed from said preform.

4,005,969

APPARATUS FOR LONGITUDINAL STRETCH FOR BLOW MOLDING

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

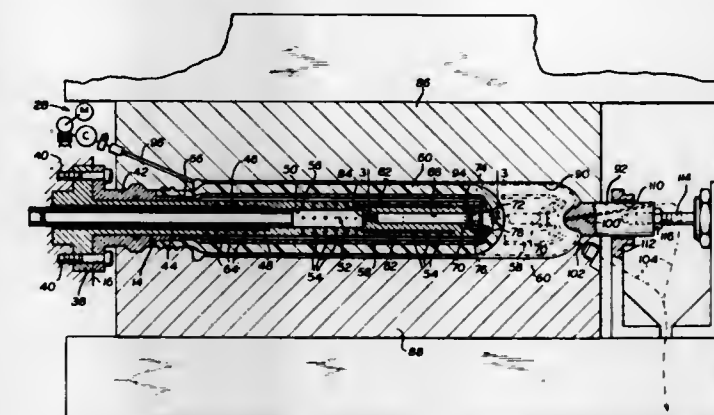
Division of Ser. No. 441,811, Feb. 12, 1974, Pat. No.

3,905,738. This application Jan. 31, 1975, Ser. No. 545,923

Int. Cl.² B29C 17/07

U.S. Cl. 425—389

9 Claims



1. Blow molding apparatus comprising in combination, a core rod, an elastic balloon attached to the core rod at the neck end thereof, the balloon hugging the core rod when the balloon is in a deflated condition preparatory to having a parison applied over the outside surface of the balloon, and an end portion of the core rod remote from the neck end of the rod and that moves axially to extend the length of the core rod, means on said core rod to provide fluid passage between the core rod and balloon during core rod extension so that the balloon and the parison thereon are stretched lengthwise with the parison diameter and balloon diameter being substantially unchanged.

4,005,968

PIPE END REFORMING APPARATUS

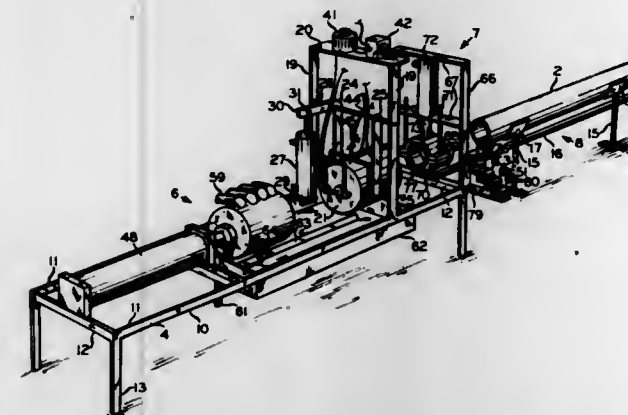
William V. Crawford, Williamstown, Ky., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 19, 1975, Ser. No. 578,962

Int. Cl.² B29C 3/00, 17/00

U.S. Cl. 425—384

7 Claims



1. A pipe end reforming apparatus comprising:

- a support;
- a mandrel;
- first means movably mounting said mandrel on said support with said mandrel being movable in a generally linear path between a retracted position and a forming position for engagement with an end portion of a pipe;
- clamp means mounted on said support and adapted for selectively holding a pipe in a preselected position;
- heating means; and
- second means movably mounting said heating means on said support with said heating means being movable, independently of said mandrel, in an arcuate path between a first position and a second position, when in said second position said heating means being in heat transfer relation to an end portion of a pipe and being in axial alignment with said clamp means and said mandrel and when in said first position said heating means being out of axial alignment with said mandrel and the pipe thereby providing clearance for said mandrel to move to the forming position whereby heating and forming can be accomplished without moving said pipe.

4,005,970

APPARATUS FOR CONTINUOUSLY PRODUCING SEALS IN TUBE-SHAPED PLASTICS FILM MATERIAL

Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

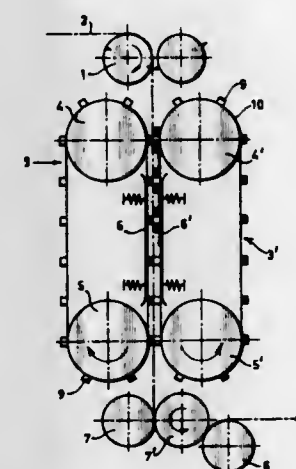
Filed Feb. 3, 1976, Ser. No. 654,840

Claims priority, application Netherlands, Feb. 3, 1975, 7501266

Int. Cl.² B29C 21/00

U.S. Cl. 425—392

16 Claims



1. Apparatus for continuously producing seals in tube-shaped plastics film material, comprising means for supplying the web of material, at least one heating beam travelling along with the web and subsequently returning, means for keeping the web mechanically tension-free at the location where it is warm, means for keeping the heated film layers one against the other up to a pressing station, said pressing station comprising two rollers at least one of which is provided with cool-

ing means, and finally, means for discharging the web, a plurality of heating beams being provided which are interconnected by flexible and longitudinally adjustable means such as belts so as to form an endless loop which is guided over and driven by appropriate adjustable tensioning rollers.

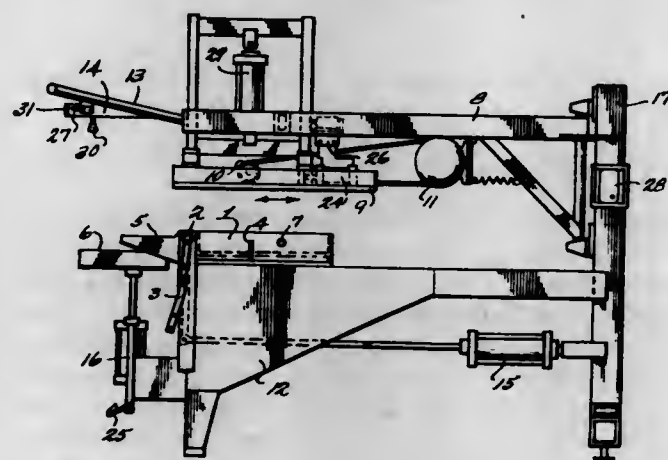
4,005,971

CASTING MACHINE FOR MAKING CONCRETE SLABS
Nils Hjarne Knudsen, Dragor, Denmark, assignor to N. Hjarne Knudsen A/S, Kastrop, Denmark
Continuation-in-part of Ser. No. 377,194, July 9, 1973, abandoned. This application Feb. 5, 1975, Ser. No. 547,246
Claims priority, application Germany, July 8, 1972, 7225536[U]

Int. Cl.² B28B 3/02

U.S. Cl. 425-410

6 Claims



1. In a casting machine for making concrete slabs and having a concrete receiving interchangeable mold comprising side walls and a bottom, and being mounted in support so as to be swingable 180° about a horizontal axis from a concrete filling position into a mold stripping position, and a vibrator displaceably mounted above the mold, the improvement comprising means for mounting the vibrator swingable about a vertical axis from a position at the side of the mold to a working position over the mold in its filling position, and a vertically movable pressure and vibrator plate mounted on said vibrator so that it can be brought to press against and vibrate the surface concrete filled into and up over the top edge of the mold walls in a sidewardly reciprocating movement, means for activating and deactivating the vibrator and means for reciprocating said plate relative to said arm to perform short glazing reciprocations in its own horizontal plane without vibrations.

4,005,972

INVERTIBLE APPARATUS FOR MOLDING A CONCRETE PANEL

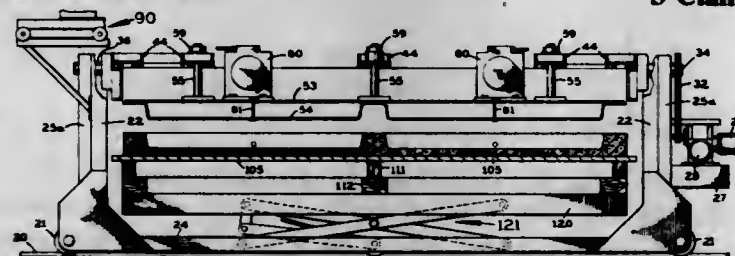
Alex Sommers, North Miami Beach, Fla., assignor to Bearing-wall Systems Inc., Hollywood, Fla.

Filed Apr. 4, 1975, Ser. No. 565,101

Int. Cl.² B28B 13/05

U.S. Cl. 425-439

3 Claims



1. In an apparatus for molding a thin concrete panel of broad surface area, said apparatus having a rigid, unitary mold frame which provides the peripheral sides of a mold cavity;

a support framework for the mold frame having upstanding supports outside the mold frame at opposite ends of the latter;

a pair of aligned, horizontal pivot shafts pivotally connecting said opposite ends of the mold frame to said upstanding supports for pivotal adjustment of said mold frame through 180° between an upright horizontal position and an inverted horizontal position;

a separate bottom plate slidably vertically inside said mold frame and located at the bottom of the mold frame when the latter is in its upright position;

a mold core resting on top of said bottom plate inside the mold frame when the mold frame is in said upright position;

clamp means operatively engaging the mold frame to releasably clamp a pallet on top of the mold frame to extend horizontally across the top of the mold cavity therein above said bottom plate and said core in said upright position of the mold frame and to extend horizontally beneath the mold cavity in said inverted position of the mold frame;

and a vertically displaceable horizontal platform beneath the mold frame for engaging the pallet from below in said inverted position of the mold frame and for carrying the pallet down away from the inverted mold frame after said clamp means has released the pallet from the inverted mold frame;

the improvement:

wherein said opposite ends of the mold frame have outwardly-facing recess means therein on opposite sides of said pivot shafts;

and further comprising two pairs of locking members respectively supported by said upstanding supports at said opposite ends of the mold frame, with the locking members of each pair being respectively located on opposite sides of the corresponding pivot shaft and being slidably mounted for horizontal displacement between an outwardly retracted position spaced beyond the adjacent end of the mold frame and an inner position snugly received in the corresponding recess means in the adjacent end of the mold frame to hold the mold frame horizontal in both its upright and inverted positions.

4,005,973

BLOCK MOLDING MACHINE HAVING PALLET SUPPLY MEANS

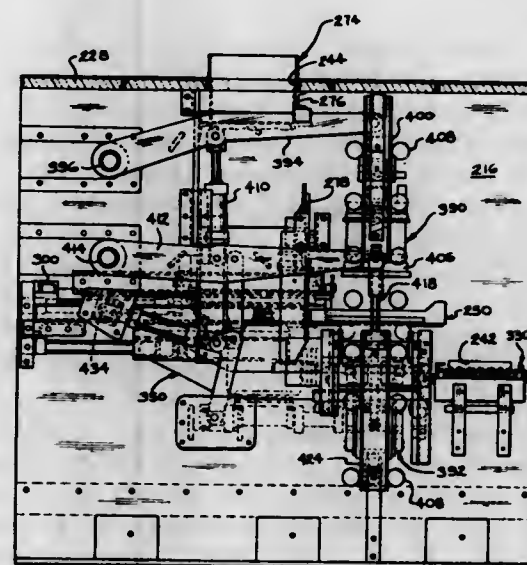
Milo G. Balhorn, Waterloo, Iowa, assignor to Old Fort International, Inc., Adrian, Mich.

Division of Ser. No. 544,137, Jan. 27, 1975, Pat. No. 3,961,874. This application Feb. 12, 1976, Ser. No. 657,373

Int. Cl.² B28B 3/04

U.S. Cl. 425-443

3 Claims



1. In a block molding machine, a frame, a moldbox sup-

ported by the frame and open at the bottom under which a pallet can be supported during block molding operations, a mechanism supported by the frame and extending under the moldbox for supporting and lowering a block-loaded pallet from said moldbox and subsequently for raising and supporting against the bottom of the moldbox the next succeeding pallet, a pallet magazine supported by said frame on the rearward side of said moldbox and having a discharge portion open on the lower front side for releasing the lowermost pallet therein for transfer forward to said moldbox, said pallet magazine having an inlet portion for receiving pallets fed singly thereto, an ejector and pallet feed mechanism mounted on said frame for ejecting in a forward direction the block-loaded pallet from under said moldbox and as an incident to the ejecting action to remove the lowermost pallet from said magazine and to transfer it to said moldbox for being raised by said mechanism, and an auxiliary pallet feeder mounted adjacent to said magazine for feeding pallets singly to the magazine, said auxiliary pallet feeder including a storage hopper in which pallets can be stored for feeding to said magazine.

4,005,975

APPARATUS FOR CONNECTING TOGETHER PARTS OF FOAM PLASTICS

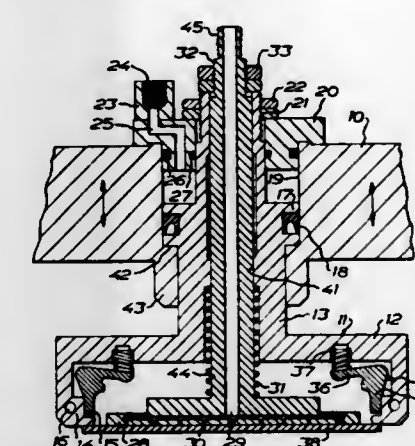
Sören Elov Mauritz Sollerud, Norrköping, Sweden, assignor to Tetra Pak Development SA, Lausanne, Switzerland
Division of Ser. No. 422,812, Dec. 7, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,433

Claims priority, application Sweden, Dec. 8, 1972, 16017/72

Int. Cl.² B29C 23/00; B29D 27/00, 9/00

U.S. Cl. 425-500

9 Claims



1. An apparatus for connecting together first and second parts of foam plastics, comprising

- a first holder means for the first part,
- heating means movable relative to the first holder means from a retracted position to an active position where it applies heat against a surface of a first part in the first holder means to melt a portion thereof,
- a second holder means for holding the second part at a position opposed to the first holder means when heat is being applied to the first part,
- said first and second holder means being relatively movable between first and second positions, said first position being one in which a second part in the second holder means is so spaced from a first part in the first holder means as not to be influenced by the heat from the heating means when at its said active position, said second position being one in which the molten portion of the first part is engaged with the non-heated portion of the second part.

4,005,976

RODENT EXTERMINATOR

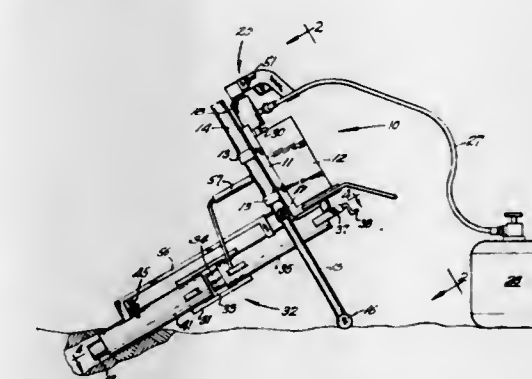
James L. Rombach, 2155 Nirvana St., Eugene, Oreg. 97401, and David W. Strebel, 4380 Hall Road, Santa Rosa, Calif. 95401

Filed Aug. 14, 1975, Ser. No. 604,553

Int. Cl.² F23D 13/00

U.S. Cl. 431-13

6 Claims



1. A portable apparatus for discharging and igniting a quantity of flammable gas within a closed area, said apparatus comprising,

a frame including a support for ground engagement,

4,005,974
MOLD-CLOSING UNIT, PARTICULARLY FOR INJECTION-MOLDING MACHINES

Tibor Szabo, Ludenscheid, Germany, assignor to Tibor Szabo, Ludenscheid, Germany

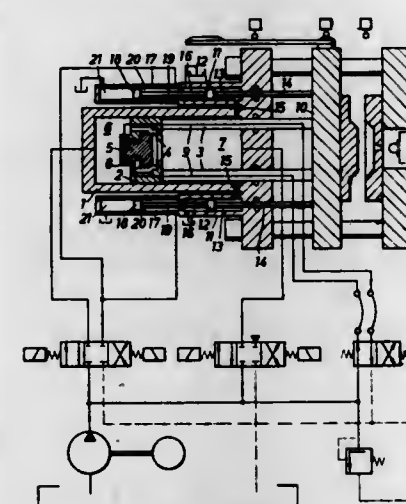
Filed Jan. 24, 1975, Ser. No. 543,919

Claims priority, application Germany, Jan. 29, 1974, 2404105

Int. Cl.² B29F 1/00; F15B 11/00

U.S. Cl. 425-450.1

11 Claims



1. A mold-closing unit for injection molding machines having a double acting closing piston operating in a closing cylinder divided by the closing piston into two pressure medium filled working chambers interconnected via a closable connecting channel in the closing piston, at least one piston rod extending through one of the working chambers and connected to a movable mold part and attached to the closing piston, the improvement which comprises at least one auxiliary cylinder having a working chamber hydraulically connected to one of the working chambers of the closing cylinder and having an auxiliary piston slidable with a piston rod which piston rod is coupled to the closing piston to move simultaneously therewith, whereby the volume of the working chamber of the auxiliary cylinder is increased when the piston rod of the closing cylinder is inserted into the closing cylinder and is correspondingly reduced when the piston rod is retracted from the closing cylinder.

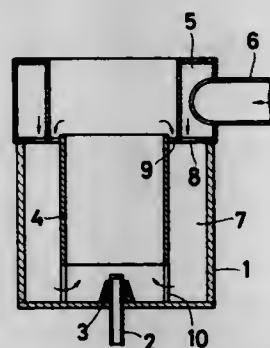
a barrel including nozzle means for discharge of the flammable gas, said barrel including adjustable means regulating the intake of ambient air into the barrel for mixing with the gas,
an igniter mounted within said barrel,
a gas control valve mounted on said frame,
a switch means mounted on said framework closing an electrical circuit to an ignition system serving said igniter means for ignition of the discharged gas.

4,005,977

GAS CIRCULATING COMBUSTION MEANS

Yoshio Kawamura, Kawaguchi, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Jan. 6, 1976, Ser. No. 646,892
Claims priority, application Japan, Jan. 13, 1975, 50-6159
Int. Cl.² F23M 3/14

U.S. Cl. 431-116



1. A gas circulating combustion means comprising an outer cylinder having one end thereof closed to serve as the bottom and the other end left open, an inner cylinder disposed inside said outer cylinder and an air feed cylinder, said combustion means being so constructed that a fuel discharge nozzle pointed in the direction of the interior of the outer cylinder is disposed at the bottom of the outer cylinder, a path for gas circulation is constituted by the inner cylinder, the outer cylinder and the bottom of said outer cylinder, said air feed cylinder is disposed at the end of the outer cylinder opposite the bottom of the outer cylinder to form a part of the enclosure of said gas circulation path and is provided with an air discharge opening for discharging air in the direction of the gas circulation path, a combustion gas suction inlet is disposed next to said air discharge opening between the air feed cylinder and the inner cylinder so that when the air is discharged via the air discharge opening into the gas circulation path, the resultant current of discharged air causes a part of the combustion gas existing in the inner cylinder to be withdrawn into the circulation path, and a reflux inlet adapted to admit the gas circulation path into the inner cylinder is disposed between one end of the inner cylinder and the bottom of the outer cylinder.

4,005,978

CANDLE WAX COMPOSITION

Peter J. Calabretta, Bayside Hills, and Frank J. Keppel, Brooklyn, both of N.Y., assignors to Felton International, Inc., Brooklyn, N.Y.

Filed Mar. 4, 1975, Ser. No. 555,206
Int. Cl.² C10L 5/00; C11C 5/00

U.S. Cl. 431-288

7 Claims

1. An improved wax-candle composition suitable for preparing a cast candle therefrom in a single pouring, said improvement comprising the combination of paraffin wax as the major component in said composition, and about 0.5% to 1.5% by weight of phthalic anhydride, said paraffin wax having a melting point between about 60° C and about 80° C.

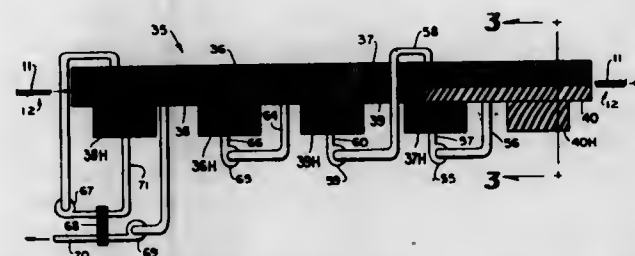
4,005,979

MULTISTAGE PROGRESSIVE DRYING METHOD

James Donald Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.
Division of Ser. No. 453,839, March 22, 1974, Pat. No. 3,923,449. This application July 3, 1975, Ser. No. 593,102
Int. Cl.² F27B 9/28

U.S. Cl. 432-8

5 Claims



1. Method of heating a carpet product to remove moisture therefrom, while serially passing the carpet product through a plurality of heating zones so that the carpet product initially passes through a first heating zone and subsequently passes through a second heating zone, comprising the steps of:
subjecting the carpet product to heated fluid within each of said plural heating zones, so that moisture associated with the carpet product passing through a heating zone is at least partially removed by evaporation from the carpet product within the heating zone;
withdrawing a first volume of fluid from only said first heating zone and exhausting said withdrawn fluid to atmosphere without any further moisture removing exposure of the withdrawn fluid to the carpet product;
supplying said first heating zone with a volume of make-up fluid which is withdrawn only from said second one of said plural heating zones and which is substantially equal in volume to said first volume less the volume of moisture removed from the carpet product within said first zone; and
admitting make-up fluid from a source external to all of said heating zones, to only the last of said plural heating zone through which the carpet product passes.

4,005,980

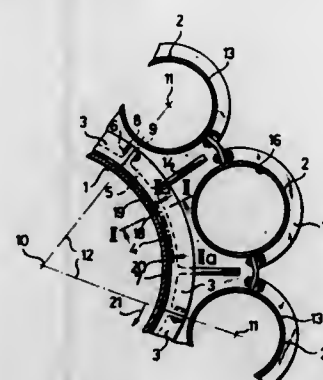
SATELLITE TUBE SUPPORT

Paul Abel, Eannigerloh, Germany, assignor to Polysius AG, Neubeckum, Germany
Filed Sept. 5, 1975, Ser. No. 610,675
Claims priority, application Germany, Sept. 19, 1974, 2444817

Int. Cl.² F27D 15/02

U.S. Cl. 432-80

16 Claims



1. In a rotary tube assembly for heat exchange between solid and gas having a plurality of axially extending satellite cooler tubes uniformly distributed around the outer periphery of a rotary tube in the vicinity of the exit end thereof, and supporting means for mounting the satellite tubes on the rotary tube; the improvement wherein said supporting means comprises a plurality of like support elements each constituting one circumferential segment of an annular ring adapted to surround

said rotary tube in closely fitting relationship thereto, securing means for detachably securing said support elements to each other to form a continuous support ring, seating means on each support element for engaging at least one of said satellite tubes to locate and support said satellite tubes on said rotary tube, and abutment means on said rotary tube and said support elements for detachably mounting said ring on said rotary tube, said abutment means being engageable with each other to limit said continuous support ring in circumferential and axial movement relative to said rotary tube.

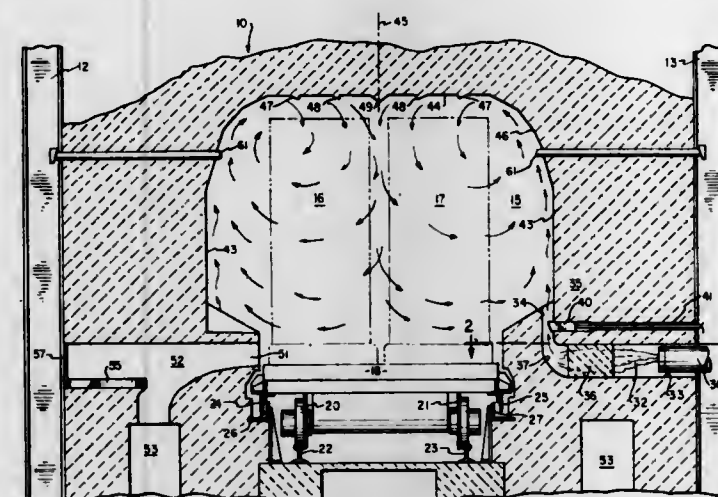
4,005,981

TUNNEL KILN

John E. Turnbull, Brookville, Pa., assignor to Hanley Company, Summerville, Pa.
Filed Apr. 28, 1975, Ser. No. 572,629
Int. Cl.² F27B 9/00

U.S. Cl. 432-144

16 Claims



1. A continuous tunnel kiln firing section comprising:
an elongated housing through which stacks of ware to be fired may be moved;
said housing comprising vertical sides, a horizontal roof connecting said sides, and means between the lower ends of the sides forming the base of said housing, said base means including means for continuously transporting the stacks of ware through said housing,
a plurality of excess-air burners spaced along each side of said housing for generating high volume swiftly moving streams of hot gases;
a plurality of inlet ducts spaced longitudinally along the lower portion of each side of said housing and connected with said burners for directing the streams of hot gases from said burners upward in lateral non-longitudinal flow adjacent the inner walls of said sides;
a plurality of exhaust ducts spaced longitudinally along the lower portion of each side of said housing for exhausting excess gases from the housing;
said inlet and exhaust ducts being spaced relative to each other such that said hot gases circulate laterally over along the roof of said housing, laterally downward and

through the stacks of ware to be fired, and are drawn upward again in substantially the same lateral flow path with the swiftly moving streams of hot gases from said burners to form a powerful lateral recirculating current of hot gases which provides substantially uniform temperatures on a given lateral plane throughout the stacks of ware to be fired.

4,005,982

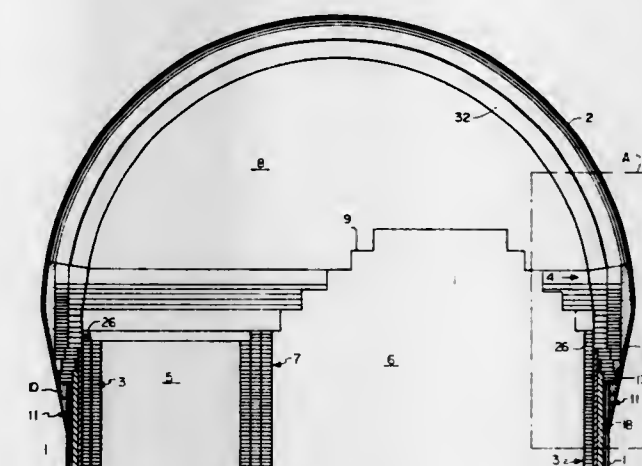
HOT-BLAST STOVE FOR A BLAST FURNACE

Helmut Palz, Wiesbaden; Rudolf Hebel, Ginsheim, and Otto Bauersachs, Saarbrücken, all of Germany, assignors to Dider-Werke AG, Wiesbaden, Germany
Filed Sept. 25, 1975, Ser. No. 616,897
Claims priority, application Germany, Sept. 28, 1974, 2446407

Int. Cl.² F27B 14/08

U.S. Cl. 432-248

12 Claims



1. A hot-blast stove comprising:
a vertically extending metallic shaft casing having therein a refractory shaft lining surrounding a combustion shaft chamber and a grating shaft, said shaft casing including a lower cylindrical section and an upper funnel-shaped widened section integrally joined to said cylindrical section and flaring upwardly and outwardly therefrom;
a metallic cupola casing having a configuration of part of a sphere of a diameter greater than that of said cylindrical section, said cupola casing being integrally joined to said shaft casing at the upper end of said funnel-shaped widened section thereof, said cupola casing having therein a refractory cupola lining;
an annular supporting frame positioned within and rigidly attached to said funnel-shaped widened section, said supporting frame surrounding said shaft lining and being free of direct attachment to said cylindrical section; and said supporting frame having integrally attached thereto an annular platform supporting said cupola lining.

CHEMICAL

4,005,983 METHOD AND APPARATUS FOR COLORIMETRIC ANALYSIS

Harald Dahms, 22 Lakeview Road, Ossining, N.Y. 10562
Division of Ser. No. 297,597, Oct. 16, 1972, abandoned, which
is a continuation of Ser. No. 89,228, Nov. 13, 1970,
abandoned. This application June 21, 1974, Ser. No. 481,803
Int. Cl.² G01N 31/22, 33/18

U.S. Cl. 23—230 R

7 Claims



1. A method for determining the water content of a sample, comprising the steps of:
measuring the optical density of a known volume of first KF reagent, said KF reagent having an optical density which is substantially linearly related to the amount of water added thereto,
adding a sample containing an unknown amount of water to said KF reagents
measuring the optical density of said KF reagent after addition thereto of said sample containing an unknown amount of water, and
determining the amount of water in said sample using said linear relationship between optical density and water content of said KF reagent.

4,005,984 DIAGNOSTIC COMPOSITION AND METHOD OF USING THE SAME

Reese Fell Alsop, Lloyd Lane, Lloyd Neck, Huntington, N.Y. 11743

Continuation-in-part of Ser. No. 578,771, May 16, 1975, abandoned. This application Feb. 17, 1976, Ser. No. 658,550
Int. Cl.² G01N 33/16

U.S. Cl. 23—230 B

9 Claims

1. A diagnostic composition for the detection of occult blood in stools consisting essentially of an intimate mixture of chemical reagents selected from the group consisting of guaiac, glacial acetic acid, hydrogen peroxide, barium peroxide, benzidine dihydrochloride, and o-tolidine and a lubricant.

4,005,985 CATALYTIC REACTOR

Thomas Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 7, 1972, Ser. No. 216,100

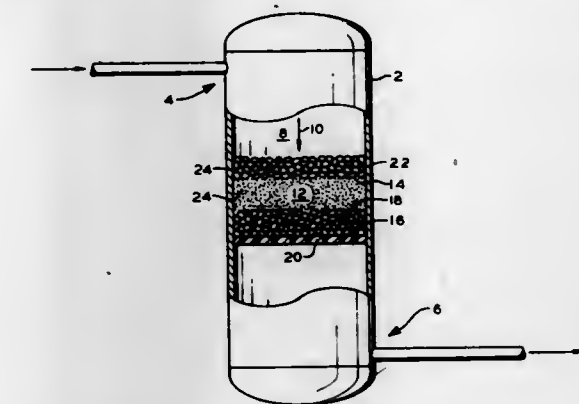
Int. Cl.² B01J 8/02; C07C 3/34

U.S. Cl. 23—288 R

4 Claims

1. In a catalytic reactor for the dehydrogenation of a paraffinic hydrocarbon material feed stream flowing through the reactor from an inlet to an outlet end of the reactor and having a platinum-tin promoted zinc aluminate catalyst layer in the reactor traversing the direction of flow of the feed stream therethrough, the improvement comprising:
a first layer of silica-free particles positioned in contact with a lower surface of the platinum-tin promoted zinc aluminate catalyst between said catalyst and the outlet of the reactor, said first layer covering substantially the entire lower surface of said catalyst; and

a second layer of silica-free particles positioned in contact with an upper surface of said catalyst between said cata-



lyst and the inlet of the reactor, said second layer covering substantially the entire upper surface of said catalyst.

4,005,986 DEVICE FOR MAKING HIGH TEMPERATURE REFORMED GAS

Tsuneco Miyashita, Kawasaki; Kazuo Sano; Kyoji Sasaguri; Kazuo Ishihara, and Shunichi Hironaka, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

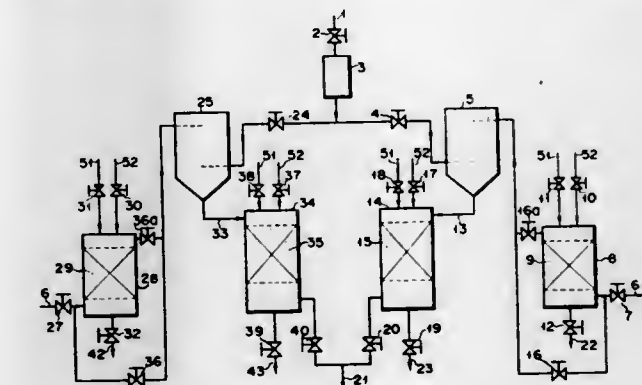
Filed Oct. 31, 1973, Ser. No. 411,333

Claims priority, application Japan, Nov. 6, 1972, 47-111006

Int. Cl.² B01J 8/02; C01B 2/02

U.S. Cl. 23—288 R

9 Claims



1. A device for making high temperature reformed gas mainly comprising hydrogen and carbon monoxide, said device comprising:
a source of coke oven gas (1);
a source of blast furnace gas (6);
a continuous heating apparatus (3) coupled to said coke oven gas source for preheating the coke oven gas (1);
a first system including:
a first intermittent heat exchanger (8) coupled to said blast furnace gas source and containing therein a packing bed (9) of the heat-accumulator type for preheating the blast furnace gas (6);
a first separate cyclone-type gas mixing chamber (5) having a first inlet coupled to the output of said continuous heating apparatus (3) and a second inlet coupled to the output of said first intermittent heat exchanger (8) for mixing the two preheated gases (1 and 6); and
a first intermittent reforming furnace (14) coupled to the output of said separate cyclone-type gas mixing chamber (5) and containing therein a packing bed (15) of the heat-accumulator type impregnated with a catalyst for a reforming reaction; and
a second system including a second intermittent heat exchanger (28), a second separate cyclone-type gas mixing chamber (25) and a second intermittent reforming furnace (34) coupled together and to said continuous heat-

ing apparatus (3) and blast furnace gas source as the corresponding elements in said first system; and first valve means coupling said first and second systems in parallel to said heating apparatus and second valve means coupling said first and second systems in parallel to said blast furnace gas source, and for permitting alternate operation of said first and second systems.

4,005,987

PROCESS FOR DRYING MOIST MATERIALS, PARTICULARLY CRYSTALLINE SOLIDS CONTAINING WATER OF HYDRATION

Egon Jury, Egelsbach-Bayersfeld, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

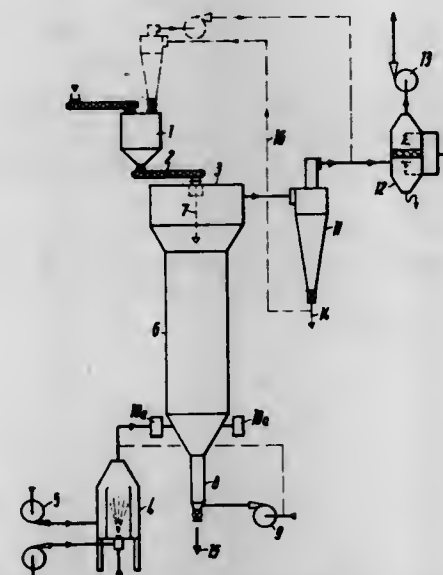
Filed Sept. 30, 1974, Ser. No. 510,738

Claims priority, application Germany, Oct. 1, 1973, 2349211

Int. Cl.² C01G 49/14

U.S. Cl. 23—313 FB

2 Claims



1. A process for removing water of hydration from iron sulfate heptahydrate and agglomerating the resulting crystalline solid which comprises the steps of:

- passing a hot gas stream upwardly through a shaft at a velocity of 2 to 30 m/sec and an inlet temperature of substantially 500° to 1000° C.
- introducing particles of said crystalline solid into said shaft at an upper portion thereof,
- permitting said particles to descend in counterflow to said gas stream whereby said particles agglomerate while water of hydration is driven off,
- cooling the agglomerated material at a lower portion of said shaft below that at which said hot gas stream is introduced by treating the agglomerated material with cold air,
- recovering fine particles from said hot gas stream upon its emergence from said shaft, and
- adding the recovered fine particles to the solid introduced into said shaft.

4,005,988

INTERLAYER FOR TRANSIENT LIQUID PHASE DIFFUSION BONDING

Daniel Francis Paulonis, Moodus; David Scott Duvall, Cobalt, and Gerard Casimer Sikorowicz, Kensington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1975, Ser. No. 642,626

Int. Cl.² B32B 15/00

U.S. Cl. 29—194

12 Claims

1. A diffusion bonding assembly which comprises: two superalloy substrates having matched surface portions to be joined;

a thin interlayer sandwiched between the surfaces, said interlayer comprising at least one coating bonded to at least one of the substrate surfaces to be joined; the overall interlayer composition having as its basis metal the same base metal as the superalloys and, containing a high boron content, having a melting temperature below that of the superalloys and a melting temperature below that causing irreversible adverse metallurgical change in the substrates.

4,005,989

COATED SUPERALLOY ARTICLE

Noel Butters Preston, Somers, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 13, 1976, Ser. No. 648,853

Int. Cl.² B32B 15/20

U.S. Cl. 29—194

9 Claims

1. A coated article comprising: a superalloy substrate, a first coating thereon consisting essentially of an aluminide of the basis metal of the substrate, and an MCrAlY coating thereover, where M is selected from the group consisting of nickel, cobalt, and iron.

4,005,990

SUPERCONDUCTORS

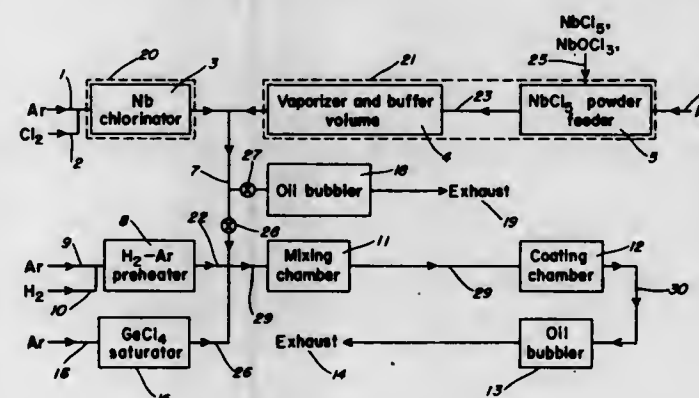
Lawrence R. Newkirk, Los Alamos, and Flavio A. Valencia, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 26, 1975, Ser. No. 590,747

Int. Cl.² B23P 3/00; C23C 27/02

U.S. Cl. 29—196

12 Claims



1. The composition of matter which comprises material of the general formula Nb₂Ge containing about 1 to about 10 at. % oxygen.

4,005,991

METAL MADE OF STEEL PLATE AND ALUMINUM MATERIAL

Yositaka Uebayasi; Hiroshi Kumon; Michinobu Yamada, and Yoshikazu Oe, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Continuation of Ser. No. 317,684, Dec. 22, 1972, abandoned.

This application Oct. 16, 1975, Ser. No. 623,005

Claims priority, application Japan, Dec. 29, 1971, 47-3108

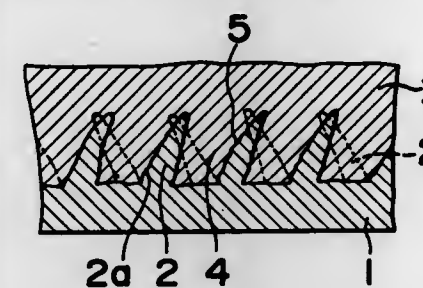
Int. Cl.² B32B 15/18, 15/20

U.S. Cl. 29—196.2

8 Claims

1. A metal composite comprising a steel plate having a desired shape and an aluminum material permanently bonded by being cast onto said steel plate on at least one of the opposed surfaces of said steel plate, said one of the surfaces of said steel plate having thereon a plurality of teeth spaced at predetermined intervals therealong to define primary interstices therebetween, each of said teeth being raised up from,

extending outwardly from and being integral with said one of the surfaces of said plate, each of said teeth being inclined relative to the plane of said one of said surfaces of said steel plate and also to a plane perpendicular to said plane of said one of said surfaces of said steel plate, and each of said teeth having on a surface thereof a plurality of surface irregularities, and said irregularities having irregular interstices therebetween, said aluminum material extending into the primary and



irregular interstices thereby to provide a firm interlock between said steel plate and said aluminum material, said surface irregularities being formed by the step of driving a chisel into the one surface of the steel plate at an angle to the plane of the surface of the plate for raising the teeth up out of the surface of the plate, the surface irregularities being formed naturally on the surfaces of the teeth as the teeth are raised out of the surface of the plate.

4,005,992

NOVEL GASOLINE COMPOSITIONS AND ADDITIVES THEREFOR

Leonard M. Niebylski, Birmingham, and Ellis B. Rifkin, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 8, 1976, Ser. No. 664,504

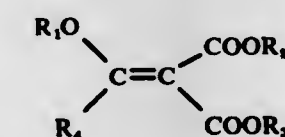
Int. Cl.² C10L 1/22

U.S. Cl. 44—68

23 Claims

1. As a composition of matter, a gasoline for an internal combustion engine comprising

- an antiknock amount of a cyclopentadienyl manganese tricarbonyl antiknock compound, and
- an amount sufficient to reduce plugging of an exhaust gas catalyst of a compound having the general formula:



wherein R₁, R₂ and R₃ are independently selected from hydrogen, hydrocarbyl radicals, and substituted hydrocarbyl radicals, and R₄ is selected from hydrogen, hydrocarbyl radicals, substituted hydrocarbyl radicals, hydrocarbyloxy radicals, or hydrocarbyloxycarbonyl radicals.

4,005,993

NOVEL GASOLINE COMPOSITIONS

Leonard M. Niebylski, Birmingham, and Ellis B. Rifkin, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 8, 1976, Ser. No. 664,505

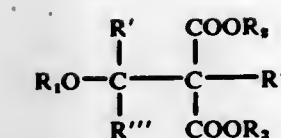
Int. Cl.² C10L 1/22

U.S. Cl. 44—68

26 Claims

1. As a composition of matter, a gasoline for an internal combustion engine comprising

- an antiknock amount of a cyclopentadienyl manganese tricarbonyl antiknock compound, and
- an amount sufficient to reduce plugging of an exhaust gas catalyst of a compound having the general formula:



wherein R₁—R₃ and R'—R''' are each independently selected from hydrogen, hydrocarbyl radicals, and substituted hydrocarbyl radicals.

4,005,994

PROCESS AND APPARATUS FOR CONVERTING SOLID WASTES TO PIPELINE GAS

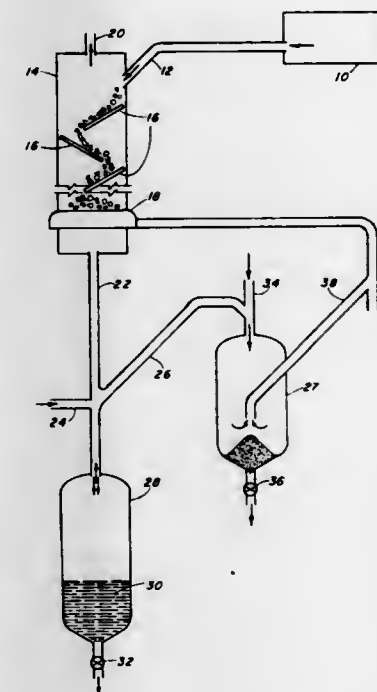
Herman F. Feldmann, Worthington, Ohio, assignor to Syngas Recycling Corporation, Toronto, Canada

Filed Dec. 22, 1975, Ser. No. 643,358

Int. Cl.² C10J 3/00

U.S. Cl. 48—111

15 Claims



1. Apparatus for converting solid waste to methane-containing gas comprising:

- a methane-containing gas production reactor including means for delivering solid wastes of given moisture content to input duct means of an elongate confined zone of said methane-containing gas production reactor, said elongate zone and said duct means being configured and arranged to effect movement of said wastes along said zone, said zone being under pressure;
- means for introducing synthesis gas exhibiting a given thermal energy to said zone at a location remote from said input duct means, said synthesis gas including a mixture of carbon monoxide, carbon dioxide, hydrogen, and water vapor;
- said zone being configured and arranged with respect to said delivery of said wastes and said synthesis gas to control the rate of passage of the wastes through the zone, said means introducing said synthesis gas being situated to effect movement of said gas along said zone in a direction countercurrent to and confronting said moving wastes, whereby, as said wastes move through said zone there is a progressive diminution of said moisture in said wastes, said synthesis gas and said wastes being in contact and under sufficient temperature and pressure to partially convert the wastes into methane-containing gas, and there is produced a carbon containing char;
- means for removing the methane-containing gas from the zone;
- means for effecting the withdrawal of the char from the zone;

a gasification reactor and means for delivering oxygen and water vapor and said char, in a condition substantially free of inorganic components of said wastes, to said reactor under sufficient pressure and temperature to convert a part of said char, oxygen and water vapor to said synthesis gas, said gasification reactor comprising the source of synthesis gas delivered to said zone; and means for delivering the synthesis gas from the gasification reactor to said introducing means.

4,005,995

PROCESS FOR PRODUCING A GASEOUS PRODUCT FROM CARBONACEOUS MATERIAL

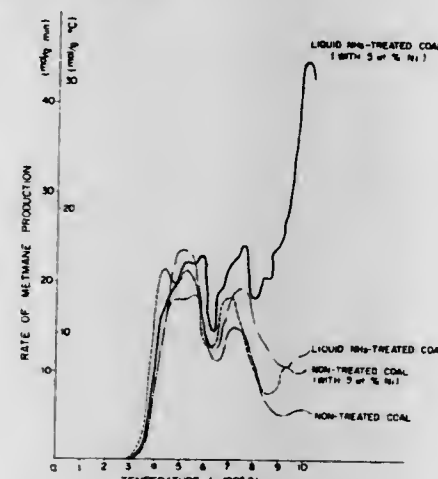
Yasukatsu Tamai; Yoshiyuki Nishiyama, and Minoru Mitida, all of Sendai, Japan, assignors to Tohoku University, Japan
Filed Oct. 1, 1975, Ser. No. 618,583

Claims priority, application Japan, Mar. 26, 1975, 50-036497

Int. Cl.³ C10J 3/06

U.S. Cl. 48-197 R

9 Claims



1. A process for producing a gaseous product from particulate carbonaceous material which is solid at room temperature comprising:

pretreating the particulate carbonaceous material with liquid ammonia at room temperature to 150°C to extract out of said carbonaceous material at least about 80% of the substances extractable with liquid ammonia; separating the carbonaceous material from the liquid ammonia; and

treating the resultant carbonaceous material with a gasifying agent at a temperature of 400° to 1,000°C under a pressure ranging from atmospheric pressure to super-atmospheric pressure in the presence or absence of a catalyst to obtain a gaseous product.

4,005,996

METHANATION PROCESS FOR THE PRODUCTION OF AN ALTERNATE FUEL FOR NATURAL GAS

Arthur L. Hausberger, Jeffersontown, Ky., and Gene A. Hammons, El Paso, Tex., assignors to El Paso Natural Gas Company, El Paso, Tex.

Filed Sept. 4, 1975, Ser. No. 610,163

Int. Cl.³ C10J 1/00

U.S. Cl. 48-197 R

11 Claims

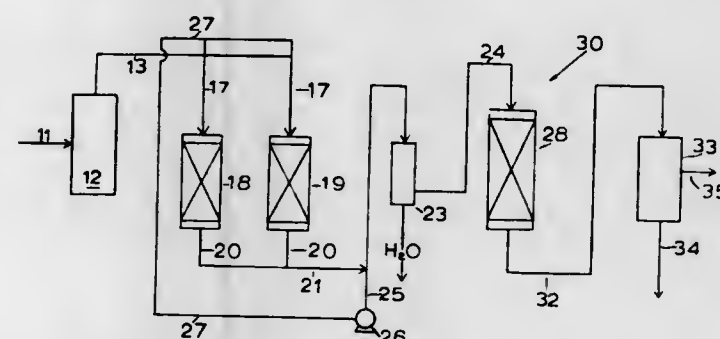
1. A process for the catalytic enrichment of a scrubbed feed gas, derived from the gasification of coal, and which has been scrubbed for the partial removal of carbon dioxide which includes the methanation of carbon oxides in multiple stages to produce a methane rich gas of pipeline quality, in which,

A. said scrubbed feed gas comprises hydrogen, methane and carbon oxides, the carbon oxides being present in a concentration of from 15 to 25 mole %, the carbon dioxide representing less than 4% of the said scrubbed gas and said hydrogen being present in at least a stoichiometric amount sufficient to produce a minimum H₂:CO ratio of 3:1, and a maximum H₂:CO ratio no greater than 4:1;

B. the improvement which includes reacting hydrogen and carbon oxides over a highly active catalyst in a first methanation stage to produce methane and steam at an inlet temperature sufficiently high to initiate the methanation reaction and at an outlet temperature no greater than 1050° F. to produce a hot and wet product gas and

C. recycling a portion of said hot and wet product gas to said scrubbed feed gas at such a rate to provide a ratio of recycle to feed gas of no greater than 5:1 and mixing said recycled portion of said hot and wet gas therewith in sufficient volume to produce a mixed inlet gas having a steam to gas ratio of between 0.18-0.45:1, thereby:

- supplying heat to the scrubbed gas to bring said gas up to reaction temperature,
- supplying steam to said gas to prevent carbon deposition on the catalyst during the first stage of methanation and to absorb the exothermic heat of reaction and



3. modifying the gas composition so as to bring said composition out of the carbon forming range by reducing the monoxide concentration to a level of less than 5.5% while simultaneously increasing the methane concentration by a factor in excess of 4;

D. thereafter cooling the remaining portion of said product gas to a temperature of from 450° to 600° F.,

E. reacting the residual carbon oxides and hydrogen in a final methanation stage over a highly active catalyst at an inlet temperature at least sufficiently high to initiate the methanation reaction and at an outlet temperature of no greater than 850° F. to complete the methanation reaction and to reduce the residual hydrogen and carbon dioxide to a level of less than 6 mole %; and

F. cooling the gases from said final methanation stage to remove water therefrom and thereby produce a dry, methane rich gas having a gross heating value in excess of 940 BTU per cubic foot and a residual hydrogen and carbon dioxide concentration of less than 6 mole %.

4,005,997

GAS DEHYDRATION WITH LIQUID DESICCANTS AND REGENERATION THEREOF

Allan E. Fowler, and John E. Protz, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 24, 1975, Ser. No. 552,678

Int. Cl.³ B01D 53/26

U.S. Cl. 55-32

11 Claims

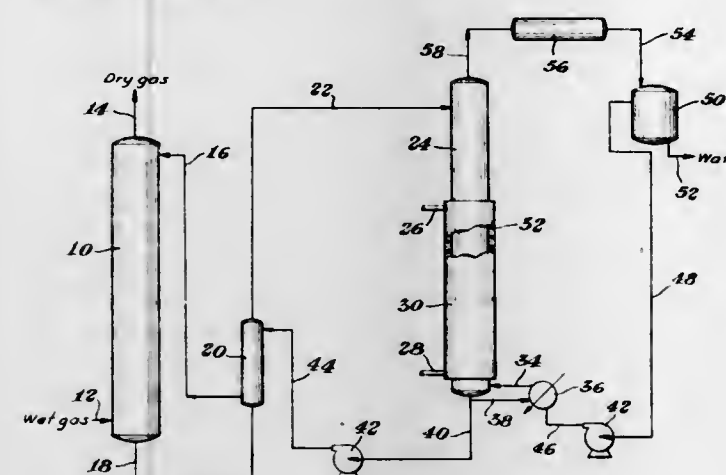
1. The method of increasing the dew point depression of a gas stream using low energy requirements which comprises

a. contacting a moisture laden gas stream with a substantially completely dehydrated liquid organic desiccant in a contacting zone to generate a gas stream having an increased dew point depression and a water rich liquid organic desiccant,

b. heating said water rich liquid organic desiccant from said contactor zone in a thermal reconcentration zone heated to a temperature varying between the boiling point of said water rich desiccant and the decomposition temperature of the pure desiccant whereby a major portion of the water is removed from said liquid desiccant,

c. contacting said partially dried liquid desiccant with a

hydrocarbon azeotrope agent which is substantially insoluble in said desiccant and which boils in the range from about 35° to about 235° C. or mixtures thereof, in an azeotrope zone uniformly heated to a temperature in the range from about 5° to about 40° C. below the decomposition temperature of the pure desiccant whereby substantially all the remaining water is removed from said liquid desiccant,



- recovering the water-hydrocarbon azeotrope,
- separating the hydrocarbon azeotrope from excess water,
- recycling said azeotrope to said azeotrope zone,
- recovering a dehydrated organic desiccant, and
- recycling said dehydrated desiccant to said contacting zone.

4,005,998

SEPARATION PROCESS

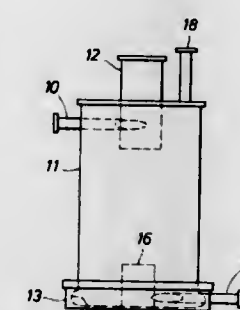
John E. Gorman, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 549,268, Feb. 12, 1975, abandoned. This application Apr. 1, 1976, Ser. No. 672,803

Int. Cl.³ B01D 45/16

U.S. Cl. 55-84

2 Claims



1. A process for the separation of polymeric particulate solids from their heated admixture with gases in a vertically-disposed cylindrical separator having an upper section and a lower section, said lower section terminating in an interior circumferential groove containing a tangentially-positioned solids outlet, which process comprises:

- injecting the admixture at a vapor velocity of at least about 700 feet per second through from a jet inlet positioned tangentially in said upper section;
- withdrawing the major portion of said gases through a gas outlet positioned in said upper section;
- passing the solids and residual portions of the gases in a tangential path down the inner surface of said cylindrical separator to a bottom plate communicating with said interior circumferential groove, said bottom plate having centrally-positioned thereto a vertically-disposed means for reducing turbulence in the flow pattern of the solids and residual gases, said vertically disposed means having a water inlet for injection of water into the lower section of the separator;
- injecting water through said water inlet at a rate of between about 0.5 and 3.5 parts by weight per 100 parts by weight of solids; and

e. withdrawing the solids through said tangentially-positioned solids outlet.

4,005,999

VAPOR REACTOR

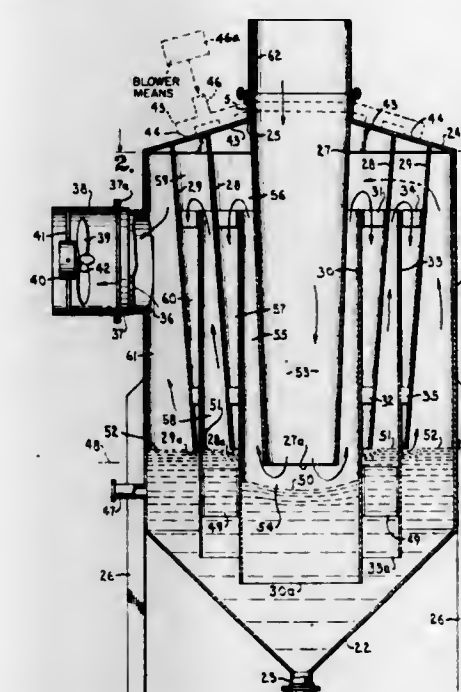
Drexel T. Carlson, 2909 W. 93rd St. Terrace, Leawood, Kans. 66206

Filed Mar. 3, 1975, Ser. No. 554,631

Int. Cl.³ B01D 47/02

U.S. Cl. 55-93

30 Claims



1. A process of treating hot, polluted gas having particulate matter therein, which hot, polluted gas is at a temperature substantially above ambient air temperature, comprising the steps of:

- sequentially twice drawing a continuous stream of the polluted gas downwardly to impact against the surface of a body of water, thereby to substantially saturate and humidify the hot gas stream,
- each time while passing the gas stream under a separate barrier subsequent to each impact, each barrier closely approaching the water body surface,
- with the said humidified, polluted gas stream being drawn upwardly between said impacts into an ambient air addition zone,
- each impact serving both to humidify the hot polluted gas stream and remove some of the larger particles carried thereby therefrom,
- continuously mixing ambient air having a lower temperature than that of the humidified, particulate carrying, polluted gas stream with the said gas stream in said ambient air addition zone between the impacts thereof on the surface,
- sufficient ambient air being added to said gas stream in said zone to take the total gas volume in the ambient air addition zone below the dew point at the overall temperature and pressure conditions existing in said zone,
- thereby transforming the said humidified, polluted gas stream from a state of substantial saturation to supersaturation with nucleation and agglomeration of the particulate matter therewithin into larger particles,
- all of the said operations on said hot polluted gas stream taking place within continuously connected, confined spaces, whereby the drawing of said stream therethrough creates a rarefaction which somewhat lowers the boiling point of the water.

24. A gas scrubber for scrubbing hot, polluted gas containing particulate matter, which hot, polluted gas is at a temperature substantially above ambient air temperature, comprising, in combination:

a pair of enclosed chambers each having a body of water in the lower portion thereof,
 a substantially vertical wall in each chamber dividing at least the upper portion of the space over the water body therein into two zones, each said wall closely approaching the surface of the water body in each chamber with its lowermost extremity,
 the upper portion of one zone of each chamber having a gas inlet and the upper portion of the other zone of each chamber having a gas outlet,
 a gas flow duct connecting the gas outlet of a first one of said chambers and the gas inlet to the second of said chambers,
 an ambient air inlet opening into said gas flow duct and in communication with a source of ambient air, and
 means for continuously drawing said hot, polluted gas through said chambers from the gas inlet to the first chamber to the gas outlet of the second chamber, thereby to substantially saturate and humidify the hot gas stream in each chamber, and
 further drawing sufficient ambient air through said inlet opening into said flow duct that the total gas volume in said flow duct is taken below the dew point at the overall temperature and pressure conditions existing therein, thereby transforming the said humidified, polluted gas from a state of substantial saturation to supersaturation with nucleation and agglomeration of the particulate matter therewithin into larger particles,
 said means for continuously drawing said gas also operative to create a condition of rarefaction in said chambers which somewhat lowers the boiling point of the water therein.

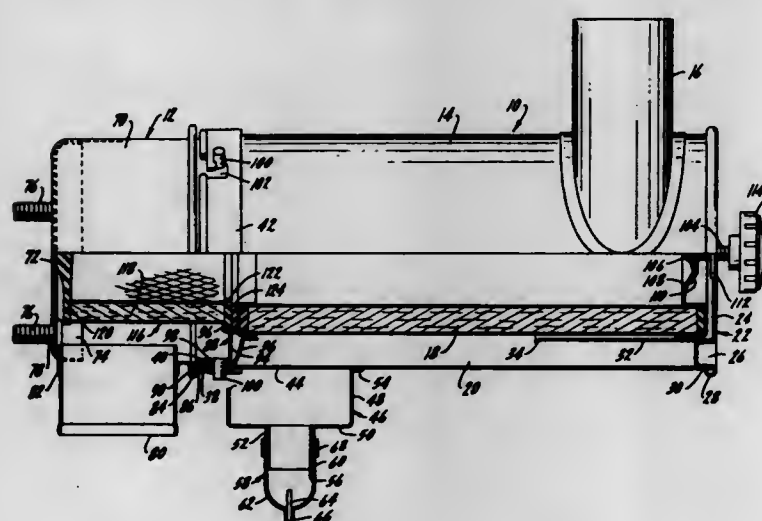
4,006,000

ALL DRY AIR CLEANER

Domenic P. Tortorici, and John J. Dreznes, both of Chicago, Ill., assignors to United Filtration Corporation, Chicago, Ill.
 Continuation-in-part of Ser. No. 477,043, June 6, 1974, abandoned. This application Feb. 7, 1975, Ser. No. 547,808
 Int. Cl.² B01D 50/00

U.S. Cl. 55—323

6 Claims



1. An air cleaner assembly comprising:
 - a generally cylindrical housing having a dirty air inlet through the housing, said inlet being connected tangentially to the housing and arranged therewith to set up a helical swirling motion of the air in the housing, a clean air outlet opening through one end of the housing, the opposite end of the housing being closed to prevent the flow of air therethrough,
 - a generally cylindrical main filter insertable into the housing and of a length to be wholly confined therein,
 - means secured to the housing for supporting and generally axially aligning the main filter within the housing, said filter having an outside diameter less than the inside diameter of the housing so as to partially define a gener-

ally cylindrical air swirl zone between the filter and housing.
 a separate plenum chamber having a sidewall and an end surface closing one end, an inlet through the other end of the plenum chamber constructed to be coupled with the housing outlet to receive clean air therefrom, and an outlet through the side wall of the plenum chamber constructed for connection to an air intake of an internal combustion engine to establish communication of air therebetween, a safety filter insertable into the plenum chamber and of a length to be wholly confined therein, means for seating the safety filter in position between the plenum chamber inlet and outlet,
 connecting means for detachably fastening the outlet end of the housing to the inlet end of the plenum chamber in an attached position thereby establishing communication between the housing outlet and plenum chamber inlet, said connecting means being so constructed that only a limited axial displacement of the housing away from the plenum chamber is required for detachment and removal of the housing and main filter therewith, said displacement being substantially less than the length of the housing, and
 the housing outlet and plenum chamber inlet comprising open ends of the generally cylindrical housing and plenum chamber respectively, said ends being so constructed as to fit one within the other in generally circumferential engagement in the attached position, thereby cooperating with said connecting means to fasten the housing and plenum chamber together.

4,006,001

PRODUCTION OF INTERMEDIATE PURITY OXYGEN BY PLURAL DISTILLATION

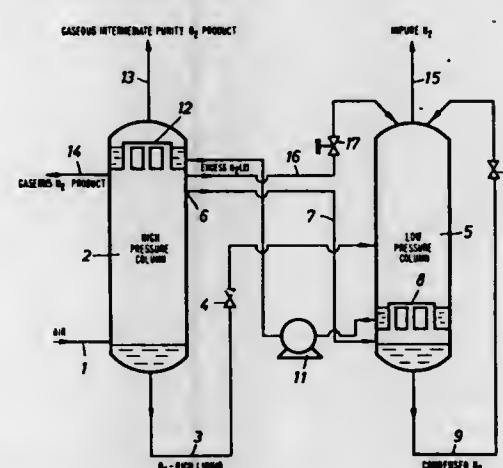
Eugen Schonpflug, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany
 Filed Jan. 20, 1975, Ser. No. 542,270

Claims priority, application Germany, Jan. 18, 1974, 2402246

Int. Cl.² F29J 3/02

U.S. Cl. 62—29

3 Claims



1. A low-temperature separation process for the production from air of oxygen of intermediate purity containing about 35 to 95% by volume oxygen, comprising:
 - a. subjecting air to low temperature rectification in a first distillation column operating under superatmospheric pressure to obtain a bottoms fraction enriched in oxygen and first overhead vapor enriched in nitrogen;
 - b. passing said bottoms fraction to a second distillation column operating at a pressure lower than said first column, said second and first columns being spaced apart and distinct from one another, and further distilling said bottoms fraction to obtain a bottoms liquid product of intermediate purity oxygen and a second overhead fraction enriched in nitrogen;
 - c. passing a portion of said first overhead fraction enriched with nitrogen from said first column into the bottom of

4,006,003

PROCESS FOR MELTING GLASS

Valdis R. Daiga, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 29, 1975, Ser. No. 626,692

Int. Cl.² C03B 5/04

8 Claims

- said second column in indirect heat exchange relationship with said bottom liquid product of intermediate purity oxygen to vaporize a portion of said intermediate purity oxygen to be used as vapor boil-up in said second column and to condense said first overhead fraction enriched in nitrogen;
- d. pumping a further portion of said bottoms liquid product of intermediate purity oxygen to a condenser located at the head of the first distillation column to completely vaporize said further portion and to condense a further portion of said first overhead fraction enriched in nitrogen; and
- e. withdrawing the entire resultant vaporized further portion of intermediate purity oxygen from said low temperature separation process, none of said vaporized further portion being recycled to the second column.

U.S. Cl. 65—135

1. In a method of manufacturing glass comprising discharging glass forming ingredients unto a pool of molten glass and burning a combustible fuel above the surface of said pool so as to produce a source of heat to convert said ingredients to a molten glass the improvement wherein said fuel is a pressurized mixture of a coal and oil.

4,006,004

PHOSPHATE ENRICHED PEAT MOSS FERTILIZER AND METHOD THEREFOR INCLUDING FREE AMINO ACID SUPPLEMENTATION

Rupen B. Seferian, Pasadena; Roy M. Kaprielian, San Marino, and Joseph B. Michaelson, North Hollywood, all of Calif., assignors to Rupen B. Seferian, Pasadena and Roy M. Kaprielian, San Marino, both of, Calif.

Filed Aug. 25, 1975, Ser. No. 607,206

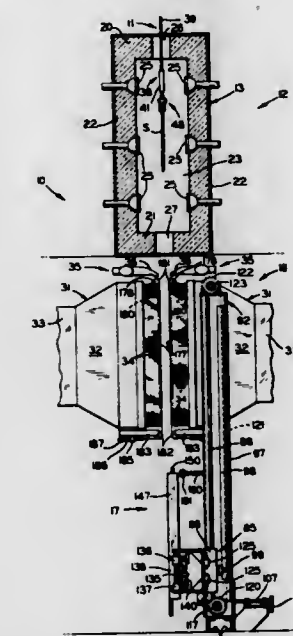
Int. Cl.² C05B 15/00; C05F 11/02

16 Claims

U.S. Cl. 65—114

18 Claims

1. Method for the production of phosphate enriched high organic content fertilizer comprising peat moss, including reacting said peat moss with at least one part by weight of an acid phosphate reactant per one part of peat moss, said reactant comprising a mixture of one part by weight of an alkali metal acid phosphate salt and from one to eight parts by weight of orthophosphoric acid, and recovering the product.



4,006,005

PHOSPHATE ENRICHED MANURE FERTILIZER AND METHOD THEREFOR INCLUDING FREE AMINO ACID SUPPLEMENTATION

Rupen B. Seferian, Pasadena; Roy M. Kaprielian, San Marino, and Joseph B. Michaelson, North Hollywood, all of Calif., assignors to Rupen B. Seferian, Pasadena and Roy M. Kaprielian, San Marino, both of, Calif.

Filed Aug. 25, 1975, Ser. No. 607,149

Int. Cl.² C05B 15/00; C05F 3/00

16 Claims

1. Method for the production of phosphate enriched high organic content fertilizer comprising manure, including reacting said manure with at least one part by weight of an acid phosphate reactant per one part of manure, said reactant comprising a mixture of one part by weight of an alkali metal acid phosphate salt and from one to eight parts by weight of orthophosphoric acid, and recovering the product.

4,006,006

FERTILIZER

Ronald A. Penque, Glen Ridge, N.J., assignor to Biocel Corporation, New York, N.Y.

Division of Ser. No. 404,305, Oct. 9, 1973, Pat. No. 3,933,577, which is a continuation-in-part of Ser. No. 105,123, Jan. 8, 1971, Pat. No. 3,850,771. This application Mar. 10, 1975, Ser. No. 556,827

Int. Cl.² C05F 9/00

9 Claims

U.S. Cl. 71—14

1. An anti-caking fertilizer product comprising a mixture of $MgNH_4PO_4$ and $CaNH_4PO_4$ and ingredients consisting of inks,

active transport material by solvent coating the material onto a non-adherent base and removing at least part of the solvent;

- b. detaching the film from the base;
- c. annealing the film above its glass transition temperature to provide a film free of strains;
- d. applying a layer of a photoconductive material to the organic film; and
- e. attaching the layer of photoconductive material at its exposed surface to a conductive substrate with an adhesive material.

4,006,020

OVERCOATED ELECTROSTATOGRAPHIC PHOTORECEPTOR

John D. Polastri, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 476,024, June 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 474,296, May 29, 1974, abandoned. This application Mar. 13, 1975, Ser. No. 558,027
Int. Cl.² G03G 5/04

U.S. Cl. 96-1.5

7 Claims

1. An electrostatographic photoreceptor which comprises:
 - a. a conductive substrate;
 - b. a layer of an alloy of selenium and arsenic as photoconductive insulating material in operative contact with the conductive substrate; and
 - c. an organic overcoating on said photoconductive layer comprising a crosslinkable polymeric composition comprised of:
 - i. a first polymer which is the addition polymerization product of methyl methacrylate, n-butylacrylate and acrylic or methacrylic acid; and
 - ii. a second polymer which is the addition polymerization product of styrene and maleic anhydride.

4,006,021

SENSITIZING A GRANULAR DISPERSION OF A COLOR GENERATOR AND AN ORGANIC HALOGEN COMPOUND BY HEAT

Hiroshi Yamashita; Nobuyoshi Sekikawa, and Hisatake Ono, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 245,401, April 19, 1972, abandoned. This application Apr. 14, 1975, Ser. No. 567,965
Claims priority, application Japan, Apr. 20, 1971, 46-24965; United Kingdom, Apr. 20, 1972, 18461/72; Germany, Apr. 20, 1972, 2219360; France, Apr. 20, 1972, 72.13971

Int. Cl.² G03C 5/24, 1/52

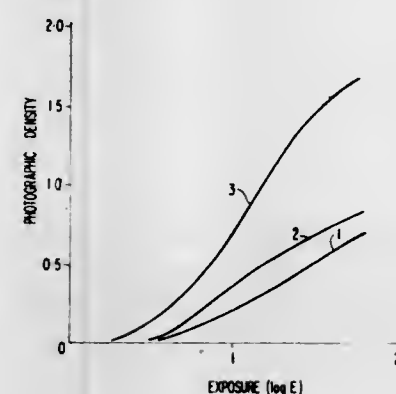
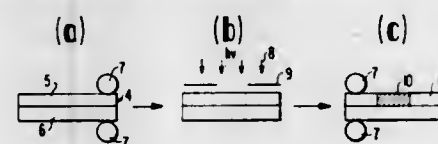
U.S. Cl. 96-27 E

26 Claims

1. A dry method for forming a colored image by a negative-positive working photographic procedure which comprises:

1. heating a dried recording material, which recording material comprises a support having thereon a color image-forming system comprising a dispersion of discrete oblate spheroids of (a) an organic-halogen compound and (b) a separate color generator which is an organic compound containing a nitrogen atom, in a hydrophilic binder, said organic halogen compound generating halogen ions and/or free radicals containing halogen on irradiation which react with said color generator, and said organic compound containing a nitrogen atom being selected from the group consisting of diphenylamine, n-hydroxydiphenylamine, N-ethyldiphenylamine, o-nitrodiphenylamine, N,N-dimethylaniline, N,N-diethylaniline, N,N,N',N'-tetramethyl-p-phenylenediamine, N-phenyl-alpha-naphthylamine, N-phenyl-beta-naphthylamine, N,N'-dimethyl-alpha-naphthylamine, N,N'-dimethyl-beta-naphthylamine, dibenzylaniline, indole, N-vinylindole, 5-cyanoindole, 3-methylindole, triphenylamine, N,N'-diphenyl-p-phenylenediamine, benzidine, N,N'-diphenylbenzidine,

1, 2-dianilinoethylene 4,4', 4''-methenyltris (N,N-dimethylaniline, N-vinylcarbazole, p,p'-pentylidenebis(N,N-dimethylaniline), p,p'-triaminotriphenyl-carbinol, p,p', p''-triamino-o-methyltriphenylmethane, aniline, carbazole, dibenzylamine, N-phenyl-N-methylaniline, bis(p-dimethylaminophenyl) methane, N-phenylindole, o-aminodiphenylamine, p,p'-(dimethylamino)diphenylamine, N-ethylcarbazole, 3-phenyl-indole, p-phenylenediamine, N,N,N',N', tetramethyl-p-phenylene-diamine, triphenylamine, p, p'-benzylidene-bis (N,N-dimethylaniline), p,p'-benzylidenedianiline, dibenzylethyl amine and dibenzylmethyl amine;



2. thereafter imagewise exposing said recording material to radiation to form a visible color image of the reaction product of said color generator and the product(s) from said organic halogen compound; the heating of Step (1) being at a temperature of from about 60+ C., to about 150° C., for a time sufficient to increase the density of said visible color image to about twice the density obtained with an otherwise identical recording material which has not been subjected to said heating.

4,006,022

RECORDING PROCESS UTILIZING SUPERCOOLED ORGANIC COMPOUNDS

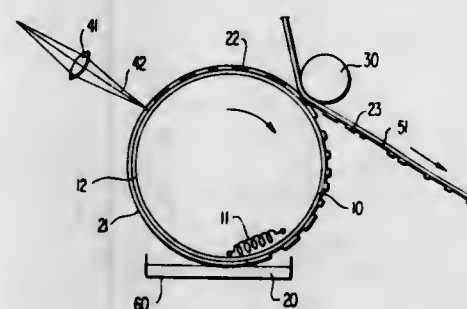
Shuichi Ohtsuka; Seichi Taguchi, and Satoru Honjo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 19, 1973, Ser. No. 417,323
Claims priority, application Japan, Nov. 18, 1972, 47-115843

Int. Cl.² G03C 5/24

U.S. Cl. 96-48 R

15 Claims



1. A recording process comprising heating a recording

material comprising a support having thereon a layer of at least one organic compound selected from the group consisting of benzothiazole, benzil, benzoin, vanillin, tribenzylamine, N-vinylcarbazole, benzophenone, diphenylamine, diaminodiphenylmethane, triphenylamine, benzoic anhydride, itaconic acid, diacetoneacrylamide, acrylamide, azoxybenzene, azobenzene, trans-stilbene, triphenylmethane, dihydroanthracene, benzamide, alpha-naphthol and o-phthalaldehyde, said organic compound being capable of exhibiting a supercooled state until said organic compound melts; cooling said organic compound to a supercooled condition; and thereafter image wise irradiating said layer of said organic compound with electromagnetic waves such that the irradiated portion of the organic compound crystallizes.

4,006,023

PHOTOGRAPHIC POLYMERIC COMPOSITION CONTAINING A LEUCO DYE CYANIDE

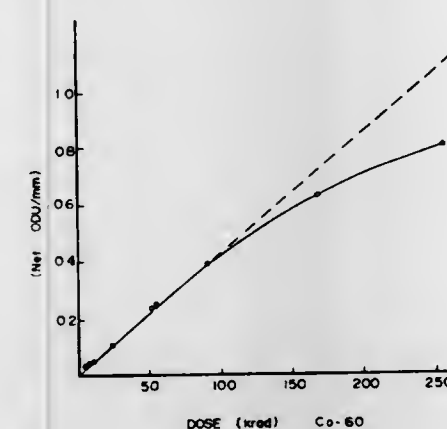
William L. McLaughlin, Washington, D.C.; Harry Levine, Silver Spring, and Marvin Rosenstein, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Oct. 7, 1974, Ser. No. 512,621

Int. Cl.² G03C 1/52

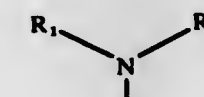
U.S. Cl. 96-90 R

26 Claims



1. A process for the production of a photographic thermsetting radiation sensitive polymeric composition comprising the steps of combining:

- i. 83-89.5% by weight of vinyl and/or acrylic monomers, which, when polymerized into a non-tacky solid polymer matrix, provide a host material for radiochromic triphenylmethane dye cyanides, which monomers are chosen to form a final solidified polymer which has a dielectric constant of greater than about 4;
- ii. 1-15% by weight of a hydrophobic, leuco triphenylacetone nitrile compound with at least one of the three phenyl groups having at the position para to the central methane carbon atom of a radical of the formula:



wherein R_1 and R_2 , alike or different, are hydrogen, $C_1 - C_4$ alkyl, $C_1 - C_4$ hydroxyalkyl, or $C_1 - C_4$ alkylated or halogenated benzyl, said radical being alike or different on the various phenyl groups, said compound having hydrogen or methyl on the three phenyl groups at the positions meta to the central methane carbon atom, and
iii. 1/2-2% by weight of a chemical initiator of the polymerization of vinyl and acrylic monomers which is compatible with the triphenylacetone nitrile compound used, said chemical initiator being an azo compound wherein the azo

group is acrylic and bonded on both ends to carbon groups which are aliphatic and have 3-6 carbon atoms and at least one of which carbon atoms is tertiary; providing mild acidity to the product of said combining step equivalent to the addition of 0.1-1% acetic acid thereto; and

heating in a mold at a temperature in the range below which polymerization will not proceed and above which the auxochromic groups of said triphenylacetone nitrile compound are dissociated in an oxygen-free atmosphere, until a three-dimensional, solid glassy vinyl and/or acrylic polymer having said leuco triphenylacetone nitrile compound dispersed therein is formed.

4,006,024

PHOTOSENSITIVE COMPOSITIONS COMPRISING A POLYESTER-POLYETHER BLOCK POLYMER

Jyoji Iwata; Hidehiko Kobayashi; Kazuo Toyomoto; Kazuhiro Suzuki; Yoshio Hayashi, and Masakazu Kurihara, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 441,547, Feb. 11, 1974, Pat. No.

3,960,572. This application Feb. 3, 1976, Ser. No. 654,812

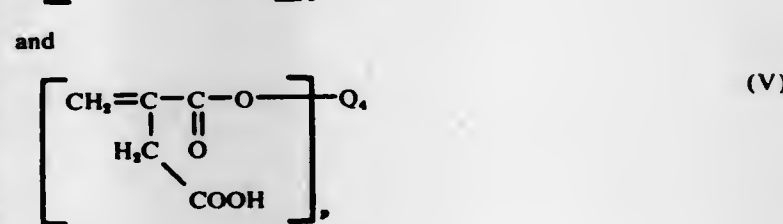
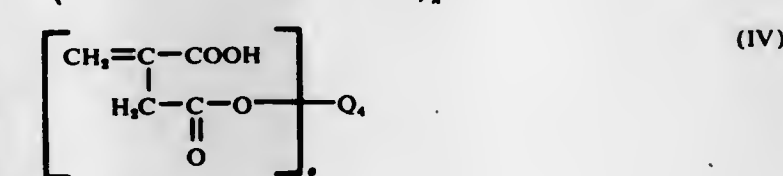
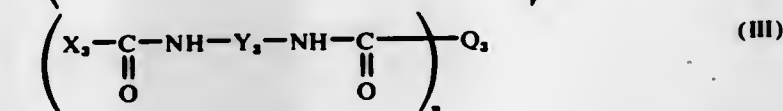
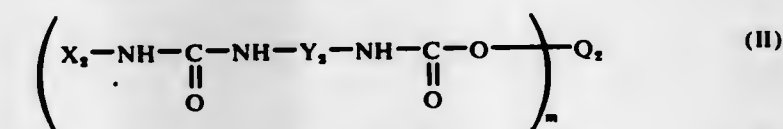
Claims priority, application Japan, Feb. 21, 1973, 48-21033; Apr. 21, 1973, 48-44646; May 21, 1973, 48-55510; Oct. 23, 1973, 48-118501

Int. Cl.² G03C 1/68

U.S. Cl. 96-115 R

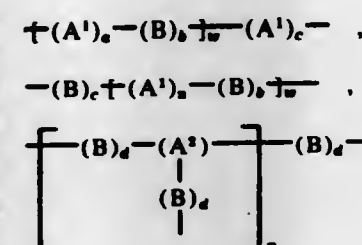
15 Claims

1. A photosensitive composition comprising (I) about 100 parts by weight of at least one prepolymer having a number average molecular weight of about 800 to 20,000 selected from the group consisting of



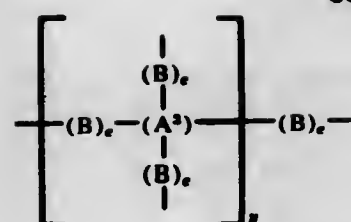
wherein

X_2 represents a residue of an amine having one or two ethylenically unsaturated bonds;
 X_3 represents a residue of a carboxylic acid having one ethylenically unsaturated bond;
 Y_2 and Y_3 represent a residue of a diisocyanate respectively;
 Q_2 , Q_3 and Q_4 each is a residue of a hydroxy terminated block polymer and is represented by the formula



or

-continued



- i. (A¹) represents a residue of a polyetherdiol having a number average molecular weight of about 200 to 5,000, (A²) represents a residue of a polyethertriol having a number average molecular weight of about 500 to 5,000, (A³) represents a residue of a polyethertetraol having a number average molecular weight of about 500 to 5,000, (B) represents a residue of a saturated polyesterdiol having a number average molecular weight of about 200 to 5,000,
- iii. the weight ratio of the total weight of A¹ to B, A² to B, or A³ to B is in the range of from about 1:4 to 4:1;
- iv. a is an integer from 1 to 4; b is an integer from 1 to 4; c is an integer from 0 to 4; d is an integer from 1 to 3; e is an integer from 0 to 3; e is an integer from 0 to 4; x is an integer from 1 to 4; y is 1 or 2; 2 ≤ (a + b)w + c ≤ 20, but c is not zero in the case of the prepolymer (IV) or (V); 2 ≤ d + x ≤ 5, and when e is 1 or 2, y is 1 or 2; and when e is 3 or 4, y is 1; m, n, o and p each is an integer from 2 to 6, and m, n, o and p is 2 in the case of A¹; k, m, n, o and p each is an integer from 3 to 6 in the case of A²; and k, m, n, o and p each is 4 or 6 in the case of A³,
- (2) 0 to about 120 parts by weight of at least one polymerizable ethylenically unsaturated monomeric compound; and (3) a photopolymerization initiator in an amount of about 0.001 to 10 weight percent of the total weight of the prepolymer (1) and the polymerizable ethylenically unsaturated monomeric compound (2).

4,006,025

PROCESS FOR DISPERSING SENSITIZING DYES

Thomas F. Swank, Chelmsford, and Richard Wasack, Wayland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 6, 1975, Ser. No. 584,487
Int. Cl.² G03C 1/24, 1/16

U.S. Cl. 96-129 14 Claims
1. A process for forming a colloidal stable dispersion of a spectral sensitizing dye directly in water, which comprises the steps of:

- a. mixing substantially water-insoluble spectral sensitizing dye particles with water in the absence of an organic solvent to form a slurry having a dye concentration of about 0.5% to about 30% on a weight/weight basis; and
- b. homogenizing or milling said slurry at an elevated temperature of from about 40° C. to about 50° C. in the presence of a surfactant to provide finely divided dye particles having particle sizes in the range from about 0.5 to about 1.0 μ which are uniformly dispersed in said water.

4,006,026

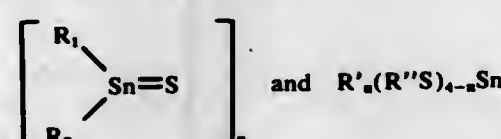
METHOD OF IMPROVING THE TARNISH RESISTANCE OF SILVER

Wolfgang Dahms, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Feb. 21, 1973, Ser. No. 334,243
Int. Cl.² C09D 5/08

U.S. Cl. 106-14 7 Claims
1. A method for passivating and improving the tarnish resistance of a metal surface consisting essentially of silver which comprises applying to said surface a preparation containing an effective amount therefor of an active ingredient which is a

compound of quadrivalent tin selected from the group consisting of a compound of the formula



wherein R₁, R₂ and R₃ are alkyl having 2 to 22 carbon atoms, R' is alkyl having 4 to 22 carbon atoms or —CH₂COOR₃, where R₃ is alkyl having 1 to 22 carbon atoms, and n is 1, 2 or 3, distributed in a liquid carrier.

4,006,027

PROCESS FOR PRODUCING FOUNDRY MOUNDS AND CORES

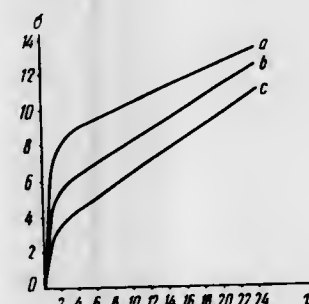
Abram Moiseevich Lyass, Sharikopodshipnikovskaya ulitsa, 2, kv. 146; Pavel Afanasievich Borsuk, Nizhne-Pervomaiskaya ulitsa, 59, kv. 10; Zokhrab Gamid Ogly Usbov, B. Cherkizovskaya ulitsa, kvartal 8-11, korpus 21, kv. 106; Viktor Georgievich Kuznetsov, 5 Kozhukhovskaya ulitsa, 10, kv. 36; Naum Yakovlevich Kagan, 2 ulitsa Marlinol roschl, 14v, kv. 22, all of Moscow; Jury Alexeevich Razumeev, Ulitsa Kolontsova, 7, kv. 6, Mytischl Moskovskoi oblasti; Vladimir Mironovich Bortnik, Elskaya ulitsa, 9, kv. 26, Moscow; Isai Volfovich Korenbljum, Veernaya ulitsa, 3, korpus 4, kv. 112, Moscow, and Valentina Alexeevna Dmitrieva, ulitsa Trofimova, 25, kv. 43, Moscow, all of U.S.S.R.

Continuation of Ser. No. 441,446, Feb. 11, 1974, abandoned, which is a continuation of Ser. No. 278,869, Aug. 8, 1972, abandoned. This application May 28, 1975, Ser. No. 581,480

Int. Cl.² B28B 7/34

U.S. Cl. 106-38.5 R

14 Claims



1. A process for the production of foundry moulds and cores comprising the steps of preparing a mixture of moulding sand, an organic binder and a hardening agent, said hardening agent being of particulate material and comprising predominantly CaO and Al₂O₃ in a relative molar proportion of from 1.6:1 to 4:1 and containing from 40 to 98% by weight of tricalcium aluminate, shaping the resultant mixture and allowing it to harden in atmospheric air, said organic binder being selected from the group consisting of (A) lignosulfonates of an alkali or alkali-earth metal, an ammonium ion or mixtures thereof, (B) dextrin, and (C) an aqueous composition whose solids content consists essentially of substantially equal parts by weight of (a) levoglucosane and (b) calcium salts of hydroxy-acids, free hydroxy-acids and their lactones as calculated for α-oxy-γ-valerolactone, and (c) approximately 10% by weight of ethylene glycol and its acetic esters based on the total weight of (a) and (b).

4,006,028

SEALING GLASS COMPOSITIONS AND PASTES AND USE THEREOF

Nell B. Nofziger, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 3, 1975, Ser. No. 592,968
Int. Cl.² C03C 3/12, 3/10

U.S. Cl. 106-47 R 27 Claims
1. In a particulate glass composition comprising:

- a. at least about 70 weight percent of a PbO-containing glass frit component having a sealing temperature of between about 350° to about 415° C., and
- b. at least about 10-25 weight percent of at least one coarse particulate refractory filler component having a coefficient of thermal expansion of less than about 65 × 10⁻⁷ in./in./° C. (0°-300° C.) and a particle size distribution of about:

% of Particles	Microns
90	40-60
75	30-45
50	15-35
25	7-20
10	2-10
5	0.5-3

the improvement comprising:

- c. at least about 0.25-10 weight percent of at least one fine particulate refractory filler component having a coefficient of thermal expansion of less than about 65 × 10⁻⁷ in./in./° C. (0°-300° C.) and a particle size distribution of about:

% of Particles	Microns
90	5-10
75	3-8
50	2-4
25	0.8-2.5
10	0.5-2.0
5	0.2-1.5

4,006,029

HYDRATION RESISTANT FUSED DOLOMITIC GRAIN AND PRODUCTION METHOD THEREFOR

Donald L. Guile, Horseheads, and Robert K. Smith, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 17, 1974, Ser. No. 480,287

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Int. Cl.² C04B 35/04, 35/62

U.S. Cl. 106-58 20 Claims

1. A basic, fused refractory material consisting essentially of, by weight on the oxide basis, 50-67% MgO and 33-50% CaO, and being characterized in at least a surface layer thereof by a fine microcrystalline structure having at least 2.0% MgO in solid solution in the CaO phase.

4,006,030

METHOD OF PREVENTING DETERIORATION OF INORGANIC SUBSTRATE SURFACE

Akitoshi Yoshida; Koichiro Yanagida, and Tadanobu Maruyama, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 415,357, Nov. 13, 1973, abandoned. This application July 8, 1975, Ser. No. 594,039
Claims priority, application Japan, Nov. 21, 1972, 47-117037

Int. Cl.² C04B 41/22

U.S. Cl. 106-74 7 Claims

1. A method of preventing deterioration of an inorganic substrate surface which comprises coating or impregnating the surface thereof with a silicate solution or a silica sol having a particle diameter of 5-300 mμ and comprising a monovalent alkali metal component, an ammonium component and a silica component at a molar ratio of 1:1-10:4-5000 corresponding to M₂O: [R₁R₂R₃R₄N]₂O: SiO₂ wherein M is Li, K or Na; and R₁, R₂, R₃ and R₄ each represent a hydrocarbon group

or an alkanol group and the silicate solution or the silica sol is prepared by passing a solution of an alkali silicate through a cation exchange resin.

4,006,031

CARBON BLACK PREPARATION FOR USE IN MINERAL BINDER

Horst Ferch, Bruchkobel, and Hans Wagner, Maintal, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed May 28, 1975, Ser. No. 581,474

Claims priority, application Germany, May 29, 1974, 2426266

Int. Cl.² C09C 1/56

U.S. Cl. 106-307 21 Claims

1. A composition suitable for use in preparing a carbon black containing mineral binder of improved weathering stability consisting essentially of an aqueous carbon black mixture including 0.02 to 0.4% by weight of the carbon black of a fluorine containing wetting agent.

4,006,032

PROCESS FOR REMOVING OFF-FLAVOR FROM MAPLE SIRUP

Claude H. Hills, Flouretown, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 30, 1976, Ser. No. 653,794

Int. Cl.² C13D 3/14

U.S. Cl. 127-46 A 16 Claims

1. A process for removing off-flavor from maple sirup made from buddy sap and from maple sirup made from sap contaminated with buddy sap comprising passing the sirup through a bed of ion exchange resin.

4,006,033

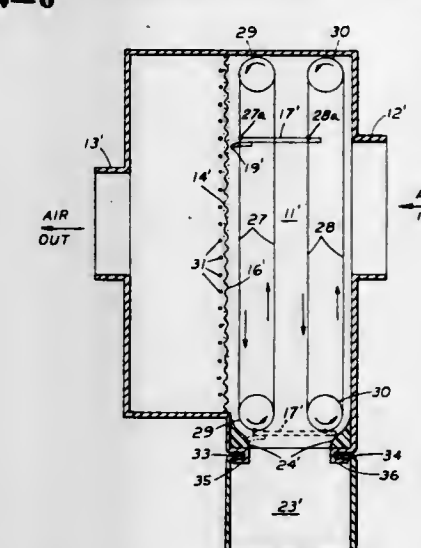
TRASH REMOVAL FROM VACUUM SYSTEM IN AN OPEN END SPINNING MACHINE

Richard A. Schewe, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Sept. 8, 1975, Ser. No. 611,400

Int. Cl.² B01D 35/16; B08B 1/00

U.S. Cl. 134-6 18 Claims



1. A method for removing trash from an air stream in the vacuum system of an open end spinning machine without interrupting the spinning operation, said method comprising the steps of filtering said trash from the air stream, scraping and sweeping said trash by a traveling scraper from the filter into a closed collection compartment without substantially impeding the flow of said air stream, substantially sealing-off said compartment from the air stream by means comprising the scraper, opening said compartment while the compartment is substantially sealed-off from the air stream, and cleaning said trash from the opened compartment.

4,006,034

METHOD OF PREPARING AN ELECTROCHEMICAL CELL IN UNCHARGED STATE

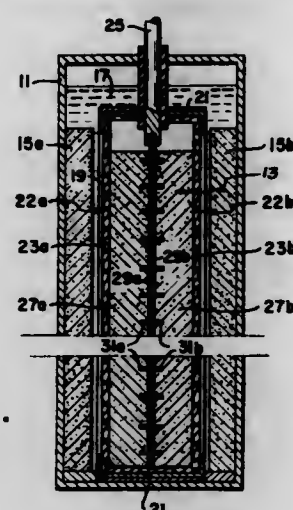
Hiroshi Shimotake, Hinsdale; Louis G. Bartholme, Joliet, and John D. Arntzen, Naperville, all of Ill.; assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 11, 1976, Ser. No. 665,746

Int. Cl.² H01M 4/36

U.S. Cl. 29—623.1

13 Claims



1. A method of preparing a positive electrode for use in a secondary electrochemical cell opposite to a negative electrode containing an element for alloying with lithium comprising blending particulate lithium sulfide, transition metal and electrolytic salt of alkali metal halides or alkaline earth metal halides at a temperature below the melting point of the electrolytic salt to form a solid mixture; heating said solid mixture to a temperature in excess of the melting point of said electrolytic salt while simultaneously pressing said mixture onto an electrically conductive substrate to form a plaque; and assembling said plaque as a positive electrode within said electrochemical cell opposite to said negative electrode and electrically charging said cell to produce a transition metal sulfide in said positive electrode and a lithium alloy within said negative electrode.

4,006,035

MAINTENANCE-FREE BATTERY AND METHOD FOR REDUCING THE CURRENT DRAW OF SUCH BATTERIES

George W. Mao, St. Paul, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 514,023, Oct. 11, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,192

Int. Cl.² H01M 4/36

U.S. Cl. 429—72

11 Claims

1. In a maintenance-free lead-acid battery comprising a battery container having a plurality of cells, a cover sealed to the container, venting means providing passages for the escape of evolved gas and an electrolyte contained in the cells, each cell including a plurality of positive and negative electrodes disposed therein comprising a grid supporting structure having a layer of active material attached thereto, the improvement wherein said electrolyte contains an additive consisting of cadmium or a cadmium compound in an amount sufficient to decrease the gassing current during constant voltage overcharge of said maintenance-free battery, the amount of cadmium corresponding to that provided by from about 0.1 to about 0.5% cadmium sulfate, based upon the weight of the electrolyte, and at least the grid supporting structure for the negative electrode consisting of an alloy essentially free of antimony and capable of allowing the cadmium added to deposit on the negative electrode during charging in amounts sufficient to decrease the gassing current

during constant voltage overcharge of the maintenance-free battery.

7. A method of reducing the gassing current during constant voltage overcharge in a maintenance-free battery comprising a battery container having a plurality of cells each including a plurality of positive and negative electrodes disposed therein comprising a grid supporting structure having a layer of active material attached thereto and an electrolyte contained in the cells which comprises adding an additive consisting of cadmium or a cadmium compound to said electrolyte in an amount sufficient to decrease the gassing current during constant voltage overcharge, the amount of cadmium corresponding to that provided by from about 0.1 to about 0.5% cadmium sulfate, based upon the weight of the electrolyte, and at least the grid supporting structure for the negative electrode consisting of an alloy essentially free of antimony and capable of allowing the cadmium added to deposit on the negative electrode during charging in amounts sufficient to decrease the gassing current during constant voltage overcharge of the maintenance-free battery.

4,006,036

METHOD FOR REDUCING ZINC OXIDE CONTENT OF ZINC PARTICLES

John C. Charkoudian, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1974, Ser. No. 536,433

Int. Cl.² H01M 4/38

U.S. Cl. 427—123

8 Claims

1. The method for producing an anode assembly which comprises the steps, in sequence, of treating zinc particles with a solution of a zinc sequestering agent at a pH of about 7, washing the thus-treated zinc particles, mixing the zinc particles with a polymeric binder material, coating an electrically conductive substrate with the mixture, and drying the coating to form an adherent zinc coating on said substrate.

4,006,037

MINERAL FILLED, HIGH IMPACT, POLYOLEFIN MOLDING COMPOSITIONS

Michael R. Tirpak, Maywood; James J. Schouten, Glen Ellyn, and Charles E. Green, Brookfield, all of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Filed Nov. 4, 1974, Ser. No. 520,881

Int. Cl.² H01M 2/02

U.S. Cl. 429—176

18 Claims

1. A thermoplastic molding composition suitable for forming articles having high heat stability with high impact resistance at low temperature consisting essentially of a copolymer of propylene and ethylene, said copolymer containing a finely divided feldsparic anhydrous alumino silicate wherein the feldsparic alumino silicate has an oil absorptivity of from about 12 to 30 pounds of oil per hundred pounds of the feldsparic alumino silicate and a Mohs' hardness of from about 5.0 to about 6.5, the copolymer contains from 75 to 90 weight percent propylene and 10 to 25 weight percent ethylene and the feldsparic alumino silicate is present within the range of from about 10 to about 35 weight percent of the composition.

4,006,038

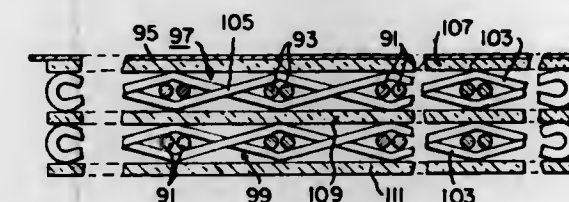
HEAT REFLECTING TAPE FOR THERMOELECTRIC CONVERTER

David L. Purdy, Indiana, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.
Division of Ser. No. 205,591, Dec. 7, 1971, Pat. No. 3,923,551, which is a division of Ser. No. 817,271, April 14, 1969, Pat. No. 3,649,367, which is a continuation of Ser. No. 554,874, June 2, 1966, abandoned. This application Nov. 13, 1975, Ser. No. 631,587

Int. Cl.² H01L 25/00

U.S. Cl. 136—225

2 Claims



1. A tape for a thermoelectric converter including cloth composed of threads interlaced with thermoelectric wires, said tape also including a layer of heat-radiation reflecting material extending over said cloth insulated from said wires.

4,006,039

COMPONENT FOR THERMOELECTRIC GENERATOR

David L. Purdy, Indiana, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.
Division of Ser. No. 205,591, Dec. 7, 1971, Pat. No. 3,923,551, which is a division of Ser. No. 817,271, April 14, 1969, Pat. No. 3,649,367, which is a continuation of Ser. No. 554,874, June 2, 1966, abandoned. This application Nov. 13, 1975, Ser. No. 631,588

Int. Cl.² H01L 25/00

U.S. Cl. 136—237

3 Claims



1. An electrical component for a thermoelectric converter including a tape formed of cloth composed of electrically insulating threads interlaced with a large number of thermoelectric wires having terminal ends, a ceramic insulator having, over limited areas thereof, each area corresponding to a terminal end, a coating of a first metal which adheres to said insulator, and an electrical thermoelectric junction including a second metal, which wets said first metal and adheres to said terminal ends but does not wet said insulator, the said junction including said first and second metals and said terminal ends.

4,006,040

SEMICONDUCTOR DEVICE MANUFACTURE

Harvey E. Cline; Thomas R. Anthony, both of Schenectady, and Mike F. Chang, Liverpool, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 31, 1975, Ser. No. 645,672

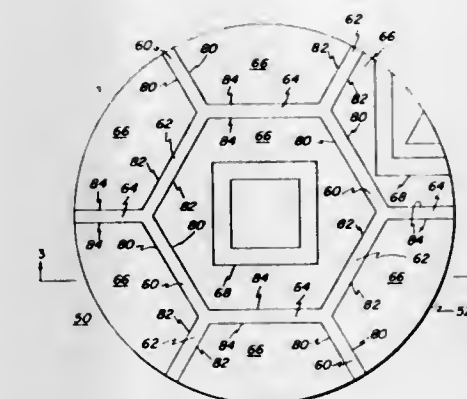
Int. Cl.² H01L 21/225

U.S. Cl. 148—1.5

33 Claims

1. An improved method for migrating a melt of metal-rich semiconductor material through a solid body of the semiconductor material including the process steps of:

- selecting a body of single crystal semiconductor material having two major opposed surfaces comprising the top and bottom surfaces thereof, a predetermined type conductivity, a predetermined level of resistivity, a preferred diamond cubic crystal structure, a preferred planar crystal orientation for at least one of the major surfaces, a vertical axis substantially perpendicular to the opposed major surfaces, and a first preferred crystal axis substantially parallel with the vertical axis and substantially perpendicular to the opposed major surfaces;
- vapor depositing a layer of metal on the major surface having a preferred planar crystal orientation, the layer having a preferred width and a preferred thickness and so oriented as to form at least one metal wire having a longitudinal axis substantially aligned parallel with a second preferred crystal axis of the crystal structure of the material of the body;



- heating the body and the layer of metal to an elevated temperature for a predetermined period of time sufficient to sinter at least a portion of the layer of metal to a portion of the semiconductor material of the major surface of the body;
- heating the sintered body and the metal wire to a predetermined elevated temperature sufficient to form a melt of metal-rich semiconductor material on the surface of the body;
- establishing a temperature gradient substantially parallel to the vertical axis of the body and the first axis of the crystal structure; and
- migrating the melt of metal-rich semiconductor material through the solid body, substantially aligned with the first axis of the crystal structure, to a predetermined depth beneath that major surface to form a planar region of recrystallized material of the body having solid solubility of the metal therein.

4,006,041

ONE STEP FILM-FORMING PHOSPHATIZATION OF METALLIC SURFACES AND COMPOSITION FOR EFFECTING SAME

Juan Brugarolas Fabregas, 92, Via Layetana, Barcelona, Spain, and Frederic Gruber, 6 rue Auguste Thomas, Asniers, France

Continuation-in-part of Ser. No. 516,739, Oct. 21, 1974, abandoned. This application Sept. 24, 1975, Ser. No. 616,430
Claims priority, application Spain, Oct. 22, 1973, 420039; May 10, 1974, 426388

Int. Cl.² B05D 7/14, 3/02; C23F 7/26, 7/08

U.S. Cl. 148—6.16

10 Claims

1. The method of forming a corrosion resistant coating on metals which provides, in addition, an adherent surface for paints, comprising forming a treatment solution by dissolving in an acid selected from the group consisting of phosphoric, boro-phosphoric and the acid esters of phosphoric at least one metal salt selected from the group consisting of the salts of zinc, manganese, iron and lead in an amount sufficient to provide a solution of primary phosphates of said metals, adding to the said solution containing said primary phosphates an

organic reducing agent, partially oxidizing the resultant composition through the addition of chromic acid or its salts in quantity sufficient to produce in said solution trivalent chromium ions, applying said treatment solution to the surface of a metal, said solution being in the pH range of from about 1 to 3, and thereafter drying the treated metal surface to form thereon a reticulated film strongly adherent to the base metal.

4,006,042

METHOD OF AND APPARATUS FOR HARDENING WORKPIECES OF STEEL

Wolfgang Kieferle, Ravensburg, Germany, assignor to Hawera Probst Kommanditgesellschaft Hartmetall-Werkzeugfabrik Ravensburg, Ravensburg, Germany

Filed Mar. 17, 1975, Ser. No. 559,247

Claims priority, application Germany, Mar. 18, 1974, 2412982; Dec. 5, 1974, 2457605

Int. Cl.² C21D 1/48

U.S. Cl. 148—16.5

4 Claims

1. A method of hardening a workpiece of steel, comprising in combination the steps of: heating the workpiece to austenitizing temperature by using only purified air consisting essentially of oxygen and nitrogen as well as compounds thereof, pressurizing and surrounding said workpiece by way of the same pressurized gas mixture comprising only the purified air and propane, consisting essentially of oxygen and nitrogen as well as compounds thereof, setting the dew point of the gas mixture to a range of from -4°C to -7°C and subsequently quenching the thus treated workpiece in the same gas mixture of purified air and propane.

4,006,043

METHOD OF MAINTAINING AT VERY LOW VALUES THE CONTENT OF CYANIDE IN SALT BATHS CONTAINING CYANATES

Antoine Gaucher, Saint-Etienne, and Gérard Guilhot, St-Jean Bonnefonds, both of France, assignors to Centre Stephanols de Recherches Mécaniques Hydromécanique et Frottement, Andrezieux-Bouthéon, France

Filed May 13, 1975, Ser. No. 576,993

Claims priority, application France, May 17, 1974, 74.17195; Apr. 10, 1975, 75.11166

Int. Cl.² B23K 35/24

U.S. Cl. 148—27

8 Claims

1. A method of maintaining at very low values the cyanide content in baths of molten salts in which the main active principle is the cyanate anion CNO^- , comprising conjointly providing in said bath sulphur in an amount between 0.001 and 0.1% by weight of said bath, introducing a substance containing at least one carbonyl group into said bath and maintaining said substance in said bath in a quantity such that, per kg. of bath and per 24 hours maintenance at working temperature, said substance has a weight of CO of between 1 and 25 grams, and maintaining the working temperature of said bath between 480°C and 650°C .

4,006,044

STEEL SLAB CONTAINING SILICON FOR USE IN ELECTRICAL SHEET AND STRIP MANUFACTURED BY CONTINUOUS CASTING AND METHOD FOR MANUFACTURING THEREOF

Tatsuo Oya; Minoru Motoyoshi; Masumi Okamoto; Kiyoshi Tanaka, and Takayasu Sugiyama, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 501,818, Aug. 29, 1974, abandoned, which is a continuation of Ser. No. 253,850, May 16, 1972, abandoned. This application Apr. 1, 1975, Ser. No. 563,980

Int. Cl.² C04B 35/00

U.S. Cl. 148—31.55

4 Claims

1. A continuously cast and vacuum degassed steel strip for use as a cube-on-edge oriented electrical steel sheet and strip

which possesses no blister in the final product, obtained by the process which comprises heating a slab consisting essentially of 2.5 to 4.0 wt.% silicon, less than 0.40% aluminum, less than 3 ppm hydrogen and less than $[\text{Al}(\%) \times 10^2 + 40]$ ppm of nitrogen, with the balance being iron at a temperature not lower than about $1,200^{\circ}\text{C}$, and then hot rolling the slab, cold rolling the strip with a reduction not less than about 40%, subjecting the strip to decarburization annealing, and then final annealing the strip at a temperature not less than about $1,100^{\circ}\text{C}$.

4,006,045

METHOD FOR PRODUCING HIGH POWER SEMICONDUCTOR DEVICE USING ANODIC TREATMENT AND ENHANCED DIFFUSION

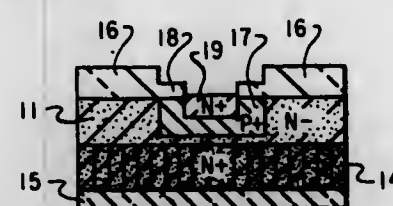
Joseph A. Aboaf, Peekskill; Robert W. Broadie, Hopewell Junction; Edward M. Hull, La Grangeville, and H. Bernhard Pogge, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 516,064, Oct. 21, 1974, Pat. No. 3,961,353. This application Feb. 13, 1976, Ser. No. 657,869

Int. Cl.² H01L 21/22, 29/04; B23P 1/00

U.S. Cl. 148—187

7 Claims



1. In the method of producing a semiconductor device, the steps comprising:

- providing a semiconductor substrate having a top and back surface;
- forming a porous portion by anodic treatment within said substrate extending inwardly of said back surface;
- forming a protective insulating layer on the top surface of said substrate;
- doping said porous portion to a region of higher conductivity than said substrate;
- forming a protective layer on the back surface of said substrate;
- removing the top protective insulating layer from said substrate; and
- introducing impurities into the top surface of said substrate so as to form a semiconductor device.

4,006,046

METHOD FOR COMPENSATING FOR EMITTER-PUSH EFFECT IN THE FABRICATION OF TRANSISTORS

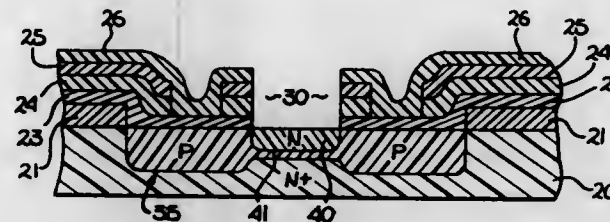
Parekh C. Pravin, Winchester, Mass., assignor to TRW Inc., Los Angeles, Calif.

Filed Apr. 21, 1975, Ser. No. 570,036

Int. Cl.² H01L 21/225

U.S. Cl. 148—187

13 Claims



1. A method for fabricating an electrical translating device comprising the steps of:

- a. providing a semiconductor wafer of a first conductivity type;
- b. disposing a first passivating layer on the surface of said semiconductor wafer;

- c. forming an opening in said first passivating layer exposing a portion of the surface of said semiconductor wafer;
- d. disposing a first dopant layer of a second conductivity type opposite to said first conductivity type at least within said opening;
- e. disposing a second passivating nitride layer upon said first dopant layer;
- f. forming an opening in said second passivating layer which is smaller than the opening in said first passivating layer exposing a portion of said first dopant layer;
- g. removing a uniform portion of said exposed first dopant layer; and
- h. diffusing a first dopant from said first dopant layer into said semiconductor wafer and forming a first and second concentration region of said first dopant, said first concentration region being beneath said second passivating layer and having a greater concentration of said first dopant than said second concentration region of said semiconductor wafer, said second concentration region being beneath said opening in said second passivating layer.

palladium or platinum metal; X is a halide, an alkyl group or a bidentate ligand; and m is from 1 to 4 and n is from 0 to 3

exposing said substrate to which said complex has been applied to heat at a temperature of less than a temperature at which the substrate loses its dimensional stability, to effect decomposition of said complex and to create a residue on said substrate catalytic to a copper, nickel, cobalt or gold metal in an electroless bath solution; and depositing a copper, nickel, cobalt or gold metal from said electroless bath on said substrate in an area rendered catalytic by decomposition of said complex.

4,006,048

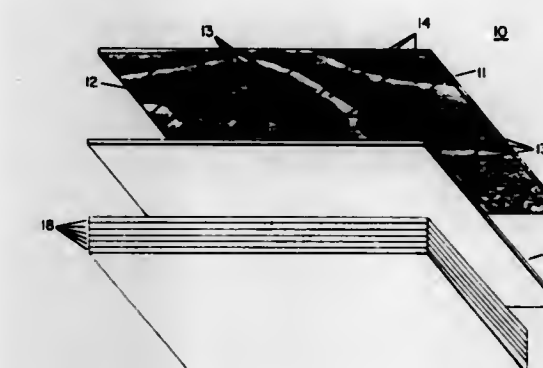
REVERSE PRINTED HIGH-PRESSURE LAMINATES
Daniel L. Cannady, Jr., Allendale, S.C., and Salvatore E. Palazzolo, Elizabeth City, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 14, 1975, Ser. No. 604,749

Int. Cl.² B32B 33/00

U.S. Cl. 156—90

10 Claims



4,006,047

CATALYSTS FOR ELECTROLESS DEPOSITION OF METALS ON COMPARATIVELY LOW-TEMPERATURE POLYOLEFIN AND POLYESTER SUBSTRATES

Charles Roscoe Brummett, Harrisburg; Ray Ned Shaak, Lebanon, and Daniel Marshall Andrews, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

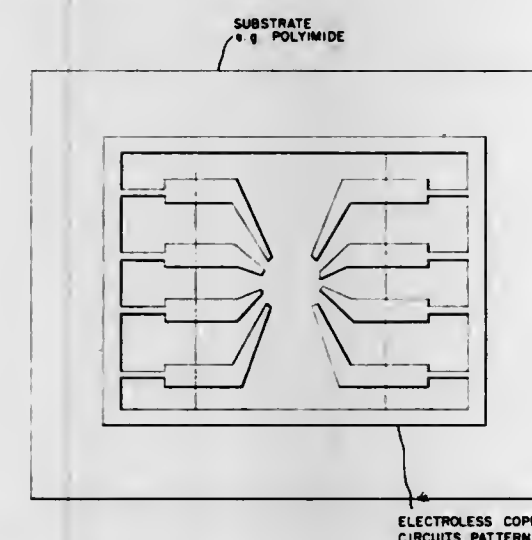
Continuation-in-part of Ser. No. 490,817, July 22, 1974, Pat. No. 3,937,857. This application Nov. 8, 1974, Ser. No. 521,999

The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.

Int. Cl.² B05D 5/12, 3/04

U.S. Cl. 156—656

15 Claims



1. A method for the deposition of a copper, nickel cobalt, or gold as metal onto an inert substrate for said metal said substrate being selected from the group consisting of polyester, polyamides, polyvinylchloride, polyethylene, polypropylene, copolymers of either polyolefin, and poly (1a) olefins in the homologous series of the polyethylene and polypropylene, from an electroless bath containing said metal, said method comprising the steps of:

- degreasing said substrate;
- applying to said substrate a thin film of a thermally decomposable complex of palladium or platinum having the formulae

$$\text{LmPdXn, or}$$

$$\text{LmPtXn}$$

wherein

L is a ligand or an unsaturated organic group; Pd or Pt is

1. A method of making a heat and pressure consolidated decorative laminate comprising the steps of:

- A. preparing a core layer comprising a plurality of fibrous sheets impregnated with a resinous material; and then
- B. placing on top of the core at least one unfilled kraft paper barrier sheet impregnated with at least 30 weight percent of a resin selected from the group consisting of aminotriazine-aldehyde resin, urea-aldehyde resin, thiourea-aldehyde resin, mixtures thereof, and unsaturated polyester resin; and then
- C. placing on top of the barrier sheet an unfilled, protective, fibrous overlay sheet selected from the group consisting of alpha cellulose and regenerated cellulose paper impregnated with a resin selected from the group consisting of aminotriazine-aldehyde resin, urea-aldehyde resin, thiourea-aldehyde resin, mixtures thereof, and unsaturated polyester resin; said protective sheet having a design printed on the surface facing the barrier sheet, said design having applied thereto a coating of pigmented material, said pigmented material, containing about 2 to 80 weight percent colored pigment dispersed in a carrier medium, and
- D. heat and pressure consolidating the sheets into a unitary, bonded laminate; wherein the barrier sheet is effective to prevent core resin bleed through to the overlay sheet, and the pigmented material applied to coat the protective sheet design is effective to mask the color of the barrier and core sheets.

4,006,049

PIPE COATING APPARATUS

David L. Gardner, Rte. 11, Box 64, Conroe, Tex. 77301

Filed May 19, 1975, Ser. No. 578,890

Int. Cl.² B65H 81/00

U.S. Cl. 156—195

21 Claims

1. A method of coating pipe comprising the steps of:

- a. placing coating material of specified width on an endless conveyor;

b. compressively and adhesively applying said coating material in helical turns to a rotating pipe which is axially advanced adjacent said endless conveyor; said compressive application causing flow of one edge of said coating material against the last applied turn thereof, whereby said flow is permitted by confining said coating on the opposite edge thereof;

c. and after compressive application, temporarily supporting the face of said coating material in a region adjacent said opposite edge and over a width less than said specified width.

7. Apparatus for applying a coating of a weight material to the exterior of a pipe, comprising:

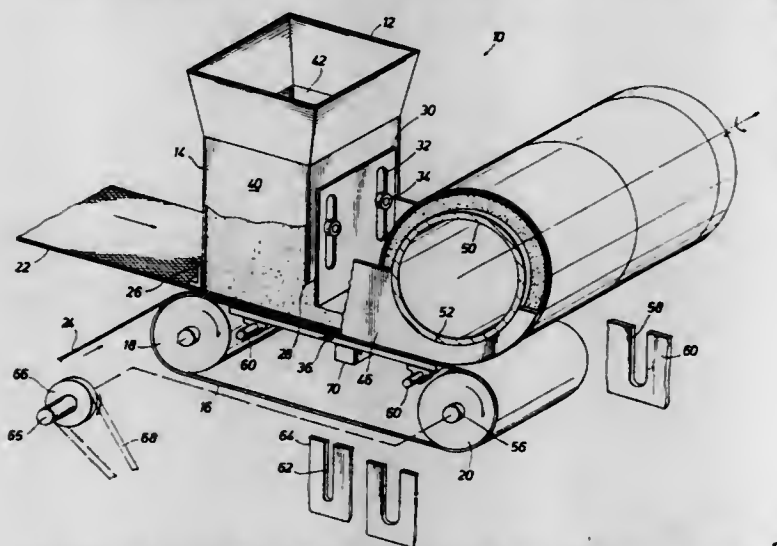
pipe handling means for advancing a pipe to be coated along the axis of the pipe and for rotating the pipe about the pipe axis as the pipe is advanced;

a first cylindrical roller positioned approximately below the axis of the pipe and adapted to rotate about a first roller axis spaced a predetermined distance from the exterior surface of the pipe;

a second cylindrical roller positioned laterally from the first roller and adapted to rotate about a second roller axis parallel to the first roller axis;

a conveyor belt extending between the first and second rollers adapted to advance its upper surface toward the first roller in endless fashion;

weight material dispensing means disposed above the conveyor belt and between the first and second rollers for



receiving a quantity of weight material and dispensing the weight material over the conveyor belt for application to the exterior surface of the pipe;

first guide means for guiding the weight material on the conveyor belt toward the pipe to wrap around the pipe in helical fashion and which defines a generally rectangular ribbon of weight material having first and second sides on the right and left of an outer face;

means for advancing the conveyor belt toward the pipe to carry the weight material for wrapping around the pipe where one side of the ribbon is placed adjacent to the previously applied helical turns of weight material on the pipe;

the first roller being positioned with respect to the pipe to compress the weight material onto the pipe and to apply the weight material thereover in helical fashion as the pipe is rotated and advanced;

a side defining means contacting the ribbon of weight material to shape and define the second side thereof which side is exposed after application to the pipe for contact against a subsequently applied helically positioned portion of the ribbon of coating material;

the second side and the adjacent outer face defining an edge between them and which second side and outer face come together at an approximately right angle; and face defining means cooperatively arranged with the side defining means for shaping and defining the edge as the ribbon of weight material as applied to the pipe.

4,006,050 METHOD OF MANUFACTURING CARDS AND OTHER DOCUMENTS

Gerald Covington Hurst, Tadworth, and Kenneth Adams, South Croydon, both of England, assignors to George M. Whitley Limited, Rushlip, England

Filed Feb. 7, 1975, Ser. No. 548,138

Claims priority, application United Kingdom, Feb. 11, 1974, 6197/74

Int. Cl.² B44C 1/16; B32B 31/20

U.S. Cl. 156—234

6 Claims

1. A method of manufacturing a card or document, which comprises (a) forming by xerography a developed, transferable image of a security nature on a transfer sheet which sheet comprises a carrier sheet, a release layer adjacent to the carrier sheet and a lacquer layer on that side of the release layer remote from the carrier sheet, the formation of the image being on that side of the lacquer layer remote from the release sheet; and (b) causing the image on the transfer sheet to abut a base formed of a plastics material and causing the transference of at least the image and lacquer layer to the base by a combination of heat and pressure so that the material of the image and the base become fused together.

4,006,051 METHOD OF PREPARING A LOW-FRICTION LAMINATE LINER FOR BEARINGS

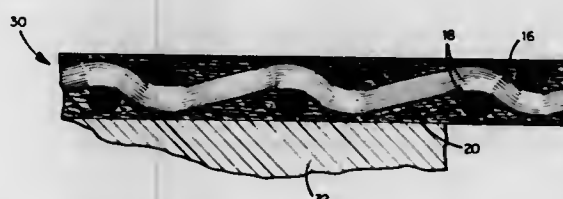
David A. Board, Jr., Laconia, N.H., assignor to New Hampshire Ball Bearings, Inc., Laconia, N.H.

Division of Ser. No. 444,340, Feb. 21, 1974, Pat. No. 3,950,599. This application July 11, 1975, Ser. No. 595,297

Int. Cl.² F16C 33/20

U.S. Cl. 156—247

19 Claims



1. A method of preparing a laminate liner suitable for use as a low-friction bearing liner, which method comprises:

a. providing an assembly of successively overlying layers of sheet materials, which assembly comprises

i. a flexible backing sheet material,

ii. a separate flexible thin porous polymeric sheet material consisting essentially of a fibrous thermoplastic polymeric material having low-friction, self-lubricating properties,

iii. the backing sheet member characterized by a plurality of substantially regular and uniform relatively large openings therein,

iv. the polymeric sheet material characterized by a plurality of small pores therein, and

v. the assembly having a one exposed surface of the backing sheet member and another exposed surface of the polymeric sheet material;

b. applying a layer of a heat-hardenable resin binder material to the one exposed surface of the backing sheet member in an amount sufficient to fill in the openings of the backing sheet material;

c. placing the resin binder-filled assembly between opposing release surfaces;

d. compressing the assembly under heat and pressure conditions sufficient to force the resin binder material throughout the assembly and to force the porous fibrous polymeric sheet material into the openings of the backing sheet material to bond mechanically the polymeric sheet material to the backing sheet material; and

e. removing at least one release surface and recovering an

integral, thin, flexible, laminate liner suitable for use as a bearing liner and characterized by one resin-rich surface adapted to be secured to a supporting member, and another facing surface characterized by low-friction, self-lubricating properties.

4,006,052 DIFFUSION METHOD FOR DEPOSITING MICROPOROUS FILM

Wu Lan Wang, Newark, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation of Ser. No. 223,538, Feb. 4, 1972, abandoned, which is a continuation of Ser. No. 780,988, Dec. 4, 1968, abandoned. This application Mar. 29, 1974, Ser. No. 456,352

Int. Cl.² B05D 3/10, 5/00

U.S. Cl. 156—280

9 Claims

1. A method for forming a vapor permeable, breathable, grain layer on the top surface of a porous natural leather replacement product substrate which comprises the steps of:

A. Coating a solution of a polyurethane elastomer in a solvent onto a release surface of a flexible sheet;

B. Wetting the said leather replacement product substrate with a wetting liquid which is miscible with the solvent of Step A, and in which the polyurethane elastomer of Step A is insoluble to produce a wetted substrate free from a surface film of wetting liquid on its top surface;

C. Laminating the product of Step A to the product of Step B so that the polyurethane solution of Step A is in contact with the top surface of the wetted substrate of Step B by bringing the said products into registry, passing through nip rolls, depositing the polyurethane elastomer as a base film on the top surface of the substrate by bathing the laminate in a separate bath of the wetting liquid, and removing said flexible sheet;

D. Applying a solution of a polyurethane elastomer in a solvent to the side of the base film carrying the deposited elastomer of Step C;

E. Bringing the uncoated bottom surface of the polyurethane elastomer solution coated substrate of Step D into registry with the top surface of a porous support which is wetted with a wetting liquid which is miscible with the solvent of Step D, and in which the polyurethane elastomer of Step D is insoluble;

F. Maintaining the contact of Step E until the polyurethane elastomer of Step D is deposited as a grain layer on the base film of Step C as a result of diffusion of said wetting liquid through the substrate;

G. Washing the resulting product and thereafter drying.

4,006,053 MANUFACTURE OF MOULDED ARTICLES

Anthony Gerald Goodfellow, Merseyside, England, assignor to Dunlop Limited, London, England

Filed Mar. 10, 1976, Ser. No. 665,429

Claims priority, application United Kingdom, Mar. 20, 1975, 11567/75

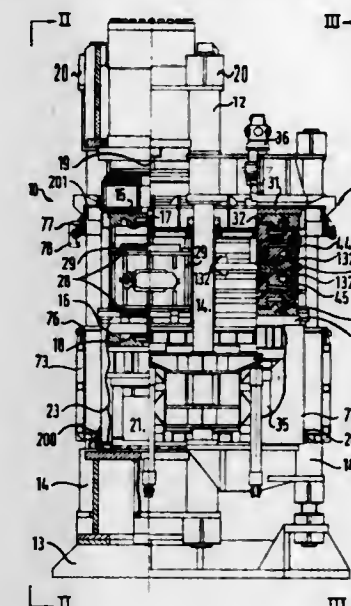
Int. Cl.² B29H 3/10; B29G 3/00

U.S. Cl. 156—394

7 Claims

1. Apparatus for producing a moulded article from a plurality of components, the apparatus comprising a press having die members which are relatively movable as the press is opened and closed and a transfer unit assembly which is movable into and out of the press to and from an operative position between two of the die members of the press, the transfer unit assembly comprising relatively movable parts having at least one reservoir for mouldable material therebetween and having mould surfaces which, when the transfer unit is in its operative position, co-operate with mould surfaces of the die members to form mould cavities for the components and the arrangement being such that when the press is closed with the transfer unit assembly in its operative position the parts of the unit will be relatively moved by the press to cause the dimen-

sions of the said at least one reservoir to be reduced so that mouldable material will be transferred into the mould cavities and the arrangement being such that thereafter the transfer



unit may be removed from the press and the press thereafter re-closed to bring the moulded components supported on the die members into assembled relation and to bond the components together.

4,006,054 METHOD OF MAKING FILTER TUBES

Brian Arthur Head, Chatham, England, assignor to Whatman Reeve Angel Limited, Maldstone, England

Division of Ser. No. 523,587, Nov. 14, 1974, Pat. No. 3,972,694. This application Nov. 12, 1975, Ser. No. 630,955

Int. Cl.² D21H 3/62, 5/18; D21J 7/00

U.S. Cl. 162—156

16 Claims

1. A method of preparing a glass-fiber filter tube, which method comprises:

a. impregnating a filter tube composed of a plurality of randomly disposed, nonwoven, glass fibers having a diameter of from about 0.001 to 10 microns with a volatile organic solvent solution of a hardenable silicone resin; and

b. heating the impregnated filter tube to a temperature sufficient to remove the volatile organic solvent and to crosslink and harden the silicone resin and to bond the crossover junctions of the glass fibers, thereby providing a porous, improved, self-supporting, filter tube.

11. A method of preparing an improved glass-fiber filter tube, which method comprises:

a. dispersing borosilicate glass fibers having a diameter from about 0.03 to about 8 microns in an aqueous solution;

b. forming the dispersed glass fibers about the surface of a porous mandrel to form a fibrous tube of the borosilicate glass fibers about the exterior surface of the mandrel;

c. drying the tube of borosilicate glass fibers to form a glass-fiber filter tube of the desired porosity;

d. immersing the dried filter tube into a volatile solvent solution containing a heat-hardenable silicone resin to impregnate the filter tube; and

e. heating the impregnated tube to a temperature to evaporate the solvent and to cross-link the silicone resin and to bond the glass fibers at the junctions of the fiber cross-overs with from about 3 to 50% by weight of a hardened silicone resin.

4,006,055

RESILIENT TENSION DEVICE IN NUCLEAR REACTORS
 Diethelm Knödler; Hans Krüpf, and Alexander Steinke, all of
 Erlangen, Germany, assignors to Siemens Aktiengesellschaft,
 Munich, Germany

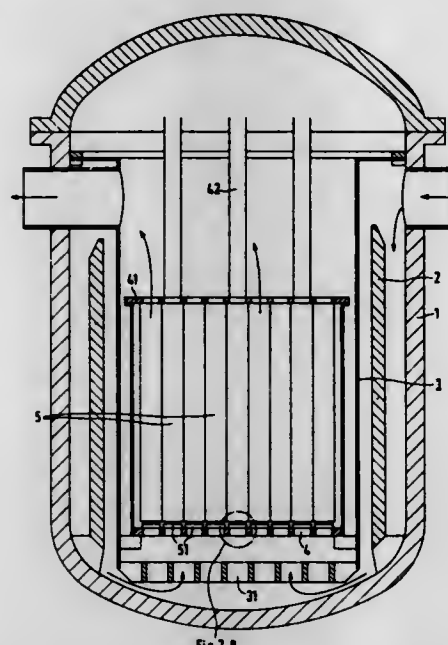
Filed Aug. 10, 1972, Ser. No. 279,290

Claims priority, application Germany, Aug. 11, 1971,
 2140170

Int. Cl.² G21C 19/28

U.S. Cl. 176—61

3 Claims



1. A nuclear reactor fuel element assembly including vertically interspaced upper and lower grid plates, at least one fuel element vertically positioned between said grid plates, and a system for guiding a coolant flow upwardly through said grid plates and said element, said grid plates forming grid openings and said element having upper and lower ends registered with said openings; wherein the improvement comprises said element's upper end abutting said upper grid plate and said element's lower end being spaced above said lower grid plate to define a space between said element's lower end and said lower grid plate, a frame structure having an upper level and disposed in said space and upwardly supported by said lower grid plate and having an open construction to permit said coolant to flow upwardly through said element's lower end, at least one upwardly acting spring positioned below the upper level of said frame structure and connected with the frame structure, means extending vertically slidably through said frame structure for transmitting the force of said spring upwardly to said fuel element's lower end; and means for pinning said element's lower end and said frame structure and said lower grid plate together, the second-named means holding said element's lower end and said frame in registration with said lower grid's opening and against relative rotative twisting and with said element's lower end free for vertical movement, said frame structure comprising upper and lower frame plates having central through openings for passing said coolant flow upwardly therethrough, and said spring being positioned between said frame plates, said lower frame plate being positioned in said lower grid plate's opening below the latter's upper level.

4,006,056

CONTROLLED RELEASE COMPOSITION CONTAINING STABILIZED UREASE

Meyer Michael Weber, Milwaukee, Wis., assignor to Midwest Biochemical Corporation, Milwaukee, Wis.

Filed Sept. 19, 1975, Ser. No. 614,920

Int. Cl.² C12B 1/00

U.S. Cl. 195—2

14 Claims

1. A composition of matter comprising:
 a. a solid, isotropic, controlled release agent,
 b. stabilized urease, and

c. an accelerator, said accelerator being an enzyme selected from the group consisting of cellulase, hemicellulase, protease, and mixtures thereof.

4,006,057

METHOD OF PRODUCING L-CYSTEINE AND L-CYSTINE
 Konosuke Sano, Machido; Ketsu Matsuda, Kawasaki; Koji Mitsugi, Yokohama; Kazuhiko Yamada, Fujisawa; Fumihide Tamura, Kawasaki; Naohiko Yasuda, Yokosuka, and Ichiro Noda, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 4, 1975, Ser. No. 628,840

Claims priority, application Japan, Nov. 6, 1974,
 49-127153; Dec. 3, 1974, 49-137697

Int. Cl.² C12D 13/06

U.S. Cl. 195—29

17 Claims

1. A method for producing L-cysteine and/or L-cystine which comprises:

- holding 2-amino-thiazoline-4-carboxylic acid in an aqueous solution at a pH of 5 to 11 in the presence of an effective amount of enzyme produced by a microorganism; said enzyme being capable of converting 2-amino-thiazoline-4-carboxylic acid to L-cysteine and/or L-cystine, and said microorganism being capable of growing in a medium containing 2-amino-thiazoline-4-carboxylic acid as a nitrogen source, and of producing said enzyme; and
- recovering the L-cysteine and/or L-cystine formed from said aqueous solution.

4,006,058

BIOPOLYMER PRODUCTION PROCESS

Joseph George Savins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,986

Int. Cl.² C12D 13/04

U.S. Cl. 195—49

11 Claims

1. In a process for the production of a heteropolysaccharide by fermentation of a methanol containing culture medium with a microorganism of *Methylomonas mucosa* NRRL B-5696, the improvement comprising incorporating into said culture medium an alkali metal glycerophosphate as the predominant source of assimilable phosphate.

4,006,059

HYDROPHOBIC NONCOVALENT BINDING OF PROTEINS TO SUPPORT MATERIALS

Larry G. Butler, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed July 29, 1974, Ser. No. 492,508

Int. Cl.² C07G 7/02

U.S. Cl. 195—68

5 Claims

1. A method of noncovalent binding of proteins to support materials, said method comprising:

- selecting a hydrophilic support material having hydroxyl or amino groups;
- treating said selected support material by chemically modifying said material by treatment with phenoxyacetyl chloride to make said support material hydrophobic in nature to thus form a hydrophobic derivative of said support material suitable for immobilizing proteins when exposed to said treated hydrophobic material;
- selecting a protein that is capable of being immobilized on said treated hydrophobic material with said protein having a capacity for subsequent biological activity; and
- exposing said selected protein to said treated hydrophobic material to cause said protein to be effectively immobilized on said treated hydrophobic material by adsorption and substantially without impairing said subsequent biological activity of the protein.

4,006,060

THIENAMYCIN PRODUCTION

Jean S. Kahan; Frederick M. Kahan, both of Rahway; Edward O. Stapley, Metuchen; Robert T. Goegelman, Linden, all of N.J., and Sebastian Hernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 526,992, Nov. 25, 1974, Pat. No. 3,950,357. This application Nov. 18, 1975, Ser. No. 632,938

Int. Cl.² C12D 9/14

U.S. Cl. 195—80 R

2 Claims

1. A process for the production of the antibiotic thienamycin which comprises cultivating a thienamycin-producing strain of *Streptomyces cattleya* in an aqueous nutrient medium containing assimilable sources of carbohydrate, nitrogen and inorganic salts under submerged aerobic conditions and recovering the antibiotic so produced.

4,006,061

LACTATE DEHYDROGENASE DETERMINATION METHOD

Lloyd E. Weeks, St. Louis, and John H. Johnson, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,799

Int. Cl.² C12K 1/04

U.S. Cl. 195—103.5 R

7 Claims

1. The method of determining lactate dehydrogenase activity in a biological fluid comprising reacting said biological fluid with an aqueous solution saturated with air or oxygen and containing lactate, NAD and an electron acceptor at a temperature of from about 25° to about 40° C and a pH of from about 8.8 to about 9.8 and measuring the uptake of oxygen by the oxidation of the resulting NADH with an oxygen-sensing electrode.

4,006,062

STILL EXTRACTOR WITH NOVEL STOPCOCK MEANS

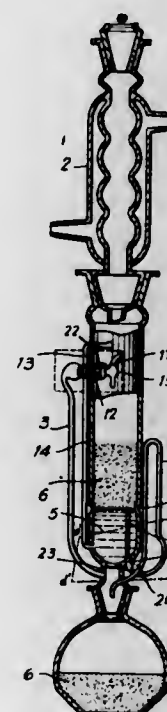
Vishwa Mitra Bhuchar; Arun Kumar Agrawal; Franz Kiss; Jayanti Prasad Vasisht; Dharam Parkash, and Oudh Narain Lal Srivastava, all of Delhi, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed Jan. 9, 1975, Ser. No. 539,845

Int. Cl.² B01D 3/34, 11/04

U.S. Cl. 202—169

7 Claims



1. A solvent extractor comprising a distillation flask, an extraction unit connected to said distillation flask and a condenser, said extraction unit comprising:
 a container for holding a substance for treatment with a solvent,

4,006,063

METHOD FOR MEASURING SURFACE CHARACTERISTICS OF METALS AND METALLOIDS

Minas Ensanian, P.O. Box 98, Eldred, Pa. 16731

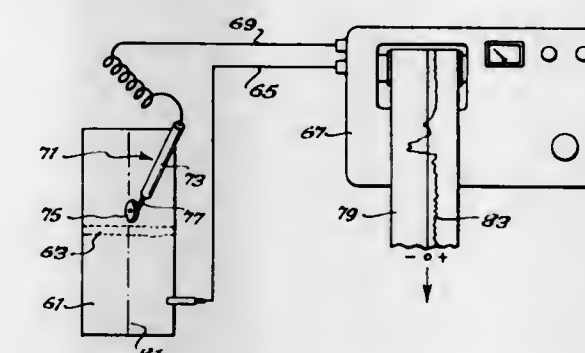
Continuation of Ser. No. 79,033, Oct. 8, 1970, abandoned.

This application May 5, 1975, Ser. No. 574,360

Int. Cl.² G01N 27/46

U.S. Cl. 204—1 T

12 Claims



1. A process for detecting chemical and physical irregularities in a material of the class consisting of metals and metalloids which comprises providing a probe, said probe comprising an axle, an electrode of a material of said class, and a rollable, self-supporting, non-metallic body, containing an electrolyte, carried by and rotatable with said electrode about said axle, and continuously recording the voltage, and the polarity of said voltage, generated between said electrode and the surface of a test piece of a material of said class while establishing and maintaining substantially line contact between said body and said surface by rolling said electrode and body along a path on said surface while maintaining said electrode in electrical contact with said surface through said electrolyte.

4,006,064

PROCESS FOR THE ELECTRODEPOSITION OF CHROME PLATE USING FLUORINE-CONTAINING WETTING AGENTS

Hans Niederprüm, Monheim; Heinz Günter Klein, Cologne, and Johann Nikolaus Meussdoerffer, Blecher, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 10, 1976, Ser. No. 657,014

Claims priority, application Germany, Feb. 28, 1975, 2508708

Int. Cl.² C25D 3/10

U.S. Cl. 204—51

10 Claims

8. An electrolyte solution for the electrodeposition of chrome layers comprising water, a hexavalent chromium compound and a quaternary ammonium perfluoralkane sulfonate as a surfactant.

4,006,065

PROCESS FOR THE SYNTHESIS OF PURE ISOMERS OF LONG CHAIN ALKENES

Otto Meresz, 8 Wallingford Road, and Cecilia Mozsai, 10 Sunny Glenway, No. 103, both of Don Mills, Ontario, Canada

Division of Ser. No. 368,960, June 11, 1973, Pat. No. 3,932,616. This application Sept. 22, 1975, Ser. No. 615,740
Claims priority, application United Kingdom, June 26, 1972, 29835/72

Int. Cl.² C25B 3/00, 3/10; C07C 11/00

U.S. Cl. 204—59 R

7 Claims

1. A process for preparing long chain olefinic compounds which includes electrolyzing in the liquid phase a mixture comprising a short chain carboxylic acid and a longer chain carboxylic acid, at least one of which acids has unsaturation, in solution in organic solvent which comprises a mixture of a first organic solvent capable of maintaining carboxylate ions in solution and thus becoming conducting, and a second organic solution which is nonconducting, and recovering the long chain olefinic compounds so formed

4,006,066

METHOD OF AND APPARATUS FOR THE TREATMENT OF EXHAUST-GASES IN THE ELECTROLYTIC PRODUCTION OF ALUMINUM

Volker Sparwald, Grevenbroich, Germany, assignor to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn and Metallgesellschaft Aktiengesellschaft, Frankfurt, both of Germany, part interest to each

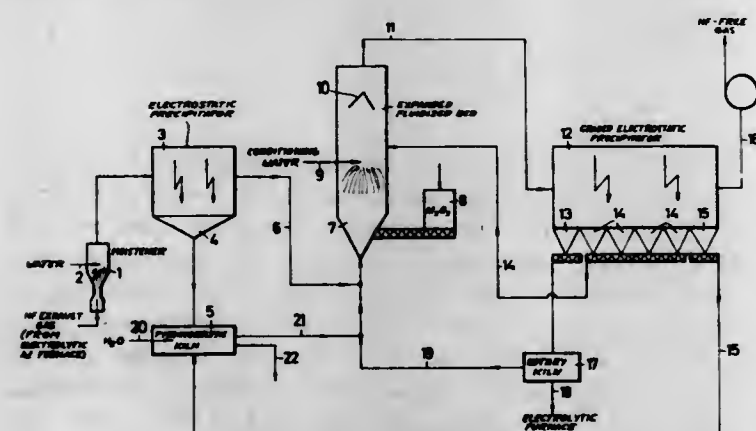
Filed Jan. 22, 1975, Ser. No. 542,931

Claims priority, application Germany, Jan. 24, 1974, 2403282

Int. Cl.² C25C 3/06

U.S. Cl. 204—67

8 Claims



1. A method of removing hydrogen fluoride from an exhaust gas produced by a plant for the electrolytic production of aluminum, said gas containing impurities detrimental to the alumina, said method comprises the steps of:

- electrostatically precipitating said impurities from said gas;
- thereafter passing said gas from which the impurities have been electrostatically precipitated in step (a) through an expanded fluorized bed of alumina particles to adsorb hydrogen fluoride from said gas on said alumina particles;
- entraining the alumina particles on which hydrogen fluoride is adsorbed from said gas from the top of said expanded bed in a gas-solid suspension;
- separating solids from said suspension by electrostatically precipitation immediately upon passage of said suspension from said bed, thereby grading said solid into a coarse-grain fraction, a medium-grain fraction and a fine-grain fraction, said fractions being separately collected;
- heating said coarse-grain fraction and thereafter feeding the heated coarse-grain fraction to a furnace for the electrolytic production of aluminum; and
- subjecting said fine-grain fraction to pyrohydrolysis to evolve hydrogen fluoride therefrom.

4,006,067

OXIDATION-REDUCTION PROCESS

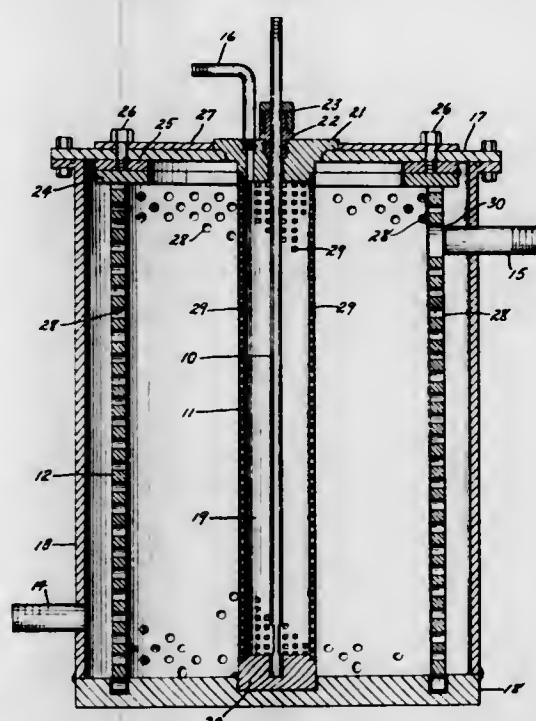
Mark C. Gussack, 1 Overlook Ave., Great Neck, N.Y. 11021

Filed Mar. 5, 1973, Ser. No. 338,343

Int. Cl.² C25C 1/10

U.S. Cl. 204—151

5 Claims



1. In an electrochemical process for oxidizing chromium in the +3 oxidation state to the +6 oxidation state comprising the steps of: providing an electrochemical cell having an anode compartment containing an anode, a cathode compartment containing a cathode and a semipermeable membrane capable of preventing passage of chromium in the +3 oxidation state separating said anode compartment from said cathode compartment; providing an acidic catholyte solution in said cathode compartment, said catholyte solution being substantially free of chromium in the +3 oxidation state; providing an anolyte solution in the anode compartment, said anolyte solution containing chromium in the +3 oxidation state; and passing a current between said anode and said cathode; the improvement wherein said anolyte solution is passed through and fills a multiplicity of pores provided in said anode while current is passed between said anode and cathode.

4,006,068

POLYMERCAPTOESTERS OF POLYGLYCIDOLS

Violette L. Stevens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

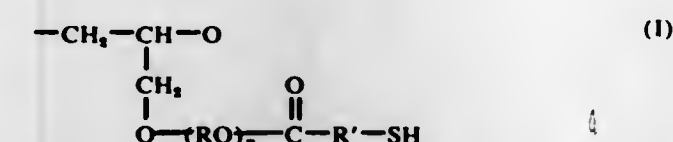
Filed Apr. 30, 1975, Ser. No. 573,225

Int. Cl.² C08F 283/14

U.S. Cl. 204—159.11

21 Claims

1. A condensation polymer comprising at least one unit represented by the formula



wherein R is independently in each unit the residue of a ring-opened alkylene oxide moiety; R' is independently in each unit a divalent C₁-C₂₀ hydrocarbon residue of a mercaptocarboxylic acid; and x is independently in each unit zero or a positive integer up to about 100, provided that when said condensation polymer comprises only one unit represented by formula (1) it additionally comprises at least two units of a ring-opened alkylene oxide and x is zero.

4,006,069

SUPPORT FOR ELECTROPHORETIC ANALYSIS

Nobuo Hiratsuka, and Nakatsugu Yaginuma, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 17, 1975, Ser. No. 632,884

Claims priority, application Japan, Nov. 15, 1974, 49-131828

Int. Cl.² G01N 27/26, 27/28

U.S. Cl. 204—180 G

15 Claims

1. In an electrophoretic analysis process utilizing a supported analysis member, the improvement wherein said supported analysis member comprises a porous polymeric flat plate and a polymeric gel enclosed in the open cells of the flat plate.

4,006,070

METAL OXIDE FILMS

Robert David King, Solihull, and Robert Hiscutt, Birmingham, both of England, assignors to Triplex Safety Glass Company Limited, London, England

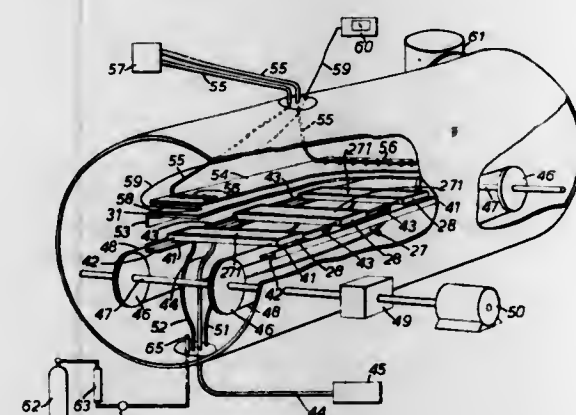
Filed Jan. 26, 1972, Ser. No. 220,899

Claims priority, application United Kingdom, Feb. 5, 1971, 4234/71

Int. Cl.² C23C 15/00

U.S. Cl. 204—192

48 Claims



1. A method of depositing a transparent, electrically conducting, metal oxide film onto the surface of a substrate of extended lateral dimensions, said method comprising the steps of:

- arranging a cathode assembly whose overall lateral dimensions are not substantially less than those of the substrate in the vicinity of the substrate but spaced apart therefrom to define a working space between the cathode assembly and the substrate surface, the cathode assembly being so constructed as to present a plurality of elongated, side-by-side strips comprising a metal capable of being reactively sputtered, said strips being spaced apart to define passages therebetween;
 - enclosing the cathode assembly and the substrate within a vacuum chamber containing an atmosphere of oxygen and at least one other gas which is inert to oxygen and to the other materials in the vacuum chamber, at a controlled reduced pressure;
 - heating the substrate to a selected, elevated temperature prior to a reactive sputtering step to be recited;
 - maintaining a substantial degree of uniformity in the oxygen concentration in said working space by allowing said atmosphere to penetrate through the spaces between said spaced strips and into said working space;
 - applying a high negative potential to the cathode assembly to effect deposition of said metal oxide film by reactive sputtering substantially perpendicularly from said strips on to the substrate; and
 - maintaining the substrate at the selected, elevated temperature during the sputtering step;
 - causing relative translatory movement between the cathode assembly and the substrate in a direction transverse to the length of said strips, through an amplitude substantially smaller than the overall length of the cathode assembly, but sufficient to cause all parts of the substrate surface to be coated by sputtering from at least one of said strips during the deposition process.
45. An article having its smallest lateral dimension greater than 30 cm. and having a stable transparent electrically conductive film deposited on a surface thereof, said film:
- having a specific electrical resistivity of between 2×10^{-4} ohm cm. and 20×10^{-4} ohm cm., which resistivity is substantially uniform over the whole of said film;
 - having a thickness which is everywhere less than 10,000 Å;
 - having a light transmission figure of over 70%; and
 - having been deposited by a reactive sputtering method comprising the steps of:
- arranging a cathode assembly whose overall lateral dimensions are not substantially less than those of the substrate in the vicinity of the substrate but spaced apart therefrom to define a working space between the cathode assembly and the substrate surface, the cathode assembly being so constructed as to present a plurality of elongated, side-by-side strips comprising a metal capable of being reactively sputtered, said strips being spaced apart to define passages therebetween;
 - enclosing the cathode assembly and the substrate within a vacuum chamber containing an atmosphere of oxygen and at least one other gas which is inert to oxygen and to the other materials in the vacuum chamber, at a controlled reduced pressure;
 - heating the substrate to a selected, elevated temperature prior to sputtering;
 - maintaining a substantial degree of uniformity in the oxygen concentration in said working space by allowing said atmosphere to penetrate through the spaces between said spaced strips into said working space;
 - maintaining the substrate at the selected, elevated temperature during sputtering;
 - applying a high negative potential to said cathode assembly to effect deposition of said metal oxide film by reactive sputtering substantially perpendicularly from said strips onto the substrate;
 - selecting the value of the oxygen concentration, substrate temperature, vacuum chamber pressure, and cathode potential such that the deposited coating is haze-free and its specific electrical resistivity lies at or near a selected value.

close to the minimum of the curve which is obtained by plotting specific electrical resistivity against oxygen concentration while maintaining the substrate temperature, vacuum chamber pressure, and cathode potential all constant at selected values and

e. causing relative translatory movement between said cathode assembly and the substrate in a direction transverse to the length of said strips, through an amplitude substantially smaller than the overall length of the cathode assembly, but sufficient to cause all parts of the substrate surface to be coated by sputtering from at least one of said strips during the deposition process.

4,006,071

ACCUMULATOR PROGRAM FOR ELECTROPLATING ENERGY

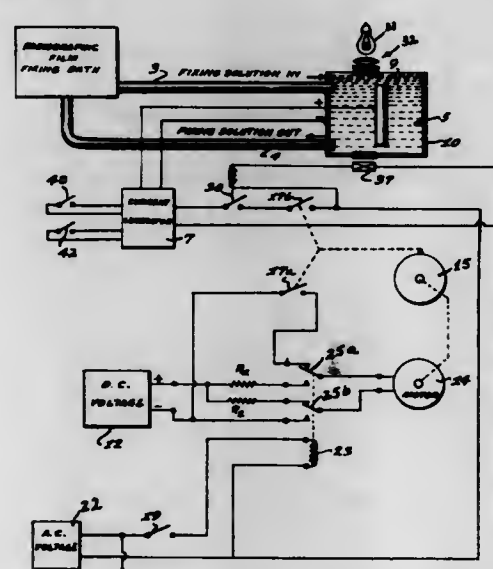
Earl J. Martchenko, 3405 Sinton Road, Colorado Springs, Colo. 80907

Filed May 19, 1975, Ser. No. 578,381

Int. Cl.³ C25C 1/22; C25D 3/46

U.S. Cl. 204—228

1 Claim



1. A time accumulator control for electrolytic process comprising:

a current generator;
electrolytic plating means including:
a cathode forming tank,
an anode disposed within said tank, said anode and cathode being electrically connected to the current generator;

power means,
means including first switch means interconnecting the power means and the current generator;
time multiplying means operatively connected to the switch means and responsive to a first input signal of given time duration, which time multiplying means includes:
a reversible motor having clockwise and counterclockwise input terminals;
a voltage source;

voltage control means interconnecting the said voltage source and the motor, and
a second switch means operatively connected to the voltage control means for applying a first voltage to the clockwise terminal of the motor and a second voltage to the counter-clockwise terminal of the motor;

a first input signal of given time duration comprising:
a voltage source,
control means operatively connected to the voltage source, and
means interconnecting the voltage source to the second switch means for operation thereof;

third switch means operatively connected to the current generator for controlling the operation thereof,
color sensing means, including a light source disposed and

positioned so as to direct a beam of light through the said tank,

photoelectric switching means disposed to receive the said light and operatively connected to the third switching means for controlling the operation thereof, and
fourth switch means operatively connected to the current generator for controlling the current produced thereby, said switch means being responsive to a second input signal of given time duration.

4,006,072

DEVICE FOR ELIMINATING IMPURE IONS IN CHROMIUM PLATING BATH

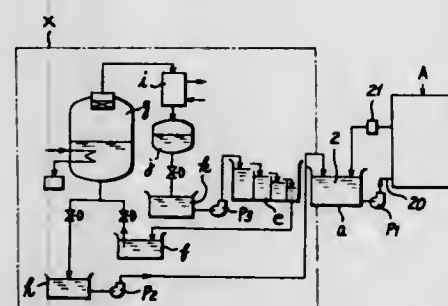
Kiyoteru Takayasu, 617 Nimyo-cho 1980-banchi, Nara, Nara, Japan

Filed June 2, 1975, Ser. No. 583,039

Int. Cl.³ C25C 1/10; C25D 3/04

U.S. Cl. 204—238

17 Claims



1. A device for removing metal ion impurities from chromium plating baths without depletion of chromate ions comprising

1. an electrolytic tank operable to hold plating bath;
2. at least one cathode disposed within said tank for immersion in plating bath held therein;

3. a plurality of anodes disposed within said tank for immersion in plating bath held therein and spaced from said cathode, said anode (a) being a hollow member, the lower, immersible end portion of which is closed, said member being composed of a corrosion resistant base material selected from the group consisting of (i) titanium, zinc, niobium and tantalum and (ii) alloys of titanium, zinc, niobium, tantalum and nickel, (b) having an outer active layer over and in electrical contact with at least the lower closed end portion of said member, said layer being a material selected from the group consisting of (i) platinum, palladium, ruthenium, rhodium, iridium and osmium and (ii) alloys of platinum, palladium, ruthenium, rhodium, iridium and osmium, and (c) having magnetic means disposed within said hollow member operable to impart a magnetic field around said anode; and

4. means operable to apply an electrical potential between said cathode and anodes.

4,006,073

THIN FILM DEPOSITION BY ELECTRIC AND MAGNETIC CROSSED-FIELD DIODE SPUTTERING

Kimo M. Welch, Mountain View, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 3, 1975, Ser. No. 565,019

Int. Cl.³ C23C 15/00; H01J 25/00

U.S. Cl. 204—298

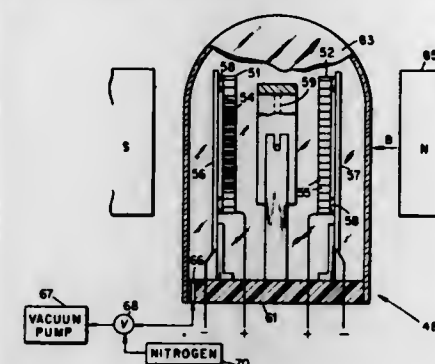
5 Claims

1. Apparatus for applying a thin film coating to a workpiece, comprising:

a cathode comprised of sputtering material;
a holder for mounting the workpiece opposite said cathode;
a plurality of anodes between said holder and said cathode, said plurality of anodes each being comprised of a wall

defining a central passage, said anodes being grouped together with the central passages of said anodes being parallel with one end of the passages opening towards said cathode and the opposite end opening towards said workpiece holder;

means for supplying an ionizable gas around said cathode, anodes, and workpiece holder;



means for establishing an electric field between said cathode and anodes sufficient to sustain an electrical discharge therebetween through said gas; and
means for establishing a magnetic field to extend throughout the space around said anodes and cathode.

4,006,074

REFORMING WITH A PLATINUM-ALUMINA CATALYST

Henry Erickson, Park Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 286,993, Sept. 7, 1972. This application

Dec. 22, 1975, Ser. No. 642,947

Int. Cl.³ C10G 35/08

U.S. Cl. 208—138

9 Claims

1. In a method for reforming a hydrocarbon feedstock comprising paraffins and naphthenes in at least one reaction zone with a catalyst comprising a catalytically effective amount of at least one platinum group metal component and alumina in the presence of free molecular hydrogen at hydrocarbon conversion conditions, the improvement which comprises using as the alumina a composition comprising macro-size particles containing a mixture of two distinct phases, said phases being (1) calcined discrete entities comprising first alumina, a major portion of said entities having a minimum dimension greater than about 50 microns and a maximum dimension of less than 200 microns and (2) a phase comprising calcined second alumina wherein the weight ratio of (1) to (2) is within the range from about 0.05:1 to about 2:1 and said second alumina is first calcined after the formation of macro-size particles.

4,006,075

METHOD OF REGENERATING A CRACKING CATALYST WITH SUBSTANTIALLY COMPLETE COMBUSTION OF CARBON MONOXIDE

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 6, 1975, Ser. No. 538,738

Int. Cl.³ C10G 11/18

U.S. Cl. 208—164

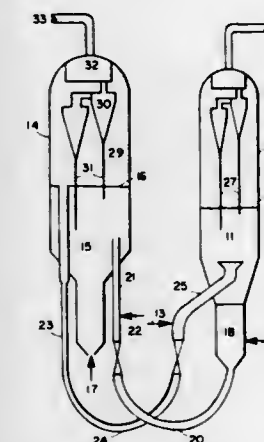
21 Claims

1. In a fluidized catalytic cracking process comprising contacting a hydrocarbon feedstock with cracking catalyst in a reaction zone under cracking conditions to produce cracked hydrocarbon vapors and coke contaminated catalyst, wherein said coke contaminated catalyst is regenerated in a regeneration zone at elevated temperature with an oxygen-containing regeneration gas, wherein catalyst in the regeneration zone is fluidized by the upward flow of the regeneration gas to form a dense phase catalyst bed and a dilute catalyst phase, the improvement for regenerating coke contaminated catalyst which comprises the following steps all of which are accomplished at a substantially constant regeneration gas rate:

1. increasing the temperature of the dense phase catalyst bed to a level ranging from about 1250° to about 1400° F.

while maintaining the amount of coke produced in said reaction zone substantially constant so as to increase the rate of conversion of coke to carbon monoxide and carbon dioxide;

2. reducing the coke make in the reaction zone while maintaining the temperature of the dense phase bed substantially that of step (1) for a time sufficient to effect an increased oxygen concentration in the regeneration zone to burn at least an additional portion of coke from the coke contaminated catalyst to obtain in the regeneration zone a regenerated catalyst having a residual carbon content of less than about 0.2 wt. % and a substantially



catalyst-free flue gas containing less than about 0.2 vol. % of carbon monoxide; and

3. reducing the temperature of the dense phase catalyst bed to a level ranging from about 20° to about 100° F below that employed in steps (1) and (2) in order to maintain at least the level of residual carbon on regenerated catalyst obtained in step (2) and the content of carbon monoxide in the substantially catalyst-free flue gas at no greater level than that obtained in step (2), steps (1), (2) and (3) being effected while maintaining the temperature of the dilute catalyst phase at least that of the dense phase catalyst bed and within the range of from about 1250° to about 1450° F so as to avoid excessive afterburning in that portion of the regeneration zone wherein the flue gas is substantially catalyst-free.

4,006,076

PROCESS FOR THE PRODUCTION OF LOW-SULFUR-CONTENT HYDROCARBON MIXTURES

Robert I. Christensen, San Rafael, and George D. Gould, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 355,230, April 27, 1973, Pat.

No. 3,902,991. This application June 2, 1975, Ser. No.

583,139

The portion of the term of this patent subsequent to Sept. 2, 1992, has been disclaimed.

Int. Cl.³ C10G 23/02, 34/00

U.S. Cl. 208—211

26 Claims

1. A process for producing a low-sulfur hydrocarbon mixture by desulfurizing a hydrocarbon feedstock, said feedstock being a reduced-crude obtained from a whole crude oil having a sulfur content of at least about 1 weight percent, which comprises:

1. separating said feedstock into a vacuum gas oil fraction and a vacuum residuum fraction;

2. contacting at least a portion of said vacuum gas oil with a first hydrodesulfurization catalyst and hydrogen gas in a first hydrodesulfurization zone under a hydrogen partial pressure in the range 300 to 800 psig and a temperature in the range 550 to 850° F., said catalyst comprising a sulfided composite of a Group VIII metal, a Group VIA metal, phosphorus and a catalyst base comprising alumina, said catalyst having a pore volume in the range from 0.3 to 1 cc per gram, the pores of said catalyst

4,006,083

PRESSURE DIFFERENTIAL SWITCH

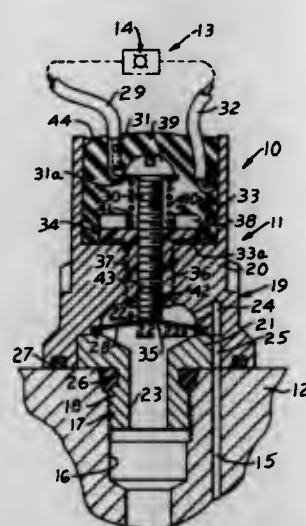
Ralph Westervelt, Pekin, and Lawrence F. Fratzke, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 9, 1975, Ser. No. 620,998

Int. Cl.² B01D 35/14

U.S. Cl. 210-90

12 Claims



1. In an apparatus for indicating a clogged condition of a fluid filter having an inlet and an outlet; electrically conductive housing means defining a chamber, electrically conductive snap-action wall means extending across said chamber dividing the chamber into a first portion and a second portion, said wall means being electrically connected to said housing, means for providing fluid communication between said first chamber portion and the filter inlet, means for providing fluid communication between said second chamber portion and the filter outlet, said wall means being self-biased toward a normal conical disposition projecting toward said first chamber portion, contact means, insulating means threaded to said housing and carrying said contact means to have normally closed electrical engagement with said wall means, the improvement comprising circuit means having a first portion electrically connected to said contact means, and a second portion retained in electrically connected engagement with said housing by said insulating means, said wall means being prestressed by said contact means and arranged to snap away from said contact means to open the circuit between said first and second circuit portions when the differential fluid pressure between said first and second chamber portions reaches a preselected elevated value; and means responsive to the opening of the circuit to indicate the reaching of said elevated pressure.

4,006,084

OIL RECLAIMING DEVICE

Glen R. Priest, Rte. 1, Box 3, Landmark Estates, Geronimo, Okla. 73543

Continuation-in-part of Ser. No. 358,893, May 10, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,378

Int. Cl.² B01D 3/28

U.S. Cl. 210-180

9 Claims

1. An oil reconditioning device for removing solid and liquid contaminants from lubricating oil comprising: a housing having an inlet at a lower end; an oil filter chamber in the lower portion of said housing; a filter in said filter chamber for removing said contaminants from said oil; a preheating chamber in said housing above said filter chamber; a hollow convex frustoconical vaporization plate comprising a plurality of concentric tiers within said housing on said filter above said filter chamber, the uppermost tier of said vaporization plate being provided with a plurality of circumferentially spaced capillaries for flow of oil and contaminants through said plate; the bottom face of said vaporization plate defining the roof of a frustoconical preheating chamber between said filter and

said vaporization plate for initially heating oil and liquid contaminants to vaporize the more volatile of said contaminants; the top face of said vaporization plate defining the floor of a vaporization chamber within said housing; a perforated plate secured with the bottom of said vaporization plate defining a floor of said preheating chamber; heating means in the upper portion of said housing for heating said vaporization chamber, said vaporization plate and said preheating chamber; said

vaporization plate being formed of a heat conducting material for heating said preheating chamber; means defining a side outlet from said housing immediately above the lowermost tier of said vaporization plate opening into said vaporization chamber; and means providing a vent passage from said vaporization chamber in the upper portion of said housing for escape of vaporized contaminants from said vaporization chamber.

4,006,085

LIQUID TREATING APPARATUS

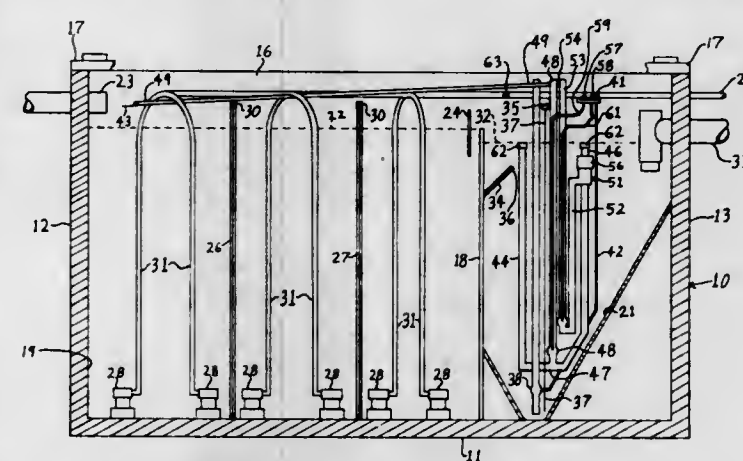
Orval Q. Matteson, 306 Reynolds St., Jacksonville, Ala. 36265

Filed Apr. 30, 1975, Ser. No. 573,351

Int. Cl.² C02C 1/08

U.S. Cl. 210-195 S

12 Claims



1. Liquid treating apparatus comprising:
a. an aeration chamber having an inlet for receiving the liquid to be treated and an outlet for discharging said liquid from said aeration chamber;
b. means of aerating said liquid in said aeration chamber;
c. a settling chamber having an inlet passageway and a discharge passageway in spaced relation to each other with said inlet passageway in communication with said outlet of said aeration chamber;
d. at least one permeable restraining member in said settling chamber of a fine mesh which restrains and dissipates currents yet permits liquid flow therethrough in a diffused manner and extending over substantially the entire cross-section of said settling chamber, between said inlet passageway and said discharge passageway with the upper

end of said restraining member extending above the high liquid level in said settling chamber and the lower end thereof terminating adjacent the bottom of said settling chamber and dividing said settling chamber into at least two compartments, and

e. sediment transfer means communicating with said settling chamber adjacent to the bottom thereof between said inlet passageway and said restraining member for transferring sediment from said settling chamber.

7. Liquid treating apparatus comprising:

a. an aeration chamber having an inlet for receiving the liquid to be treated and spaced from the discharge end of said aeration chamber.

b. means aerating said liquid in said aeration chamber,

c. a settling chamber having an inlet passageway in communication with said aeration chamber for receiving said liquid discharged from said aeration chamber and defining a weir over which the liquid flows,

d. a discharge passageway for said settling chamber at an elevation below the upper end of said weir defining a liquid level in said settling chamber below said upper end, and

e. a permeable deflection member being of a close mesh mounted in said settling chamber subjacent the liquid level therein and adjacent said weir and extending upwardly and away from said weir in position to restrain, distract, and deflect downward movement of said liquid discharged over said upper end of said weir.

4,006,086

APPARATUS FOR REMOVAL OF OIL FILMS FROM WATER

Ikuro Tsunoi, Yokohama, Japan, assignor to Kabushiki-Kaisha Kyoel Senpaku Kogyo, Yokohama, Japan

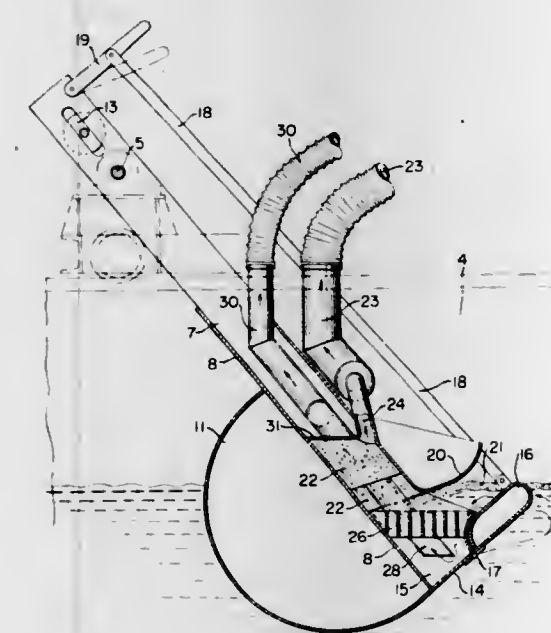
Filed May 14, 1975, Ser. No. 577,554

Claims priority, application Japan, July 1, 1974, 49-75217

Int. Cl.² E02B 15/04

U.S. Cl. 210-242 R

2 Claims



1. Apparatus for collecting light liquid from the surface of a body of water, said apparatus comprising an elongate chamber vertically arranged between the fuselages of a twinfuselage ship, an upper end of said chamber pivotably supported for swing movement in a direction parallel to an elongate axis of the fuselages with the lower end provided with float means for floatable support on the surface of water, inlet opening means in the lower end of the chamber in the direction of swinging movement, weir means pivotably connected to the lower edge of said inlet opening constructed and arranged to provide an adjustable lower edge for said inlet opening; horizontal plate

means defining the upper edge of said inlet opening, said plate being inclined upwardly in the direction faced by said inlet opening and being spaced above said weir means, a perforate plate horizontally arranged within said chamber near the bottom thereof, pump and conduit means for removing water from said chamber, an inlet end of said conduit being located in said chamber beneath said perforate plate above the bottom of the chamber, pump and conduit means for removing oil from said chamber, an inlet end of said conduit being located in said chamber above the perforate plate and beneath the upper end of said chamber.

4,006,087

FLUID DISTRIBUTION SYSTEM

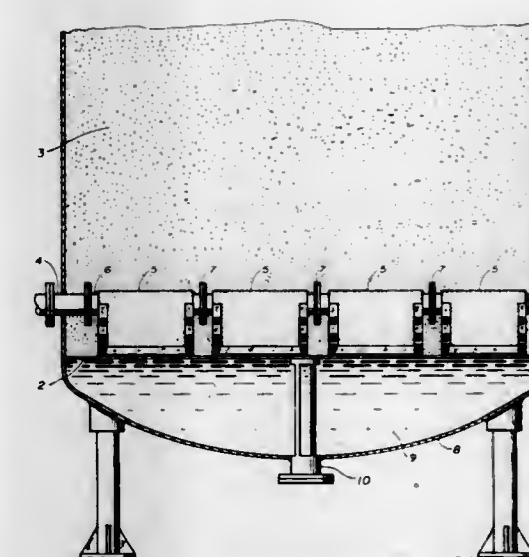
Thomas James Denton, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 23, 1975, Ser. No. 580,432

Int. Cl.² B01D 23/20

U.S. Cl. 210-289

2 Claims



1. A drain system for a bed of granular media supported within a vessel, including,
a horizontal plate mounted in the lower portion of a vessel,
a pair of simple channels mounted by their first ends on the horizontal plate to extend vertically and segmented on their upper ends,
a conduit segment of tubular form having perforations the length of the underside of the conduit segment and fitted into and supported at each end within the segmented upper ends of the channels and connected to a conduit which extends through the vessel wall,
a rigid support grating extending between the sides of the channels and beneath the conduit to form an unobstructed volume beneath the perforations,
and a screen structure draped over the pipe segment and channel and sealed to the channel sides and plate to fix its mesh openings as a part of the path for fluid flowing to and from the perforations while laterally supported by the grating to isolate the media particles from the perforations.

4,006,088

SNAP-LOCK BUTTON-TYPE FLUID CONNECTOR WITH RECESS

Burton Salkin, Schaumburg, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 8, 1975, Ser. No. 620,618

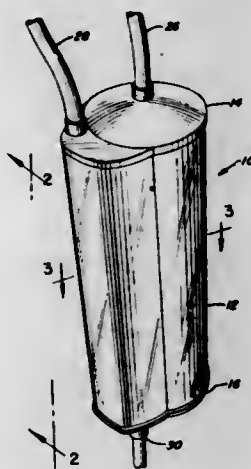
Int. Cl.² B01D 13/00

U.S. Cl. 210/321 B

8 Claims

1. A dialyzer comprising a semipermeable membrane, an external fluid conduit, a button-type connector connecting the semipermeable membrane to said external fluid conduit, said membrane having an aperture therethrough, said connector

including a cap and an integral barrel extending from said cap, said barrel having means defining at least one snap-lock recess in said barrel surface, and said connector having passageway extending through said barrel and cap, said dialyzer having complementary means for engaging said snap-lock recess to



lockingly maintain the button-type connector in place, said barrel extending through said aperture and said cap sealingly engaging the membrane adjacent said aperture such that a seal connection is provided between the membrane and said complementary means.

4,006,089

POLYOXYETHYLENE POLYAMINE MANNICH BASE PRODUCTS AND USE OF SAME IN FUELS AND LUBRICANTS

Sheldon Chibnik, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,268

Int. Cl.³ C10M 1/32

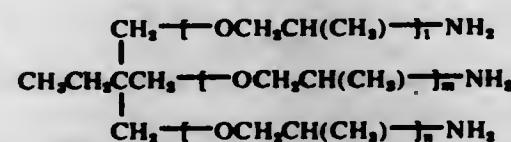
U.S. Cl. 252-51.5 R

11 Claims

1. A lubricant composition comprising a major amount of a lubricating oil of lubricating viscosity and a minor detergent amount of a Mannich base product which is the condensation product of (1) a polyalkyl-substituted hydroxyaromatic compound wherein the polyalkyl has a number average molecular weight of from about 100 to about 4000, (2) an amine having one of the formulae



and



wherein x is chosen such that the molecular weight of the amine is from about 142 to about 2000, b is from about 10 to about 50, $a + c$ is about 3.5 and the sum of l , m and n is from about 3 to about 10 and (3) an aldehyde wherein the respective molar ratios of reactants are 1:0.1-10:0.1-10.

4,006,090 ALPHA IRON (III) OXIDE CRYSTALS AND DERIVATIVES

Henry Nelson Beck, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,044, June 28, 1974, Pat. No.

3,919,404. This application July 21, 1975, Ser. No. 597,723

Int. Cl.³ C01G 49/06, 49/08

U.S. Cl. 252-62.56

5 Claims

1. Porous, elongated, polycrystalline, hematite particles having lengths of from about 0.05 to about 5 microns, effective diameters of from about 0.02 to about 0.9 microns and aspect ratios of from about 1.2 to about 6,

said particles being physically composed of elongate microcrystallites, loosely adhered together in the form of a generally cylindrical bundle with their long axes generally parallel to the long axis of the bundle,

said microcrystallites having effective diameters of from about 80A up to about one half the effective diameter of said bundle, and

said particles being chemically composed of alpha iron oxide containing from about 2 to about 4 weight percent of chemically bound sulfate and from about 0.003 to about 0.02 weight percent of chemically bound lithium.

4. Magnetite particles produced by the reduction of the hematite particles of claim 1 and having the shape, size and fine structure thereof, said magnetite particles having magnetic susceptibilities of from 293 to 416 oersteds, saturation magnetizations of 78 to 88 e.m.u./gram and squareness ratios (δ_r/δ_s) of 0.33-0.42.

5. Gamma iron oxide particles produced by the oxidation of the magnetite particles of claim 4 and having the shape, size and fine structure of the hematite particles of claim 1 and having magnetic coercivities of from 196 to 306 oersteds, saturation magnetizations of 66-71 e.m.u./gram and squareness ratios (δ_r/δ_s) of 0.32-0.38.

4,006,091

PLASTIC BOTTLE STORABLE OVEN CLEANER

Richard A. Lindblom, Comstock Park, and Richard E. Madden, Middleville, both of Mich., assignors to Amway Corporation, Ada, Mich.

Filed Mar. 14, 1975, Ser. No. 558,411

Int. Cl.³ C11D 7/06, 7/10, 7/26; C23G 1/14

U.S. Cl. 252-90

27 Claims

1. A packaged liquid oven cleaning composition which comprises: a plastic container containing a liquid oven cleaning composition, said liquid oven cleaning composition itself comprising: a sufficient quantity, from about 5% to about 12%, of sodium hydroxide to provide a strong cleaning base for the composition; starch in the quantity range of from about one per cent to about ten per cent by weight; one of a di- and trivalent metallic soap, selected from the group consisting of magnesium, copper, zinc and aluminum soap, in the quantity range of from about 0.5 to 5% by weight; and sufficient water to render the composition sufficiently spreadable yet sufficiently consistent for use as an oven cleaner.

4,006,092

LAUNDERING AID

J. Paul Jones, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 230,491, Feb. 29, 1972, abandoned. This application Aug. 1, 1973, Ser. No. 384,528

The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.

Int. Cl.³ C11D 3/395

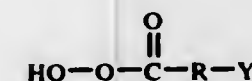
U.S. Cl. 252-95

6 Claims

1. A dye transfer inhibiting composition consisting essentially of

a. from about 2 to about 75% by weight of a peroxygen compound selected from the group consisting of (1)

water-soluble monopersulfates (2) water-soluble monophosphates, (3) organic peroxyacids having the general formula



wherein R is selected from the group consisting of alkylene groups containing from about 1 to about 16 carbon atoms and arylene groups containing from about 6 to about 8 carbon atoms, and Y is selected from the group consisting of hydrogen, chlorine, methyl, phenyl.



(4) water-soluble salts of said peroxyacids, and (5) mixtures of compounds selected from groups (1) through (4);

b. from about 0.2 to 40% by weight of an activator compound selected from the group consisting of aldehydes, ketones, and compounds which yield aldehydes or ketones in aqueous solution, said activator producing a Relative Oxidation Constant of 0.25 or greater;

c. from about 5 to 40% by weight of a polyvinyl compound selected from the group consisting of vinylpyrrolidone-acrylonitrile copolymers, vinylpyrrolidone-maleic anhydride copolymers and poly-4-vinyl-methyl-pyridinium iodide;

d. from about 1 to about 85% of a buffering compound capable of maintaining the pH of an aqueous solution of said dye transfer inhibiting composition within the range of from about 7 to about 12;

said composition being substantially free of anionic surfactants.

4,006,093

SURFACTANTS CONTAINING IODINE

Paul Diessel, Mannheim, Germany; Herbert Helfert, Trenton, Mich.; Reiner Hamm, Ludwigshafen, and Hans-Georg Scharpenberg, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 6, 1974, Ser. No. 530,303

Claims priority, application Germany, Dec. 17, 1973, 2362580

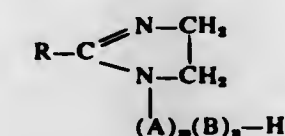
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.³ C11D 3/48

U.S. Cl. 252-106

4 Claims

1. A detergent-iodine addition complex which yields a germicidally active amount of iodine, the detergent component of the complex being at least one compound of the formula



in which R is alkyl or alkenyl of 2 to 22 carbon atoms, A is an ethylene oxide radical, B is a propylene oxide radical, m is an integer from 10 to 30 and n is an integer from 3 to 10, and the ratio $n:m$ is from 1:2 to 1:8, and the amount of iodine bound in said complex being from 15 to 40% by weight, based on the detergent component.

4,006,094

HAND DRYING AND CONDITIONING MATERIAL

Marshall Pellar, 7070 Fairway Road, La Jolla, Calif. 92037

Filed Nov. 7, 1973, Ser. No. 413,667

Int. Cl.³ C09K 3/14

U.S. Cl. 252-194

2 Claims

1. A hand drying and conditioning material comprising in combination:

a base of wood material in small rough particles having a particle size of 1/32" screen size or smaller,

a small quantity of powdered tricalcium phosphate desiccant material comprising two to twenty percent by weight of said wood particles,

said wood particles being selected from the group consisting of redwood, peanut hulls, and corn husks.

4,006,095

STABLE HYDROCARBON SOLUTIONS OF ALUMINUM HYDRIDE

Doyt K. Hoffman; Ricardo O. Bach, and Conrad W. Kamien-ski, all of Gastonia, N.C., assignors to Lithium Corporation of America, New York, N.Y.

Filed Mar. 31, 1972, Ser. No. 239,993

Int. Cl.³ C01B 6/06; C07F 5/06

U.S. Cl. 252-188

14 Claims

1. In a method of preparing liquid hydrocarbon solvent solutions of AlH_3 , the steps which comprise reacting essentially 3 moles of an alkali metal hydride with 1 mole of AlHal_3 , where Hal is halogen selected from the group consisting of chlorine, bromine and iodine, in a liquid hydrocarbon solvent medium in the presence of an ether selected from the group consisting of tetrahydrofuran and dimethylether.

4,006,096

METHOD OF MAKING FISSIONABLE-FUEL AND FERTILE BREEDER MATERIALS FOR NUCLEAR REACTORS

Rüdiger Förthmann; Muwaffak Hamesch, and Hubertus Nickel, all of Jülich, Germany, assignors to Kernforschung-sanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Germany

Division of Ser. No. 210,247, Dec. 20, 1971. This application Jan. 26, 1973, Ser. No. 326,823

Claims priority, application Germany, Dec. 24, 1970, 2063720

Int. Cl.³ G21C 3/62; G09K 3/00

U.S. Cl. 252-301.1 S

2 Claims

1. A method of preparing a nuclear material for a nuclear reactor which comprises the steps of:

a. precipitating an aqueous solution of a nuclear material selected from the group which consists of thorium and uranium nitrates with ammonium hydroxide and filtering the precipitate,

b. combining the precipitate with an aqueous solution containing a water soluble aluminum or niobium salt and nitric acid heated to boiling to form a colloidal solution,

c. partially evaporating the colloidal solution and mixing with hexamethylenetetramine and adding to a paraffin oil bath to form particles,

d. freeing the particles by washing with petroleum ether and extracting the ammonium nitrate by storing under a concentrated ammonia solution, removing the particles by filtration and air drying,

e. sintering the particles until dense fuel cores form, and

f. coating the fuel particles with a pyrocarbon layer.

4,006,097

YB ACTIVATED HAFNIUM OXIDE PHOSPHOR AND METHODS OF MAKING

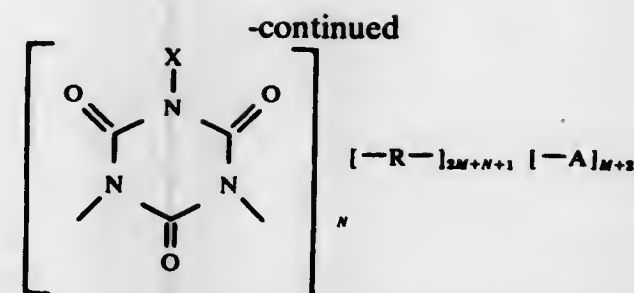
Paul V. Kelsey, Jr., Blacksburg, Va., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 509,293, Sept. 24, 1974, abandoned. This application May 5, 1975, Ser. No. 574,275 Int. Cl.³ C09K 11/46

U.S. Cl. 252-301.4 F 2 Claims

1. A method of making a phosphor composition having the general formula $\text{HfO}_2\cdot\text{Yb}$ with Yb being present in an amount of from 0.005 to 0.10 moles per mole of hafnium which comprises the steps of: forming a substantially homogeneous mixture of appropriate amounts of the oxides of hafnium and ytterbium to yield the desired formulation; firing said mixture in a controlled atmosphere furnace under a nitrogen atmosphere for about 6 hours at about 1000° C; and mortaring said fired mixture and refiring in a nitrogen atmosphere at about 1250° C for about 6 hours.

2. A method of making a phosphor composition having the general formula $\text{HfO}_2\cdot\text{Yb}$ with Yb being present in an amount of from 0.005 to 0.10 moles per mole of hafnium which comprises the steps of: forming an aqueous solution of appropriate amounts of $\text{HfOCl}_2\cdot 8\text{H}_2\text{O}$ and Yb_2O_3 ; adding a sufficient amount of HNO_3 to said solution to solubilize said Yb_2O_3 and heating and stirring constantly at a temperature of about 70° C until a clear solution is obtained; adding a precipitating agent selected from the group consisting of oxalic acid, ammonium carbonate, and ammonium hydroxide to form a precipitate; filtering and drying said precipitate; and first firing said precipitate in a controlled atmosphere furnace with a nitrogen atmosphere at about 980° C to 1000° C for about 2 hours and second firing said precipitate in said furnace at about 1200° C for 2 hours.



wherein

R = divalent hydrocarbon or substituted hydrocarbon radical, containing 2 to about 40 carbon atoms,

X is selected from the group consisting of metals, or quaternary ammonium radicals,

A is a monovalent organic radical selected from the group consisting of $-\text{NHCOR}'$, $-\text{NHCONHR}'$, $-\text{NH}_2$, $-\text{NHR}'$, and $-\text{NR}'_2$,

R' is a monovalent hydrocarbon radical or substituted hydrocarbon radical containing from 1 to about 40 carbon atoms,

M is the average number of trisubstituted isocyanurate rings per molecule and is a positive integer from zero to about 400,

2M+N+1 = the average number of divalent R groups and is a positive integer from 2 to about 11,000, and wherein M+2 is the average number of A groups and is a positive integer from 2 to about 400, and wherein there are no N-to-N bonds, no A-to-N bonds, no A-to-A bonds and no R-to-R bonds,

N is the average number of isocyanurate salt groups and is a positive integer from 1 to about 10,000, are useful emulsifying agents.

4,006,099

MANUFACTURE OF GASEOUS MIXTURES COMPRISING HYDROGEN AND CARBON MONOXIDE

Charles P. Marion, Mamaroneck, N.Y., and William B. Crouch, Whittier, Calif., assignors to Texaco Inc., New York, N.Y.

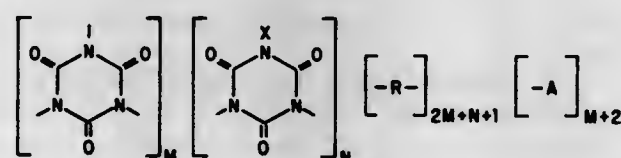
Filed June 16, 1975, Ser. No. 587,191

Int. Cl.³ C01B 2/14

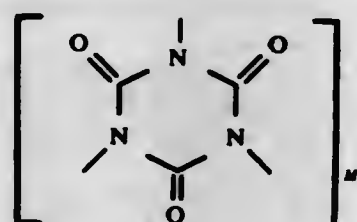
U.S. Cl. 252-373

2 Claims

1. In the manufacture of a product gas mixture comprising H_2 and CO, together with CO_2 , H_2O , particulate carbon, and one or more materials from the group consisting of CH_4 , COS, H_2S , A, and N_2 by the partial oxidation of a dispersion of petroleum oil and steam with a free-oxygen containing gas in the reaction zone of a free-flow noncatalytic gas generator at a pressure in the range of about 1 to 250 atmospheres and at an autogenous temperature in the range of about 1500° to 3500° F, wherein said reactants are introduced into the reaction zone of said gas generator by way of a double-annulus-type burner having a central cylindrical conduit, an intermediate coaxial conduit with a converging nozzle at the downstream tip of the burner, said intermediate conduit surrounding said central conduit and being longitudinally and radially spaced therefrom so as to provide an intermediate annular passage therebetween, and an outer coaxial conduit with a converging nozzle at the downstream tip of the burner, said outer conduit surrounding said intermediate conduit and being longitudinally and radially spaced therefrom so as to provide an outer annular passage therebetween; the improvement which comprises passing through said central conduit of said annulus-type burner a stream of free-oxygen containing gas comprising a portion of the total oxygen subsequently required in the reaction zone, simultaneously passing through said intermediate annular passage said stream of petroleum oil-steam dispersion; simultaneously passing through said outer annular passage a stream of free-oxygen containing gas comprising the remainder of the free-oxygen required in the reaction zone, wherein the linear velocities of said stream of free-oxygen containing gas are in the range of about 300 to



I. A composition comprising a mixture of compounds containing in a single molecule isocyanurate and metal isocyanurate, and having the general structure



990 feet per second, and the linear velocity of said stream of petroleum oil-steam dispersion is in the range of about 650 to 1100 ft. per sec. and is at a higher velocity than either or both of said streams of free-oxygen containing gas; impinging said three streams together so as to produce a mixture in which the atomic ratio of free-oxygen in the oxidant to carbon in the petroleum oil is in the range of about 0.8 to 1.35; and reacting said mixture by partial oxidation at a temperature in the range of about 1500° to 3500° F and a pressure in the range of about 1 to 250 atmospheres to produce said product gas mixture.

4,006,100

MANUFACTURE OF GASEOUS MIXTURES COMPRISING HYDROGEN AND CARBON MONOXIDE

William B. Crouch, Whittier, Calif., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 29, 1975, Ser. No. 572,775

Int. Cl.³ C01B 2/14

U.S. Cl. 252-373

4 Claims

1. In the manufacture of a product gas mixture comprising H_2 , CO, CO_2 , H_2O together with particulate carbon and impurities selected from the group consisting of CH_4 , COS, H_2S , A, N_2 , and mixtures thereof by the partial oxidation of a liquid hydrocarbonaceous fuel selected from the group consisting of petroleum distillate and residua, gas oil, residual fuel, reduced crude, whole crude, asphalt, coal tar, coal oil, shale oil, tar sand oil, and mixtures thereof with a free-oxygen containing gas in the reaction zone of a free-flow noncatalytic gas generator at a pressure in the range of about 1 to 250 atmospheres and an autogenous temperature in the range of about 1500° to 3500° F, and wherein said reactants are introduced into the reaction zone of said gas generator by way of an annulus-type burner having a central coaxial cylindrical conduit, an outer coaxial conduit with a converging nozzle at the downstream tip of the burner, said outer conduit surrounding said central conduit and being longitudinally and radially spaced therefrom so as to provide an annular passage therebetween, the improvement which comprises passing through said central conduit of said annulus-type burner a stream of said liquid hydrocarbonaceous fuel in liquid phase at a velocity in the range of about 0.1 to 1 foot per second, simultaneously passing through said annular passage at a velocity in the range of about 50 feet per second to sonic velocity a stream of free-oxygen containing gas in admixture with a temperature moderator; impinging said streams together so as to produce an atomized mixture in which the atomic ratio of free-oxygen to carbon in the fuel is in the range of about 0.6 to 1.5; and reacting said atomized mixture to produce said product gas mixture.

4,006,101

POLYMERIZATION OF OLEFINS AND CATALYSTS THEREFOR

Kazuo Matsuura, Kawasaki; Nobuyuki Kuroda, Yokohama; Takeichi Shirashi, Kawasaki, and Mitsuji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company Ltd., Japan

Continuation-in-part of Ser. No. 439,959, Feb. 5, 1974, abandoned. This application Aug. 29, 1975, Ser. No. 608,898 Claims priority, application Japan, Feb. 9, 1973, 48-16157

Int. Cl.³ C08F 4/02, 4/64, 4/68

U.S. Cl. 252-429 C

3 Claims

1. A catalyst composition for use in the polymerization or copolymerization of olefins which consists essentially of a solid carrier and a titanium halide, a vanadium halide mixtures thereof carried thereon, said halides being liquid at the treatment conditions, said titanium halide being titanium tetrachloride, titanium tetrabromide, ethoxy trichlorotitanium, diethoxy dichlorotitanium, dibutoxy dichlorotitanium or phenoxy trichlorotitanium and said vanadium halide being vanadium tetrachloride or oxytrichlorovanadium, said solid carrier resulting from the reaction of

a. anhydrous magnesium halide

b. silicon tetrachloride, and
c. a compound having the general formula

ROH

where R is an organic group of 1 to 20 carbon atoms, said organic group being an alkyl, alkenyl, aryl or aralkyl group or substituted alkyl, alkenyl, aryl or aralkyl group, in which the substituents do not substantially react with the other components of the composition, the mol ratio of the compound ROH to silicon tetrachloride being in the range from 1 to 1/10 to 100, and the mol ratio of said anhydrous magnesium halide to said silicon tetrachloride being 1 to 0.01 to 100, the reaction being carried out at a temperature of from 10° to 300° C.

4,006,102

STABILIZED RHENIUM CATALYST

Haren S. Gandhi, Dearborn Heights; Mordecai Shelef, Southfield; Henryk K. Stepien, Detroit, and Hsin C. Yao, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 25, 1975, Ser. No. 607,658

Int. Cl.³ B01J 21/04, 21/08, 23/36

U.S. Cl. 252-454

4 Claims

1. A rhenium catalyst resistant to volatilization after oxidation to a higher oxidation state consisting of:
a catalyst substrate formed of a ceramic material;
a refractory oxide coating on said substrate;
rhenium metal deposited on said refractory oxide coating in a finely divided form;
said refractory oxide coating being present in an amount in excess of 15% by weight of the total weight of the substrate.

4,006,103

CATALYST FOR TREATING EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE

Garbis H. Meguerian, Olympia Fields; Eugene H. Hirschberg, Park Forest, and Frederick W. Rakowsky, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 336,256, Feb. 27, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,352

Int. Cl.³ B01J 21/04, 23/40, 23/74, 27/24

U.S. Cl. 252-438

17 Claims

1. A catalyst for the reduction of nitrogen oxides in the exhaust gas from an internal combustion engine, which catalyst comprises a nickel component, a rhodium component, and a monolithic ceramic support for said nickel component and said rhodium component, said nickel component being present in an amount ranging from 2.5 to 12 wt.%, expressed as the metal and based on total catalyst weight, and comprising at least 75 wt.% of the total active metals present, and said rhodium component being present in an amount ranging from 0.01 to 0.08 wt.%, expressed as the metal and based on total catalyst weight, said catalyst being prepared by sequentially applying in the order specified hereinbelow to said monolithic ceramic support first a solution containing a dissolved salt of nickel and second a solution containing a dissolved salt of rhodium, the application of each solution being followed by the removal of the diluent of that solution by drying to deposit on the support the salt of that solution and the calcination of the support with the salt of that solution thereon, said calcination being conducted in air at a temperature of about 1,000° to 1,500° F.

4,006,104

PROCESS FOR CONVERTING γ -BUTYROLACTONE INTO TETRAHYDROFURAN

Georg Michalczyk, Neukirchen-Vluyn, and Karl-Heinz Gluzek, Alpen, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany
Division of Ser. No. 488,351, July 15, 1974, Pat. No. 3,969,371. This application Sept. 15, 1975, Ser. No. 613,396
Claims priority, application Germany, Aug. 3, 1973, 2339344

Int. Cl.² B01J 23/84

U.S. Cl. 252-465

3 Claims

1. A catalyst suitable for the high conversion of γ -butyrolactone selectively to tetrahydrofuran consisting essentially of cobalt-modified copper chromite on aluminum oxide, wherein said catalyst comprises from about 12.0 to 14.5 weight percent CoO, from about 12.5 to 16.0 weight percent CuO, from about 15.5 to 19.5 weight percent Cr₂O₃ and the balance aluminum oxide.

4,006,105

NO₂ REDUCTION CATALYST FOR INTERNAL COMBUSTION ENGINE EMISSION CONTROL

Robert J. Fedor, Westlake, and Cameron S. Ogden, Hudson, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.
Continuation-in-part of Ser. No. 441,504, Feb. 11, 1974; Ser. No. 451,032, March 22, 1974; Ser. No. 453,567, March 22, 1974; Ser. No. 457,101, April 1, 1974; Ser. No. 460,742, April 15, 1974; Ser. No. 460,786, April 15, 1974; Ser. No. 460,787, April 15, 1974; Ser. No. 460,436, April 15, 1974; Ser. No. 466,737, May 3, 1974; Ser. No. 466,965, May 6, 1974; Ser. No. 467,106, May 6, 1974; all abandoned, which in turn are a continuation-in-part of Ser. No. 207,338, filed Dec. 3, 1971; Ser. No. 207,284, Dec. 13, 1971; Ser. No. 207,337, Dec. 13, 1971; Ser. No. 207,303, Dec. 13, 1971; Ser. No. 240,028, Mar. 31, 1972; Ser. No. 240,029, Mar. 31, 1972; Ser. No. 240,091, Mar. 31, 1972; Ser. No. 240,090, Mar. 31, 1972; Ser. No. 240,092, Mar. 31, 1972; Ser. No. 207,281, Dec. 13, 1971; Ser. No. 207,525, Dec. 13, 1971, all abandoned, which in turn are a continuation-in-part of Ser. No. 149,331, June 2, 1971 abandoned. The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.

Int. Cl.² B01J 21/04, 23/72, 23/86, 35/04

U.S. Cl. 252-465

23 Claims

1. A catalytic structure capable of reducing the concentration of undesirable gases in the exhaust gases of an internal combustion engine by chemically reducing oxides of nitrogen, said structure having high NO₂ reducing activity and comprising a thin, expanded metal foil structure having a plurality of strands defining openings therebetween said structure consisting essentially of a metallic reinforcing member and a metallic catalytic surface layer metallurgically bonded thereto, said layer comprising an NO₂ reducing catalyst comprising a mixture of nickel and copper, said metallic reinforcing member comprising:

- i. from about 50 to 85 weight percent of a first metal selected from the group consisting of nickel, mixtures of nickel and cobalt, mixtures of nickel and iron, and mixtures of nickel, iron and cobalt, said iron and cobalt individually not exceeding about 1 weight percent of said member and said nickel being present in said mixtures in an amount of at least about 48 weight percent of said member, and
- ii. from about 15 to about 50 weight percent of a second metal selected from the group consisting of chromium and mixtures of chromium and aluminum, said aluminum not exceeding about 10 weight percent of said member

and said chromium being present in said mixtures in an amount of at least about 5 weight percent of said member.

4,006,106

SELF SEALABLE GLASSY RESISTOR COMPOSITION FOR A RESISTOR SEALED SPARK PLUG

Mitsutaka Yoshida, Chita, and Masao Sakai, Kasugai, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Sept. 29, 1975, Ser. No. 617,596

Claims priority, application Japan, Oct. 8, 1974, 49-115145
Int. Cl.² H01B 1/02, 1/04; H01C 1/02, 1/04

U.S. Cl. 252-513

3 Claims

1. A self sealable glassy resistor composition for a resistor sealed spark plug consisting essentially of 5-40% by weight of at least one of the resistance value stabilizing component selected from the group consisting of oxides of metals of Groups IVb and Vb of the Periodic Table, La₂O₃, ThO₂, and SiC; a water soluble carbonaceous material selected from the group consisting of: sugar, lactose, maltose, raffinose, glucose, xylose, dextrine methyl cellulose, ethylene glycol, glycerine, propylene glycol, polyethylene glycol and polyvinyl alcohol, present in such an amount that 0.1-5.0% by weight of carbon value is contained in the final composition, 35-85% by weight of borosilicate glass powder, 5-25% by weight of at least one metal or alloy, the melting point of which is higher than the glass seal temperature, said metal or alloy being selected from the group consisting of: Fe, Fe-B, Fe-Ti, Cu, Ni, Cr, Mn and Ni-Cr, and 2-20% by weight of at least one metal or alloy, the melting point of which is lower than the glass seal temperature, said metal or alloy being selected from the group consisting of: Sn, Sb, Zn, Al, Pb, Te, Cu-Sn and Cu-Zn, provided that the total amount of both the higher melting point metal or alloy and the lower melting point metal or alloy is not greater than 30% by weight.

4,006,107

METHOD OF PRODUCING TERNARY LEAD MOLYBDENUM SULFIDES

Simon Foner, Belmont; Edward J. McNiff, Jr., and Edwin J. Alexander, both of Danvers, all of Mass., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 13, 1975, Ser. No. 604,384

Int. Cl.² C01B 17/00; H01L 39/00

U.S. Cl. 252-518

3 Claims

1. A method of preparing a compound having a T_g of at least about 12.3 K and an H₂ of at least about 400 kG at 4.2 K comprising the steps of:

- a. mixing commercial reagent grade powders of lead, molybdenum and sulfur in the atomic proportions of Pb_zMo_yS_x, where z = 5.4-7.2, y = 4.5-5.6, and x = 0.8-1.1;
- b. heating the aforementioned mixture in a sealed, evacuated container to a temperature in the range of 950°-1150° C;
- c. maintaining the temperature until the compound is formed; and
- d. cooling the compound to ambient temperature at a controlled rate not in excess of 4° C per minute.

4,006,108

Z-ETHYL-3,6,6-TRIMETHYL-2-CYCLOHEXENE-1-CARBOXYLIC ACID ESTERS

Paul Albert Ochsner, Geneva, and Hanspeter Schenk, Zumikon, both of Switzerland, assignors to Glivaudan Corporation, Clifton, N.J.

Filed Apr. 14, 1975, Ser. No. 567,891

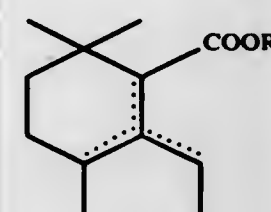
Claims priority, application Switzerland, Apr. 19, 1974, 5436/74; Feb. 13, 1975, 1772/75

Int. Cl.² C11B 9/00

U.S. Cl. 252-522

5 Claims

1. A cyclohexanoyl compound of the general formula



(Va)

wherein R represents a C₁₋₄ alkyl or phenyl group and one of the three lines indicated by dots represents an additional bond.

4,006,109

TRIMETHYL NONENE ALCOHOLS AND PERFUME COMPOSITIONS

Paul Albert Ochsner, Geneva, and Karl-Fred De Polo, Onex, both of Switzerland, assignors to Glivaudan Corporation, Clifton, N.J.

Filed Mar. 10, 1975, Ser. No. 556,991

Claims priority, application Switzerland, Mar. 15, 1974, 3628/74

Int. Cl.² C11B 9/00

U.S. Cl. 252-522

5 Claims

1. An odorant composition which comprises an olfactorily-effective amount of an alcohol of formula I given in claim 1 and at least one other olfactory agent.

4,006,110

MANUFACTURE OF FREE-FLOWING PARTICULATE HEAVY DUTY SYNTHETIC DETERGENT COMPOSITION

Edward J. Kenney, Bernardsville; Frank R. Smith, Jr., North Plainfield, and Walter A. DiSalvo, North Arlington, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 203,365, Nov. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 124,111, March 15, 1971, Pat. No. 3,838,072, and a continuation-in-part of Ser. No. 134,324, April 15, 1971, Pat. No. 3,886,098. This

application May 13, 1974, Ser. No. 469,502

The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

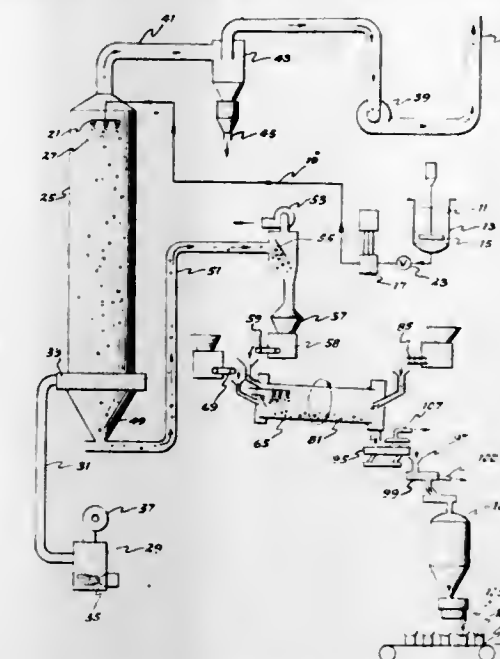
Int. Cl.² C11D 1/22, 1/83

U.S. Cl. 252-540

10 Claims

1. A method of preparing a particulate detergent composition which comprises spraying onto a particulate base detergent composition consisting essentially of a water soluble anionic sulf(on)ate synthetic organic detergent having a higher linear alkyl chain therein, 0 to about 36 nonionic detergent, sodium silicate and adjuvant(s), the particles of which are substantially all within the 6 to 140 mesh U.S. Standard Sieve series range and contain less than 5% of particles passing through a 200 mesh sieve, with the ratio of sulf(on)ate detergent to sodium silicate being from 3:1 to 1:3 and with said sodium silicate being of a Na₂O:SiO₂ ratio in the range of 1:1.6 to 1:3, while maintaining the particles in motion, from 1 to 6% of a normally solid nonionic detergent in liquid state, at a temperature of 40° to 90° C., with the amount of nonionic detergent in the product being from 1/15 to 1/4 that of the

anionic detergent, said nonionic detergent being selected from the group consisting of higher alkoxy poly-lower alkoxy lower alkanols and nonyl or higher alkyl aryloxy poly-lower alkoxy lower alkanols wherein higher designates a carbon atom con-



tent of 10 to 16, lower designates a carbon atom content of 2 to 3 and the aryl of the aryloxy radical is selected from the group consisting of phenyl, tolyl and xylol and the poly-lower alkoxy lower alkanol group in said nonionic detergent compound contains 4 to 100 mols of lower alkylene oxide per mol.

4,006,111

PRODUCTION OF ALKANE: OLEFIN SULFONATE MIXTURES BY SEQUENTIAL SULFONATION AND SULFITATION

Virender Nath Malhotra, and John Mather, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed July 11, 1973, Ser. No. 378,082

Claims priority, application United Kingdom, July 12, 1972, 36252/72

Int. Cl.² C07D 139/12, 143/16; C11D 1/14, 1/37

U.S. Cl. 252-555

4 Claims

1. A process for preparing a mixture of alkane and alpha-olefin sulfonates containing from 6 to 20 carbon atoms for use in detergent formulations, by sulphonation and sulphitation of an alpha-olefin feedstock characterized in that the total alpha-olefin feedstock containing from 6 to 20 carbon atoms is subjected to incomplete sulphonation with a conversion of from 10 to 70%, and sulphitation sequentially.

4,006,112

STARCH/POLYESTER BASED ON TRIMELLITIC ACID COMPOUND

Mark E. Bateman, Woodridge, and Eugene M. Holda, Glen Ellyn, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 512,109, Oct. 4, 1974, Pat. No. 3,931,422.

This application Apr. 23, 1975, Ser. No. 570,709

Int. Cl.² C08L 3/02

U.S. Cl. 260-9

5 Claims

1. A composition comprising degraded starch and a polyester of a polyhydric alcohol and a trimellitic acid compound, said polyester having an average molecular weight under about 4,000 and an acid number of at least 35, wherein said polyester is present in a weight ratio of 0.1 to 100 parts by weight per each 100 parts by weight starch solids.

4,006,113

NOVEL COATING COMPOSITION CONTAINING ACETYLENE-CONJUGATED DIENE RANDOM COPOLYMERS

Junji Furukawa, Kyoto; Eichi Kobayashi, and Takahiro Kawagoe, both of Uji, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,032

Claims priority, application Japan, Sept. 12, 1973, 48-102229; Sept. 12, 1973, 48-102230

Int. Cl.³ C08L 91/00

U.S. Cl. 260—23.7 R 10 Claims

1. A coating composition consisting essentially of 100 parts by weight of (A) an acetylene-conjugated diene random copolymer having an acetylene unit content of 5–60 mol % and a block character P of 0.8–1.2 and 5–1,000 parts by weight of (B) a carbon-carbon double bond-containing compound selected from the group consisting of (a) natural drying oil and semi-drying oil selected from the group consisting of linseed oil, tung oil, coconut oil and cotton oil, (b) rubber selected from the group consisting of polybutadiene, polyisoprene, polychloroprene, styrene-butadiene copolymer, butadiene-isobutylene copolymer and butadiene-acrylonitrile copolymer and (c) a monomer selected from the group consisting of styrene, acrylonitrile, methyl methacrylate, acrylamide, vinyl acetate, vinyl pyridine and maleic anhydride.

4,006,114

FLAME RETARDANT POLYPROPYLENE COMPOSITIONS

Allen William Carlson, Wayne, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 26, 1975, Ser. No. 635,505

Int. Cl.³ C08L 91/00

U.S. Cl. 260—28.5 D 9 Claims

1. A flame retardant polypropylene composition which comprises:
 - a. polypropylene resin
 - b. sufficient chlorinated polyethylene to provide a weight ratio of chlorinated polyethylene to polypropylene in the range from about 20:80 to about 50:50, said chlorinated polyethylene containing from about 20 to about 55 percent by weight bound chlorine;
 - c. at least 5 parts by weight of antimony oxide per 100 parts of the combined weights of polypropylene and chlorinated polyethylene;
 - d. at least 15 parts by weight of chlorinated paraffin hydrocarbon per 100 parts of the combined weights of polypropylene and chlorinated polyethylene, said chlorinated paraffin hydrocarbon containing on the average from about 18 to 36 carbon atoms per molecule and between about 40 to about 80 percent by weight bound chlorine.
 - e. at least 20 parts by weight of alumina trihydrate per 100 parts of the combined weights of polypropylene and chlorinated polyethylene.

4,006,115

PHTHALATE ESTER CONTAINING NYLON COMPOSITION

Donald Lee Elbert, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1974, Ser. No. 536,670

Int. Cl.³ C08K 3/22, 5/12; C08L 77/00

U.S. Cl. 260—31.8 N 13 Claims

1. A composition of matter comprising a nylon resin, an additive insoluble in the nylon resin selected from the group consisting of fillers, and flame-retardant synergists and from

0.1 to 10 percent by weight of a phthalate ester of a C₄ to C₁₂ alkyl or cycloalkyl alcohol or a phenol, wherein the filler is from 5 to 50 weight percent of the total composition and the flame-retardant synergist is from 1 to 10 weight percent of the total composition.

4,006,116

BLOCK COPOLYMER COMPOSITIONS AND ARTICLES

Richard J. G. Dominguez, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 26, 1975, Ser. No. 635,564

Int. Cl.³ A43B 13/04; C08K 5/01

U.S. Cl. 260—33.6 AQ 8 Claims

1. A composition comprising:
 - a. 100 parts by weight of block copolymers including
 - a₁ 50–90 parts by weight of at least one block copolymer A having at least two monoalkenylarene polymer blocks and at least about 95% hydrogenated polymer block of a conjugated diene, said copolymer comprising 25–35% by weight of monoalkenylarene polymer blocks, each of the latter having an average molecular weight between about 7,500 and 15,000;
 - a₂ 10–50 parts by weight of at least one block copolymer B having at least two monoalkenylarene polymer blocks and at least about 95% hydrogenated polymer block of a conjugated diene, said copolymer comprising 25–36% by weight of monoalkenylarene polymer blocks, each of the latter having an average molecular weight between about 20,000 and 37,000;
 - b. 50–150 parts by weight of a hydrocarbon oil containing less than about 30% by weight of aromatics;
 - c. 25–90 parts by weight of an alpha-olefin polymer having a melt flow between 5 and 25 dg/min.;
 - d. 0–35 parts by weight of resin; and
 - e. 0–150 parts by weight of a finely divided filler.

4,006,117

AMINE PHOSPHITE ANTIOXIDANTS

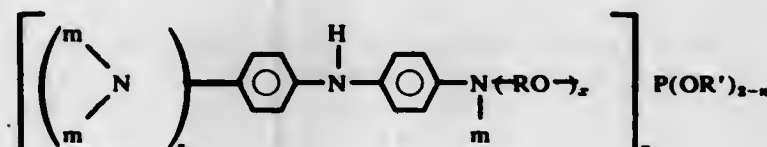
D. Bruce Merrifield, Williamsville; Joseph A. Pawlak, Cheektowaga, and James G. Colson, Williamsville, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 326,200, Jan. 24, 1973, abandoned. This application June 6, 1975, Ser. No. 584,445

Int. Cl.³ C08K 5/52

U.S. Cl. 260—45.9 NP 12 Claims

1. A method of stabilizing organic substrates against atmospheric degradation comprising incorporating therein a stabilizing amount of at least one compound of the formula



wherein

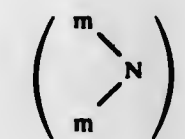
R is selected from the group consisting of ethylene, 1,2-propylene, 1,2-butylene, 2,3-butylene, styrylene and mixtures thereof,

X is an integer from 1 to 12,

R' is substituted or unsubstituted alkyl or aryl,

n is an integer from 1 to 3,

each m is a member, selected independently from the group consisting of hydrocarbon of 1 to 20 carbon atoms, —RO—H and —RO—P(OR')₂, wherein R, R', n and x are as above described, and z is 0 or 1, providing that when z is 0,



is hydrogen.

4,006,118

FLAME-RETARDANT THERMOPLASTIC POLYMER COMPOSITIONS

Yoshikatsu Ogawa, Takatsuki; Takeshi Kasahara, Sakai, and Haruhiko Hisada, Yao, all of Japan, assignors to Marubishi Yuka Kogyo Kabushiki Kaisha and Mitsubishi Petrochemical Company Limited, both of, Japan

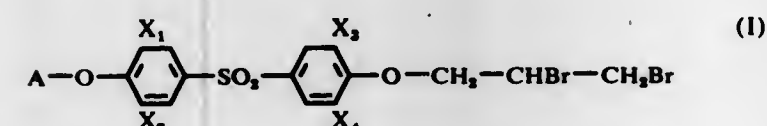
Continuation-in-part of Ser. No. 264,778, June 21, 1972, abandoned. This application May 4, 1973, Ser. No. 357,189

Claims priority, application Japan, July 28, 1971, 46-56044; Oct. 15, 1971, 46-80927

Int. Cl.³ C08K 5/59, 5/41

U.S. Cl. 260—45.75 B 10 Claims

1. A flame-retardant thermoplastic polymer composition comprising at least one thermoplastic polymer derived from an ethylenically unsaturated monomer and from 0.1 to 20%, based on the weight of the thermoplastic polymer, of at least one specific brominated alkoxydiphenyl sulfone derivative of the formula (I):



wherein A is a member selected from the group consisting of a hydrogen atom and allyl, propyl, 2,3-dichloropropyl and 2,3-dibromopropyl groups, and X₁, X₂, X₃ and X₄ are members selected from the group consisting of chlorine and bromine atoms with at least two of them being bromine atom.

4,006,119

STABILIZED EPIHALOHYDRIN POLYMERS

Howard C. Beadle, and Irving Gibbs, both of Norwalk, Conn., assignors to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Sept. 17, 1975, Ser. No. 614,146

Int. Cl.³ C08K 5/39

U.S. Cl. 260—45.75 N 12 Claims

1. A composition having improved aging resistance comprising a polymer selected from the group consisting of a homopolymer of epihalohydrin and copolymers of epihalohydrin with an epoxide and a sufficient amount of a nickel (II) salt of a branched-chain dialkylthiocarbamate having 3 to 5 carbon atoms in each alkyl group to impart said improved aging resistance to the composition.

4,006,120

THERMOSTABLE POLYESTER

Erich Behr, Troisdorf, and Wolfgang Wolfes, Bergheim, Sieg, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

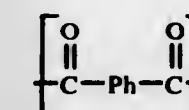
Continuation-in-part of Ser. No. 244,239, April 14, 1972, abandoned, which is a continuation of Ser. No. 33,968, May 1, 1970, abandoned. This application June 5, 1974, Ser. No. 476,761

Claims priority, application Germany, May 27, 1969, 1926843

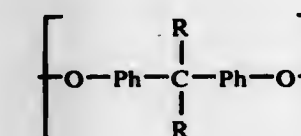
Int. Cl.³ C08G 63/18

U.S. Cl. 260—47 C 8 Claims

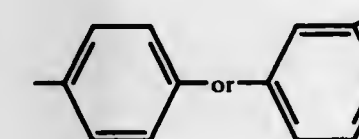
1. A process for the preparation of a thermostable polyester having an intrinsic viscosity of 0.8 to 1.4 determined in a 0.5% by weight solution in o-dichlorobenzene at 20° C which polymer is insoluble in tetrachloroethane and consists of about 40 to 200 units, said polymer having units of the formula



combined with units of the formula



wherein Ph is



and both R radicals are methyl on some units and both R radicals are phenyl on the balance of the units, said methyl units comprising 5 to 30 mol percent of the total R-containing units which comprises heating and condensing in the absence of a catalyst a mixture of 2,2-bis-(4-hydroxyphenyl)-propane and 4,4'-dihydroxytetraphenyl-methane having a melting point of at least 300° C together with a compound supplying an isophthalyl or terephthalyl moiety until there is prepared said polyester which is insoluble in tetrachloroethane.

4,006,121

DOOR LATCH MECHANISM CONTROLLING SWITCH IN MICROWAVE OVEN OR THE LIKE

Tatsuji Isono, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed June 24, 1974, Ser. No. 482,654

Claims priority, application Japan, June 27, 1973, 48-77025[U]; June 27, 1973, 48-77026[U]

Int. Cl.³ H01H 3/16, 9/20; H05B 9/06

U.S. Cl. 200—61.64 14 Claims

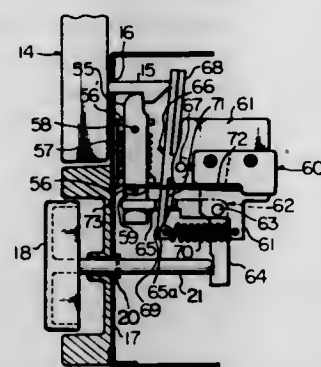
1. A latch mechanism for latching a door structure to a casing, comprising in combination a latch member movable with the door structure,

a support member fixedly mounted on the casing,

catch means supported on the support member and having a first position engageable with the latch member for latching the door structure to the casing and a second position engageable with the latch member for maintaining the door structure unlatched from the casing,

resilient biasing means responsive to movement of the catch means between the first and second positions thereof and operative to bias the catch means toward the first position when the catch means is moved toward and into the first

position thereof and to bias the catch means toward the second position when the catch means is moved toward and into the second position,
electric switch means having a closed condition responsive to the movement of the catch means into the first position thereof and an open condition responsive to the movement of the catch means toward the second position thereof,
leverage linkage means which is engageable at one end with said catch means and at the other end with said electric switch means for amplifying and transmitting the movement of the catch means to the first or second position thereof to the switch means, and



manually-operated unlatching means responsive to the first position thereof and movable between a first position to allow the catch means to stay in the first position thereof and a second position to hold the catch means out of the first position thereof, said unlatching means being held in the first position thereof when the catch means is in the first position thereof and being moved to the second position thereof when manually operated, said leverage linkage means being engageable at said one end with the unlatching means for transmitting the movement of the unlatching means toward the second position thereof to the switch means and thereby actuating the switch means into said open condition when the unlatching means is manually moved into the second position thereof.

4,006,122

POLYESTER-AMIDES PREPARED FROM POLYMALONATES AND ISOCYANATES

Augustin T. Chen, Hamden, and William J. Farrissey, Jr., Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

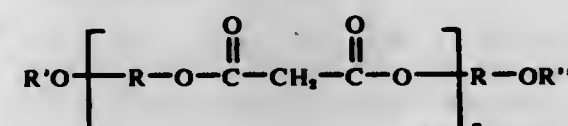
Filed Mar. 11, 1974, Ser. No. 449,938

Int. Cl.² C08G 18/34, 18/42

U.S. Cl. 260—75 TN

26 Claims

1. A poly(ester-amide) which is the product of reacting, in the presence of a basic catalyst,
a. a polymalonate having the formula



wherein n is an integer from 1 to 20, R is the hydroxyl-free residue of a diol selected from the class consisting of alkanediols, cycloalkanediols, poly(alkylene glycols), di(hydroxyalkyl)ethers of dihydric phenols, and bis(hydroxyphenyl)alkanes, and R' and R'' are independently selected from the class consisting of hydrogen, hydrocarbylcarbonyl, and the acyl radical of a hydrocarbon monocarboxylic acid; and

b. an organic polyisocyanate in an amount such that there is at least one isocyanate group for each hydroxy group, if any, present in the polymalonate and there is also at least one isocyanate group for each molecule of polymalonate.

4,006,123 CONDUCTIVE ALIPHATIC POLYESTER OR POLYETHERESTER HAVING UNITS CONTAINING PHOSPHONIUM SULFONATE GROUPS

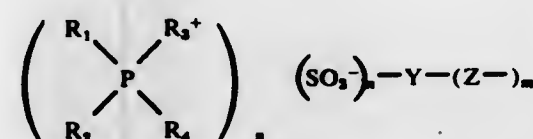
Harry Vaughn Samuelson, Wilmington, and Gurdial Singh, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 403,221, Oct. 3, 1973, abandoned. This application Feb. 25, 1975, Ser. No. 552,867 Int. Cl.² C08G 63/68

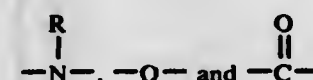
U.S. Cl. 260—75 P

5 Claims

1. A conductive aliphatic polyester of polyetherester having a glass transition temperature measured by nuclear magnetic resonance peak ratio of less than 25°C, a log R_g of less than 10 and having units containing phosphonium sulfonate groups of the formula



where R_1 , R_2 , R_3 and R_4 represents monovalent hydrocarbon groups with the proviso that R_1 and R_2 may jointly represent an alkylene group, Y is a divalent hydrocarbon group of up to 24 carbon atoms in which any unsaturation is aromatic and which may be interrupted by oxygen, sulfonamide or sulfonyl groups, Z is selected from the group consisting of



wherein R is hydrogen or an alkyl group of 1–18 carbon atoms and n and m are 1 or 2, said groups being present in an amount of from 0.01 mol % to about 50 mol % based on the total mols of dicarboxylic acid units and/or hydroxycarboxylic acid units in the polymer chain.

4,006,124

AMIDINE-METAL COMPLEXES AND THEIR USE AS CATALYSTS FOR ISOCYANATE POLYADDITION REACTIONS

Rainer Welte, Bensberg-Herkenrath, and Gerhard Grögler, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 26, 1975, Ser. No. 590,768

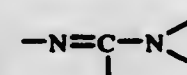
Claims priority, application Germany, July 16, 1974, 2434185

Int. Cl.² C08G 18/00

U.S. Cl. 260—77.5 AC

4 Claims

1. In a process of producing a polyurethane by reacting a polyisocyanate, and at least one active hydrogen containing compound in the presence of a catalyst the improvement wherein the catalyst is a complex formed by mixing amidines containing the characteristic group



with 0.5 to 4 times the molar quantity of a metal compound corresponding to the formula

MeX_nY_m

in which

Me represents an $(n+m)$ -valent metal,

X represents an aliphatic hydrocarbon radical with 1 to 18 carbon atoms, an aromatic hydrocarbon radical with 6 to 10 carbon atoms, or an araliphatic hydrocarbon radical with 7 to 15 carbon atoms,

Y represents an aliphatic C_2 – C_{18} -carboxylate anion with a single negative charge and optionally containing olefinic double bonds and/or alcoholic hydroxyl groups, or a C_2 – C_{18} -enolate anion carrying a single negative charge, $n = 0$ to 2, $m = 0$ to 4 with the proviso that $n + m$ together = 2 to 4.

4,006,125

CURABLE POLYPHOSPHAZENES

Kennard A. Reynard, Mentor, and Arthur H. Gerber, University Heights, both of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

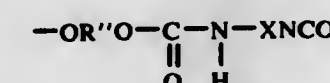
Continuation of Ser. No. 504,740, Sept. 10, 1974, abandoned. This application July 21, 1975, Ser. No. 597,748

Int. Cl.² C08G 18/00

U.S. Cl. 260—77.5 AQ

8 Claims

1. A curable linear polyphosphazene composition which can be crosslinked at room temperature and above in the presence of moisture comprising a polyphosphazene which consists of randomly repeating substituents attached to the phosphorus atoms of a $-P=N-$ backbone, said substituents being represented by the general formulae $-OR$ and OR' , wherein each OR represents a monovalent member selected from the group consisting of alkoxy, polyfluoroalkoxy, aryloxy, arylalkoxy, and substituted derivatives thereof and all of the OR groups are not required to be identical, and each OR' represents the group



wherein R'' is a divalent alkylene or arylalkylene group and all the R'' groups are not required to be the same and X is a divalent arylene or alkylene group; the degree of polymerization of said polyphosphazene being from 10 to about 50,000.

4,006,126

PROCESS FOR THE CHLORINATION OF VINYL POLYMERS

Roberto Rettore, Treviso, and Giorgio Gatta, Mestre (Venice), both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

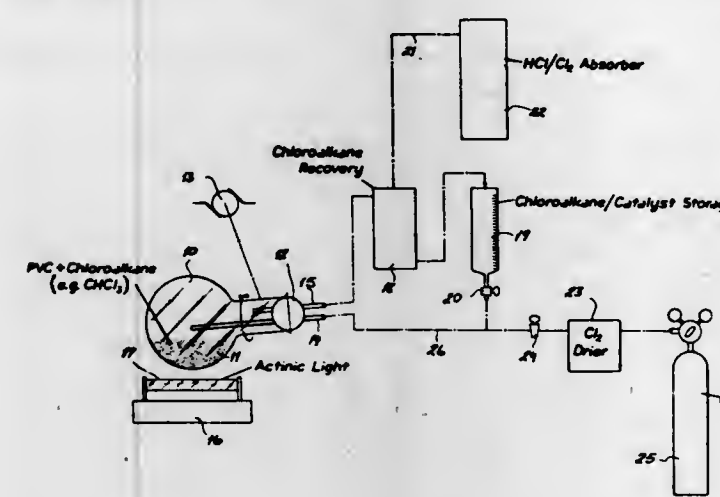
Continuation of Ser. No. 616,053, Feb. 14, 1967, abandoned. This application Feb. 17, 1970, Ser. No. 12,896

Claims priority, application Italy, Feb. 16, 1966, 14558/66

Int. Cl.² C08F 8/20

U.S. Cl. 526—17

14 Claims



1. A process for chlorinating a vinyl-chloride polymer in a powdered state, comprising the steps of:
mixing the powder with a least one liquid chloroalkane

present in an amount ranging between 10 and 55 parts by volume in cm^3 per 100 parts by weight in grams of said polymer and under substantially anhydrous conditions with at most 0.2% by weight H_2O ; and
subjecting the resulting substantially anhydrous mixture in powder form to treatment with gaseous chlorine while catalytically activating the system at a temperature below the vitreous-transition temperature of the polymer.

4,006,127

CATIONIC DIAZACYANINE DYESTUFFS

Roderich Raue, Leverkusen, and Hans-Lothar Dorsch, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 5, 1973, Ser. No. 403,790

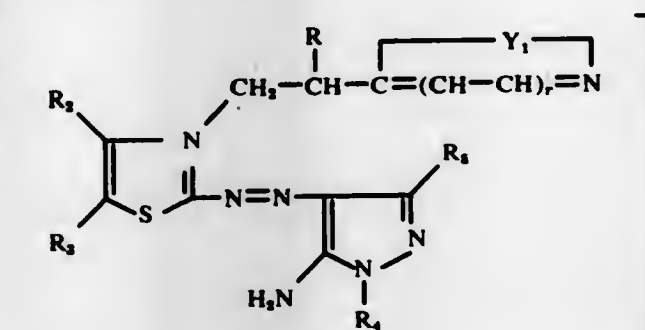
Claims priority, application Germany, Oct. 5, 1972, 2248738

Int. Cl.² C09B 43/00

U.S. Cl. 260—146 R

17 Claims

1. Dyestuff of the formula



wherein

R_1 and R_2 independently of one another are hydrogen, C_1 – C_4 -alkyl, phenyl, halogen, nitro, cyano, thiocyanato, C_1 – C_4 -alkoxy, phenoxy, benzyloxy, C_1 – C_4 -alkylmercapto, C_1 – C_4 -alkylsulfonyl, aminosulfonyl, acetyl, benzoyl, acetyl amino, benzoyl amino, C_1 – C_4 -alkylsulfonylamino, C_1 – C_4 -alkoxycarbonyl, phenoxy carbonyl, aminocarbonyl or carboxyl; or

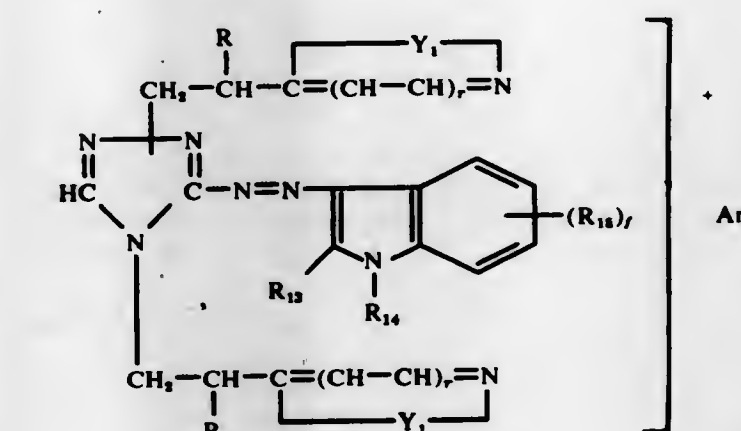
R_1 and R_2 taken together form a cyclohexene or benzene ring which is unsubstituted or substituted by R_3 ;

R_3 is hydrogen, C_1 – C_4 -alkyl, phenyl, cyclohexyl or benzyl;

R_4 is hydrogen, C_1 – C_4 -alkyl or C_1 – C_4 -alkoxy; Y_1 together with $C(=CH-CH)_n=N$ forms pyridine, quinoline, imidazole, benzimidazole, thiazole, benzthiazole or pyrimidine ring, which ring is unsubstituted or substituted by one or two members selected from the group consisting of methyl, methoxymethyl, ethyl, phenyl and dimethyl-amino;

R is hydrogen or alkyl of 1 to 4 carbon atoms; $An^{(-)}$ is an anion; and
 r is 0 or 1.

6. Dyestuff of the formula



wherein

R is hydrogen or C_1 – C_4 -alkyl;

Y, together with C-(CH-CH)₂=N forms pyridine, quino-
line, imidazole, benzimidazole, thiazole, benzthiazole or
pyrimidine ring, which ring is unsubstituted or substituted
by one or two members selected from the group consist-
ing of methyl, methoxymethyl, ethyl, phenyl and dimeth-
ylamino;

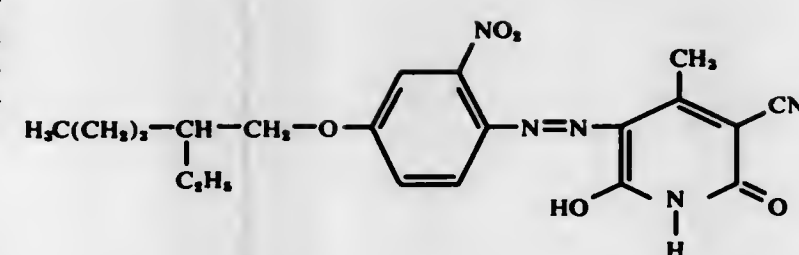
An⁽⁻⁾ is an anion;

r is 0 or 1;

R₁₂ is C₁-C₆-alkyl, phenyl or benzyl;

R₁₄ is hydrogen, C₁-C₆-alkyl or C₃-C₆-alkenyl or C₃-C₆-
alkynyl, benzyl or phenylethyl;

R₁₆ is hydrogen, C₁-C₆-alkyl, C₁-C₆-alkoxy or halogen; and
f is 1 or 2.



4,006,130

TRISAZO DYESTUFFS CONTAINING ETHERIFIED OR ESTERIFIED HYDROXYL GROUPS

Reiner Ditzer, Odenthal-Voigt-winkel, Germany, assignor to
Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Dec. 6, 1974, Ser. No. 530,443

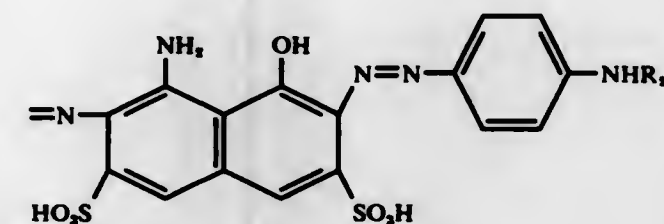
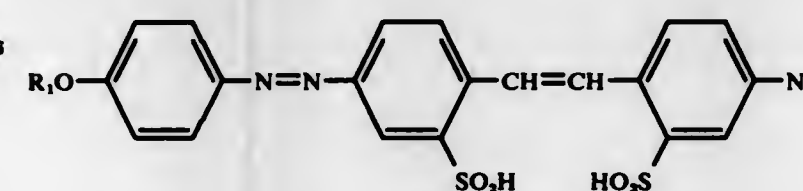
Claims priority, application Germany, Dec. 6, 1973,
2360708

Int. Cl.² C09C 31/18; D06P 1/06, 3/00, 3/60

U.S. Cl. 260-173

1 Claim

1. Polyazo dyestuff which in the form of the free acid corre-
sponds to the formula



wherein

R₁ is C₁-C₄-alkyl; and

R₂ is C₁-C₆-alkylcarbonyl or benzoyl wherein said benzoyl is
unsubstituted or substituted in the benzene nucleus by
methyl, methoxy, chlorine, nitro, or sulpho.

4,006,131

ANIONIC DIASAZO DYES HAVING A 2,2'-DIHALODIPHENYL TETRAZO COMPONENT RADICAL

Hanspeter Uehlinger, Basel, Switzerland, assignor to Sandoz
Ltd., Basel, Switzerland

Filed Dec. 28, 1973, Ser. No. 429,167

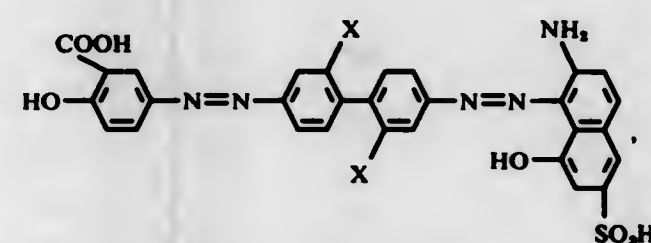
Claims priority, application Sweden, Jan. 8, 1973, 7300144

Int. Cl.² C09B 31/08, 35/20

U.S. Cl. 260-181

16 Claims

1. A compound of the formula



or a salt thereof, wherein each X is independently fluoro,
chloro or bromo.

4,006,129

2-NITRO-4-ALIPHATICOXY-PHENYL-AZO-2,6-DIHY-
DROXY-3-CYANO-4-METHYLPYRIDINE COMPOUNDS
Ernst Heinrich, Horst Kindler, both of Frankfurt am Main-
Fechenheim, and Joachim Ribka, Offenbach am Main-Bur-
gel, all of Germany, assignors to Cassella Farbwerke Main-
kur Aktiengesellschaft, Germany

Filed Oct. 21, 1974, Ser. No. 516,360

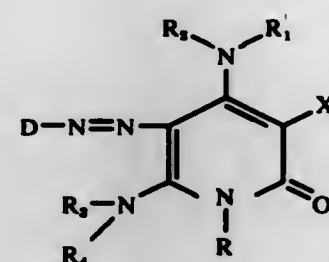
Claims priority, application Germany, Oct. 22, 1973,
2352858

Int. Cl.² C09B 29/36

U.S. Cl. 260-156

1 Claim

1. The water-insoluble monoazo dye of the formula



in which

D is the radical of a diazo component;

R is C₁-C₆-alkyl; C₁-C₆-alkyl substituted by halogen, cyano,
hydroxyl, C₁-C₆-alkoxy or C₃-C₆-alkoxycarbonyl; cyclo-
hexyl; cyclohexyl substituted by methyl; phenyl; phenyl
substituted by C₁-C₆-alkyl, C₁-C₆-alkoxy, halogen or
cyano; benzyl; phenethyl; or benzyl or phenethyl substi-
tuted by chlorine, C₁-C₆-alkyl or C₁-C₆-alkoxy;

X is cyano

R₁-R₄ are hydrogen; C₁-C₆-alkyl; C₁-C₆-alkyl substituted by
halogen, cyano, hydroxyl, C₁-C₆-alkoxy or C₃-C₆-alkox-
ycarbonyl; benzyl; phenethyl; or benzyl or phenethyl
substituted by chlorine, C₁-C₆-alkyl or C₁-C₆-alkoxy.

4,006,132

1'-FORMYL-1'-HALOBENZENEAZOMETHANE
COMPOUNDS HAVING HERBICIDAL ACTIVITY
Malcolm W. Moon, Kalamazoo, Mich., assignor to The Upjohn
Company, Kalamazoo, Mich.

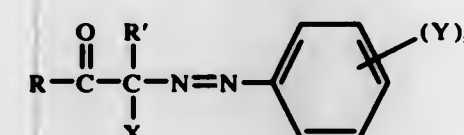
Continuation of Ser. No. 468,768, May 10, 1974, abandoned,
which is a division of Ser. No. 138,338, April 28, 1971, Pat.
No. 3,830,642. This application Nov. 14, 1975, Ser. No.
631,865

Int. Cl.² A01N 9/24; C07C 107/04

U.S. Cl. 260-192

41 Claims

1. A compound of the structural formula:



wherein R is alkyl of from 1 to 8 carbon atoms, inclusion;
alkoxy of from 1 to 8 carbon atoms, inclusive; haloalkoxy of
from 1 to 8 carbon atoms, inclusive; cycloalkoxy of from 3 to 8
carbon atoms, inclusive; cycloalkoxy of from 3 to 8 carbon
atoms, inclusive; or haloalkyl of from 1 to 8 carbon atoms,
inclusive; R' is lower-alkyl of from 1 to 8 carbon atoms, inclu-
sive, phenyl, cycloalkyl of from 3 to 8 carbon atoms, inclusive;
or X; X is bromine, chlorine, or fluorine; m is an integer 0
through 5, inclusive, and Y is (independently when m is more
than 1) halogen, lower-alkyl of from 1 to 4 carbon atoms,
inclusive, lower-alkoxy of from 1 to 4 carbon atoms, inclusive,
or halolower-alkyl of from 1 to 4 carbon atoms, inclusive;
providing however, that m is 2 whenever R' is X, and that the
sum of the carbon atoms in substituents (Y)_m is not more than
15.

4,006,133

AMINOGLYCOSIDE ANTIBIOTICS

Eiji Ohki, Ichikawa; Hiromichi Sacki, Yamato, and Shinichi
Sugawara, Tokyo, all of Japan, assignors to Sankyo Com-
pany Limited, Japan

Filed Oct. 18, 1974, Ser. No. 515,814

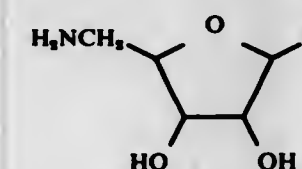
Claims priority, application Japan, Oct. 25, 1973,
48-120325

Int. Cl.² C07G 11/00

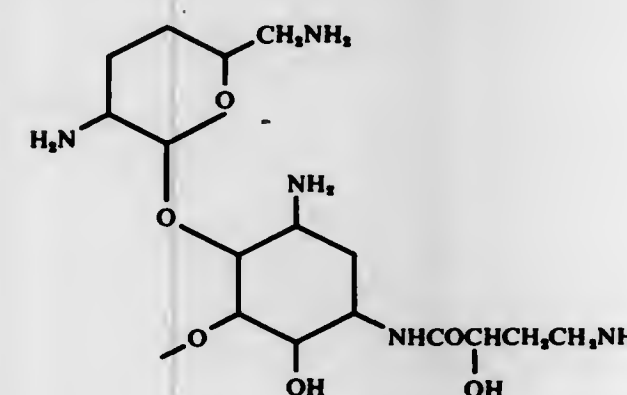
U.S. Cl. 536-17

5 Claims

1. Compounds having the formula (I):



wherein R is a radical of formula (II):



4,006,134

CALCIUM SUGAR PHOSPHATES

John Whetstone, Woodlea, Scotland, assignor to Imperial
Chemical Industries Limited, London, England
Continuation of Ser. No. 392,488, Aug. 29, 1973, abandoned,
which is a division of Ser. No. 177,980, Sept. 7, 1971, Pat. No.
3,782,901. This application Jan. 9, 1976, Ser. No. 647,981
Claims priority, application United Kingdom, Sept. 7, 1970,
42763/70

Int. Cl.² C08B 37/00

U.S. Cl. 536-117

8 Claims

1. In a process for the manufacture of a phosphoric acid
ester of a polyhydric alcohol by cooling an aqueous solution or
slurry of a polyhydric alcohol and an inorganic calcium oxy-
compound to a temperature between 0° and 10° C. and then
phosphorylating the cooled solution or slurry with phospho-
rous oxychloride, the improvement comprising circulating the
solution or slurry around a closed loop reaction system which
includes a cooling zone and a cooled and stirred reaction
zone, cooling said circulating solution or slurry by circulation
through the cooling zone to reduce the temperature thereof to
near 10° C., then further cooling said circulating solution or
slurry to a temperature of 0° C to 10° C and then phospho-
rylating said further cooled solution or slurry with the said phos-
phorous oxychloride in the cooled and stirred reaction zone.

4,006,135

HYDROXYMETHYL BENZODIAZEPINE DERIVATIVES

Umakant Devdas Shenoy, London, England, assignor to DDSA
Pharmaceuticals, London, England

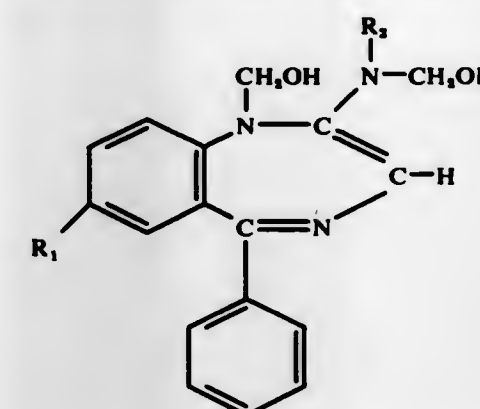
Continuation-in-part of Ser. No. 480,917, June 19, 1974,
abandoned. This application July 11, 1974, Ser. No. 487,479

Int. Cl.² C07D 243/20, 401/04

U.S. Cl. 260-239 BD

7 Claims

1. A benzodiazepine derivative of the formula



(I) wherein

R₁ is a radical selected from the group consisting of hydro-
gen, halogen, trifluoromethyl, cyano, nitro, lower alkyl,
lower alkoxy and lower alkylthio; and

R₂ represents a lower alkyl radical;

four oxides thereof and acid addition salts thereof and of the
four oxides with therapeutically acceptable inorganic or or-
ganic acids.

4,006,136

PROSTAGLANDIN INTERMEDIATES

Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F.
Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada,
assignors to Ayerst McKenna and Harrison Ltd., Montreal,
Canada

Division of Ser. No. 238,650, March 27, 1972, Pat. No.

3,849,474. This application July 19, 1974, Ser. No. 489,856

Int. Cl.² C07C 69/74

U.S. Cl. 260-240 R

6 Claims

1. Dimethyl trans-2-(3-hydroxy-1-octenyl)-cyclopropane-
1,1-dicarboxylate.

3. Dimethyl and diethyl trans-2-(3-oxo-1-octenyl)cyclopro-
pane-1,1-dicarboxylate.

4. Diethyl trans-3-(acetoxymethyl)-2-(3-oxo-1-octenyl)-cyclopropane-1,1-dicarboxylate.
 5. Diethyl trans-3-(acetoxymethyl)-2-(3-hydroxy-1-octenyl)cyclopropane-1,1-dicarboxylate.

4,006,137

2-ETHENYL IMIDAZOLIUM DERIVATIVES

Rudiger D. Haugwitz, and Barbara V. Maurer, both of Titusville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 21, 1975, Ser. No. 606,387

Int. Cl.³ C07D 233/06, 403/06

U.S. Cl. 260—240 D

8 Claims

1. A compound selected from the group consisting of 2-[2-(4-methoxyphenyl)ethenyl]-1,3-dimethyl-1H-imidazolium iodide; 1,3-dimethyl-2-[2-(2-pyridinyl)ethenyl]-1H-imidazolium iodide; 1,3-dimethyl-2-[2-(1-methyl-1H-pyrrol-2-yl)ethenyl]-1H-imidazolium iodide; 1,3-dimethyl-2-[2-(2-furanyl)ethenyl]-1H-imidazolium iodide; 2-[2-(4-chlorophenyl)ethenyl]-1,3-dimethyl-1H-imidazolium iodide; 1,3-dimethyl-2-[2-(2-thienyl)ethenyl]-1H-imidazolium iodide; and 1,3-dimethyl-2-[2-(1-naphthalenyl)ethenyl]-1H-imidazolium iodide.

4,006,138

CRYSTALLINE FORM OF SODIUM O-FORMYLCEFAAMANDOLE

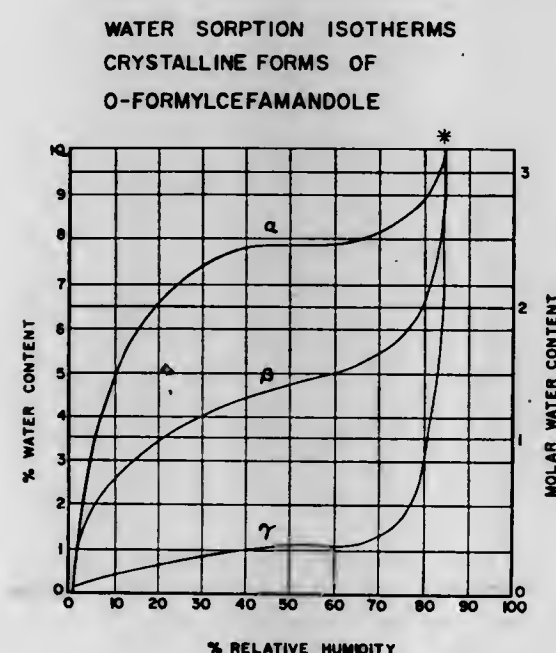
Kuo S. Yang, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 11, 1975, Ser. No. 567,324

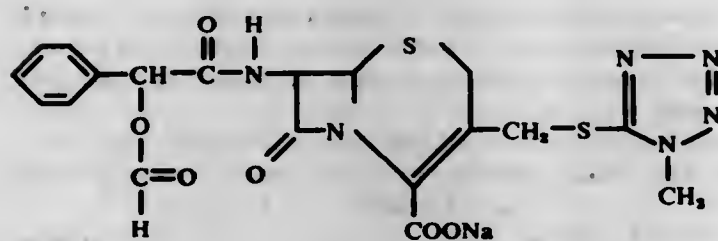
Int. Cl.³ C07D 501/60

U.S. Cl. 260—243 C

1 Claim



1. The crystalline anhydrate form of the compound of the formula



which has a melting point of $190 \pm 1^\circ \text{C}$. and which has the following X-ray powder diffraction pattern obtained with nickel filtered copper radiation of $\gamma 1.5405$ wherein d represents the interplanar spacings and I/I_1 the relative intensities:

d	I/I_1
17.80	.30
11.76	.30
9.39	.10
7.49	.70
7.18	.20
6.20	.15
5.52	.40
5.00	.40
4.74	.20
4.54	.80
4.20	.50
3.98	.10
3.72	1.00
3.51	.05
3.32	.02
3.06	.10
2.91	.15
2.83	.15
2.75	.10
2.56	.05
2.36	.10
2.17	.10
2.11	.10

4,006,139

1,2,4-DITHIAAZ-3-ENES

Ronald G. Micetich; Clinton G. Chin, and Robert B. Morin, all of Edmonton, Canada, assignors to Connlab Holdings Limited, Willowdale, Canada

Filed Apr. 24, 1975, Ser. No. 571,427

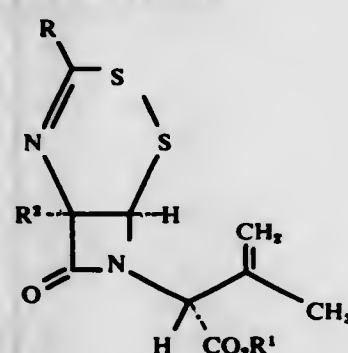
Claims priority, application Canada, Aug. 30, 1974, 208248

Int. Cl.³ C07D 285/00

U.S. Cl. 260—243 R

21 Claims

1. A compound of the formula:



wherein R stands for

- benzyl,
 phenoxymethyl,
 4-amino-4-carboxy-1-butyl,
 R^2O- , R^2S- , R^2R^1N- wherein
 R^2 is loweralkyl, phenyl or phenylloweralkyl,
 R^1 is hydrogen or R^2 , and
 OH when the radicals R^2O- , R^2S- and R^2R^1N- are hydrolyzed;
 R^2 is hydrogen or methoxy, and
 R^1 is hydrogen or a cleavable radical selected from the following:
 $-CH_2OCH_3$, loweralkyl, 2,2,2-trichloroethyl,
 benzyl, p-nitrobenzyl, benzhydryl, phenoxyethyl or trimethylsilyl.

4,006,140

MORPHOLINOTHIO OXAMIDES

Pyong-Nae Son, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 367,642, June 6, 1973, Pat. No. 3,910,864.

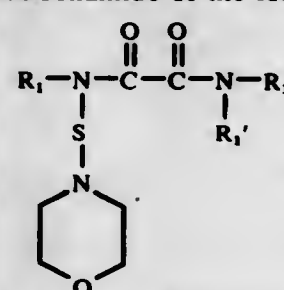
This application June 19, 1975, Ser. No. 588,310

Int. Cl.³ C07D 295/22

U.S. Cl. 260—246 B

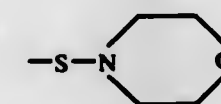
3 Claims

1. A morpholinethiooxamide of the formula



wherein R_1 is selected from the group consisting of hydrogen,

alkyl radicals containing 1 to about 12 carbon atoms, a phenyl radical, and a cyclohexyl radical, and R_1' is the same as R_1 or is the group



4,006,141

NITROIMIDAZOLYL-TRIAZOLO-PYRIDAZINE COMPOUNDS

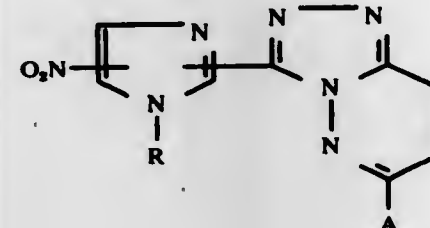
Herbert Berger, Mannheim-Kaferthal; Rudi Gall, Grossachsen; Kurt Stach, Mannheim-Waldhof; Wolfgang Vomel, and Rita Hoffmann, both of Mannheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany
 Division of Ser. No. 336,099, Feb. 26, 1973, Pat. No. 3,928,349. This application July 31, 1975, Ser. No. 601,116
 Claims priority, application Germany, Apr. 1, 1972, 2215999

Int. Cl.³ C07D 487/04

U.S. Cl. 260—250 AC

10 Claims

1. Nitroimidazolyl-triazolo-pyridazine compound of the formula



wherein

R is hydrogen, lower alkyl, 2-hydroxy-alkyl, 2-alkanoyloxy-alkyl, or 2-alkoxyalkyl, wherein the alkyl moieties contain up to 6 carbon atoms;

A is hydrogen, halogen, azido, cyano, alkyl, alkoxy, alkylthio, alkylsulfonyl, carboxyl, alkoxycarbonyl, alkoxycarbonylimidoyl, hydrazino, carbamoyl, amidino, carboximidohydrazide, hydrazino substituted by one or two alkanoyl, alkyl or cycloalkyl radicals, carbamoyl substituted by one or two alkanoyl, alkyl or cycloalkyl radicals, or carboximidohydrazide substituted on the terminal amino nitrogen by one or two alkanoyl, alkyl or cycloalkyl radicals; wherein the alkyl radicals or containing moieties are of no more than 6 atoms each,

and the pharmacologically acceptable salts thereof.

4,006,142

PREPARATION OF METHYL-3-(2-QUINOXALINYLMETHYLENE)CARBAZATE-N¹,N⁴-DIOXIDE

Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 338,906, March 7, 1973, Pat. No. 3,926,991. This application July 18, 1975, Ser. No. 597,209

Int. Cl.³ C07D 241/52

U.S. Cl. 260—250 QN

2 Claims

1. A process for the preparation of methyl-3-(2-quinoxalinylmethylene)carbazate N¹,N⁴-dioxide which comprises the step of reacting methyl-3-(2-quinoxalinylmethylene) carbazate with two equivalents of m-chloroperbenzoic acid in a reaction inert solvent at a temperature of from about 20° up to 100°C . until reaction is substantially complete.

4,006,143
HETEROCYCLIC SUBSTITUTED PYRIMIDINE COMPOUNDS

Edward F. Rogers, Middletown; John Hannah, Matawan, both of N.J., and Richard A. Dybas, Center Square, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

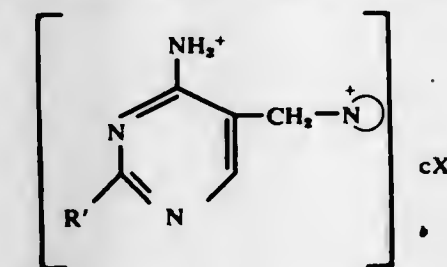
Continuation-in-part of Ser. No. 459,501, April 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 224,620, Feb. 8, 1972, abandoned. This application Oct. 16, 1975, Ser. No. 623,211

Int. Cl.³ C07D 401/14

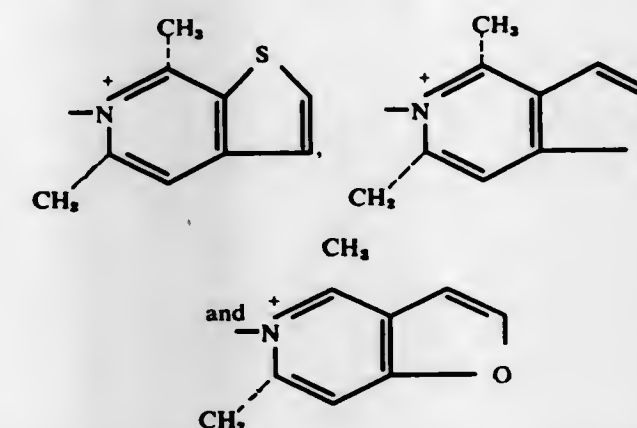
U.S. Cl. 260—256.4 N

9 Claims

1. A compound having the following formula:



wherein R' is alkyl having 1 to 3 carbon atoms; X^- is a non-toxic anion; b and c are integers such that the positive charge of b moles of cation are neutralized by c moles of anion X^- ; and $-N-$ is a member of the group consisting of:



wherein the dotted line indicates that the alpha methyl group can be present or a hydrogen group can be present, with the proviso that one and only one methyl group is present.

4,006,144

10,11-DIHYDRO-DIBENZO(b,f)THIEPIN DERIVATIVES
Max Gerecke, Reinach; Jean-Pierre Kaplan, Bubendorf, and Emilio Kyburz, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

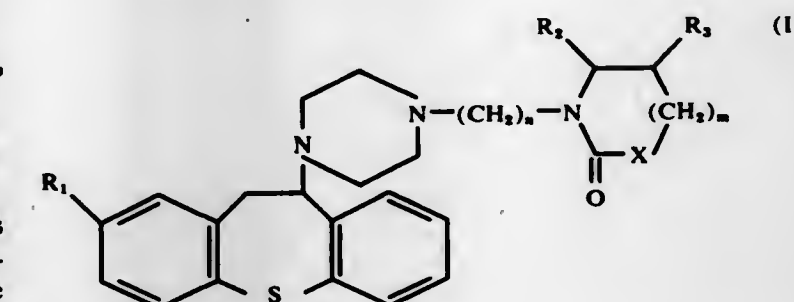
Division of Ser. No. 378,730, July 12, 1973, Pat. No. 3,929,791. This application Oct. 3, 1975, Ser. No. 619,149
 Claims priority, application Switzerland, July 21, 1972, 1001/72; May 17, 1973, 7059/73

Int. Cl.³ C07D 409/14

U.S. Cl. 260—268 TR

3 Claims

1. A compound of the formula



wherein n is 2 or 3, R_1 is halogen, lower alkyl, di(lower alkyl)-sulphamoyl, nitro, amino, di(lower alkyl)-amino or trifluoro-

methyl, X is methylene, m is zero and R₂ and R₃ each is hydrogen, or a pharmaceutically acceptable acid addition salt thereof.

4,006,145

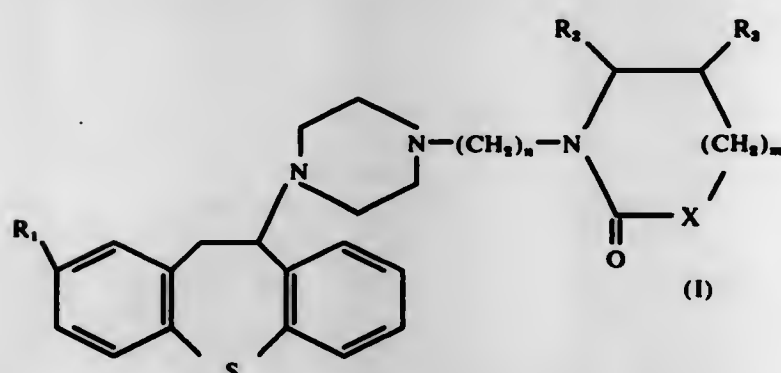
10,11-DIHYDRO DIBENZO(b,f)THIEPIN DERIVATIVES
Max Gerecke, Reinach; Jean-Pierre Kaplan, Bubendorf, and Emilio Kyburz, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 378,730, July 12, 1973, Pat. No. 3,929,791. This application Oct. 3, 1975, Ser. No. 619,169
Claims priority, application Switzerland, July 21, 1972, 11001/72; May 17, 1973, 7059/73

Int. Cl.³ C07D 409/14

U.S. Cl. 260—268 TR

1. A compound of the formula

2 Claims



wherein n is 2 or 3, R₁ is halogen, lower alkyl, di(lower alkyl)-sulphamoyl nitro, amino, di(lower alkyl)amino or trifluoromethyl, X is methylene, m is 1 and R₂ and R₃ each is hydrogen or a pharmaceutically acceptable acid addition salt thereof.

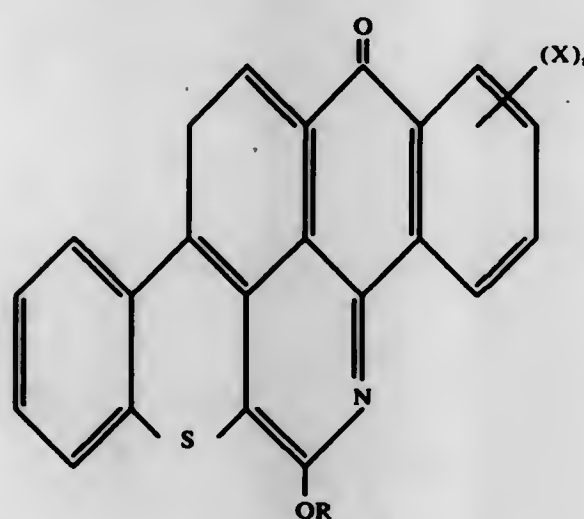
4,006,146

5-AZA-7-THIADIBENZOCRYSENE DERIVATIVES
Giacchino Boffa, and Nicola Mazzaferro, both of Novara, Italy, assignors to Montedison Fibre S.p.A., Milan, Italy
Filed Jan. 10, 1975, Ser. No. 540,166
Claims priority, application Italy, Jan. 11, 1974, 19331/74
Int. Cl.³ C09B 5/02

U.S. Cl. 260—272

3 Claims

1. As new compounds, 14H-5-aza-7-thiadibenzo-[b,def]-crysene corresponding to the general formula:



wherein:

X = chlorine

n = zero or 1.0

R = a lower alkyl radical.

4,006,147

TETRACHLOROETHOXYETHYL ESTERS AND METHOD FOR THEIR PREPARATION

Frantisek Hrabak, and Karel Bochal, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Dec. 21, 1973, Ser. No. 427,224

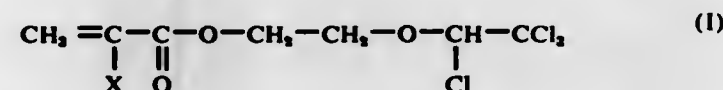
Claims priority, application Czechoslovakia, Dec. 28, 1972, 9028/72; Dec. 28, 1972, 9029/72

Int. Cl.³ C07C 69/54

U.S. Cl. 260—486 H

1 Claim

1. Tetrachloroethoxyethyl esters of the general formula



where X is a hydrogen atom or CH₃ radical.

4,006,148

CARBOSTYRIL DERIVATIVES USED AS COCCIDIOSTATS

Herbert Louis Wehrmeister, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Aug. 6, 1975, Ser. No. 602,602

Int. Cl.³ C07D 215/22

U.S. Cl. 260—289 K

4 Claims

1. The compound 7-chloro-3-phenylcarbostyryl.
2. The compound 5-chloro-3-phenylcarbostyryl.
3. The compound 7-chloro-3-(p-methoxyphenyl) carbostyryl.
4. The compound 7-chloro-3-(2,4-dichlorophenoxy) carbostyryl.

4,006,149

CATALYTIC PRODUCTION OF PYRIDINES FROM ALKYNES AND NITRILES

Helmut Bonnemann, Essen (Ruhr), and Hartmut Schenklohn, Mulheim (Ruhr), both of Germany, assignors to Studiengesellschaft Kohle M.B.H., Mulheim (Ruhr), Germany
Filed Apr. 2, 1975, Ser. No. 564,392

Claims priority, application Germany, Apr. 4, 1974, 2416295

Int. Cl.³ C07D 213/08

U.S. Cl. 260—290 P

7 Claims

1. In the cocyclization of an alkyne selected from the group consisting of acetylene, lower alkyl acetylene, phenyl-acetylene, lower alkoxy-acetylene and lower alkoxy-lower alkyl-acetylene and a nitrile selected from the group consisting of lower alkyl nitrile, phenyl nitrile, phenyl-lower alkyl nitrile and lower alkenyl nitrile in the presence of a cobalt complex compound as catalyst to form a pyridine ring compound, the improvement which comprises employing as said catalyst a member selected from the group consisting of

a. a catalyst obtained by reducing a divalent or trivalent cobalt salt in the presence of at least one of the alkyne or nitrile reactants, employing as the reducing agent a metal or organometallic compound wherein the metal is zinc, cadmium or a metal of the main Groups I to III of the Periodic Table of elements, or
b. a cobalt(I) diene complex of the type cyclooctenyl-cobalt(I)-cyclooctadiene, methyl heptadienyl-cobalt(I)-butadiene and cyclopentadienyl-cobalt(I)-cyclooctadiene.

4,006,150

ALKYLSULFONYL METHYL-SUBSTITUTED PYRIDINE N-OXIDES

Richard B. Greenwald, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

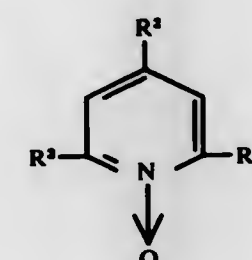
Filed Mar. 31, 1976, Ser. No. 672,291

Int. Cl.³ C07D 213/34

U.S. Cl. 260—294.8 F

1. A compound of the formula

8 Claims



wherein R¹ is hydrogen or —CH₂SO₂R wherein R is lower alkyl having 1 to 4 carbon atoms; R² is hydrogen, lower alkyl having 1 to 4 carbon atoms or said —CH₂SO₂R and R³ is hydrogen or lower alkyl having 1 to 4 carbon atoms, at least one of said R¹ and R² being —CH₂SO₂R.

4,006,151

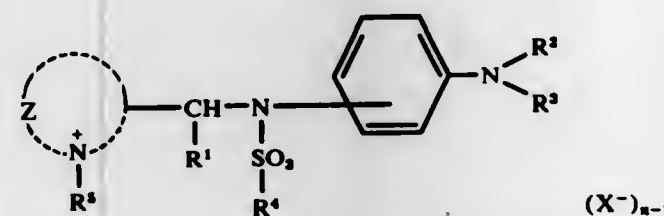
PRECURSORS OF β-AZA-DISUBSTITUTED AMINO STYRYL DYES

Stanley M. Bloom, Waban; Alan L. Borrer, and Richard B. Greenwald, both of Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Continuation-in-part of Ser. No. 399,456, Sept. 21, 1973, abandoned, Division of Ser. No. 261,270, June 9, 1972, Pat. No. 3,794,465. This application June 25, 1975, Ser. No. 590,144

Int. Cl.³ C07D 213/34

U.S. Cl. 260—294.8 F

1. A compound represented by the formula:



wherein R¹ is hydrogen or 1 to 4 carbon alkyl; R², R³ and R⁴ is 1 to 4 carbon alkyl; R⁴ is 1 to 4 carbon alkyl or phenyl; Z, taken with N, represents the atoms necessary to make up pyridine radical; X is an acid anion; and n is 1 when R² carries a negative charge and 2 when R² is electrically neutral.

4,006,152

ε-N-PYRIDYL-4-METHYLOXYCARBONYLLYSINE

Daniel F. Veber, Ambler, and Ralph F. Hirschmann, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.
Continuation-in-part of Ser. No. 393,351, Sept. 6, 1973, Pat. No. 3,950,348, which is a division of Ser. No. 214,384, Dec. 30, 1971, Pat. No. 3,780,015. This application Nov. 26, 1975, Ser. No. 635,465

Int. Cl.³ C07D 213/55

U.S. Cl. 260—295 R

1. ε-N-pyridyl-4-methyloxycarbonyllysine.

4,006,153

ANTHELMINTIC BENZIMIDAZOLES WITH IMPROVED AQUEOUS STABILITY

Richard J. Bochs, East Brunswick, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 25, 1974, Ser. No. 518,139

Int. Cl.³ C07D 417/04

U.S. Cl. 260—302 H

3 Claims

1. The triethylamine salt of 1-carboxymethyleneamino-5-isopropoxycarbonylamino-2-(4'-thiazolyl) benzimidazole.
2. The trimethylamine salt of 1-carboxymethyleneamino-5-isopropoxycarbonylamino-2-(4'-thiazolyl) benzimidazole.
3. The diethylamine salt of 1-carboxymethyleneamino-5-isopropoxycarbonylamino-2-(4'-thiazolyl) benzimidazole.

4,006,154

HETEROCYCLIC SUBSTITUTED THIO AND SULFONYL GLYOXYLINITRILEOXIME PHOSPHATES AND PHOSPHONATES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

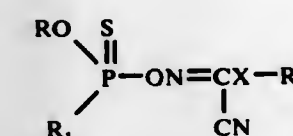
Division of Ser. No. 222,368, Jan. 31, 1972, Pat. No. 3,931,358. This application Aug. 18, 1975, Ser. No. 605,587

Int. Cl.³ C07D 277/74, 277/36, 235/28

U.S. Cl. 260—302 E

11 Claims

1. A compound of the formula



in which R is lower alkyl having 1 to 4 carbon atoms, inclusive; R₁ is selected from the group consisting of lower alkyl having 1 to 4 carbon atoms, inclusive, and lower alkoxy having 1 to 4 carbon atoms, inclusive; X is selected from the group consisting of thio and sulfonyl; R₂ is selected from the group consisting of benzothiazol-2-yl, benzimidazol-2-yl, and thiazol-2-yl.

4,006,155

METHOD FOR PREPARATION OF PHOSPHORUS POLYSULFIDES

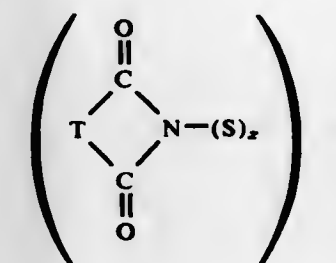
Alfred Bay Sullivan, Wadsworth, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 266,458, June 26, 1972, Pat. No. 3,859,297, and Ser. No. 880,893, Nov. 28, 1969, Pat. No. 3,705,923. This application Sept. 23, 1974, Ser. No. 508,047
Int. Cl.³ C07D 277/78; C07F 9/62

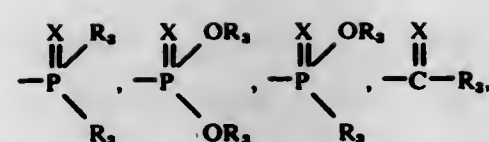
U.S. Cl. 260—306.5

8 Claims

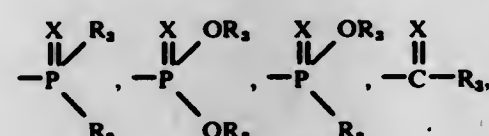
1. A process for the preparation of phosphorus polysulfides which comprises the step of reacting a compound Y'(SH)_n with a compound



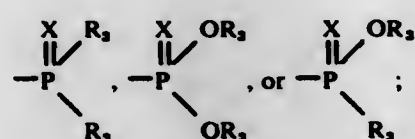
in which T is alkylene of 2-6 carbon atoms, cycloalkylene of 5-8 carbon atoms, alkenylene of 2-10 carbon atoms, cycloalkenylene of 5-8 carbon atoms, o-phenylene, or 2,5-naphthalene and n, n' and x are one or two; when n and n' are one, Y' is



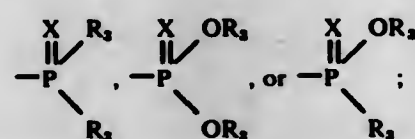
or $-R_2$ where R_2 is alkyl of 1-20 carbon atoms, cycloalkyl of 3-12 carbon atoms, hydrocarbyl aralkyl of 7-9 carbon atoms, alkenyl of 3-10 carbon atoms, phenyl, naphthyl, anthracenyl, or hydrocarbyl alkaryl of 7-10 carbon atoms and Y is



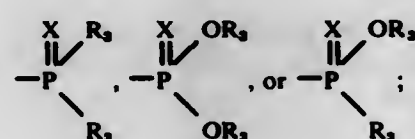
azolyl or nuclear mono-substituted azoaryl in which the substituents are selected from the group consisting of halo, hydroxy, lower alkoxy, nitro, lower alkyl, acetyl, lower alkanoyl, acetoxy, acetoxy lower alkyl, phenylcarbamoyl, and 2-mercapto-4,4,6-trimethyl-1(H) pyrimidinyl, or $-R_2$ with the proviso that at least one of Y and Y' is



when n is two, n' is one and Y is alkylene of 2-6 carbon atoms, cycloalkylene of 5-8 carbon atoms, alkenylene of 2-10 carbon atoms, alkenylene of 5-8 carbon atoms, phenylene or naphthalene and Y' is



when n' is two, n is one and Y' is alkylene of 2-6 carbon atoms, cycloalkylene of 5-8 carbon atoms, alkenylene of 2-10 carbon atoms, alkenylene of 5-8 carbon atoms, phenylene or naphthalene and Y is



and X each occurrence is oxygen or sulfur.

4,006,156

3-ALKYL-2-(NITROMETHYLENE) THIAZOLIDINE

James E. Powell, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed June 27, 1975, Ser. No. 590,984

Int. Cl.² C07D 277/10

U.S. Cl. 260-306.7 R

2 Claims

1. A 3-alkyl-2-(nitromethylene)thiazolidine in which the alkyl moiety has from 1 to 3 carbon atoms.

4,006,157
PROCESS FOR THE PREPARATION OF 1,2,4-TRIAZOLE DERIVATIVES

Beat Böhner, Binningen; Dag Dawes, Pratteln; Hermann Kay, Fullinsdorf; Willy Meyer, Basel, all of Switzerland, and Jean Perchais, Rixheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 460,624, Dec. 4, 1974, abandoned. This application June 24, 1975, Ser. No. 589,991
Claims priority, application Switzerland, Apr. 17, 1973, 5495/73

Int. Cl.² C07D 249/12

U.S. Cl. 260-308 R

3 Claims

1. Process for the preparation of 1-isopropyl-3-hydroxy-5-chloro-1,2,4-triazole wherein isopropylhydrazine hydrochloride is reacted with N-chlorocarbonylisocyanide dichloride in approximately equimolar amounts in the presence of a polar solvent.

4,006,158

FLUORESCENT 1,2,3-TRIAZOLE DERIVATIVES OF 3-PHENYLCOUMARIN

Fritz Fleck, Bottmingen; Hans Balzer, Munchenstein, and Horst Aebli, Basel, all of Switzerland; assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 695,330, Jan. 3, 1968, abandoned.

This application Apr. 28, 1975, Ser. No. 572,005

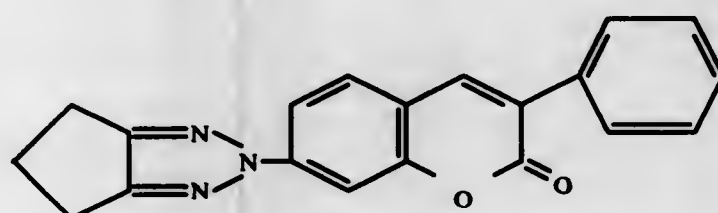
Claims priority, application Switzerland, Jan. 5, 1967, 108/67

Int. Cl.² C07D 405/04, 405/10

U.S. Cl. 260-308 B

1 Claim

1. A compound having the formula



4,006,159

SUBSTITUTED 1,2,4-TRIAZOLE CARBOXAMIDES

Howard Newman, Monsey, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 14, 1975, Ser. No. 558,611

Int. Cl.² A61K 31/41, 31/625; C07D 249/10

U.S. Cl. 260-308 R

6 Claims

1. 1-(and 2 and 4)-Octanoyl-s-triazole-3-carboxamide.

4,006,160

PROCESS FOR THE SYNTHESIS OF N-HYDROXYPYRROLES, N-HYDROXYIMIDAZOLES, AND DERIVATIVES THEREOF

Rudolph Abraham Abramovitch, and Berkeley Wendell Cue, Jr., both of Tuscaloosa, Ala., assignors to University of Alabama, University, Ala.

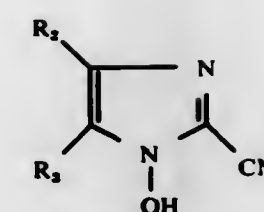
Division of Ser. No. 341,663, March 15, 1973, Pat. No. 3,886,180. This application May 19, 1975, Ser. No. 578,895

Int. Cl.² C07D 233/90, 235/24

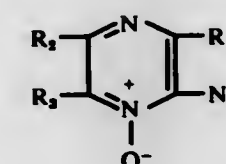
U.S. Cl. 260-309

1 Claim

1. A process for the production of an N-hydroxyimidazole-2-carbonitrile compound possessing antibacterial activity and having the formula:



wherein R_2 is hydrogen, alkyl or aryl and R_3 is hydrogen, alkyl or aryl or R_2 and R_2 comprise part of a fused aromatic or heteroaromatic nucleus which comprises thermally decomposing a 2-azidopyrazine N-oxide having the formula:



in which R_1 is hydrogen, R_2 is hydrogen, alkyl or aryl and R_3 is hydrogen, alkyl or aryl or where R_2 and R_3 comprise part of a fused aromatic or heteroaromatic nucleus and said reaction being carried out in an inert solvent at a temperature above the decomposition temperature of the azide, under an anhydrous atmosphere.

4,006,161

THIO-SUBSTITUTED 2-OXO-INDOLINES

Richard E. Holmes, Indianapolis, and Glen P. Jourdan, Martinsville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 26, 1973, Ser. No. 427,946

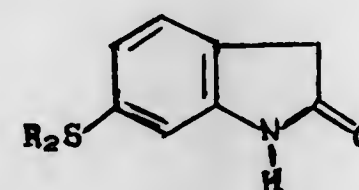
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07D 209/34

U.S. Cl. 260-325 R

5 Claims

1. A compound of the formula



in which R_2 is C_1-C_3 alkyl, benzyl, halobenzyl, nitrobenzyl, C_1-C_3 alkylbenzyl, or phenyl.

4,006,162

IMINOISOINDOLINONE PIGMENTS

Ernst Model, Basel; Jost von der Crone, and Andre Pugin, both of Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1975, Ser. No. 575,091

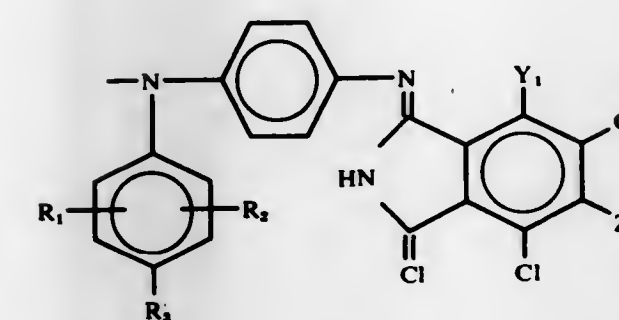
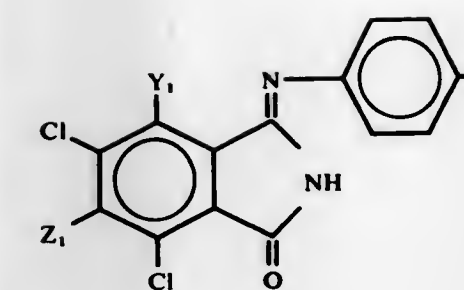
Claims priority, application Switzerland, May 7, 1974, 6181/74

Int. Cl.² C07D 209/46

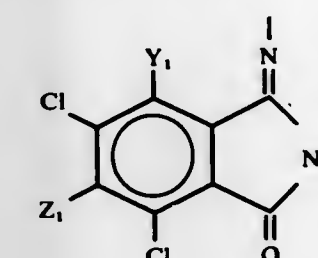
U.S. Cl. 260-325 PH

5 Claims

1. An iminoisoindolinone pigment of the formula



wherein Y_1 and Z_1 denote chloro, alkoxy containing 1 to 4 carbon atoms, R_1 and R_2 denote H, halogen, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, phenoxy, phenoxy optionally substituted by chloro, alkyl containing 1 to 4 carbon atoms, or alkoxy containing 1 to 4 carbon atoms, or trifluoromethyl, R_3 denotes H, halogen, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, or a group of the formula



4,006,163

ANTHRAQUINONE DYESTUFFS

Hans Peter K  lliker, Munchenstein, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,823

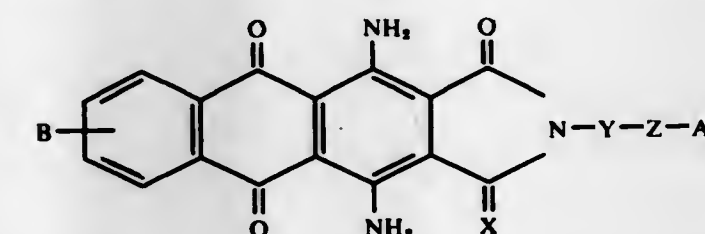
Claims priority, application Switzerland, Mar. 21, 1972, 4169/72

Int. Cl.² C09B 5/24; C07D 209/66, 209/68

U.S. Cl. 260-326 C

14 Claims

1. An anthraquinone dye of sparing aqueous solubility, of the formula



wherein

X represents oxygen or NH,

Y represents alkylene having up to 10 carbon atoms or alkylene of up to 10 carbon atoms interrupted by a thio group, an imino group, an N-methyl imino group, or one or two oxy groups, or is alkylene of up to 10 carbon atoms substituted by an $-OH$ group or an $-OAc$ group,

Z represents oxy or $-NR_1$, in which

R_1 represents alkyl of 1-4 carbon atoms or hydrogen, Ac

represents formyl or unsubstituted or substituted alkyl and alkenyl carbonyl having up to 18 carbon atoms wherein the substituents are selected from the group consisting of bromo, methylmercapto, chloro and ethoxy; or cycloalkylcarbonyl having up to 18 carbon atoms; or an araliphatic carbonyl selected from the group consisting of phenylacetyl, β -phenylpropionyl, methylphenylacetyl, phenoxyacetyl, p-chlorophenoxyacetyl and cinnamylcarbonyl; or aromatic carbonyl selected from the group consisting of benzoyl, methylbenzoyl, chlorobenzoyl, nitrobenzoyl, methylmethoxybenzoyl, benzoylbenzoyl, chloronitrobenzoyl, dimethylbenzoyl, ethoxybenzoyl, α -naphthoyl and β -naphthoyl; or a substituted or unsubstituted alkyl sulfonyl having up to 18 carbon atoms wherein the substituents are selected from the group consisting of methoxy and ethoxy; or aromatic sulfonyl selected from the group consisting of benzenesulfonyl, toluenesulfonyl, ethylbenzenesulfonyl, dimethylbenzenesulfonyl and ethoxybenzenesulfonyl; or a cycloalkyl sulfonyl having up to 18 carbon atoms; or a substituted or unsubstituted alkyl carbamyl having up to 18 carbon atoms wherein the substituents are selected from the group consisting of chloro, methoxycarbonyl and butoxycarbonyl; or a cycloalkyl carbamyl having up to 18 carbon atoms; or an aromatic carbamyl selected from the group consisting of p-phenylazophenylcarbamyl, phenylcarbamyl, tolylcarbamyl, chlorophenylcarbamyl, dimethylphenylcarbamyl, nitrophenylcarbamyl, dichlorophenylcarbamyl, methoxyphenylcarbamyl, naphthylcarbamyl and biphenylcarbamyl; or a heterocyclic carbamyl selected from the group consisting of tetrahydrofuryl-2-carbamyl, pyridyl-3-carbamyl, furyl-2-carbamyl and sulfonamyl-3-carbamyl; and B represents chlorine, bromine or hydrogen.

4,006,164

4-ARYL-1,2,3,4-TETRAHYDROPYRROLO[3,4-b]INDOLES

Willard M. Welch, Jr., North Stonington, and Charles A. Harbert, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

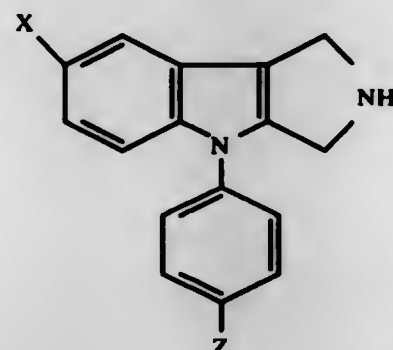
Division of Ser. No. 456,641, April 1, 1974, Pat. No. 3,925,409. This application June 23, 1975, Ser. No. 589,384

Int. Cl.² C07D 487/04

U.S. Cl. 260—326.5 B

3 Claims

1. A compound selected from those of the formula



wherein X is selected from the group consisting of fluoro, chloro, bromo, methyl and hydrogen; and Z is selected from the group consisting of fluoro, chloro, methoxy and hydrogen.

4,006,165

PROCESS FOR CONVERTING MALEIC ANHYDRIDE TO γ -BUTYROLACTONE

Georg Michalezyk, Neukirchen-Vluyn, and Karl-Heinz Gluzek, Alpen, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 488,352, July 15, 1974, Pat. No. 3,948,805. This application Aug. 4, 1975, Ser. No. 601,750

Claims priority, application Germany, Aug. 3, 1973, 2339343

Int. Cl.² C07D 307/32

U.S. Cl. 260—343.6

9 Claims

1. A process for converting maleic anhydride to γ -butyrolactone which comprises treating said anhydride in the liquid phase with hydrogen at a temperature of from about 20° to 400° C. and a pressure of from about 50 to 350 kg/cm² in the presence of co-catalysts comprising palladium and nickel-copper chromite wherein the mole ratio of nickel as NiO to copper chromite as CuO and Cr₂O₃ ranges from about 1:0.1 to 1:5.0.

4,006,166

HYDROXYCITRIC ACID DERIVATIVES

Robert William Guthrie, Fairfield, and Richard Wightman Kierstead, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

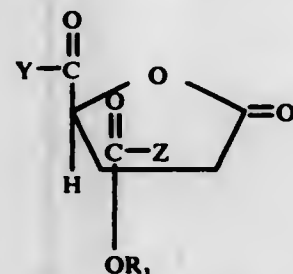
Division of Ser. No. 376,478, July 5, 1973, Pat. No. 3,919,254, which is a division of Ser. No. 204,288, Dec. 2, 1971, Pat. No. 3,767,678. This application Aug. 1, 1975, Ser. No. 601,678

Int. Cl.² C07D 307/32

U.S. Cl. 260—343.6

6 Claims

1. A compound of the formula



wherein R₁ is lower alkanoyl; Y is NR₂R₄; Z is OR₂;

wherein R₂ is hydrogen; R₃ and R₄ each taken independently is hydrogen, lower alkyl, monocyclic cycloalkyl of 3 to 8 carbon atoms or 1-adamantyl; or an optical antipode or a pharmaceutically acceptable salt thereof.

4,006,167

VAPOR PHASE OXIDATION OF UNSATURATED ALIPHATIC HYDROCARBON TO MALEIC ANHYDRIDE USING A CATALYST CONSISTING ESSENTIALLY OF THE OXIDES OF VANADIUM, PHOSPHOROUS, ZIRCONIUM, AND MANGANESE

Sumio Umemura; Kyoji Ohdan; Fumihiko Sakai; Yasuo Bando, and Harumi Ikezawa, all of Ube, Japan, assignors to UBE Industries, Ltd., Japan

Filed June 23, 1975, Ser. No. 589,518

Claims priority, application Japan, June 28, 1974, 49-73255; July 30, 1974, 49-86609

Int. Cl.² C07D 307/60

U.S. Cl. 260—346.8 A

8 Claims

1. A process for producing maleic anhydride by catalytic oxidation of an unsaturated aliphatic hydrocarbon having 4 to 6 carbon atoms, which comprises contacting a feed-gas mixture comprising said unsaturated aliphatic hydrocarbon and oxygen or an oxygen-containing gas in the vapor phase at a temperature of 300° C to 450° C for a period of 0.1 to 1.8 seconds with a catalyst consisting essentially of oxides of (A) vanadium, (B) phosphorus, (C) zirconium and (D) manganese in the atomic ratios defined by the formula

VP₂Zr₂Mn₂O₄

wherein each of a, b and c is a positive number indicating an atomic ratio of each of the aforesaid (B), (C) and (D) to vanadium and falling within the following ranges, a = 1.0 to 7.5, b = 1.3 to 96.0 and c = 0.05 to 1.0, and d is a positive number satisfying the average valency of the (A), (B), (C) and (D), and being within the range of 8 to 200.

4,006,168

CATALYST TREATMENT

Ralph O. Kerr, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Mar. 31, 1975, Ser. No. 563,740

Int. Cl.² C07D 307/60

U.S. Cl. 260—346.8 A

14 Claims

1. In a process for the vapor phase oxidation of C₄ to C₈ hydrocarbons to dicarboxylic acids wherein said hydrocarbon is contacted with a vanadium-molybdenum-oxygen catalyst, wherein said catalyst gradually decreases in activity, the improvement comprising adding to said catalyst, after said decrease in activity, a volatilized compound of molybdenum, nickel, cobalt, manganese, uranium or mixtures thereof.

4,006,169

EPOXIDATION OF α,β -ETHYLENIC KETONES

Elvin L. Anderson, Moorestown, N.J.; Bing L. Lam, Haverford, and George R. Wellman, Warminster, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 26, 1976, Ser. No. 661,478

Int. Cl.² C07D 303/32

U.S. Cl. 260—348 R

1 Claim

1. 1,1,1-Trichloro-3,4-epoxy-2-butanone and its hydrate said hydrate being 1,1,1-trichloro-2,2-dihydroxy-3,4-epoxybutane.

4,006,170

PROCESS FOR THE PREPARATION OF 1-AMINOANTHRAQUINONE

Horst Jäger, Leverkusen, and Erich Klauke, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 17, 1975, Ser. No. 587,748

Claims priority, application Germany, June 29, 1974, 2431409

Int. Cl.² C07B 29/00; C07C 97/24

U.S. Cl. 260—378

24 Claims

1. A process for preparing 1-aminoanthraquinone, comprising the steps of:
a. reacting o-chloromethylphenylisocyanate with at least an equivalent amount of benzene in anhydrous hydrofluoric acid at a temperature of about -10° to 200°C to form the lactam of 2-amino-diphenylmethane-2'-carboxylic acid.
b. saponifying the lactam of 2-amino-diphenylmethane-2'-carboxylic acid with aqueous alkali at a temperature above about 100°C to form the 2-amino-diphenylmethane-2'-carboxylic acid,
c. contacting the 2-amino-diphenylmethane-2'-carboxylic acid with an acid condensation agent, thereby to convert the carboxylic acid to 4-amino-anthrone, and
d. contacting the 4-amino-anthrone with an oxidizing agent in an acid or alkaline medium, thereby to convert the aminoanthrone to 1-aminoanthraquinone.

4,006,171
PROCESS FOR THE PREPARATION OF
HALOGENOANTHRAQUINONES

Norbert Majer, Schildgen; Hans-Samuel Bien, Burscheid; Helmut Judat, Langenfeld, and Armin Lieberam, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 24, 1975, Ser. No. 625,725

Claims priority, application Germany, Nov. 2, 1974, 2452014; Nov. 23, 1974, 2455587

Int. Cl.² C07C 49/68

U.S. Cl. 260—384

13 Claims

1. A process for the preparation of a chloroanthraquinone or a bromoanthraquinone comprising forming a molten mixture of at least one nitroanthraquinone and diluent at a temperature of about 180° to 300° C, the diluent being in at least about 10% by weight of the mixture comprising at least one chloroanthraquinone or bromoanthraquinone, and thereafter adding halogen to said melt.

4,006,172

PROCESS FOR 7-KETO- Δ^4 -STEROIDS

William G. Salmond, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

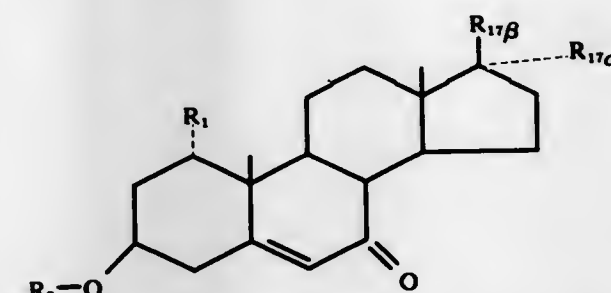
Filed Apr. 26, 1976, Ser. No. 680,022

Int. Cl.² C07J 9/00

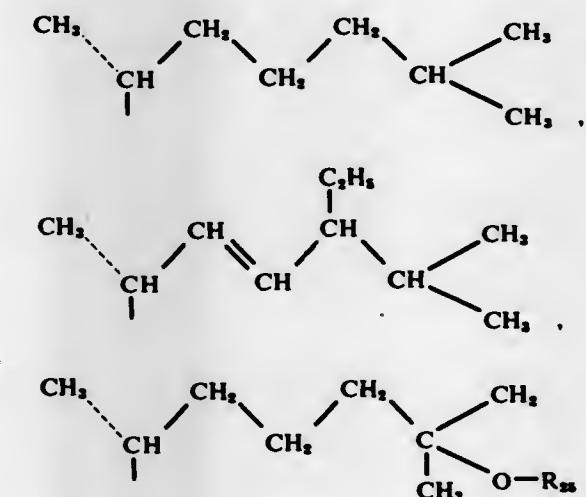
U.S. Cl. 260—397.2

12 Claims

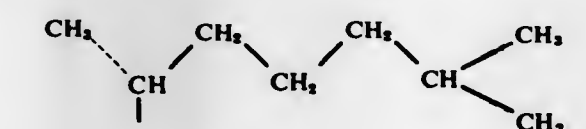
1. An improved chemical process for the production of a steroid of the formula

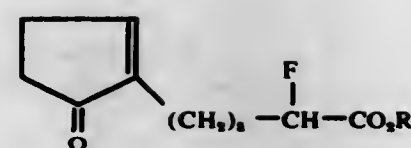


where R₁ is hydrogen, alkanoyloxy of 1 thru 6 carbon atoms or benzoyloxy; where R₂ is alkanoyl of 1 thru 6 carbon atoms or benzoyl; R_{17a} is hydrogen or methyl and R_{17b} is



hydroxy or acetoxy where R₂₅ is hydrogen, alkanoyl of 1 thru 6 carbon atoms or benzoyl with the provisos that (1) when R_{17a} is hydrogen, R_{17b} is





wherein R is selected from the group consisting of hydrogen and lower alkyl.

4,006,180
[1,3-DIHYDROXY-2-SUBSTITUTED AND
2,2-DISUBSTITUTED-INDANYLOXY(OR
THIO)]ALKANOIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

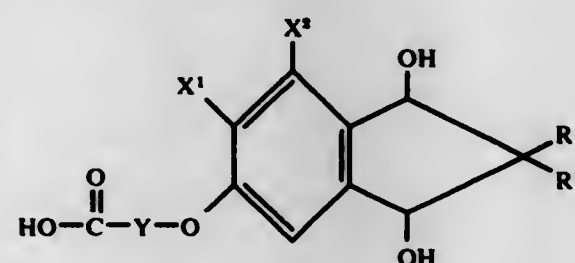
Continuation-in-part of Ser. No. 405,964, Oct. 12, 1973, abandoned. This application July 31, 1974, Ser. No. 492,943

Int. Cl.³ C07C 69/76

U.S. Cl. 260—473 F

16 Claims

1. A compound of the formula:



wherein R is lower alkyl having from 1 to 5 carbon atoms, cycloalkyl having from 5 to 6 nuclear carbon atoms, phenyl or substituted phenyl wherein the substituent is lower alkyl or halo; R¹ is hydrogen, lower alkyl having 1 to 5 carbon atoms, lower alkenyl having 3 to 5 carbon atoms, lower alkynyl having from 3 to 5 carbon atoms, phenyl lower alkyl wherein lower alkyl has 1 to 3 carbon atoms, or phenyl lower alkenyl wherein the lower alkenyl contains from 2 to 5 carbon atoms, phenyl or substituted phenyl wherein the substituents are lower alkyl or halo; or R and R¹ may be joined together with the carbon atoms to which they are attached to form a cycloalkyl having from 3 to 7 nuclear carbon atoms; X¹ is hydrogen, methyl or halo, and X² is methyl or halo; or X¹ and X² may be joined to form a hydrocarbylene chain containing 3 to 4 carbon atoms; and y is alkylene or haloalkylene containing a maximum of 4 carbon atoms, the diastereomeric form, the lower alkyl ester and the non-toxic, pharmacologically acceptable salt derivative thereof.

4,006,181
PROCESS FOR THE OBTAINING OF ESTERS OF
ACETYSALICYLIC ACID AND AMINO ALCOHOLS
 Henri Cousse, and Gilbert Mouzin, both of Castres, France, assignors to Pierre Fabre S.A., Paris, France
 Continuation of Ser. No. 382,400, July 25, 1973, abandoned.
 This application Apr. 23, 1975, Ser. No. 570,760
 Int. Cl.³ C07C 69/84

U.S. Cl. 260—474

5 Claims

1. A process for preparing the hydrochloride of dimethylaminoethyl acetylsalicylate as a crystallization product comprising treating dimethylaminoethanol in chloroform solution at a temperature below 50° C. during the addition in the absence of pyridine with a stoichiometric amount of the chloride of acetylsalicylic acid and crystallizing the hydrochloride of dimethylaminoethyl acetylsalicylate directly from the reaction mixture.

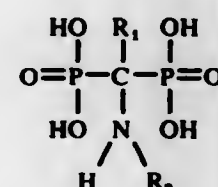
4,006,182
PROCESS FOR THE PREPARATION OF
1-AMINOALKANE-1,1-DIPHOSPHONIC ACIDS
 Walter Ploger, Hilden; Norbert Schindler, Monheim-Baumberg, and Karl-Heinz Worms, Düsseldorf-Holthausen, all of Germany, assignors to Henkel & Cie G.m.b.H., Düsseldorf-Holthausen, Germany
 Filed Mar. 16, 1972, Ser. No. 235,838
 Claims priority, application Germany, Mar. 31, 1971, 2115737

Int. Cl.³ C07F 9/38

U.S. Cl. 260—502.5

4 Claims

1. Process for the preparation of 1-aminoalkane-1,1-diphosphonic acids of the formula



in which R₁ represents a member selected from the group consisting of alkyl with 1 to 20 carbon atoms, phenyl, phenylalkyl with 7 to 12 carbon atoms, alkylphenyl with 7 to 12 carbon atoms, and in which R₂ represents a member selected from the group consisting of hydrogen and alkyl with 1 to 4 carbon atoms, consisting essentially of reacting at a temperature of 100° to 170° C adducts of a hydrogen halide selected from the group consisting of HCl and HBr to a corresponding carboxylic acid amide of the formula



wherein R₁ and R₂ have the above-assigned meanings, with phosphorous acid, in the molar ratio of carboxylic acid amide: phosphorous acid of 1:0.5 to 1:3; and recovering said 1-aminoalkane-1,1-diphosphonic acids.

4,006,183
SUBSTITUTED α-METHYLSULFINYL-O-TOLUIDINES
 Thomas E. Jackson, Madison, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

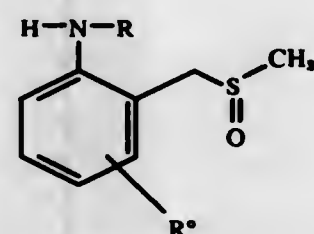
Filed July 8, 1975, Ser. No. 594,120

Int. Cl.³ C07C 103/78, 87/56; A61K 31/165, 31/135

U.S. Cl. 260—538 S

4 Claims

1. A compound of the formula:



wherein

R⁰ is hydrogen or CF₃, wherein said CF₃ is in the 3- or 4-position of the ring, and
 R is hydrogen or meta- or paratetrafluoromethyl-benzoyl, provided that when one of R⁰ and R is hydrogen, the other is other than hydrogen; or a pharmaceutically acceptable acid addition salt thereof.

4,006,184
1- OR
2-[2-HYDROXY-3-AMINO-PROPOXY]-9,10-DIHYDRO-
9,10-ETHANO-ANTHRACENES AND THEIR SALTS
 Atso Iivespaa, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 4, 1974, Ser. No. 457,741

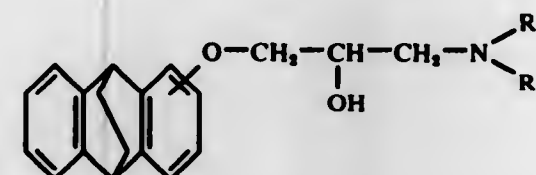
Claims priority, application Switzerland, Apr. 17, 1973, 5500/73

Int. Cl.³ C07C 93/06

U.S. Cl. 260—570.7

7 Claims

1. A compound of the formula III



wherein R₁ represents hydrogen or lower alkyl, R₂ represents hydrogen or lower alkyl and the 3-amino-2-hydroxypropoxy side chain is in the 1- or 2-position of the anthracene skeleton, and the pharmaceutically acceptable salts thereof.

4,006,185
5-SUBSTITUTED-2-FLUOROANILINES
 John H. Tobin, Beacon Falls, and John A. Wojtowicz, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

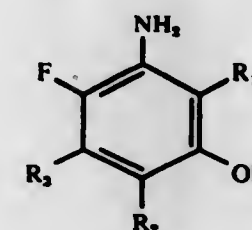
Continuation-in-part of Ser. No. 381,838; July 23, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 535,073

Int. Cl.³ C07C 85/00, 87/00

U.S. Cl. 260—575

3 Claims

1. 5-Substituted-2-fluoroanilines having the formula



wherein R is selected from the group consisting of hydrogen and lower alkyl having 1-4 carbon atoms and R₁, R₂ and R₃ are each independently selected from the group consisting of hydrogen, halogen and lower alkyl having 1-4 carbons.

4,006,186
PROCESS FOR THE PREPARATION OF THIOPHENOLS
 Hans Dieter Engels, Solingen, and Rolf-Jürgen Singer, Wuppertal-Vohwinkel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
 Continuation of Ser. No. 240,845, April 3, 1972, abandoned.
 This application May 2, 1974, Ser. No. 466,312

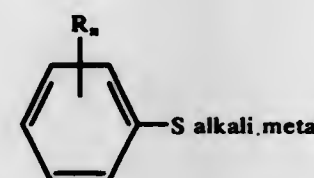
Claims priority, application Germany, Apr. 7, 1971, 2116978

Int. Cl.³ C07C 149/00, 149/12

U.S. Cl. 260—577

21 Claims

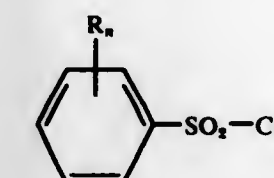
1. A process for the production of a thiophenolate of the formula



in which

n is an integer from 0 to 5, inclusive, and
 R is hydroxy, nitro, halogen, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, amino, monoalkylamino or dialkylamino, wherein each alkyl is of from 1 to 6 carbon atoms, the radicals R being identical or different when n is from 2 to 5;

which consists essentially of the steps of:
 i. contacting a phenylsulfonic acid chloride of the formula



in which R and n are defined as above with hydrazine in a reaction vessel and maintaining the resultant mixture at a temperature of 0° to 40° C;

ii. adding to said mixture in said reaction vessel hydriodic acid and hydrochloric acid and thereafter maintaining the reaction mixture at a temperature of 60°-120° C;
 iii. thereafter neutralizing any acid in said reaction mixture by addition of an alkali; and
 iv. adding to the so neutralized reaction mixture additional hydrazine and an alkali so that the mol ratio of disulfide in the reaction mixture to alkali to hydrazine is 1:2-3:2-5 and maintaining the reaction mixture for several hours at 60° to 120° C until thiophenolate is formed.

4,006,187
PREPARATION OF ARYL LITHIUM COMPOUNDS BY
METALATION

Conrad W. Kamienski; Robert C. Morrison, and Kenneth R. Martin, all of Gastonia, N.C., assignors to Lithium Corporation of America, New York, N.Y.

Filed Oct. 6, 1971, Ser. No. 187,149

Int. Cl.³ C07C 87/52; C07F 1/02

U.S. Cl. 260—577

11 Claims

1. A process for the preparation of aryllithium compounds which consists in metalating (a) an aromatic compound selected from the group consisting of substituted benzenes in which metalation of the substituent is effected and in which the substituents are selected from the group consisting of alkyl, alkoxy and dialkylamino with (b) an adduct of an organolithium compound, selected from the group consisting of C₂-C₁₈ alkylolithiums and cycloalkylolithiums, with a vinyl-substituted aromatic compound, in the presence of (c) a member selected from the group consisting of tertiary alkyl amines containing no methyl group and aryl tertiary amines in which the nitrogen of said aryl tertiary amine is directly attached to an aromatic radical, the ratio of the lithium in the (b) adduct to the (c) ingredient being in the range of 1 gram atom of lithium to from about 0.25 to about 4.5 gram moles of the (c) ingredient.

4,006,188
CYCLOALKENONES
 Clive A. Henrick, and Jeffery N. Labovitz, both of Palo Alto, Calif., assignors to Zeecon Corporation, Palo Alto, Calif.

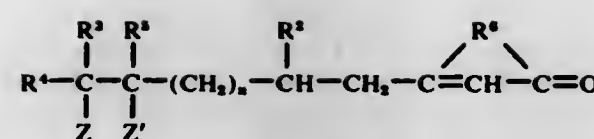
Division of Ser. No. 590,231, June 25, 1975, which is a continuation-in-part of Ser. No. 464,880, April 29, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,968

Int. Cl.³ C07C 49/46, 49/45, 49/48

U.S. Cl. 260—586 R

8 Claims

1. A compound of the formula:



wherein,

each of R^3 and R^4 is lower alkyl;
each of R^3 and R^5 is hydrogen or lower alkyl;
 R^6 is methylene, ethylene or trimethylene;
 n is one, two or three;
 Z is hydrogen, chlorine, lower alkyl or one of the groups
—OR or —SR in which R is hydrogen or lower alkyl; and
 Z' is hydrogen or together with Z forms a carbon-carbon bond.

4,006,189

PROCESS FOR PURIFYING GLYOXAL

August Sommer, Herne, and Richard Wessendorf, Essen-Heisingen, both of Germany, assignors to Veba Chemie AG, Gelsenkirchen-Buer, Germany

Filed June 11, 1974, Ser. No. 478,431

Claims priority, application Germany, June 13, 1973, 2329957

Int. Cl.² C07C 47/02

U.S. Cl. 260—601 R

6 Claims

1. In a process for the recovery of an aqueous solution of purified glyoxal hydrate from a mixture of glyoxal, volatile acids and non-volatile acids wherein said mixture is subjected to distillation to remove said volatile acids to leave behind a residue of said glyoxal and said non-volatile acids and to said residue there is added an alkali to neutralize said non-volatile acids and convert them to the corresponding alkali salt, the improvement for recovering a purified aqueous solution of glyoxal hydrate which comprises the steps of:

- Contacting the resultant mixture following addition of said alkali with a C_1 — C_3 alcohol while maintaining the pH of the resultant solution in the acid range and removing liberated water by distillation;
- Removing alkali salts of said non-volatile acids leaving behind glyoxal-di-(alkyl hemiacetal);
- Contacting said glyoxal-di-(alkyl hemiacetal) with water under neutral hydrolysis conditions; and
- recovering an aqueous solution of glyoxal hydrate.

4,006,190

PRODUCTION OF HYDROXYL COMPOUNDS

Gerald S. Koerner, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

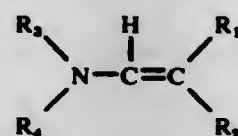
Filed Mar. 15, 1976, Ser. No. 666,842

Int. Cl.² C07C 47/19, 29/14, 31/20

U.S. Cl. 260—602

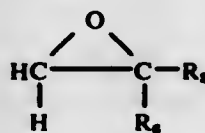
14 Claims

1. A process comprising the successive steps of:
a. reacting in a liquid phase a sterically hindered enamine with an alkylene oxide, said sterically hindered enamine being of the formula:



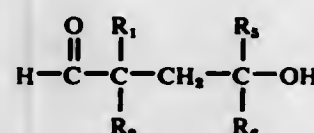
wherein R_1 and R_2 are alike or different and are hydrogen or lower alkyl groups, and wherein R_3 and R_4 are each an organic group containing at least three carbon atoms or which compositely form a single divalent organic group containing at least six carbon atoms, R_3 and R_4 being of a nature to sterically hinder the nitrogen atom of said enamine but which contain no groups which under process conditions are reactive to any substantial extent with

themselves, with said enamine or with the other reactants used and products formed in this said process, said alkylene oxide being of a formula:



wherein R_3 and R_4 are alike or different and are hydrogen or lower alkyl groups,

b. hydrolyzing the compound formed by the reaction of said enamine with said alkylene oxide by combining therewith under hydrolysis condition a stoichiometric excess of the amount of water necessary for the hydrolysis of said compound to produce a two-phase hydrolysis reaction product consisting of an oil phase rich in a sterically hindered secondary amine and an aqueous phase comprising an aqueous solution of a monohydroxyl alkyl aldehyde of the formula:



wherein R_1 , R_2 , R_3 and R_4 are set forth above, and

c. treating said two-phase hydrolysis reaction product to separate and recover therefrom said aqueous phase comprising an aqueous solution of a said monohydroxyl alkyl aldehyde.

4,006,191

PROCESS FOR THE PREPARATION OF ARALKYL MONOHYDROPEROXIDES

Heinrich Sodomann; Bruno Hauschulz, and Günther Althoff, all of Gladbeck, Germany, assignors to Phenolchemie GmbH, Gladbeck, Germany

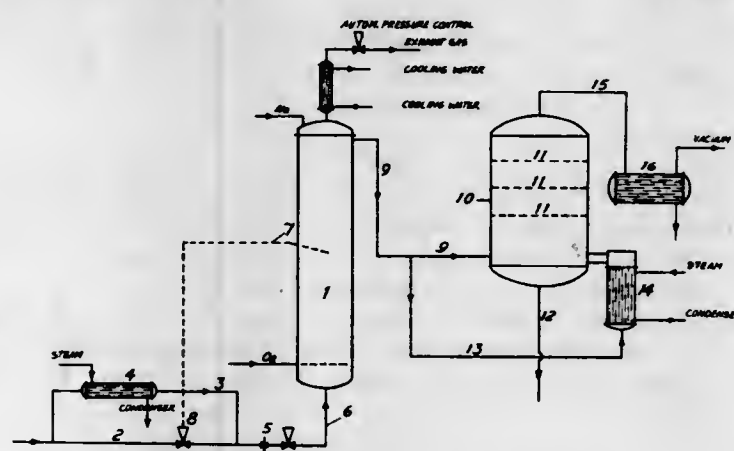
Filed Jan. 9, 1969, Ser. No. 791,539

Claims priority, application Germany, Jan. 13, 1968, 1668575

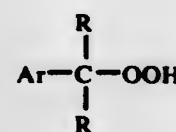
Int. Cl.² C07C 179/02

U.S. Cl. 260—610 B

4 Claims



1. Process for the preparation of aralkyl monohydroperoxides of the formula:



wherein Ar represents phenyl and R represents methyl, which comprises oxidizing a hydrocarbon of the formula:

4,006,194

PRODUCTION OF PHENOLS

Benjamin J. Luberoft, Summit, and Todd S. Simmons, Montclair, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed May 17, 1971, Ser. No. 143,845

Int. Cl.² C07C 37/00

U.S. Cl. 260—621 C

7 Claims

wherein Ar and R are as above defined with a member selected from the group consisting of oxygen and oxygen-containing gases at a temperature of about 40° to 135° C in the absence water, acid binding agents and reaction-promoting additives, to provide a conversion of between 5 to 30% hydroperoxide, directly thereafter in a second step directly introducing the oxidation product thereby obtained into a treatment zone maintained at a pressure of less than 150 Torr and under conditions whereby without any further heat input, unreacted hydrocarbons present in the oxidation product are evaporated and separated from said hydroperoxide, the heat required for the evaporation being derived solely from the heat liberated in the formation of the aralkyl monohydroperoxides.

1. A process for producing a phenol comprising: catalytically reacting by heating in the liquid phase an alkyl benzene selected from the group consisting of toluene, cumene isobutyl benzene and ethyl benzene with t-butyl hydroperoxide in the presence of a catalyst selected from the group consisting of the chlorides, naphthenates and acetylacetonates of cobalt, copper, manganese, iron and nickel to produce the corresponding t-butyl- α -phenalkyl peroxide; heating a reaction mixture comprising the t-butyl- α -phenalkyl peroxide and an acid catalyst to decompose the peroxide; said heating being effected to provide a temperature at which the carbonyl and alkanol decomposition products of said peroxide can be separated from the reaction mixture in gaseous form and the phenol decomposition product of said peroxide is a liquid; continuously separating from the reaction mixture, in gaseous form, the carbonyl and alkanol decomposition products; and recovering the phenol from the reaction mixture.

4,006,192

1,1-DI-(2,7

OCTADIENEOXYMETHYLENE)-1-(HYDROXYMETHYLENE)ALKANE

Satoru Enomoto, Fujisawa; Hitoshi Takita, Tokyo; Mikio Yanaka, Matsudo; Yutaka Mukaida, and Hisayuki Wada, both of Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,697

Claims priority, application Japan, Dec. 27, 1973, 49-144302

Int. Cl.² C07C 43/02

U.S. Cl. 260—615 R

2 Claims

1. 1,1-di-(2,7 octadieneoxymethylene)-1-(hydroxymethylene)propane.

4,006,193

ISOMERIZATION OF THE UNSATURATED ALCOHOLS

Yoichi Ninagawa; Takashi Nishida, and Kazuo Ito, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 12, 1973, Ser. No. 340,585

Claims priority, application Japan, June 14, 1972, 47-59183; Mar. 13, 1972, 47-26017; June 14, 1972, 47-59182

Int. Cl.² C07C 33/02

U.S. Cl. 260—617 R

7 Claims

1. In a process for preparing a mixture of geraniol and nerol which comprises the steps of isomerizing linalool in the presence of an orthovanadic acid ester catalyst wherein the ester moiety thereof is derived from a C_1 — C_{10} alkyl, cycloalkyl or alkenyl alcohol at about 100° to 300° C and distilling the reaction mixture consisting of geraniol, nerol, unreacted linalool and the catalyst under reduced pressure to remove unreacted linalool and the catalyst therefrom the improvement comprising distilling said reaction mixture under reduced pressure in the presence of a high boiling solvent to separate said catalyst from said reaction mixture to form a distillate mixture consisting of geraniol, nerol and unreacted linalool, and a bottom mixture consisting of said catalyst with said high boiling solvent, rectifying said distillate mixture of geraniol, nerol and unreacted linalool, to remove said unreacted linalool therefrom to obtain a mixture of geraniol and nerol.

4,006,196

PROCESS FOR THE MANUFACTURE OF GERANYL CHLORIDE

Jimmy H. Chan, Martinez, and Harold M. Pitt, Lafayette, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 4, 1976, Ser. No. 663,948

Int. Cl.² C07C 21/00

U.S. Cl. 260—654 R

8 Claims

1. A process for the manufacture of geranyl chloride comprising reacting geraniol and chlorodimethylformiminium chloride.

4,006,197

PROCESS FOR SEPARATING NORMAL PARAFFINS

Herbert J. Bieser, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 19, 1975, Ser. No. 633,183

Int. Cl.² C10G 25/04; C07C 7/13

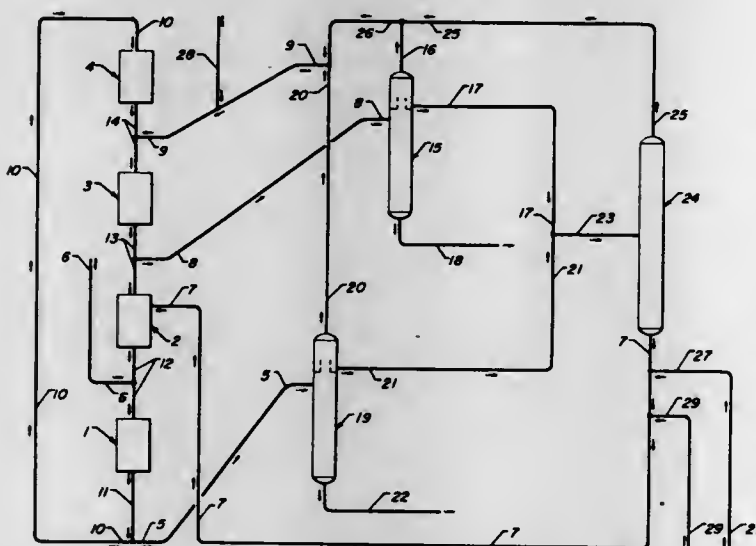
U.S. Cl. 260—676 MS

18 Claims

1. In a process for the separation of normal paraffins from a feed stream comprising a mixture of normal paraffins and

isoparaffins which process employs an adsorbent comprising a shape-selective zeolite and comprises the steps of:

- maintaining net fluid flow through a column of an adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;
- maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;
- maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone, said purification zone having a sweeping agent input stream located upstream from said feed input stream;
- maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;
- passing a sweeping agent comprising a raffinate-type compound into said purification zone;
- separating in a third fractionation means maintained at third fractionating conditions mixture of sweeping agent and desorbent material to produce a third overhead stream comprising desorbent material and a third bottoms fraction comprising sweeping agent;
- recycling at least a portion of said third overhead stream to said desorption zone;
- recycling at least a portion of said third bottoms fraction to said purification zone;
- periodically advancing through said column of adsorbent particles in a downstream direction with respect to fluid flow in said adsorption zone the feed input stream, raffinate output stream, desorbent input stream and extract output stream to effect the shifting of zones through said mass of adsorbent and the production of extract output and raffinate output streams, wherein the improvement comprises a fractionating and recycle method which comprises the steps of:
 - removing a sidecut stream comprising sweeping agent and desorbent material from said first or second fractionation means, said sidecut stream containing a lower concentration of desorbent material than either said first overhead stream or said second overhead stream;
 - passing at least a portion of said sidecut stream to said third fractionation means maintained at fractionating conditions and therein separating said sidecut stream to produce said third overhead stream and said third bottoms fraction, and
 - passing in admixture at least a portion each of said third overhead stream, said first overhead stream and said second overhead to said desorption zone.



- passing said feed stream into said adsorption zone at adsorption conditions to effect the selective adsorption of said normal paraffins by said adsorbent and withdrawing a raffinate output stream comprising isoparaffins, sweeping agent and a hereinafter described desorbent material from said adsorption zone;
- passing a desorbent material into said desorption zone at desorption conditions to effect the displacement of normal paraffins from the adsorbent in said desorption zone and withdrawing an extract output stream comprising normal paraffins, sweeping agent and desorbent material from said desorption zone;
- passing at least a portion of said extract output stream to a first fractionation means and therein fractionating at first fractionating conditions said extract output stream to produce a first overhead stream comprising a mixture of sweeping agent and desorbent material and a first bottoms fraction comprising normal paraffins;
- passing at least a portion of said raffinate output stream to a second fractionation means and therein fractionating at second fractionating conditions said raffinate output stream to produce a second overhead stream comprising a mixture of sweeping agent and desorbent material and a second bottom fraction comprising isoparaffins;

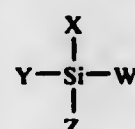
4,006,198 METHOD FOR THE PREPARATION OF TERTIARY OLEFINS

Renato Tesi; Vittorio Fattore, and Franco Buonomo, all of San Donato Milanese, Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Filed Aug. 1, 1975, Ser. No. 601,207

Claims priority, application Italy, Aug. 2, 1974, 25938/74
Int. Cl.² C07C 1/00, 1/24

- U.S. Cl. 260—682 12 Claims
- A method for the preparation of tertiary olefins starting from the corresponding tertiary ethers, consisting in contacting the ether with a catalyst compound by active alumina obtained by reacting alumina with a silicon compound selected among those corresponding to the following formula:



wherein X, Y, Z and W can be —R, —OR, —Cl, —Br, —SH₃, —COOR, —SiH₃Cl_n, R being hydrogen, an alkyl, cycloalkyl, aryl, aralkyl, or alkyl-cycloalkyl radicals having from 1 to 30 carbon atoms, n and m being integers comprised between 1 and 3 and thereafter drying and subjecting the reacted alumina to controlled oxidation.

4,006,199 METHOD FOR PREPARATION OF LIQUID POLYOLEFIN OIL

Hiroshi Isa, Yachiyo; Hiroshi Mandai, Chiba; Toshiyuki Uki-gai, Yachiyo; Auri Tominaga, Tokyo, and Tatsuji Yamashita, Chiba, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1976, Ser. No. 677,158

Claims priority, application Japan, Apr. 22, 1975, 50-49004
Int. Cl.² C07C 3/18

- U.S. Cl. 260—683.15 B 6 Claims
- A method of preparing a liquid polyolefin oil, which comprises polymerizing at a temperature of from -20° to 100° C, an olefin or a mixture of olefins having 6 or more carbon

atoms, in the presence of a catalyst mixture of (a) a dicarbonyl compound selected from the group consisting of acyclic or cyclic diketones and ketoesters and (b) an aluminum halide in an amount of from 0.7 to 5 mole per one carbonyl group or ester bond of said dicarbonyl compound, and recovering a liquid polyolefin oil from the polymerization reaction mixture.

4,006,200 POWDER PAINT BLEND COMPRISING EPOXY-FUNCTIONAL COPOLYMER AND CARBOXY AND AMIDE-FUNCTIONAL COPOLYMER

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 426,164, Dec. 19, 1973, Pat. No. 3,959,405. This application Jan. 7, 1976, Ser. No. 644,498
Int. Cl.² C08L 63/10

- U.S. Cl. 260—836 1 Claim
- In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents and plasticizers, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactable particulate mixture of

- a carboxy functional polymer,
- an epoxy-functional copolymer of monoethylenically unsaturated monomers,
- 0.05 to about 4 weight percent of a non-reactive polymeric flow control agent based on the weight of said coreactable particulate mixture,

- the improvement wherein,
- said carboxy-functional polymer has glass transition temperature in the range of about 40° to about 90° C. and molecular weight in the range of about 1500 to about 15,000, and is a qualitatively difunctional copolymer of monoethylenically unsaturated monomers consisting essentially of about 5 to about 20 weight percent of an alpha-beta olefinically unsaturated monocarboxylic acid selected from acrylic and methacrylic acid, about 2 to about 10 weight percent of an alpha-beta olefinically unsaturated amide selected from acrylamide and methacrylamide, and about 70 to about 93 weight percent of monoethylenically unsaturated, quantitatively and qualitatively monofunctional monomers, consisting essentially of esters of a C₁—C₈ monohydric alcohol and acrylic acid, esters of a C₁—C₈ monohydric alcohol and methacrylic acid and C₈—C₁₂ monovinyl hydrocarbons, and
 - said epoxy-functional copolymer of monoethylenically unsaturated monomers is qualitatively monofunctional, has glass transition temperature in the range of about 40° C. and molecular weight in the range of about 1500 to about 15,000, and consists essentially of about 5 to about 20 weight percent of a glycidyl ester of monoethylenically unsaturated carboxylic acid and about 80 to about 85 weight percent of monofunctional monomers selected from the group consisting of esters of a C₁—C₈ monohydric alcohol and acrylic acid, esters of a C₁—C₈ monohydric alcohol and methacrylic acid and C₈—C₁₂ monovinyl hydrocarbons.

4,006,201 PROCESS FOR THE PRODUCTION OF POLYVINYL CHLORIDE GRAFT COPOLYMERS

Johann Bauer; Klaus Adler; Gerhard Beier; Heinz Hefner, and Alex Sabel, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Sept. 3, 1974, Ser. No. 502,869

Claims priority, application Germany, Sept. 4, 1973, 2344553

Int. Cl.² C08F 263/00; C08L 31/04

- U.S. Cl. 260—878 R 6 Claims
- In the process for the production of polyvinyl chloride

grafted copolymers from ethylene/vinyl acetate copolymers and vinyl chloride which comprises graft polymerizing vinyl chloride onto an ethylene/vinyl acetate copolymer in an aqueous phase in the presence of a polymerization catalyst at a temperature and time sufficient to effect polymerization and recovering said polyvinyl chloride grafted copolymer, the improvement consisting of utilizing an ethylene/vinyl acetate copolymer dispersion in water in the presence of a water-soluble, free-radical-forming catalyst as said polymerization catalyst and adding vinyl chloride to the stirred reactants during polymerization at such a rate that the pressure is maintained below the saturation pressure of vinyl chloride at the polymerization temperature.

4,006,202 POLYMER COMPOSITION

James M. Watson, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Oct. 2, 1972, Ser. No. 294,015

Int. Cl.² C08L 9/06

- U.S. Cl. 260—880 R 12 Claims
- A copolymer comprised of 64 to 98% by weight of styrene and 1 to 24% by weight of SO₂ homogeneously copolymerized with 1 to 12% by weight of an elastomer, said copolymer being prepared by copolymerizing said styrene and said SO₂ in the presence of an elastomer dissolved in said styrene at a temperature of between 0 and 90° C.

4,006,203 PHOSPHINYL GUANIDINE DERIVATIVES

Leon H. Chance, New Orleans, and Cletus E. Morris, Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 667,054

Int. Cl.² C07F 9/24

- U.S. Cl. 260—940 3 Claims
- 2-Cyano-1-[bis(dimethylamino)phosphinyl]guanidine.

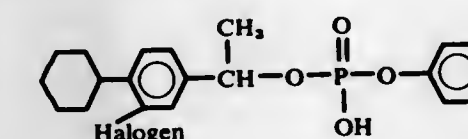
4,006,204 PHOSPHORIC ACID DIESTERS

Vithal J. Rajadhyaksha, Mission Viejo; James V. Peck, Newport Beach, and William D. Fairbairn, Atherton, all of Calif., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed Apr. 30, 1975, Ser. No. 572,888

Int. Cl.² C07F 9/12, 9/09, 9/40

- U.S. Cl. 260—958 8 Claims
- A compound having the structural formula



and a pharmaceutically acceptable salt thereof.

4,006,205 MEANS FOR APPLYING ADDITIVES TO INDUSTRIAL GAS

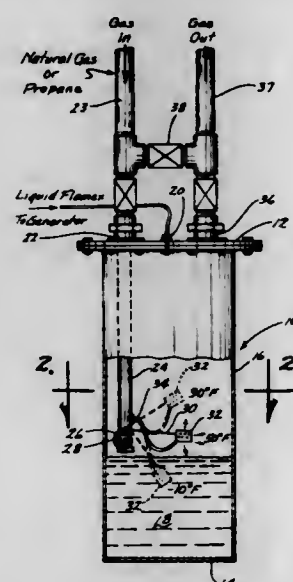
Berwyn E. Etter, 10355 Paradise Blvd., Treasure Island, Fla. 33740

Continuation-in-part of Ser. No. 558,945, March 17, 1975, Pat. No. 3,924,648, which is a continuation of Ser. No. 358,005, May 7, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,403

Int. Cl.² B01F 3/04

- U.S. Cl. 261—39 R 7 Claims
- An apparatus for applying additives to industrial gas, comprising,

a container having a top, a bottom and sides forming an enclosed chamber,
 an inlet port in said chamber adapted to be connected to a source of pressurized industrial gas,
 a quantity of liquid gas additive in the bottom of said chamber,
 a movable arm means mounted within said chamber,
 a gas discharge means on said arm means,
 said arm means being automatically temperature responsively movable from a first position wherein said gas discharge means is immersed in the liquid gas additive to a second position wherein said gas discharge means is positioned above said liquid gas additive,
 a thermal responsive element means connected to said arm



means to cause said arm means to move between its said first and second positions so that said gas discharge means will be immersed in said liquid gas additive when the temperature within said chamber is at least 0° F, and to progressively rise out of and above said liquid gas additive when the temperature within said chamber is increased, conduit means connecting said inlet port and said gas discharge means so that said industrial gas is discharged within said liquid gas additive when said gas discharge means is submerged therein; and discharge above said liquid gas additive when said gas discharge means is positioned thereabove, and
 an outlet port in said chamber adapted to discharge the gas resulting from the mixture of said industrial gas and said liquid gas additive.

4,006,206

CENTRIFUGAL APPARATUS AND METHOD FOR PROCESSING EXPLOSIVES

Robert W. Evans, Herndon, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 507,821, Sept. 20, 1974. This application Mar. 26, 1976, Ser. No. 670,818

Int. Cl.² G21C 21/00

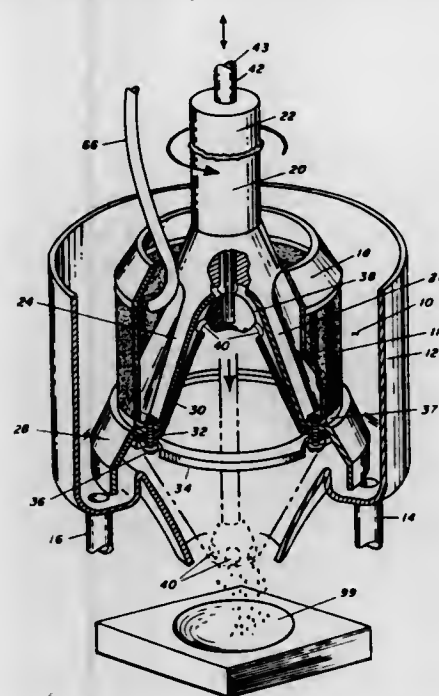
U.S. Cl. 264—3 E

3 Claims

1. A method for processing a liquid slurry of primary explosive to produce a dry, free-flowing explosive product free from agglomerates, which comprises:

- introducing the liquid slurry of primary explosive into a centrifugal extractor basket wherein the explosive solids are retained and the liquid medium is removed, said extractor basket having an open bottom which is closed by being peripherally attached to the large open end of a flexible invertible funnel whose small open end is held upright to retain the contents of said basket;
- introducing wash liquid to displace adhering liquid slurry medium from the explosive solids;
- introducing gaseous drying medium to remove adhering

liquid from said explosive solids to produce a dry, free-flowing product free from agglomerates; and
 d. inverting the flexible funnel to discharge said product through the small open end of said funnel,



said basket being rotated during the processing to effect removal of liquid.

4,006,207

MAKING SILICONE RUBBER MOLDS FROM RECLAIMED CURED SILICONE RUBBER PARTICLES AND LIQUID UNCURED SILICONE RUBBER

Leon Yeshin, Kitchener, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Mar. 26, 1975, Ser. No. 562,210

Int. Cl.² B29C 1/02

U.S. Cl. 264—108

16 Claims

1. A process for making a silicone rubber mould which comprises providing in a mould having an exposed surface of a master to be reproduced an amalgamation of an uncured, liquid, castable silicone rubber and compatible, reclaimed, cured silicone rubber particles having a specific gravity less than the specific gravity of the liquid, silicone rubber, said surface being below said amalgamation, permitting the compatible, reclaimed silicone rubber particles to float away from said surface of said master leaving said liquid, silicone rubber in contact with said surface, curing said liquid, silicone rubber and removing the resultant silicone rubber mould from said master.

4,006,208

PROCESS FOR MANUFACTURING ELASTIC HARD FIBERS

Hirotaka Toba; Keiichi Ohata, and Nagayoshi Tsukane, all of Saitama, Japan, assignors to Daicel, Ltd., Osaka, Japan

Continuation of Ser. No. 370,968, June 18, 1973, abandoned. This application Oct. 16, 1975, Ser. No. 622,953

Claims priority, application Japan, June 22, 1972, 47-62722 Int. Cl.² D01D 5/08

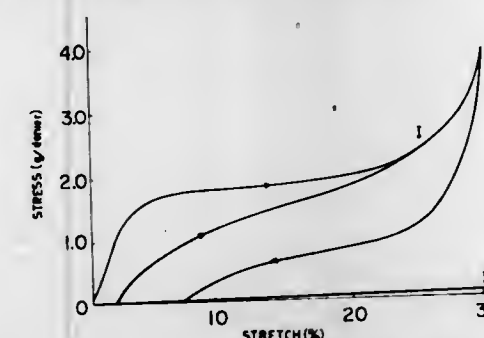
U.S. Cl. 264—176 F

9 Claims

1. A process of forming an elastic polyisobutylene oxide filament, which comprises:

- melt extruding a molten filament-forming isobutylene oxide polymer composition at a temperature in the range of from 175° C up to the decomposition temperature of polyisobutylene oxide into a filament, at least 60% of the repeating structural units of the polymer being isobutylene oxide monomer units;
- stretching the molten filament issuing from the spinneret orifice at a draw ratio of from 50 to 1000, wherein draw

ratio is defined as the wind-up speed of the filament divided by the flow speed of the molten polymer composition issuing from the spinneret orifice;
 quenching the filament to a temperature of from -20° C to +70° C within a short distance of the spinneret orifice and prior to winding up the filament; and



winding up the filament, said filament as wound up having an elastic recovery ratio of at least 70% from 50% extension and a work recovery ratio of at least 70% from 5% extension.

4,006,209

METHOD FOR ADDITIVE FEEDING

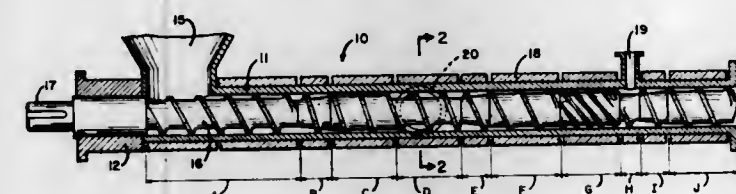
John J. Chiselko, Martinsville, and William H. Hulbert, Somerville, both of N.J., assignors to Egan Machinery Company, Somerville, N.J.

Filed Feb. 10, 1975, Ser. No. 548,283

Int. Cl.² D01F 1/02

U.S. Cl. 264—211

10 Claims



1. A process for the production of an extrudate of a resin and a solid particulate additive in a plastics extruder having a first barrel with a first bore, a resin feed opening adjacent to one end of the first barrel, a discharge orifice in the other end of the first barrel and a first rotating screw within the first bore having a melting stage and a low pressure section downstream of the melting stage, the steps comprising:

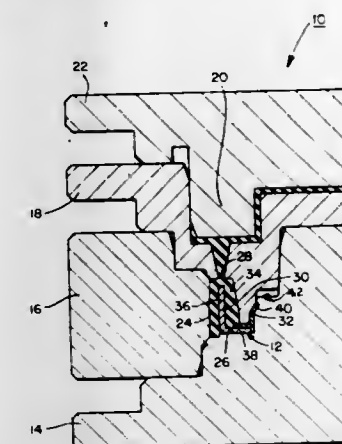
- feeding the resin to the first screw through the resin feed opening;
- conveying the resin by means of the first screw through the melting stage wherein the resin is melted and raised in pressure;
- further conveying the molten resin through the low pressure section wherein the resin pressure is decreased;
- simultaneously with feeding the resin and conveying the resin to the low pressure stage:
- feeding the solid particulate additive to the feed opening of a second barrel having a second bore intersecting the first barrel at the low pressure section thereof;
- conveying the solid particulate additive along the second bore to the intersection thereof with the low pressure section of the first barrel, by means of a second screw extending substantially the length of the second barrel; and
- introducing the solid particulate additive at a controlled rate to the resin at the low pressure section of the first barrel by operation of the second screw;
- conveying and mixing the resin and the additive downstream of the low pressure section; and
- discharging the extrudate of resin and additive through the discharge orifice.

4,006,210 METHOD OF MOLDING A SEAL WITH BALANCED PRESSURES ON A PREFORM

Dennis N. Denton, Bessemer City, N.C., assignor to Garlock Inc., Palmyra, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,169

Int. Cl.² B29C 5/00; B29D 3/00; B29G 3/00; B29H 9/00 U.S. Cl. 264—250 5 Claims



1. In a method for transfer molding a seal in which a cylindrical metal shell is supported in a mold cavity spaced from walls thereof, curable elastomer is introduced into said cavity and about said shell and cured, bonding the elastomer to said shell, the improvement comprising:

- positioning said shell in said cavity and axially aligning said shell with plural sprue openings circumferentially spaced about said cavity so that elastomer flowing through each of said sprue openings is split into two streams by an edge portion of said shell, one stream flowing inside of the shell and the other of said streams flowing outside of said shell and introducing elastomer through said sprue openings, causing said elastomer to be split into streams flowing inside and outside of said shell, equalizing pressure against inner and outer surfaces thereof.

4,006,211

METHOD FOR IMPROVING IMPACT STRENGTH IN HIGH NITRILE POLYMERS BY STRETCHING AND HEAT SETTING

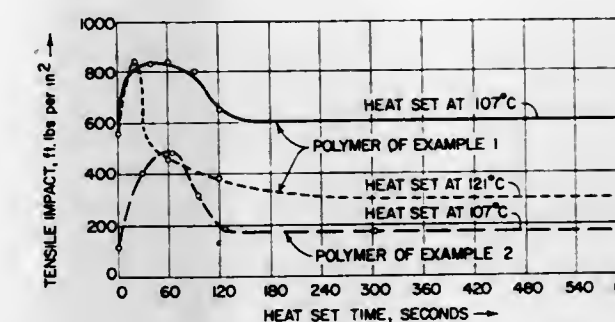
Ralph E. Isley, Northfield, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 438,615, Feb. 1, 1974, abandoned. This application May 27, 1975, Ser. No. 580,893

Int. Cl.² B29D 7/24

U.S. Cl. 264—291

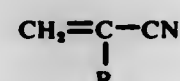
9 Claims



1. A process for improving the impact strength and dimensional stability of a polymer article consisting essentially of: orienting a solvent-free, thermoformed polymer article containing less than 0.5% by weight of water, by stretching in more than one direction in a linear stretch ratio of about 1.5:1 to 5:1 in each direction of stretch within the temperature range of from about 85° to 150° C, then heat setting said oriented article within the orienting temperature range and for a period of from about 5 seconds to 2.5

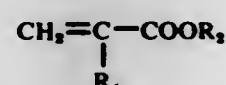
minutes while the article is retained in its stretched condition, and wherein the polymer in said article is prepared by copolymerizing in an aqueous medium 100 parts by weight of:

- A. from about 60 to 90% by weight of at least one nitrile having the structure



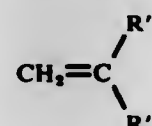
wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

- B. from about 40 to 10% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of:
1. an ester having the structure



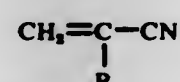
wherein R₁ is hydrogen an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R₂ is an alkyl group having from 1 to 6 carbon atoms.

2. an alpha-olefin having the structure



wherein R' and R'' are alkyl groups having from 1 to 7 carbon atoms,

3. a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers.
 4. vinyl acetate, and
 5. styrene, wherein said monomers are copolymerized in the presence of from 0 to 40 parts by weight of:
- C. a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally a comonomer selected from the group consisting of styrene and a nitrile monomer having the structure



wherein R has the above designation, said rubber polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

4,006,212

PROCESS FOR RECOVERY OF MOLYBDENUM AND RHENIUM FROM ORES

Allen Myron Alper, Towanda; Carl William Boyer, Wysox, and Brice Eugene Martin, Towanda, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 10, 1975, Ser. No. 612,097
Int. Cl.³ C01G 39/00, 47/00

U.S. Cl. 423-49

5 Claims

1. Process for recovery of molybdenum and rhenium values from sulfide ores containing said values, and impurities including contained silica, the process comprising fusing said ores with a molar excess of alkali metal carbonate of at least 15% over that required for the theoretical conversion of the molybdenum, rhenium and sulfur values to water soluble form, said

fusing carried out in a nonoxidizing atmosphere at a temperature of from about 700°-950° C, until the resulting carbon dioxide evolution ceases, solidifying and leaching the fusion mass with water to separate the water soluble values from said impurities, characterized in that there is added to the fusion mass at least an amount of alumina needed to combine with contained silica to convert the contained silica to an insoluble form during fusion, whereby said insolubles are separated from the soluble alkali metal values during water leaching.

4,006,213

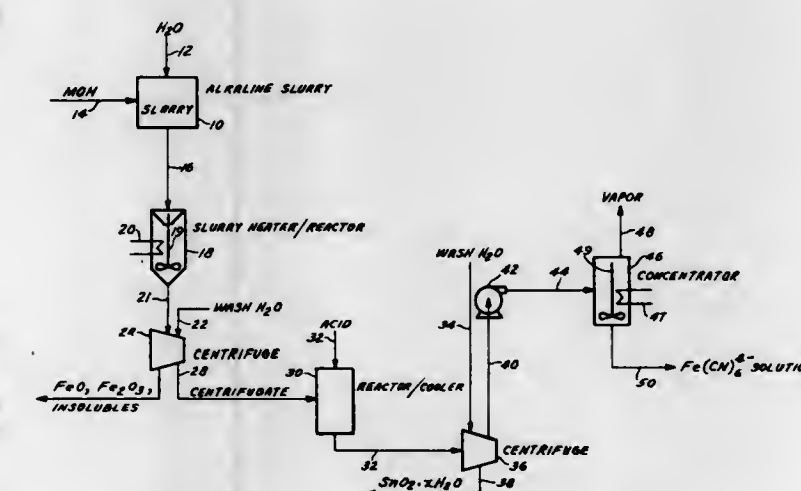
HALOGEN TIN ELECTRODEPOSITION BATH SLUDGE TREATMENT

Thomas W. Fisher; Stewart E. Rauch, Jr., both of Bethlehem, and Richard N. Steinbicker, Coopersburg, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed July 25, 1975, Ser. No. 598,979
Int. Cl.³ C01G 19/02

U.S. Cl. 423-92

1 Claim



1. A process for recovering stannic oxide, iron oxides and sodium ferrocyanide from sludge containing sodium hexafluorostannate, hydrated stannic oxide and ferri-ferrocyanide, which sludge has been derived from a halogen tin electroplating bath, comprising:

- a. removing sludge from a halogen tin electroplating bath,
- b. diluting the electroplating sludge with water to form a slurry having a sludge weight percent of from about 10 to 20,
- c. treating the slurry with an aqueous solution of a 1 to 10 molar alkali metal hydroxide while heating the slurry to a temperature up to 80° C with agitation until a constant pH within a range of 10 to 14 is attained, thereby forming a precipitate containing iron oxides and other insolubles,
- d. separating said iron oxides suitable for use as high grade iron ore and said other residual insolubles from the slurry to provide a first clarified solution containing stannate and ferrocyanide ions,
- e. treating the first clarified solution at a temperature of not more than 65° C with a 1 to 5 molar aqueous solution of an acid selected from the group consisting of hydrochloric and hydrofluoric acid until a final solution pH of about 6.5 to 7.5 is attained to precipitate said stannate ions as hydrated stannic oxide suitable for use as high grade tin ore,
- f. removing the hydrated stannic oxide to leave a second clarified solution containing alkali metal ferrocyanide, and
- g. concentrating the second clarified solution to an alkali metal ferrocyanide concentration of not less than 10 grams per liter suitable for reuse as an addition of alkali metal ferrocyanide to an electroplating bath.

4,006,214

PROCESS FOR THE RECOVERY OF FLUORINE FROM AN AQUEOUS SOLUTION

Erwin Moser, Rheinfelden, and Hans-Georg Morawe, Mannheim, both of Germany, assignors to Swiss Aluminium Ltd., Neuhausen am Rheinfall, Switzerland

Filed Sept. 27, 1973, Ser. No. 401,216

Claims priority, application Switzerland, Sept. 29, 1972, 14291/72

Int. Cl.³ C01D 5/00, 3/02; C02B 1/56, 1/42

U.S. Cl. 423-112

8 Claims

1. In a process for the treatment of aqueous solutions containing metal cations including aluminum ions and anions including sulphate and fluoride ions by means of an ion-exchange plant having ion exchange filter means, the steps comprising

- passing the aqueous solution through at least one strong acid cation-exchange filter means to remove substantially all of the metal cations including aluminum ions;
- subsequently passing the emerging aqueous solution through a weak basic anion-exchanger filter means wherein the sulphate ions are selectively and nearly completely recoverably retained due to the greater affinity of said first weak basic anion-exchanger filter means for sulphate ions over fluoride ions;
- passing the thus nearly completed desulfated aqueous solution through a second weak basic anion-exchange means wherein fluoride ions are recoverably retained.

4,006,215

RECOVERING IRON, NICKEL, OR COBALT FROM SULFATE SOLUTION

Rotrou Alan Hall, Mississauga; William Edward Jones, Burlington, and Kohur Nagaraja Subramanian, Mississauga, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

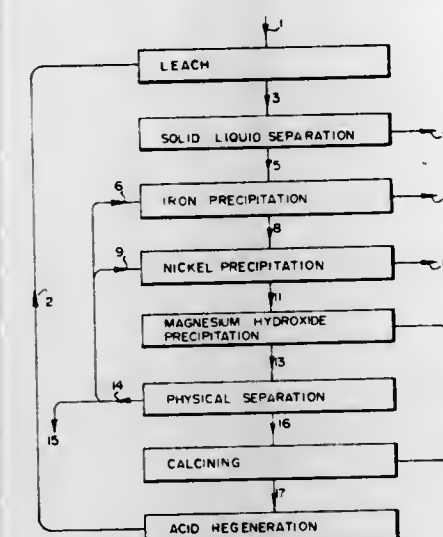
Filed Sept. 26, 1975, Ser. No. 616,926

Claims priority, application Canada, Apr. 2, 1975, 223652

Int. Cl.³ C01G 49/02, 51/04, 53/04; C01F 11/00

U.S. Cl. 423-142

6 Claims



2. A method of processing a lateritic ore or concentrate containing magnesium and at least one metal value selection from the group iron, nickel and cobalt comprising the following steps:

- I. leaching the ore or concentrate with sulfuric acid to form a leach solution containing sulfates of magnesium and the metal value(s);
- II. separating the leach solution from undissolved ore or concentrate; III. aerating the leach solution to ensure that any dissolved iron is present in the ferric state,
- IV. stripping at least one metal value from the each solution by adding magnesium hydroxide thereto to precipitate the hydroxide of the metal value;
- V. separating the precipitated hydroxide from the stripped solution;

VI. treatment the stripped solution with lime at a temperature T° C which is at least 60° C for a period of t minutes wherein:

$$t \geq 15, \text{ where } T \geq 90^\circ \text{C., and}$$

$t \geq 15 + (3/2)(90-T)$, where $60^\circ \text{C} \leq T \leq 90^\circ \text{C.}$; while subjecting the solution to low energy agitation, thereby forming small particles of magnesium hydroxide and larger particles of gypsum;

VII. separating the precipitates obtained in step VI into a coarse fraction comprising mainly gypsum and a fine fraction comprising mainly magnesium hydroxide which can be recycled for performing the precipitation of step IV on fresh leach solution; and

VIII. heat treating the calcium sulfate separated in step VIII to regenerate lime which can be recycled to perform the precipitation of step VI, and acid gas for regenerating sulfuric acid.

4,006,216

PREPARATION OF NICKEL BLACK

Victor Alexander Ettel, Mississauga, and Marcel Alin Mosolu, Toronto, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,513

Claims priority, application Canada, July 28, 1975, 232312

Int. Cl.³ C01G 53/04

U.S. Cl. 423-592

6 Claims

1. A process for producing nickel hydroxide comprising treating a nickeliferous solution with a base, which does not form a water-soluble complex with nickel, so as to raise the pH of the solution to at least about 8.0 and thereby precipitate nickel as a basic nickelous precipitate and introducing into the resulting nickeliferous slurry a mixture containing oxygen and a reducing agent selected from the group consisting of sulfur dioxide and metal sulfites and bisulfites, the oxygen content of the mixture being in excess of the stoichiometric amount needed to oxidize the reducing agent present therein, and the reducing agent being introduced into the slurry at a rate which does not substantially exceed the rate of consumption thereof.

4,006,217

PROCESS FOR MAKING MANGANESE DIOXIDE

Peter Faber, Grosswetzheim, Germany, and Jean Brenet, Strasbourg, France, assignors to Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft, Essen, Germany

Filed Apr. 23, 1975, Ser. No. 570,585

Claims priority, application Germany, Apr. 23, 1974, 2419490

Int. Cl.³ C01G 45/02

U.S. Cl. 423-605

7 Claims

1. A method for the preparation of manganese dioxide which comprises:

- a. treating a manganese (III)-containing oxide with an acid perhalo solution and simultaneously with ozone to effect disproportionation of the manganese oxide thereby yielding manganese (II) ion in solution and manganese dioxide as a precipitate therein; and
- b. removing the manganese dioxide precipitate from the manganese (II) solution of step (a).

4,006,218

POTENTIATED MEDICAMENTS

Tibor Sipos, Jackson, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 486,287, July 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 285,682, Sept. 1, 1972, abandoned. This application July 14, 1975, Ser. No. 595,986

Int. Cl.² A61K 7/22, 31/045, 31/14; A01N 9/24
U.S. Cl. 424—54 12 Claims

1. An antimicrobial composition comprising at least about 0.001 percent by weight of an antimicrobial agent and at least about 0.05 percent by weight of a potentiator therefor, wherein said antimicrobial agent is a quaternary ammonium compound selected from the group consisting of domiphen bromide, domiphen chloride, domiphen fluoride, benzalkonium chloride, cetyl pyridinium chloride, dequalinium chloride, the cis isomer of 1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride, cetyl trimethylammonium bromide, benzethonium chloride and methylbenzethonium chloride, and said potentiator is at least one primary, secondary or tertiary cyclohexylalkanol or alkylcyclohexyl alkanol selected from the group consisting of cyclohexylmethanol, 1-cyclohexylethanol, 2-cyclohexylethanol, 1-cyclohexyl-1-propanol, (cyclohexyl)-dimethylcarbinol, (4-isopropylcyclohexyl)-dimethylcarbinol, 3-cyclohexyl-1-propanol, 2-cyclohexyl-1-propanol, 1-cyclohexyl-2-propanol, 2-cyclohexyl-1,1-dimethylethanol, 2-cyclohexyl-2-methylpropanol, 2-cyclohexyl-1-methylpropanol, 2-cyclohexyl-1, 2-dimethylpropanol, 2-cyclohexyl-1, 1-dimethylpropanol, 3-cyclohexyl-2-methylpropanol, 3-cyclohexyl-1-methylpropanol, 3-cyclohexylbutanol, 3-cyclohexyl-2-methylbutanol and 3-cyclohexyl-1, 2-dimethylbutanol.

10. In the antimicrobial treatment of microbe contaminated surfaces including wounds, incisions and the like, containing bodily secretions and fluids, by applying to said surface a quaternary ammonium compound selected from the group consisting of domiphen bromide, domiphen chloride, domiphen fluoride, benzalkonium chloride, cetyl pyridinium chloride, dequalinium chloride, the cis isomer of 1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride, cetyl trimethylammonium bromide, benzethonium chloride and methylbenzethonium chloride, the improvement comprising potentiating the activity of the quaternary ammonium compound by applying the same in conjunction with a potentiator which is a primary, secondary or tertiary cyclohexylalkanol or alkylcyclohexyl alkanol selected from the group consisting of cyclohexylmethanol, 1-cyclohexylethanol, 2-cyclohexylethanol, 1-cyclohexyl-1-propanol, (cyclohexyl)-dimethylcarbinol, (4-isopropylcyclohexyl)-dimethylcarbinol, 3-cyclohexyl-1-propanol, 2-cyclohexyl-1-propanol, 1-cyclohexyl-2-propanol, 2-cyclohexyl-1, 1-dimethylethanol, 2-cyclohexyl-2-methylpropanol, 2-cyclohexyl-1-methylpropanol, 2-cyclohexyl-1, 1-dimethylpropanol, 3-cyclohexyl-2-methylpropanol, 3-cyclohexyl-1-methylpropanol, 3-cyclohexylbutanol, 3-cyclohexyl-2-methylbutanol and 3-cyclohexyl-1, 2-dimethylbutanol.

4,006,219

COMPOSITION AND METHOD FOR COUNTERING EFFECTS OF ALCOHOL CONSUMPTION

John S. Upham, Clearwater; R. Scott Grybek, and Theodore R. Raulerson, Jr., both of Tampa, all of Fla., assignors to Ceres Pharmacal Company, Des Moines, Iowa

Continuation of Ser. No. 279,338, Aug. 10, 1972, abandoned. This application Jan. 29, 1975, Ser. No. 545,041
Int. Cl.² A61K 31/151, 31/455, 31/525, 37/48

U.S. Cl. 424—94 18 Claims

1. A method of reducing the intoxicating effects associated with the consumption of beverage ethyl alcohol by a person which comprises orally administering to said intoxicated person a composition consisting essentially of at least about 30 mg. thiamine, at least about 30 mg. of riboflavin and at least

about 10 mg. of niacin, and up to 2000 mg. of yeast in a dosage unit.

4,006,220

COMPOSITIONS AND METHODS USEFUL FOR REPAIRING DEPRESSED CUTANEOUS SCARS

Sheldon K. Gottlieb, 8708 Wandering Trail Drive, Potomac, Md. 20854

Filed June 4, 1975, Ser. No. 576,858
Int. Cl.² A61K 35/16, 37/00, 31/195

U.S. Cl. 424—101 19 Claims

1. A composition useful for the repair of depressed cutaneous scars comprising at least one fibrin stabilizer and plasma in an amount to provide sufficient fibrin within a cavity formed under said scar and said fibrin stabilizer being present in an amount effective to maintain said fibrin within said cavity and thereby cause the build-up of collagen within said cavity.

4,006,221

DERIVATIVES OF DIUMYCIN A AND DIUMYCIN A' William A. Slusarchyk, Belle Mead, and Frank Lee Weisenborn, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 434,522, Jan. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 341,015, March 14, 1973, abandoned. This application Aug. 12, 1975, Ser. No. 603,997

Int. Cl.² A61K 35/00 4 Claims

3. A hydrolysis product I of a Diuycin A methyl ester derivative wherein one or two of the methyl ester groups have been converted to the free acid, said product having λ_{max}^{NaOH} 258 m μ , $E_{1\%}^{1cm}$ 101, and IR spectrum as follows: IR(KBr) 3400, 2930, 1720, 1670, 1630(sh), 1530, 1430, 1370, 1325, 1260, 1210(sh), 1100(sh), 1065, 1035(sh), 965, and 880 cm^{-1} , the following elemental analysis: carbon 48.15; hydrogen, 6.75; nitrogen, 3.96; phosphorus, 1.84; oxygen (by difference), 39.30; O-methyl, 4.18; water of hydration, 6.92; and a melting point (dec.) 175°(tan), 177°(brown), 185°(black).

4,006,222

PURIFICATION OF NYSTATIN

Julio Metzger, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 20, 1975, Ser. No. 623,840
Int. Cl.² A61K 35/00 7 Claims

1. A process for the purification of nystatin which comprises:

- suspending nystatin in a lower alkanol;
- solubilizing the nystatin with a weak organic acid having a pK_a at 25° C of 1.0 to 5.0;
- filtering off the lower alkanol extract;
- combining a chlorinated hydrocarbon solvent with the lower alkanol extract;
- neutralizing the mixture of chlorinated hydrocarbon solvent and lower alkanol extract; and
- adding water to precipitate purified nystatin.

4,006,223

DRUG COMPOSITION INTENDED FOR THE TREATMENT OF ACUTE, LETHAL AND CHRONIC RADIATION DISEASE

Irina Chitulescu, and Octav Costachel, both of Bucharest, Romania, assignors to Spitalul Clinic Filantropia Bucuresti, Bucharest, Romania

Filed Dec. 16, 1974, Ser. No. 532,861
Int. Cl.² A61K 37/00, 37/26 5 Claims

5. A pharmaceutical composition for the treatment of the acute lethal, or chronic radiation disease and its adverse effect in mammals, consisting of for one daily dose: 1×10^3 to $8 \times$

10^5 KIU of a kalikrein inhibitor polypeptide, 1 mg to 2×10^2 mg thiaminediphosphate, 0.1 mg to 10^2 mg of α_1 glycoprotein complex; 1 mg to 2×10^2 mg L-tryptophane, 1 mg to 10^2 mg L-arginine and 0.1 mg to 10^2 mg of a lipoprotein complex.

4,006,224

METHOD AND AGENT FOR TREATING INFLAMMATORY DISORDERS OF THE GASTROINTESTINAL TRACT

John Fletcher Prudden, Upper Nyack, N.Y., assignor to Les-carden Ltd., Goshen, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,741
Int. Cl.² A61K 31/13, 31/70 18 Claims

1. A method of treating ulcerative colitis in a mammal afflicted with said condition which comprises administering to said mammal an effective amount for treating ulcerative colitis of a composition containing d-glucosamine.

4,006,225

METHOD OF USING REDUCTION PRODUCTS OF EVERNINOMICINS AS ANTIBACTERIAL AGENTS AND PHARMACEUTICAL COMPOSITIONS USEFUL THEREFOR

Ashit K. Ganguly, Upper Montclair, and Olga Sarre, Verona, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 411,548, Oct. 31, 1973, Pat. No. 3,915,956, which is a continuation-in-part of Ser. No. 377,344, July 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 315,263, Dec. 14, 1972, abandoned. This application Apr. 21, 1975, Ser. No. 570,117
Int. Cl.² A61K 31/70 6 Claims

1. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection, which comprises administering to said animal a non-toxic, antibacterially effective amount of a member selected from the group consisting of nitrosoeverninomicin B, nitrosoeverninomicin C, nitrosoeverninomicin D, hydroxylaminoverninomicin B, hydroxylaminoverninomicin C, hydroxylaminoverninomicin D, nitro derivatives of said hydroxylaminoverninomicins B, C and D, and pharmaceutically acceptable salts thereof.

4,006,226

ANTICONVULSANT DIPHENYLSILANES

Donald R. Bennett, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 587,029, June 16, 1975, abandoned. This application Mar. 15, 1976, Ser. No. 666,822
Int. Cl.² A61K 31/695 19 Claims

1. A method of suppressing convulsions in a warm-blooded animal comprising administering to said animal a diphenylsilane of the formula ϕ_2SiX_2 in which X is a hydroxyl group or a radical which hydrolyzes in vivo to form the hydroxyl group, said silane being administered in amount effective to suppress convulsions in the animal.

4,006,227

COMPOSITIONS AND METHODS FOR FERTILITY CONTROL

Alfred J. Gallegos, Calzada General Anaya 209, and Vincente Cortes-Gallegos, Farallon 275, both of Mexico City, Mexico
Continuation-in-part of Ser. No. 416,212, Nov. 15, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,646
Int. Cl.² A61K 35/78 17 Claims

1. A composition for reducing progesterone in female mammals which includes a pharmaceutically acceptable carrier

and an effective amount of progesterone-regulating substance obtainable by aqueous extract of *Montanoa tomentosa* leaves and stems, said extract being produced by heat and a standard extraction ratio of about 75 grams to 150 grams of *Montanoa tomentosa* per liter of water at about 100° C.

4,006,228

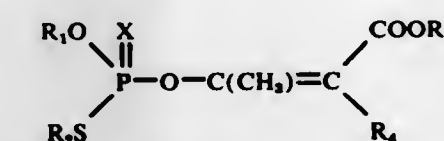
PESTICIDALLY ACTIVE THIO- AND DITHIOPHOSPHORIC ACID ESTERS

Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 10, 1975, Ser. No. 612,123
Claims priority, application Switzerland, Sept. 20, 1974, 12794/74; July 17, 1975, 9340/75

Int. Cl.² A01N 9/36; C07F 9/02 7 Claims

1. Thio- and dithiophosphoric acid esters corresponding to the formula



wherein

- R_1 is ethyl,
 R_2 is n-propyl,
 R_3 is methyl, ethyl or isopropyl,
 R_4 is phenyl, methoxycarbonylmethyl or ethoxycarbonylmethyl, and
X is oxygen or sulphur.
6. A composition for the control of insects and members of the order Acarina, which composition comprises an insecticidally or acaricidally effective amount of a thio- or dithiophosphoric acid ester as claimed in claim 1, together with a suitable carrier therefor.

4,006,229

INSECTICIDAL AND ACARICIDAL TRIHALOPHENYL THIOPHOSPHATES

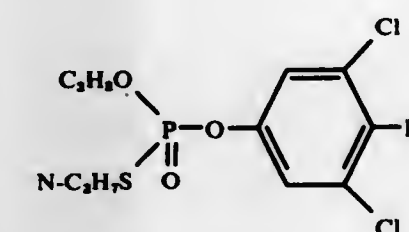
Jozef Drabek, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 192,477, Oct. 26, 1971, Pat. No. 3,919,362. This application July 21, 1975, Ser. No. 597,805

Claims priority, application Switzerland, Oct. 26, 1970, 15775/70; Sept. 7, 1971, 13101/71

Int. Cl.² A01N 9/36 4 Claims

1. An insecticidal and acaricidal composition comprising an insecticidally and acaricidally effective amount of a compound of the formula



together with a suitable inert carrier therefor.

4,006,230

7-D-(α -ACYLAMINO-ARYLACETAMIDO)-CEPHALOSPORANIC ACID DERIVATIVES

David A. Cox, and Braham Shroet, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 504,381, Sept. 9, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,297

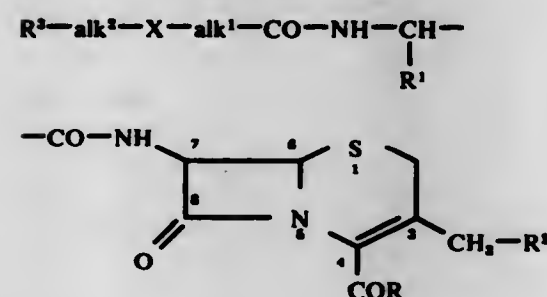
Claims priority, application United Kingdom, Sept. 13, 1973, 43033/73

Int. Cl.² C07D 501/24, 501/32

U.S. Cl. 424-246

18 Claims

1. A compound for the formula:



wherein R^1 is selected from the group consisting of phenyl and substituted phenyl having up to two substituents selected from the group consisting of halogen, hydroxy, lower alkyl, lower alkoxy and trifluoromethyl;

R is hydroxyl; and R^2 is selected from the group consisting of hydrogen, hydroxy and acetoxy;

R^2 is selected from the group consisting of sulphy, COR⁴ wherein R^4 is selected from the group consisting of hydrogen and R^4 wherein R^4 is selected from the group consisting of lower alkyl, 5-indanyl and substituted phenyl wherein the substituent is selected from the group consisting of lower alkyl and lower alkoxy; CONR⁵R⁶, wherein R^5 and R^6 are each lower alkyl;

X is selected from the group consisting of oxygen, sulphur, carbonyl, sulphonyl, sulphonyl, and -NR⁷-, wherein R^7 is selected from the group consisting of hydrogen, lower alkyl, allyl and benzyl; and alk^1 and alk^2 each represent a divalent saturated aliphatic hydrocarbon group having from 1 to 3 carbon atoms; and pharmaceutically acceptable salts thereof.

15. A pharmaceutical composition comprising a compound according to claim 1 and a pharmaceutically carrier.

4,006,231

N-AMINOSULFENYLATED DERIVATIVES OF CARBOFURAN

Allan Lindsay Black, Dundas, Australia, and Tetsuo Roy Fukuto, Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

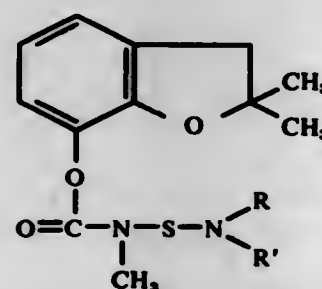
Continuation-in-part of Ser. No. 378,700, July 12, 1973, abandoned. This application June 6, 1974, Ser. No. 476,767

Int. Cl.² C07D 307/86; A01N 9/12

U.S. Cl. 424-248.5

12 Claims

1. A compound of the formula



where R and R' may be the same or different and each is alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, or benzyl, or R and R' taken together with the nitrogen form a

pyrrolidine, piperidine, morpholine, piperazine, or hexahydroazepine heterocyclic ring which may have one or more substituents selected from lower (1 to 4 carbons) alkyl, benzyl, phenyl, or lower alkoxy, with the provisos that (1) the total number of carbon atoms in said substituents is 1 to 8 inclusive, (2) the number of alkoxy substituents on the heterocyclic ring is zero or one, and (3) the number of substituents on a carbon adjacent to the nitrogen atom bonded to the sulfonyl sulfur is zero or one.

11. An insecticidal composition comprising an insecticidally effective amount of a compound of claim 1 in admixture with a carrier.

4,006,232

THERAPEUTIC METHOD OF TREATING CARDIAC ARRHYTHMIAS UTILIZING 3-SUBSTITUTED DIPHENYLHYDANTOINS

Shin Hayao, Tokyo, Japan; Herbert John Havers, Edwardsburg, Mich., and Wallace Glenn Strycker, Goshen, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

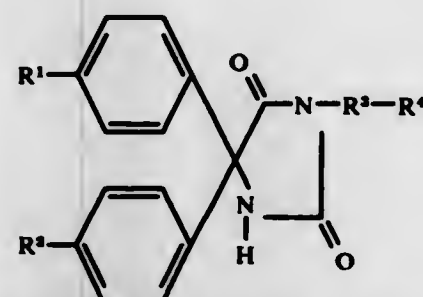
Division of Ser. No. 381,021, July 20, 1973, Pat. No. 3,892,748. This application Nov. 15, 1974, Ser. No. 524,297

Int. Cl.² A61K 31/495

U.S. Cl. 424-250

17 Claims

1. A method of treating a cardiac arrhythmia in a mammal which comprises: administering to said mammal an antiarrhythmic effective amount of a compound selected from the group consisting of



and a pharmacologically acceptable, nontoxic acid addition salt thereof, wherein:

R^1 and R^2 are selected from the group consisting of hydrogen, halogeno, loweralkyl of 1 to 3 carbon atoms, loweralkoxy of 1 to 3 carbon atoms, amino, and nitro;

R^3 is selected from the group consisting of ethylene and trimethylene, and

R^4 is selected from the group consisting of 4-phenyl-1-piperidyl, 4-hydroxy-4-phenyl-1-piperidyl, 4-phenyl-1,2,3,6-tetrahydropyridyl, and 4-phenyl-1-piperazinyl.

4,006,233

N-(PYRIMIDINYL)-TRICYCLO[3(OR 4).2.2.0^{2,4}(OR 3)]-NON (OR DEC)ENEDICARBOXIMIDES

Kenneth L. Shepard, Ambler, and William J. Paleveda, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 511,961, Oct. 4, 1974, abandoned. This application May 9, 1975, Ser. No. 575,918

Int. Cl.² C07D 403/04

U.S. Cl. 424-251

4 Claims

1. A compound having the formula:

4,006,235

TREATING CNS LYMPHOMA

Dwight R. Stickney; William S. Simmons; Charles A. Nichol; George H. Hitchings, all of Durham, and Gertrude B. Elion, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 344,179, March 23, 1973, abandoned.

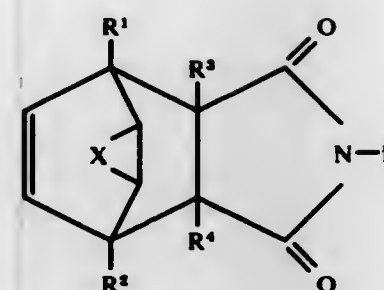
This application Feb. 12, 1975, Ser. No. 549,452

Int. Cl.² A61K 31/505

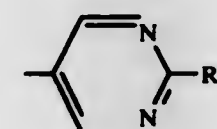
U.S. Cl. 424-251

6 Claims

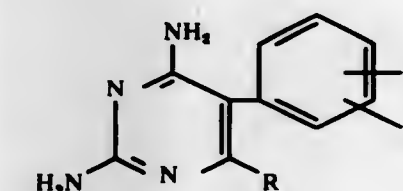
1. A method of treating a mammal infected with CNS lymphoma which comprises internally administering to the infected mammal an effective non-toxic CNS lymphoma treatment amount of a compound of Formula I



wherein:

 R^1, R^2, R^3 and R^4 are hydrogen; $=$ is $-CH_2-$ or $-CH=CH-$; R is

wherein R^5 is acetamido, or amino; or a non-toxic pharmaceutically acceptable salt thereof.



(1)

where R is lower alkyl containing 1 to 4 carbon atoms and X is a halogen atom or a pharmaceutically acceptable salt thereof.

4,006,236

SUBSTITUTED OCTAHYDROPHENANTHRIDINE PESTICIDES

Michael Stanley Schrider, South Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

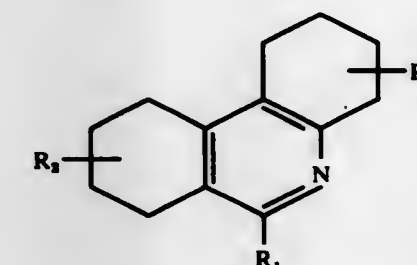
Filed Aug. 4, 1975, Ser. No. 601,732

Int. Cl.² A01N 9/22

U.S. Cl. 424-258

18 Claims

1. A method for the control of insects and Acarina comprising, contacting the larvae, nymphs or adults of said insects and Acarina with an insecticidally and Acaricidally effective amount of a compound represented by the following formula:



wherein R_1 is a member selected from the group consisting of C_1-C_{10} alkyl straight chain or branched, C_2-C_7 alkenyl straight chain or branched, C_3-C_8 alkynyl straight chain or branched, and C_3-C_7 cycloalkyl, and R_2 and R_3 are hydrogen or methyl.

4,006,237

TETRAHYDROCARBOSTYRIL DERIVATIVES FOR THE PROPHYLAXIS OF ASTHMA, HAYFEVER AND RHINITIS

Derek Richard Buckle, Redhill; Barrie Christian Charles Cantello, Horsham, and Harry Smith, Maplehurst near Horsham, all of England, assignors to Beecham Group Limited, Germany

Division of Ser. No. 512,949, Oct. 7, 1974. This application May 21, 1975, Ser. No. 579,416

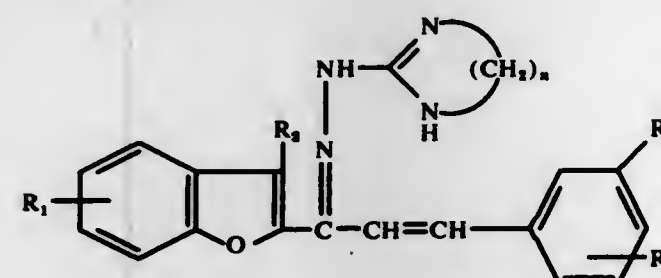
Claims priority, application United Kingdom, Oct. 11, 1973, 47508/73

Int. Cl.² A61K 31/47

U.S. Cl. 424-258

48 Claims

1. A pharmaceutical composition in a form suitable for administration to humans which comprises a compound of the formula



wherein R_1 and R_2 may be the same or different and are selected from the group consisting of hydrogen, chloro, bromo, fluoro, C_1-C_4 alkoxy, phenyl, C_1-C_4 alkyl, and C_1-C_4 alkyl thio, R_3 is selected from the group consisting of hydrogen, C_1-C_4 alkyl and phenyl, R_4 is hydrogen, C_1-C_4 alkyl or chloro and when R_3 and R_4 are present on adjacent carbon atoms, they may represent $-O-CH_2-O-$, n is 2, 3 or 4 or an acid addition salt thereof.

4,006,244

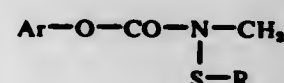
**BENZO-1,3-DIOXOLAN-4-YL
N-METHYL-N-PHENYLMERCAPTO-CARBAMATES**
Peter Siegle, Cologne; Engelbert Kühle, Bergisch-Gladbach;
Gerhard Zmisch; Ingeborg Hamann, both of Cologne,
and Bernhard Homeyer, Opladen, all of Germany, assignors
to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed May 23, 1975, Ser. No. 580,380
Claims priority, application Germany, June 15, 1974,
2428924

Int. Cl.³ A61K 31/34

U.S. Cl. 424-282

8 Claims

1. A benzo-1,3-dioxolan-4-yl N-methyl-N-phenylmercapto-carbamate of the formula



in which

Ar is benzo-1,3-dioxolan-4-yl and
R is phenyl or phenyl substituted by at least one of halogen,
nitro, alkyl and trifluoromethyl.

6. An insecticidal composition containing as active ingredi-
ent an insecticidally effective amount of a compound accord-
ing to claim 1 in admixture with a diluent.

7. A method of combating insect pests which comprises
applying to the pests or a habitat thereof an insecticidally
effective amount of a compound according to claim 1.

4,006,245

CHEMICAL COMPOUNDS

Joachim Augstein, Linford; David Carter, and Thomas Brian
Lee, both of Loughborough, all of England, assignors to
Fisons Limited, England

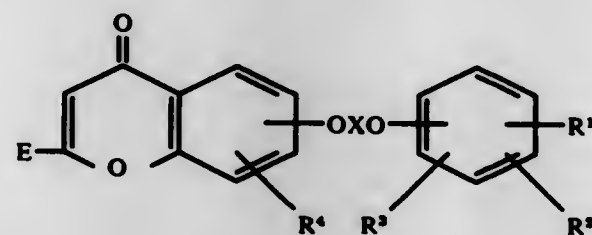
Division of Ser. No. 276,798, July 31, 1972, Pat. No.
3,882,148. This application Jan. 29, 1975, Ser. No. 545,309
Claims priority, application United Kingdom, July 29, 1971,
35605/71

Int. Cl.³ A61K 31/35

U.S. Cl. 424-283

1 Claim

1. A pharmaceutical composition for antagonizing the slow
reacting substance of anaphylaxis which comprises a com-
pound of the formula:



wherein

X is straight chain alkylene containing 3 to 7 carbon atoms
and is unsubstituted or is substituted by hydroxy,
R¹, R² and R³ are the same or different and are hydrogen,
hydroxy, methoxy, benzyloxy, acetyl, acetamino, allyl
or propyl, provided that at least one of R¹, R² and R³ are
other than hydrogen or hydroxy,
R⁴ is hydrogen, allyl or propyl,

and

E is a carboxy group or pharmaceutically acceptable salt
thereof, as active ingredient,
in an amount effective to antagonize the slow reacting
substance of anaphylaxis,
in admixture with a pharmaceutically acceptable adjuvant,
diluent or carrier.

4,006,246

**PHARMACEUTICAL COMPOSITIONS CONTAINING AN
AMINO BENZYL-AMINE AND METHOD OF USE**

Johannes Keck, Biberach an der Riss; Klaus-Reinhold Noll,
Warthausen-Oberhofen; Helmut Pleper, Biberach an der
Riss; Gerd Kruger, Biberach an der Riss, and Sigfried Pusch-
mann, Biberach an der Riss, all of Germany, assignors to
Boehringer Ingelheim GmbH, Ingelheim am Rhein, Ger-
many

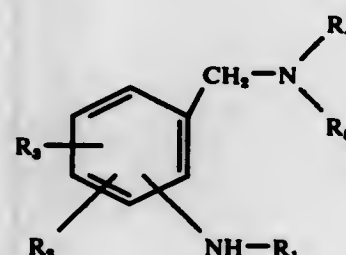
Division of Ser. No. 458,099, April 5, 1974, Pat. No.
3,950,393. This application Jan. 15, 1976, Ser. No. 649,481
Claims priority, application Germany, Apr. 13, 1973,
2318636; Jan. 23, 1974, 2402989

Int. Cl.³ A61K 31/19, 31/24, 31/135

U.S. Cl. 424-309

6 Claims

1. A pharmaceutical dosage unit composition consisting
essentially of an inert pharmaceutical carrier and an effective
anti-ulcerogenic, secretolytic, antitussive or antiatlectasis
factor production stimulating amount of a compound of the
formula



wherein

R₁ is hydrogen, lower alkanoyl, benzoyl or halobenzoyl,
R₂ is hydrogen, chlorine or bromine,
R₃ is carboxyl or lower carbalkoxy, and
R₄ and R₅ are each hydrogen, alkyl of 1 to 5 carbon atoms,
mono- or di-hydroxy-(alkyl of 1 to 5 carbon atoms),
alkenyl of 2 to 4 carbon atoms, cycloalkyl of 5 to 7 car-
bon atoms, mono- or di-hydroxy-(cycloalkyl of 5 to 7
carbon atoms) or benzyl,
or a non-toxic, pharmacologically acceptable acid addition
salt thereof.

4,006,247

UNSATURATED IMIDAZOLINES

Hans Peter Panzer, Stamford; Michael Niall Desmond O'Con-
nor, Norwalk, and Louis J. Baccal, Newington, all of Conn.,
assignors to American Cyanamid Company, Stamford,
Conn.

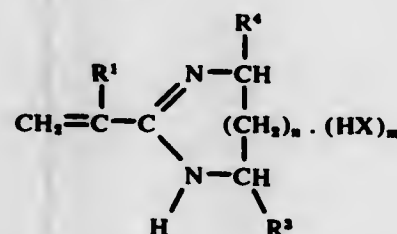
Filed May 6, 1974, Ser. No. 467,331

Int. Cl.³ C07D 49/34

U.S. Cl. 260-309.6

5 Claims

1. A compound having the formula



wherein m is 0 or 1, n is 0, X is an anion, R¹ is hydrogen or
methyl and R² and R⁴ are, individually, hydrogen, alkyl
(C₁-C₄), aryl (C₆-C₁₀), aralkyl (C₇-C₁₁) or alkaryl (C₇-C₁₁).

4,006,248

**ALKYL-p-IVALOYLBENZYLAMINOMETHYL-
BENZOPHENONES**

Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz,
Inc., E. Hanover, N.J.

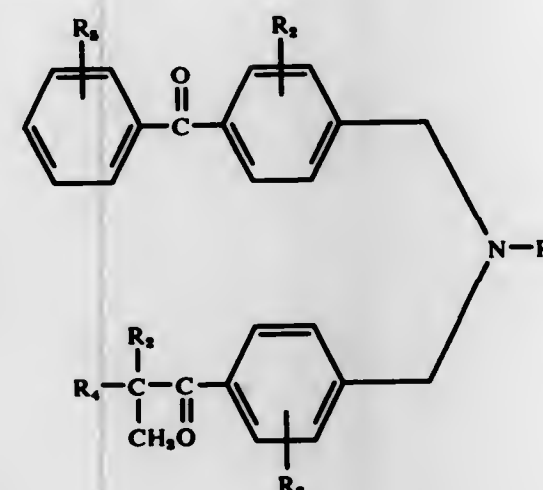
Filed Aug. 21, 1975, Ser. No. 606,459

Int. Cl.³ A01N 9/20; C07C 97/10

U.S. Cl. 424-316

9 Claims

1. A compound of the formula



where

R₁ represents lower alkyl having 1 to 4 carbons atoms, and
R₂ each independently, represent hydrogen or halo having
an atomic weight of about 19 to 36, and
R₃ and R₄ each independently represent lower alkyl having
1 to 2 carbon atoms, and
R₅ represents hydrogen or halo as defined above,
or a pharmaceutically acceptable salt thereof.

9. A method of treating lipidemia which comprises adminis-
tering to a mammal in need of said treatment a hypolipidemic
effective amount of a compound of claim 1 and a pharmaceu-
tically acceptable carrier thereof.

4,006,249

SYSTEMIC TREATMENT OF PSORIASIS

William R. Porter, Etobicoke; John K. McKenzie, and Paul A.
Mitenko, both of Winnipeg, all of Canada, assignors to
American Home Products Corporation, New York, N.Y.

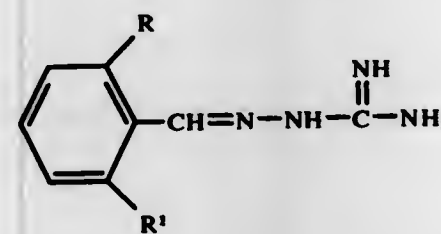
Filed Aug. 6, 1975, Ser. No. 602,603

Int. Cl.³ A61K 31/155

U.S. Cl. 424-326

9 Claims

1. A process for ameliorating the clinical manifestations of
psoriasis in a human suffering from psoriasis which comprises
administering to said human an effective amount of a com-
pound of the formula:



wherein R and R¹ are independently chlorine and fluorine,
and the pharmacologically acceptable acid addition salts
thereof.

4,006,250

SYSTEMIC TREATMENT OF PSORIASIS

Scott J. Childress, Philadelphia, Pa., assignor to American
Home Products Corporation, New York, N.Y.

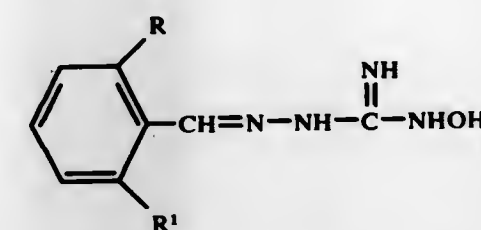
Filed Aug. 25, 1975, Ser. No. 607,647

Int. Cl.³ A61K 31/155

U.S. Cl. 424-326

12 Claims

1. A process for ameliorating the clinical manifestations of
psoriasis in a human suffering from psoriasis which comprises
administering to said human an effective amount of a com-
pound of the formula:



wherein R and R¹ are independently chlorine and fluorine,
and the pharmacologically acceptable acid addition salts
thereof.

4,006,251

**BACTERICIDAL AND FUNGICIDAL COMPOSITION
CONTAINING THIOCARBANYL SULFENAMIDES**

Ray D. Taylor, Brecksville, and Robert A. Krueger, Cuyahoga
Falls, both of Ohio, assignors to The B. F. Goodrich Com-
pany, Akron, Ohio

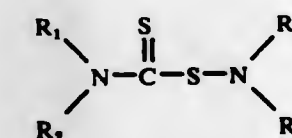
Filed July 9, 1973, Ser. No. 377,419

Int. Cl.³ A01N 9/20

U.S. Cl. 424-328

4 Claims

1. A composition having bactericidal and fungicidal proper-
ties containing (A) as an active ingredient 21 from about 0.01
percent to about 95 percent by weight based upon the weight
of the composition of a thiocarbamylsulfenamide



selected from the group consisting of N,N-dimethylthiocarba-
myl-N',N'-dicyclohexylsulfenamide and N,N-diethylthiocar-
bamyl-N',N'-dicyclohexylsulfenamide, and (B) water as a
carrier.

4,006,252

**METHODS AND COMPOSITIONS FOR REDUCING
PLASMA LIPID LEVELS**

Sidney I. Lerner, Cincinnati, Ohio, assignor to Ethyl Corpora-
tion, Richmond, Va.

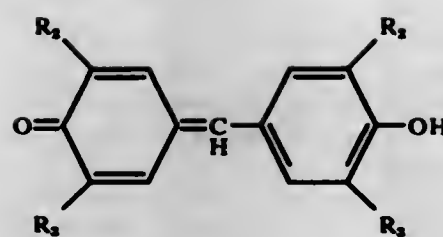
Continuation-in-part of Ser. No. 647,582, May 8, 1967,
abandoned, which is a division of Ser. No. 324,255, Nov. 18,
1963, abandoned. This application May 12, 1972, Ser. No.
252,582

Int. Cl.³ A61K 31/12

U.S. Cl. 424-331

6 Claims

1. A method of lowering plasma lipid levels in a mammal
which comprises internally administering to said mammal
from about 0.25 mg to about 1.0 grams of a compound having
the formula



wherein R_1 is alpha-branched alkyl of from 3-12 carbon atoms and R_2 is alkyl of from 1-12 carbon atoms; per kilogram of body weight per day.

4,006,253

PROCESS FOR NPN RUMINANT FEED SUPPLEMENT
Kenneth L. Berger, Palo Alto; Ronald J. Amen, Saratoga; Jorge J. Nassar, Sunnyvale, and William B. Benken, San Jose, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 8, 1975, Ser. No. 638,718

Int. Cl.² A23K 1/14

U.S. Cl. 426-69

13 Claims

1. A process for the preparation of an NPN ruminant feed supplement, which process comprises:
 - a. adding cellulose-containing commodity portionwise to a mixture of a concentrated mineral acid and urea said mixture having a pH less than 1, to cause a substantial dissolution of said cellulose containing commodity
 - b. diluting the above mixture with water and heating at an elevated temperature for a period of time sufficient to cause the chemical binding of at least 50% of theoretical of the urea, based upon the monosaccharide potential of said cellulose-containing commodity and a 1:1 molar ratio of binding of urea to monosaccharide, and
 - c. adjusting the pH of the mixture obtained in step (b) to between about 3 and 8.

4,006,254

PROTEIN SUPPLEMENTED, FLAVORED INSTANT GRITS

Bruce George Gralak, Carpentersville, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 408,864, Oct. 23, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 597,505

Int. Cl.² A23L 1/30

U.S. Cl. 426-72

12 Claims

1. A process for producing a fortified, nutritional instant-type food product which upon the addition of water and without need for heating to boiling temperatures acquires the flavor and texture characteristics of cooked corn grits, said process comprising the steps:

A. admixing

1. corn grits;
2. water, said water being added in an amount sufficient to cause the moisture content to be from 50 percent to 90 percent by weight of the total mixture;
3. an edible polysaccharide gum capable of rehydrating rapidly with the addition of water, said gum being added in an amount of 0.5 to 3.5 percent by weight of the finished corn grits product;
4. an emulsifier comprising a member selected from the group consisting essentially of polyoxyethylene sorbitan monostearate, polyoxyethylene sorbitan mono-oleate, glyceryl monostearate, and a mixture of monoglycerides and diglycerides of edible fats, oils, and fat forming fatty acids, said emulsifier being added in an amount of from 10 parts per million to 2 percent by weight based on the weight of the corn grits when less than 10 percent by weight of the grits have a particle size sufficient to pass through a U.S. No. 25 screen, and said emulsifier being present in an amount of from 50

parts per million to 2 percent by weight based on the weight of the corn grits when greater than 10 percent by weight of the grits have a particle size sufficient to pass through a U.S. No. 25 screen; and

5. a mixture of vitamins and antioxidant until the total admixture is a slurry;
- B. heating the above mixture until the temperature of the mixture is above 71° C but not exceeding a point at which degradation of the grits occurs;
- C. drying the heated mixture in the form of a thin sheet on a drum drier;
- D. collecting the dried sheet of product containing discrete particles in a starch matrix and comminuting the dried sheet to form an instant-type corn grits product;
- E. forming a moist proteinaceous flavoring material by admixing:
 1. a proteinaceous material having more than 15 percent by weight protein therein,
 2. salt, and
 3. a moisturizing gravy mix; and
- F. blending the moist proteinaceous flavoring material with the comminuted dry sheet until the blend is dry and with said proteinaceous flavoring material being added in an amount of from 1 percent to 15 percent by weight of the blended product.

4,006,255

PROCESS FOR PREPARING PROTEIN SUPPLEMENTED, FLAVORED INSTANT GRITS

Bruce G. Gralak, Carpentersville, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 408,865, Oct. 23, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 597,506

Int. Cl.² A23L 1/30

U.S. Cl. 426-72

9 Claims

1. A process for producing a fortified, nutritious instant-type food product which upon the addition of water and without need for heating to boiling temperatures acquires the flavor and texture characteristics of cooked corn grits, said process consisting of the steps:

A. admixing

1. corn grits;
2. water, said water being added in an amount sufficient to cause the moisture content to be from 30 percent to 90 percent by weight of the total mixture;
3. an edible polysaccharide gum capable of rehydrating rapidly with the addition of water, said gum being added in an amount of from 0.5 to 3.5 percent by weight of the finished corn grits product; and
4. a mixture of vitamins and antioxidant until the total admixture is a slurry;

- B. rapidly heating the above mixture to a temperature of from 71° to 100° C. said heating being accomplished within 30 seconds of the time the corn grits, water, and gum are substantially mixed together;

- C. immediately drying the heated mixture in the form of a thin sheet on a drum drier, said drying being substantially accomplished within 2.5 minutes of the time the corn grits, water, and gum are substantially mixed together;

- D. collecting the dried sheet of product containing discrete particles in a starch-gum matrix and comminuting the dried sheet to form an instant-type corn grits product;

- E. forming a moist proteinaceous flavoring material by admixing:

1. a proteinaceous material having more than 15 percent by weight protein therein;
2. salt, and
3. a moisturizing gravy mix; and

- F. blending the moist proteinaceous flavoring material with the comminuted dry sheet until the blend is dry and with said proteinaceous flavoring material being added in an amount of from 1 percent to 15 percent by weight of the blended product.

4,006,256

OLIVE STUFFED WITH RECONSTITUTED PIMENTO AND METHOD OF PRODUCTION

George C. Kyros, West Chester, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed July 11, 1975, Ser. No. 595,153

Int. Cl.² A23B 7/10; A23L 1/04

U.S. Cl. 426-102

45 Claims

SCAMP PIMENTO

MACERATE TO A PARTICLE SIZE LESS THAN 0.15 INCH

DISPERSE IN AQUEOUS MEDIUM HAVING ALGINIC ACID DISSOLVED THEREIN

SHAPE DISPERSION INTO SUITABLE SHAPE

PLACE SHAPED DISPERSION INTO SETTING SOLUTION

SET SHAPED DISPERSION TO A NON REVERSIBLE GEL

INSERT RECONSTITUTED PIMENTO GEL INTO PITTED OLIVE

1. A process for automatically stuffing olives with reconstituted pimento comprising:

- a. macerating natural pimento until the macerated particle size will form a dispersion in an aqueous medium and the average particle size of the macerated pimento is less than 0.15 inch in a maximum dimension;

- b. forming a dispersion of the macerated pimento, which is essentially calcium chloride in an aqueous medium having dissolved therein as the sole essential gelling agent from 1% to 10% by weight of alginic acid or a food-grade salt thereof, calculated as alginic acid per se where the alginic acid has at least 50 molar % of L-guluronic acid units, and the amount of macerated pimento in the dispersion is from 5% to 99% by weight of the dispersion;
- c. shaping the dispersion, which is essentially ungelled, into a form suitable for stuffing a pitted olive and wherein the shaped dispersion has a thickness of no greater than 0.5 inches;

- d. contacting the shaped dispersion with a setting solution of a food-grade compound having a water-soluble, divalent cation for a time period of at least 15 minutes, whereby the alginic acid is non-reversibly gelled throughout the shaped dispersion to a condition that is not reversible by either heat or alcohol and which forms shape-sustaining reconstituted pimento which is capable of being looped at least greater than 180° in a radius of less than 0.3 inch; and

- e. inserting by means of an automatic olive stuffing machine at least a portion of the reconstituted pimento into a pitted olive.

26. A reconstituted pimento stuffed olive wherein the reconstituted pimento has a thickness of no greater than 0.5 inch comprising a shaped and gelled dispersion of 5% to 95% by weight of macerated natural pimento wherein the particle size of the macerated pimento is less than 0.15 inch, the gelling agent is from 1% to 10% by weight alginic acid or a food-grade salt thereof wherein the alginic acid has at least 50 molar % of L-guluronic acid units, and the gel is cross-linked throughout the shaped dispersion into a non-reversible gel with a food-grade divalent cation to a condition that is not reversible by heat or alcohol, the shape of the reconstituted pimento being in a form suitable for being inserted into a

pitted olive and being capable of being looped at least 180° in a radius of less than 0.3 inch.

4,006,257

VACUUM TREATING FRUIT PIECES IN AQUEOUS SOLUTIONS CONSISTING OF SODIUM BISULFITE OR SODIUM SULFITE AND CITRIC ACID

Clarence H. Kolk, 242 New Ranch Park, Clearwater, Fla. 33515

Filed Aug. 7, 1975, Ser. No. 602,899

Int. Cl.² A21D 4/00

U.S. Cl. 426-269

5 Claims

1. A method of processing fruit, including cutting the fruit into pieces and soaking the pieces in an aqueous solution of citric acid and a member selected from the group consisting of sodium bisulfite and sodium sulfite, wherein the improvement comprises:

soaking said pieces under vacuum in an aqueous solution consisting of said member selected from the group consisting of sodium bisulfite and sodium sulfite in a concentration to produce said member selected from the group consisting of sodium bisulfite and sodium sulfite in the juice of said pieces in a range between 192 and 256 parts per million parts of the juice in said pieces by weight, and citric acid in a range between 3½ to 4½ milli-liters per 100 grams of the juice in said pieces including the citric acid that may be present in said fruit, draining said pieces, and holding the same for use.

4,006,258

PROCESS FOR PRODUCING SAUSAGE CASINGS
Hubert J. Vaessen, Deventer, Netherlands, assignor to H. Vaessen B.V., Deventer, Netherlands

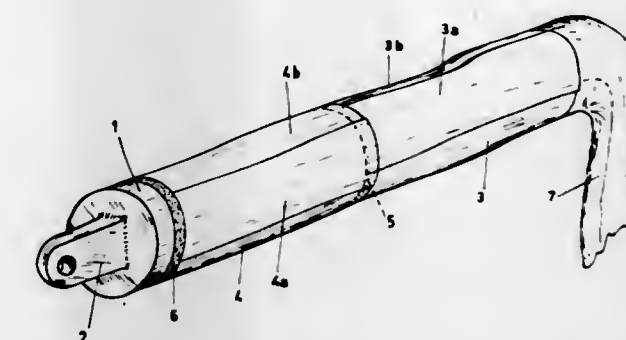
Filed Dec. 9, 1974, Ser. No. 531,099

Claims priority, application Netherlands, Dec. 12, 1973, 7317064

Int. Cl.² A23L 1/31; A22C 13/00

U.S. Cl. 426-272

8 Claims



1. A process for producing sausage casings of any desired length by joining together strips of intestine which have been rendered porous and sticking by a conventional pretreatment, with overlapping edges on a mandrel, having an upstream and a downstream end comprising

applying strips of intestine with overlapping edges about the circumference of the mandrel to stick the overlapping edges together;

partially drying the stuck product and decreasing its stickiness to the extent that the intestine material can be moved along the mandrel from the upstream end to the downstream end as a tube while maintaining at least the trailing end of the stuck product sticky;

moving the obtained product to the downstream end of the mandrel;

applying further strips of intestine with overlapping edges about the circumference of the mandrel and over the end of the stuck piece which is still sticky to stick the overlapping edges and ends together;

drying completely at least the overlapping ends stuck together and all undried portions preceding the overlapped

ends, the portion of the casing on the mandrel being dried to the extent that the casing can be moved as a tube to the downstream end of the mandrel, while maintaining at least the trailing end of the casing sticky; moving the casing to the downstream end of the mandrel; repeating the strip application and drying steps; and after the desired length of casing has been obtained the still sticky part thereof is dried completely.

4,006,259

PRESERVATIVE COATING FOR FRUITS AND VEGETABLES

Arthur F. Kalmar, Riverside, Calif., assignor to FMC Corporation, Philadelphia, Pa.

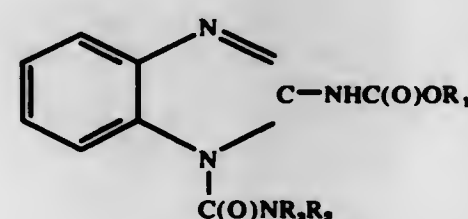
Filed Apr. 1, 1975, Ser. No. 564,145

Int. Cl.² A23B 7/14

U.S. Cl. 426—308

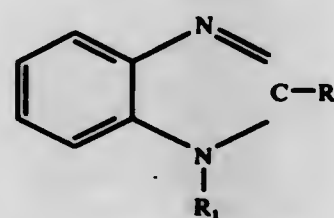
3 Claims

1. A method of preserving fresh fruits and vegetables comprising coating them with a waxy protective adhering film formed by treating the fruits and vegetables with a volatile petroleum solvent solution having dissolved therein a waxy film forming material and an alkyl aryl sulfonic acid solution of a fungicidal benzimidazole selected from the class consisting of:



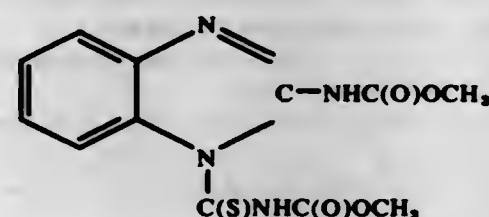
wherein

R_1 is methyl, ethyl, isopropyl or sec-butyl;
 R_2 is hydrogen, alkyl of 1 to 6 carbon atoms or alkenyl of 3 to 6 carbon atoms and
 R_3 is alkyl of 1 to 12 carbon atoms;



wherein

R is a five-membered heterocyclic ring containing nitrogen and sulfur and
 R_1 is hydrogen, lower alkyl of 1 to 5 carbon atoms or lower alkenyl of 3 to 6 carbon atoms and



and allowing the solvent to evaporate.

4,006,260

METHOD AND APPARATUS FOR EVAPORATION OF MOISTURE FROM FRUIT AND VEGETABLE PARTICLES

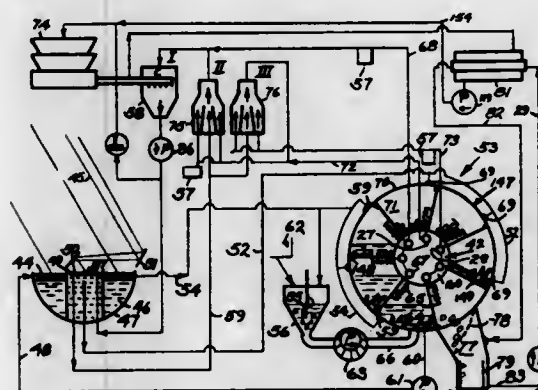
Wells A. Webb, Orovada, Nev., and William R. Webb, Berkeley, Calif., assignors to Wells A. Webb, Orovada, Nev.

Filed Jan. 29, 1975, Ser. No. 544,959

Int. Cl.² A23B 7/02; A23L 1/325

U.S. Cl. 426—438

20 Claims



- I. 1. A multi-stage process of at least two stages for dehydrating and puffing food particles, comprising the steps of: selecting a charge of food particles, each particle of a size sufficient to contain a plurality of macropores; introducing said charge of food particles into an encloseable chamber of a vessel and closing said chamber; removing moisture from said particles by dehydration including:
 - in a first stage, applying heat to said particles by submerging said particles in a liquid medium having a low vapor pressure at ambient temperatures, raising the temperature of said medium to a first elevated temperature above ambient temperature
 - reducing the pressure on said particles to a first pressure below atmospheric pressure,
 - maintaining said first temperature and said first pressure for a first period of time sufficient to reduce the moisture content of said food particles to between 20% and 50%; and in a subsequent stage removing further moisture from said particles by a non-submerged step of dehydration including supporting said particles above the level of said medium in said chamber;
 - further increasing the temperature of said liquid medium to a non-submerged temperature above said first temperature by applying heat to said particles by contacting said particles with a continuous spray of said medium;
 - decreasing the pressure on said particles to a non-submerged pressure below said first pressure and
 - maintaining said non-submerged temperature and non-submerged pressure for a period of time sufficient to reduce the moisture content of said particles to a range of between 20% and about 2%, thereby forming said particles into a puffed condition having a plurality of macropores;
 - applying a cool medium at about ambient temperature to the particles while maintaining said non-submerged pressure thereon to harden the structure and preserve the macropores; and,
 - centrifuging said particles to remove residue of said liquid medium therefrom.
- II.
- III.

4,006,261

FLAVORING WITH MIXTURES OF THEOBROMINE AND CYCLIC DIPEPTIDES

Wilhelm Pickenhagen, Onex; Paul Dietrich, Chene-Bourg, both of Switzerland; Borivoj Kell, St. Remy les Chevreuse, and Edgar Lederer, Sceaux-Seine, both of France, assignors to Firmenich S.A., Geneva, Switzerland

Continuation of Ser. No. 508,726, Sept. 24, 1974, abandoned.

This application Mar. 24, 1976, Ser. No. 669,832

Claims priority, application Switzerland, Sept. 28, 1973, 13957/73

Int. Cl.² A23L 1/234

U.S. Cl. 426—537

6 Claims

1. A flavoring composition capable of imparting and enhancing a bitter and astringent flavor to a foodstuff or beverage selected from the group consisting essentially of cocoa, a cocoa product or a cocoa imitating substitute which composition comprises, as an active ingredient, components A and B, said component A being a cyclic dipeptide or mixtures of two cyclic dipeptides and said component B being theobromine in the following weight ratios:

- a. when component A is a single cyclic dipeptide, in the weight ratio of from 1:1:1 to 1:2;
- b. when the component A is a mixture of two cyclic dipeptides, in the weight ratio of from about 1:1:1 to 1:3:5.

4,006,262

INSTANT PUDDING COMPOSITION AND PROCESS

Richard A. Smith, and Thomas E. Haney, both of Dover, Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,200

Int. Cl.² A23L 1/187

U.S. Cl. 426—573

7 Claims

1. In a composition for use in preparing an instant pudding by interaction with milk protein of an alkali pyrophosphate and an alkali orthophosphate, and containing a stiffening agent and a sugar as a sweetening agent, the improvement which comprises maintaining the particle size range of said orthophosphate such that at least 90% thereof passes through a U.S. Screen No. 100 and the particle size of said sugar such that at least 85% thereof passes through a U.S. Screen No. 70.

4,006,263

IRON-FORTIFIED SOLUBLE COFFEE AND METHOD FOR PREPARING SAME

Sigmund L. Klug, Monroe; Frederick J. Patrizio, New City, and William J. Einstman, Port Chester, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,838

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² A23F 1/04

U.S. Cl. 426—594

6 Claims

1. A method for producing an iron-fortified soluble coffee comprising the steps of:
- a. producing a liquid coffee extract from a counter-current, semi-continuous extraction process, said extract having a soluble coffee solids concentration of from about 10 to 30% by weight,
 - b. cooling said extract as it is leaving the extraction process to between about 35° and 70°F,
 - c. maintaining said extract at between 35 and 70°F for a period of time sufficient to effect precipitation of polyhydroxyphenols and polyhydroxy-phenol-polysaccharide complexes that are present in the coffee extract, then
 - d. separating said precipitated material from said extract,
 - e. adding a source of assimilable, elemental iron to the separated extract of step d at a level of from 0.04 to 1.0% elemental iron by weight of soluble coffee solids, and then
 - f. drying said iron-fortified extract.

4,006,264

PREPARATION OF CONFECTIONERS' FATS

Chester Martin Gooding, Westfield, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 411,523, Oct. 31, 1973, abandoned.

This application Jan. 10, 1975, Ser. No. 540,053

Int. Cl.² A23D 5/00

U.S. Cl. 426—607

3 Claims

1. A process for preparing a liquid fraction confectioners' fat comprising:

- randomizing by interesterification a mixture of a hydrogenated lauric fat and a hydrogenated non-lauric fat portion, said lauric fat portion containing fatty acids having predominantly 6, 8, 10, 16 and 18 carbon atoms, the non-lauric fat portion containing at least 30% palmitic acid said mixture having an iodine value of less than about 3.0,
- crystallizing the randomized mixture of fats at a temperature between about 90° F. and 110° F. for a period of time sufficient to obtain a solid filter cake fraction and a liquid filtrate fraction wherein the liquid fraction contains more lauric acid and less stearic acid than is contained in the uncrystallized, randomized mixture, said stearic acid content being reduced by about 7.7%–24% and said lauric acid content being increased by about 4.9%–10.3%; and,
- recovering the liquid fraction.

4,006,265

PROCESS FOR DETOXIFYING CROPS, PARTICULARLY CORN, INFECTED BY FUSARIUM

Károly Tamás, Kalocsa, and László Wüller, Budapest, both of Hungary, assignors to Mezogazdasági Főiskola, Kaposvár, Hungary

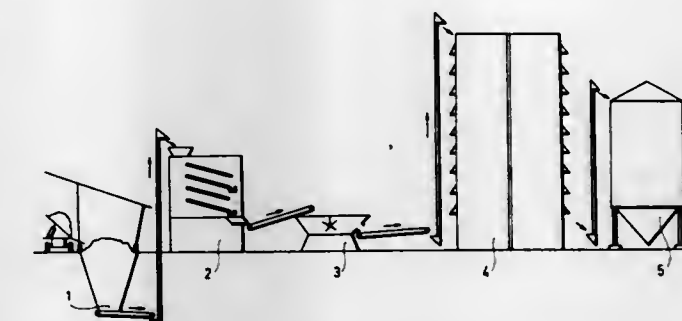
Filed Apr. 9, 1974, Ser. No. 459,377

Claims priority, application Hungary, Apr. 26, 1973, ME 1622

Int. Cl.² A01N 1/100, 17/00, 23/00

U.S. Cl. 426—623

2 Claims



1. A process for detoxifying corn used for animal feeding, said corn being infected by Fusarium, comprising the steps of steeping the corn with a member selected from the group consisting of a 3 to 6% aqueous solution of hydrogen peroxide and a 6% aqueous solution of ammonium hydroxide, and then heat drying the corn.

4,006,266

PROCESS FOR MAKING A DRY PET FOOD HAVING A HARD COMPONENT AND A SOFT COMPONENT

David Palmer Bone, Palatine, and Edward Leo Shannon, Barrington, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 8, 1975, Ser. No. 620,720

Int. Cl.² A23L 1/16

U.S. Cl. 426—623

9 Claims

1. A process for the production of a dry pet food capable of surviving long periods of storage, and having a water activity of 0.60 to 0.75 and a component first particle that is hard in texture and substantially amylaceous admixed with a compo-

nent second particle that is soft and meat-like in texture and appearance, comprising the steps of:

- blending a first mixture comprising an amylaceous ingredient, an animal protein source, a vegetable protein source, fat, and sufficient water for processing, wherein said amylaceous ingredient comprises from about 20 to about 60 percent by weight; said vegetable protein source comprises 10-30 percent by weight; said fat comprises about 5-15 percent by weight; and said animal protein source comprises 5-25 percent by weight;
- cooking while baking or extruding a mass of said first mixture at a temperature and time sufficient to gelatinize the said amylaceous ingredients;
- forming particles of said first mixture;
- cooling the cooked said first mixture to form the hard first particle having a moisture content of 8-12 percent by weight of the first particle;
- blending a second mixture comprising a natural or modified proteinaceous adhesive, a plasticizing/humectant agent, and sufficient water for processing, wherein said proteinaceous adhesive is present in an amount from about 4-60 percent by weight and said plasticizing/humectant agent is present in an amount from about 5-20 percent by weight;
- cooking while extruding a mass of said second mixture to a temperature from about 215° to about 280° F.;
- forming particles of said second mixture;
- cooling the particles to form the soft second particle having a moisture content of 10-14 percent; and
- admixing about 10 percent to about 90 percent by weight of the hard first particles with about 10 percent to about 90 percent by weight of the soft second particle.

4,006,267

COLOR HIGHLIGHTING PROCESS

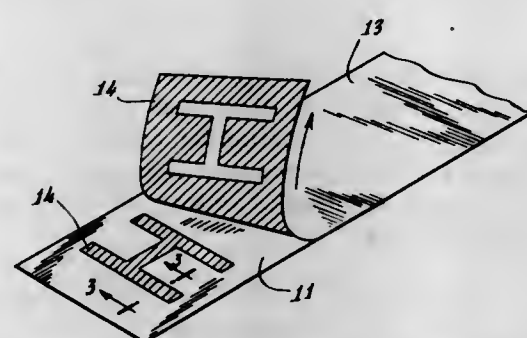
Philip Kurz, deceased, late of Columbus, Ohio, and by Jessie M. Kurz, executrix, Rockhill, S.C., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1974, Ser. No. 525,233

Int. Cl.² G03G 13/00

U.S. Cl. 427-14

10 Claims



- A method of color highlighting an image portion of a xerographic copy comprising:

- applying a colored transfer donor including a substrate and a layer of colorant in a nonthermoplastic resin binder in face-to-face contact with an image portion of a xerographic copy;
- thermally activating the xerographic image by causing it to be heated for 5 to 60 seconds within a temperature range of from about 130° to 250° F; and
- removing the transfer donor to transfer the color of the donor layer to the image portion of the xerographic copy.

4,006,268

VAPOR COLLIMATION IN VACUUM DEPOSITION OF COATINGS

Kurt D. Kennedy, Berkeley; E. Darrell Erikson, Castro Valley, and Glen R. Scheuermann, Oakland, all of Calif., assignors to Airco, Inc., Montvale, N.J.

Filed Mar. 17, 1975, Ser. No. 558,997

Int. Cl.² C23C 13/02, 13/04

U.S. Cl. 427-42

10 Claims

- A method of coating a substrate by physical vapor deposition comprising:
 - placing a substrate and a vapor source having an area greater than 0.001 m² in a chamber;
 - providing particle flux of the vapor source greater than 0.25 mole/s·m²;
 - collimating the vapor by providing a gas in the chamber at a pressure greater than 5 mT and less than 100 mT; and
 - positioning the substrate to intercept a portion of the collimated vapor which is directed outward from the vapor source.

4,006,269

PHOTODEPOSITION OF METALS ON A NON-CONDUCTIVE SUBSTRATE

Derek G. E. Kerfoot, Pierrefonds, Canada, assignor to Canada Wire and Cable Limited, Canada

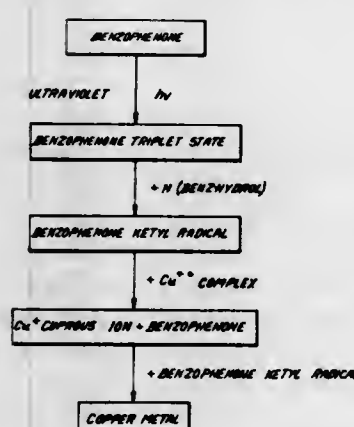
Filed Nov. 29, 1974, Ser. No. 528,210

Claims priority, application Canada, Dec. 3, 1973, 187208

Int. Cl.² B05D 3/06, 5/12

U.S. Cl. 427-54

92 Claims



- A method of plating a substrate of non-conductive material with a conductive film of predetermined metals comprising the steps of:

- applying to said substrate a sensitizing solution containing a sensitizer, a hydrogen donor and a solvent, said sensitizer being capable, upon photochemical activation, of abstracting a hydrogen atom from said hydrogen donor in the presence of said solvent thereby becoming a ketyl radical;
- subsequently immersing said substrate in a plating solution containing predetermined metal ions; and
- irradiating said substance after treatment by said sensitizing solution and while said substrate is immersed in said plating solution with an ultraviolet source emitting radiations in the spectral range of 200 to 400 mμ to generate said ketyl radical for reducing the metal ions to metal.

4,006,270

SOLID CURABLE POLYENE COMPOSITIONS AND METHOD OF COATING THEREWITH

Charles R. Morgan, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 330,818, Feb. 8, 1973, Pat. No. 3,925,320, which is a continuation-in-part of Ser. No. 250,554, May 5, 1972, abandoned. This application Nov. 24, 1975, Ser. No. 634,718

Int. Cl.² B05D 3/06

U.S. Cl. 427-54

18 Claims

- A process which comprises:
 - applying to the surface of a substrate a solid layer of a curable composition consisting essentially of:
 - A solid polyene which is a reaction product of a styrene-allyl alcohol copolymer and a member selected from the group consisting of at least one reactive unsaturated monoisocyanate and at least one reactive unsaturated monocarboxylic acid, said polyene containing at least 2 reactive carbon to carbon bonds per molecule; and
 - a liquid polythiol containing at least 2 thiol groups per molecule, the total combined functionality of (a) the reactive unsaturated carbon to carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than 4;
 - exposing selected areas of said composition to a free radical generator, thereby curing the exposed areas of said composition;
 - removing the unexposed uncured areas of the curable composition, thereby baring the surface of said substrate beneath the removed uncured areas of the composition.

4,006,271

ABRASION RESISTANT COATING FOR POLYCARBONATE SUBSTRATES

Hollis E. French, N. Chelmsford, Mass., and Juergen M. Kruse, Rockville, Md., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 28, 1976, Ser. No. 653,179

Int. Cl.² B32B 27/28; G02C 7/02

U.S. Cl. 427-164

10 Claims

- A process for forming an abrasion resistant, adherent coating on a polycarbonate substrate, comprising:
 - forming a coating solution containing from about 25 to about 75% by weight of a hydrolyzed C₁-C₂ alkyltri(lower alkoxy)silane in a water-miscible, volatile, organic solvent, said solution also containing from about 0.1 to about 20% by weight of an abrasion-resistance enhancer and at least about 0.05 parts of a stabilizing weak acid per part of enhancer;
 - applying a thin, uniform coating of said coating solution to a clean surface of the polycarbonate substrate; and,
 - dehydrating said coated component at an elevated temperature until an abrasion resistant, adherent coating is formed.

4,006,272

PROCESS FOR PREPARATION OF GLASS FIBER MATS

Kahel Sakaguchi; Masaaki Minakata; Kazutaka Yamashita, and Fumiko Sugimoto, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1975, Ser. No. 549,917

Claims priority, application Japan, Feb. 28, 1974, 49-23922

Int. Cl.² B32B 17/04, 27/28

U.S. Cl. 428-268

12 Claims

- A resin-bonded glass fiber mat having a rapid rate of dissolution in vinyl monomers, which consists essentially of:
 - a glass fiber mat having adhered thereto and substantially uniformly distributed thereon from 2.5 to 10 percent by weight, based on the weight of the glass fibers, of a binder resin consisting of

A. from 25 to 100 percent by weight of polystyrene or a copolymer of styrene and at least one comonomer copolymerizable with styrene selected from the group consisting of α-methylstyrene, acrylonitrile, methyl methacrylate, ethyl acrylate, vinyl toluene and butadiene, said copolymer containing at least 50 mole % of styrene units, said component A having a melting point of 100° to 150° C and having a number average molecular weight of 2500 to 7000, and

B. the balance of zero to 75 percent by weight of said binder resin is an unsaturated polyester resin having a melting point of 80° to 130° C.

4,006,273

WASHABLE AND DRY-CLEANABLE RAISED PRINTING ON FABRICS

Leon E. Wolinski, Cheektowaga; Arthur R. Endress, Hamburg, and David W. Teloh, Depew, all of N.Y., assignors to Pratt & Lambert, Inc., Buffalo, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,669

Int. Cl.² B05D 5/00, 3/02

U.S. Cl. 427-278

10 Claims

- The method of forming a washable and dry-cleanable foamed print on a washable and dry-cleanable fabric substrate comprising selectively applying to said substrate a printing composition comprising an adherent film forming cross-linkable polymer binder in a liquid vehicle therefore, said composition containing about 1.0 to 45 weight percent, based on the weight of said binder, of thermoplastic, thermally expandable microspheres about 0.5 to about 300 microns in diameter; drying to remove said liquid vehicle to form a dispersion of said microspheres in said binder; heating to expand said microspheres and cross-link said polymer binder to form a raised and textured surface; and curing the cross-linked polymer binder at a temperature of about 300° F for a period of about 1 to 3 minutes.

4,006,274

2,4,6-TRIS(CARBAMOYL METHYLAMINO)-1,3,5-S-TRIAZINE

Leon H. Chance, New Orleans; Judy D. Timpa, and George L. Drake, Jr., both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 19, 1975, Ser. No. 615,015

Int. Cl.² B05D 3/02

U.S. Cl. 427-381

1 Claim

- A process for imparting to cotton and cotton-polyester blended fabric a soft hand in combination with wash-wear properties, the process comprising:
 - impregnating a cellulosic fabric with an aqueous solution containing about 10% of trimethylol derivative of 2,4,6-Tris (cabamoylmethylamino)-1,3,5-s-triazine and about from 0.5% to 1.0% of a catalyst selected from the group consisting of:
 - Zn(NO₃)₂·6H₂O,
 - MgCl₂·6H₂O, and a
 - 1:1 mole ratio of citric acid and MgCl₂·6H₂O,
 - dyeing the wet impregnated fabric at about 60° to 85° C for 3-7 minutes, and
 - curing at about 150° for 3-5 minutes.

4,006,275

MATERIAL FOR, AND METHOD OF FORMING, TUBULAR WALLS FOR PRODUCT CONTAINERS

Victor Monla, San Jose, Calif., assignor to Guardian Packaging Corporation, Newark, Calif.

Division of Ser. No. 290,781, Sept. 21, 1972, Pat. No. 3,859,154. This application Sept. 25, 1974, Ser. No. 509,013

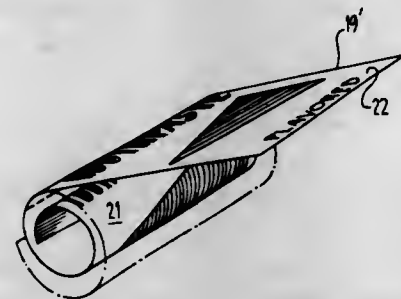
Int. Cl.² B65D 35/00

U.S. Cl. 428-36

3 Claims

- A unitary tubular wall for a product dispensing tube

comprising a section of a product packaging sheet material; a plurality of different complete messages on one side surface of said section respectively in succeeding portions serially arranged along one dimension of said section, the differences between said messages relating to different information it is desired to be in a position to convey on separate product dispensing tubes and each of said succeeding portions generally being of essentially identical length as measured along



said one dimension and each equal to the outer circumference of said tubular wall, said section being convolute along said dimension for a number of layers equal to the number of said different messages and with only one of said different messages on the exposed side of the exterior layer, and interior adjacent layers with the remaining ones of said different messages being permanently bonded to one another to form the unitary tubular wall.

4,006,276

MAGNETIC BUBBLE DOMAIN FIELD SHUNT

Peter K. George, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

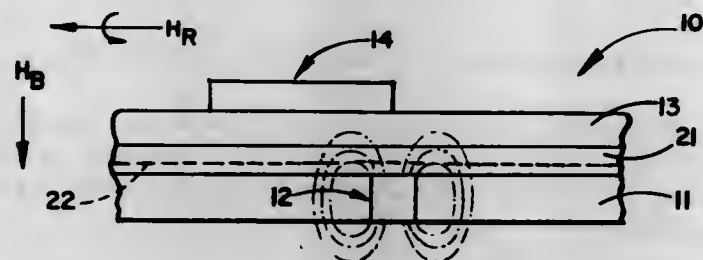
Continuation of Ser. No. 425,058, Dec. 14, 1973, abandoned.

This application May 12, 1975, Ser. No. 576,526

Int. Cl.² G11C 11/14, 19/00

U.S. Cl. 428—195

6 Claims



1. A bubble domain composite suitable for propagating magnetic bubble domains therein, comprising:

a first layer comprising bubble domain material having a high magnetization characteristic for establishing relatively small magnetic bubble domains therein in the presence of a magnetic field which is substantially normal thereto;

a second layer comprising patterned, high magnetic permeability material supported by said first layer for selectively propagating magnetic bubble domains in said first layer in response to the application of a cyclically varying magnetic field substantially parallel to said first and second layers, said second layer of material subject to a polarizing effect therein due to the magnetic field produced by said magnetic bubble domains;

a bubble domain field shunt layer comprising a layer of high magnetic permeability material such as permalloy interposed between said first and second layers to decrease the polarizing effect in said second layer caused by the magnetic field produced by magnetic bubble domains in said first layer and thereby decrease the in-plane field necessary to couple magnetic bubble domains to portions of said second layer;

said shunt layer having a substantially uniform thickness of approximately 500–1000 Å and extending over a significant portion of the active area of said first layer; and

a layer of electrically insulating material interposed between said second layer and said shunt layer.

4,006,277

RANDOM LENGTH CUTTER

William F. Laird, Kingston, Canada, assignor to Hartford Fibres Ltd., Kingston, Canada

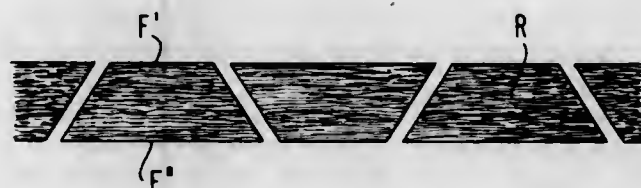
Division of Ser. No. 472,073, May 21, 1974, Pat. No.

3,915,042. This application May 20, 1975, Ser. No. 579,137

Int. Cl.² D03D 3/00

U.S. Cl. 428—224

10 Claims



1. Uniformly mixed cut staple fibers having lengths which vary substantially infinitely between predetermined maximum and minimum cut lengths wherein the number of fibers of any given length is substantially equal to the number of fibers of any other given length.

4,006,278

LOW TEMPERATURE COEFFICIENT OF RESISTIVITY CERMET RESISTORS

Clifford Joseph Pukaite, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

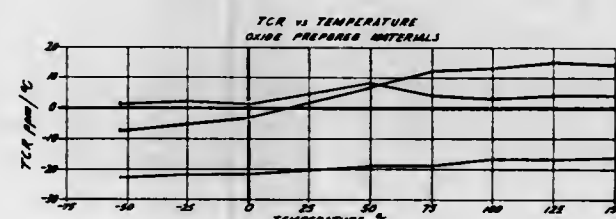
Division of Ser. No. 359,244, May 11, 1973, Pat. No.

3,899,449. This application Apr. 7, 1975, Ser. No. 565,870

Int. Cl.² H01C 17/06; H01B 1/08; B32B 17/00

U.S. Cl. 428—427

3 Claims



1. A cermet resistor comprising: a substrate composed of a ceramic insulating material, a conductive phase and a glass phase interdispersed and fused to said substrate, said conductive phase composed of vanadium oxide in the range from about 1.00 to about 10.00 weight percent and ruthenium dioxide in the range of from about 1.00 to about 30.00 weight percent, and said interdispersed glass phase present in the range of about 50.00 to about 98.00 weight percent, said glass phase composed of lead oxide in the range of about 35.00 to about 45.00 weight percent, boron trioxide in the range of about 15.00 to about 25.00 weight percent and silicon dioxide present in the range of about 30.00 to about 40.00 weight percent.

4,006,279

OXIDATION ENHANCING-VITREOUS ENAMEL COATING ON METAL SUBSTRATE AND COMPOSITION THEREFOR

Ian George Robinson, Noble Park, Australia, assignor to Blythe Colours (Australia) Proprietary Ltd., East Brighton, Australia

Continuation of Ser. No. 420,187, Nov. 29, 1973, abandoned.

This application June 13, 1975, Ser. No. 586,825

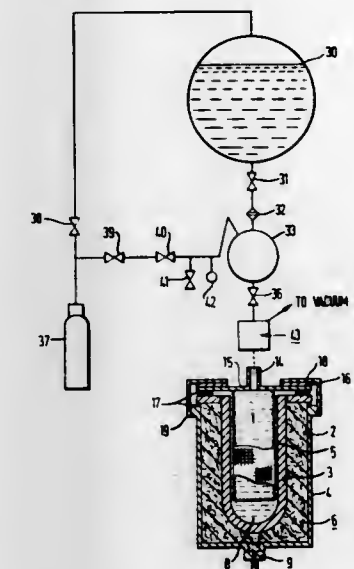
Int. Cl.² B32B 17/06; C03C 5/02

U.S. Cl. 428—432

10 Claims

6. The combination of a vitreous enamel coating adhered to a metal substrate, said coating being capable of enhancing oxidation of organic soils deposited thereon in the range of 300° to 550° F comprising a sintered comminuted mixture of previously smelted and quenched frit-producing material and a separate oxidation inducing agent in the form of a titanate bearing ore containing an oxide of a metal selected from the group consisting of nickel, cobalt, manganese, copper, chromium, iron and aluminum, in which the proportion of oxidation inducing agent to frit in the sintered comminuted mixture is in the range of 95:5 to 60:40 parts by weight.

the liquid electrode to wet a surface of the electrolyte, the method comprising the steps of introducing into the compartment liquid electrode material, contacting the constraining means with the liquid electrode material, and subjecting the liquid electrode material to a pressure sufficient to force the liquid electrode material to penetrate the constraining means and thereby wet the electrolyte.



4,006,280

BATTERY HEAT SHIELD AND WINDSHIELD WASHER RESERVOIR

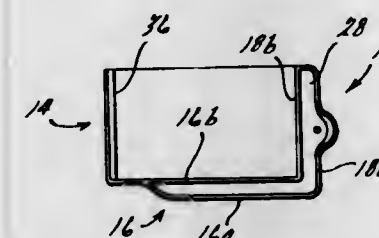
Paul La Verne Walker, Royal Oak, and Carmon Rue Strobel, Washington, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed July 11, 1975, Ser. No. 594,995

Int. Cl.² H01M 2/02; B65D 1/24

U.S. Cl. 429—98

7 Claims



1. A combination storage battery heat shield and windshield washer reservoir device comprising a boxlike structure having a generally planar cover for overlying the top of said battery, said cover being provided with openings to facilitate battery servicing, and a plurality of interconnected wall members extending generally at right angles to said cover for overlying the sides of said battery, and at least one of said wall members forming at least a portion of a chamber for storing a windshield washing fluid.

13. An electric cell comprising a compartment containing an electrode which, during use of the cell, is a liquid, an electrolyte in contact with the electrode, and a constraining means for constraining the electrode, when the electrode is in the liquid state thereof, to wet the electrolyte, said compartment further containing a gas at a pressure sufficient to ensure that the electrode, when the electrode is in the liquid state thereof, penetrates the constraining means and thus contacts the electrolyte and remains in the constraining means irrespective of any capillary action of the constraining means.

4,006,282

SEAL ARRANGEMENT FOR A LEAD TERMINAL WITH THE COVER OF A STORAGE CELL

Slpic Antoine, St. Jean de Braye, France, assignor to Sait-Societe des Accumulateurs Fixes et de Traction, Romainville and Compagnie Europeenne d'Accumulateurs, Paris, both of, France

Filed Dec. 15, 1975, Ser. No. 640,550

Claims priority, application France, Oct. 22, 1975, 75.32300

Int. Cl.² H01M 2/06

U.S. Cl. 429—181

12 Claims

1. Seal in the cover of a lead-acid storage cell comprising a terminal post of malleable metal having a shoulder on the portion of said post situated inside the storage cell and a blind hole in said terminal post opening toward the outside, an expanded headed part whose head bears on the cover, a flexible gasket situated between a portion of the cover and the shoulder of the terminal post, said expanded part acting to expand a portion of said post and also resulting in compression of the flexible gasket between the shoulder and the cover

4,006,281

ELECTRIC CELLS

Trevor Leslie Markin, Goring-on-Thames, and Anthony Richard Junkison, Didcot, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of The United Kingdom of Great Britain and Northern Ireland, England

Filed June 30, 1975, Ser. No. 591,321

Claims priority, application United Kingdom, July 5, 1974, 30015/74

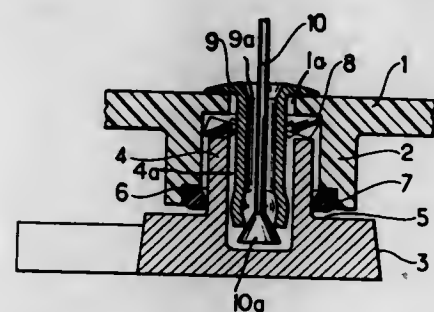
Int. Cl.² H01M 43/00

U.S. Cl. 429—103

18 Claims

1. A method of filling an electric cell which comprises a compartment for receiving a liquid electrolyte, an electrolyte, and a constraining means in the compartment for constraining

without, however, having the resultant expansion of the terminal post under the action of the said expanded part cause



contact between the portion of said cover and the expanded portion of said post.

4,006,283
PREPARATION OF DI-TERTIARY BUTYL PEROXIDE
CROSSLINK POLYOLEFIN MATERIALS
 Burton Thornley MacKenzie, Jr., Monroe; Maurice Prober, Fairfield, and Edward Vincent Wilkus, Trumbull, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,196
 Int. Cl.² C08J 3/24; C08K 5/14

U.S. Cl. 526-57 25 Claims

1. A method of effectively and rapidly dispersing and admixing liquid di-tertiary butyl peroxide with a peroxide cross-link curable polymeric polyolefin, comprising the steps of depositing a mass of particulate polyolefin material within a chamber, introducing a quantity of liquid di-tertiary butyl peroxide into the particulate polyolefin material a substantial depth below the surface of its mass, and admixing the particulate polyolefin material containing the introduced di-tertiary butyl peroxide therein to disperse the peroxide over the particles and within the mass of the polyolefin.

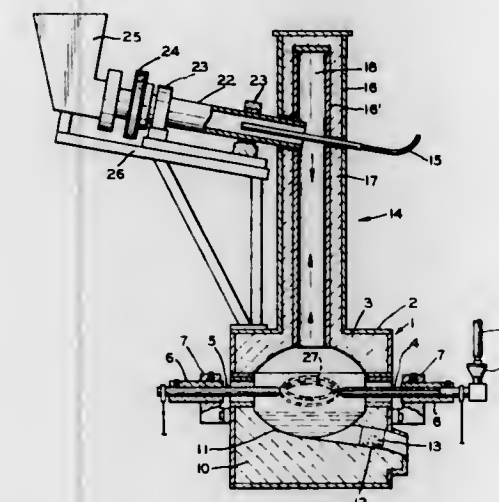
ELECTRICAL

4,006,284
EXTENDED ARC FURNACE AND PROCESS FOR
MELTING PARTICULATE CHARGE THEREIN
 Robert Sidney Segsworth, Toronto, and Charles Benjamin Alcock, Don Mills, both of Canada, assignors to Tibur Metals, Ltd., Toronto, Canada

Filed June 2, 1975, Ser. No. 580,839
 Claims priority, application Canada, Apr. 16, 1975, 224734
 Int. Cl.² H05B 11/00

U.S. Cl. 13-9 R

20 Claims



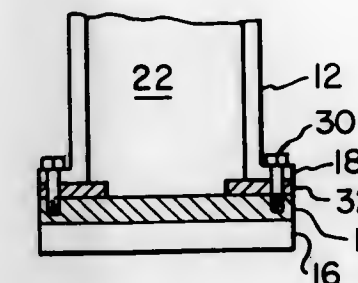
1. A furnace adapted for the heat treatment of particulate matter comprising

1. a refractory-lined vessel having one or more openings adapted to receive one or more electrodes extending into the interior of said vessel, having a hearth therein adapted to receive said treated matter, a discharge means for removing said treated matter from said hearth, and an opening in the upper region of said vessel;
2. a reaction chamber rising from said vessel having a passageway through the length thereof, said reaction chamber having an upper portion and inlet means in said upper portion for transmitting the particulate matter to be heat treated into said passageway, said passageway communicating with the opening in the upper region of said vessel, both for receiving gases heated by electrodes in said vessel and rising into said passageway, to direct said gases and said particulate matter into a counter-current heat exchange relationship, and for feeding the heated particulate matter through said upper region opening in said vessel;
3. one or more electrodes, at least one of which has an axial opening extending through at least a major portion of the length of said electrode and communicating with the interior of said vessel, said axial opening having a size predetermined to create a stabilized extended arc according to the flow rate and linear velocity of gas flowing through said opening;
4. a means for supplying the selected gas to the axial opening in said electrode or electrodes whereby to feed said gas into the interior of said vessel; and
5. a power supply connected to said electrode adapted to supply sufficient power to produce an extended arc between said electrode and one or more other electrodes or between said electrode and a charge in the hearth of said vessel wherefore the rate of gas flow and linear velocity of the gas stabilizes the said extended arc.

4,006,285
STARTER PLATE FOR ELECTRO SLAG REMELTING
APPARATUS
 Robert J. Steinman, Jr., Pittsburgh; John M. Pruss, Carnegie, and Leonard G. Joseph, Pittsburgh, all of Pa., assignors to Cyclops Corporation, Pittsburgh, Pa.
 Filed Jan. 12, 1976, Ser. No. 648,041
 Int. Cl.² H05B 3/60

U.S. Cl. 13-9 ES

10 Claims



1. In an electro slag remelting apparatus including an ingot mold having a central cavity, a base to support a bottom surface of a remelt ingot of a first metal, and a consumable electrode extending into said cavity to form said ingot, the improvement comprising a starting plate means positioned between the base and the ingot, said starting plate means having a central opening therethrough and extending inward from the ingot mold a short distance into the cavity so as to contact at least a portion of the bottom surface in the area adjacent the perimeter thereof.

4,006,286
HIGH-VOLTAGE CABLE JOINT WITH CONDUCTIVE
MEANS TO DECREASE ELECTRIC FIELD INTENSITY
THEREIN

Erik Georg Larsson, Spanga, Sweden, assignor to Kabeldon AB, Arlingsas, Sweden

Filed Dec. 19, 1975, Ser. No. 642,292

Claims priority, application Sweden, Jan. 24, 1975, 7500774

Int. Cl.² H02G 15/08

U.S. Cl. 174-73 R

2 Claims



1. Improvement in a high-voltage cable joint for electrically connecting conductors of a cable, each conductor having a surrounding layer of solid insulation, and a conducting screen surrounding at least a portion of said conductor, said cable joint having a jointing sleeve connecting bared ends of said conductors, wherein the improvement comprises: a coating surrounding at least a portion of said solid insulation of each of said conductors, said at least a portion of said solid insulation beginning at the end of said solid insulation near said jointing sleeve, said end of said solid insulation having an end

surface lying substantially perpendicular to the axis of said cable and said jointing sleeve, said coating having a resistivity lower than that of said solid insulation and which is voltage dependent; and a conducting material positioned about said jointing sleeve between the end surfaces of said solid insulating layers and in electrical communication with said coating on each solid insulation, said conducting material having a diameter approximately equal to the diameter of said solid insulation, whereby the electric field intensity is decreased.

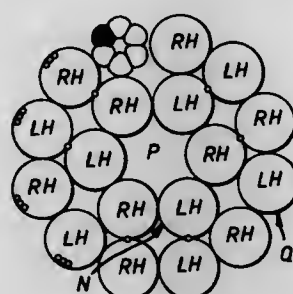
4,006,287 WELDING CABLE

John Thomas Storey, Northolt, England, assignor to Delta Metal Electronics Limited, Northolt, England
Filed Mar. 15, 1973, Ser. No. 341,591
Claims priority, application United Kingdom, Mar. 16, 1972, 12284/72

Int. Cl.² H01B 7/34

U.S. Cl. 174-15 WF

11 Claims



1. An electrical cable rope comprising eighteen electrical conductor units with six of the conductor units wound together in a helical manner to form a core with the conductors arranged in side-by-side contacting relationship, a hollow central passage being directed through the core, each conductor unit being twisted in the opposite direction to the two conductor units in contact therewith, the other twelve conductor units being wound together in a helical manner in side-by-side contacting relationship to surround said core, each of the outer conductor units being twisted in the opposite direction to the two outer conductor units in contact therewith and with each conductor unit comprising an even number of bunches of strands of electrically conductive material, said number of bunches being at least four and being arranged in side-by-side contacting relationship to define a hollow central passage through the unit, the strands of each bunch being wound together in a helical manner and in the opposite direction to the strands of the two bunches in contact therewith so that zero electrical wear points prevail in the cross-section of the unit.

4,006,288

HIGH VOLTAGE SHIELDED CABLE TERMINATION, SPLICE CONNECTION, AND METHOD OF MAKING A SPLICE CONNECTION

David R. Stevens, Hackettstown, N.J., assignor to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 537,703, Dec. 30, 1974, abandoned.
This application Dec. 5, 1975, Ser. No. 637,988

Int. Cl.² H02G 15/02, 15/08, 1/14

U.S. Cl. 174-73 R

9 Claims

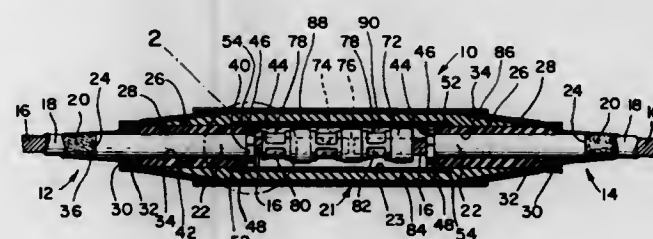
5. A termination of a high voltage cable having a conductive core surrounded by an insulating jacket within a conductive shield, wherein a portion of said conductive shield is removed to expose a portion of said insulating jacket and a portion of said insulating jacket is removed to expose a portion of said conductive core, comprising: a housing, an adaptor sleeve, and retaining means, said housing including a portion overlying the exposed portion of said conductive core and an insulating portion and a conducting portion, said adaptor sleeve

having an insulating portion disposed in engagement with said housing insulating portion and said cable insulating jacket and having a conducting portion forming an electrical path between the conducting portion of said housing and said conductive cable shield, and said retaining means comprising an annular-shaped member directly affixed onto said conductive core and engaging said portion of said housing overlying said conductive core, said retaining means being disposed in mutual abutting relationship with the terminal end face of said cable insulating jacket and the terminal end face of said adaptor sleeve for precluding axial movement of said adaptor sleeve toward the terminus of said conductive core, said retaining means being adapted to provide a thermally conductive path between said conductive core and said housing.

9. The method of making electrical connection between termini of a pair of high voltage shielded electrical cables, with the aid of a kit of component parts capable of being assembled in the field of said cable termini,

said cables each having a conductive core surrounded by an insulating jacket within a conductive shield, the shield of each cable terminating short of the cable terminus to expose a portion of the insulating jacket between the terminus and the termination of the shield, and the insulating jacket terminating short of the cable terminus to expose the conductive core between the terminus and the termination of the insulating jacket.

said kit comprising a pair of sleeves of elastomeric material, said sleeves having a conducting portion and an insulating portion, one of said sleeves adapted to be secured on each of the cable ends with said conducting portion of each sleeve overlapping in electrical engagement with the shield of the respective cable and said insulating portion



of each sleeve in engagement with the insulating jacket of the respective cable; connector means for joining the ends of said conductive cores together; a housing, said housing having an insulating portion and a conducting portion, said housing being adapted to overlie said sleeves and said connector means with said conducting portion forming a conductive path bridging said conducting portions of said pair of sleeves, said housing insulating portion being in engagement with said insulating portion of each of said pair of sleeves, and said housing defining a chamber surrounding the connector means; and a pair of retaining means for precluding axial movement of said sleeves towards the cable termini and for providing a thermally conductive path extending between each of said conductive cores and said housing, each of said retaining means being adapted to be affixed directly onto one of said conductive cores in axially engaging relation with both said one of said sleeves and its corresponding insulating jacket,

said method comprising the following steps:

- positioning said housing on one of said cables in displaced relation with respect to that cable's corresponding terminus;
- securing each one of said pair of sleeves on a respective cable end with said conductive portion of each sleeve overlapping in electrical engagement the shield of the respective cable and said insulating portion of said sleeve in engagement with the insulating jacket of the respective cable and with the terminal end face of each said sleeve in substantial alignment with the terminal end face of the insulating jacket on each said cable end respectively;
- affixing each one of said pair of retaining means directly

- onto a respective one of said conductive cores in axially engaging relation with both the terminal end face of a corresponding sleeve and the terminal end face of a corresponding insulating jacket of a corresponding cable;
- joining the ends of said conductive cores together with said connector means; and
- displacing said housing in the direction of said connector means so as to slidably reposition said housing over said pair of sleeves, said pair of retaining means, and said connector means, and with the conductive portion of said housing forming a conductive bridge between the conductive portions on said pair of sleeves.

4,006,289

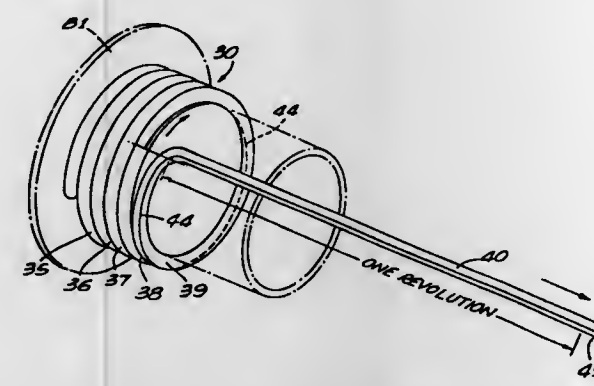
ELECTROMECHANICAL CABLE DEPLOYABLE IN A NO-TORQUE CONDITION, AND METHOD

Norman P. Roe, and Gordon W. Brown, both of Idyllwild, Calif., assignors to Consolidated Products Corporation, Idyllwild, Calif.

Continuation-in-part of Ser. No. 497,872, Aug. 16, 1974, abandoned. This application Nov. 18, 1974, Ser. No. 524,665
Int. Cl.² H01B 17/22

U.S. Cl. 174-102 R

36 Claims



1. A coiled electromechanical cable adapted for deployment in an untwisted state along a generally straight path and when thus deployed to be substantially free of twisting movements resulting from changes in the longitudinal tensile load upon the cable, the cable including a conducting core, a plurality of fibrous armoring elements arranged circumferentially around the core, and a sheath of protective material encompassing the armoring elements; the cable being arranged such that when it lies straight and untwisted said fibrous armoring elements extend generally parallel to one another and to the longitudinal axis of the cable and are circumferentially spaced apart a sufficient distance to permit the cable to be twisted when it is rolled; the cable being coiled into a roll with approximately 360° of twist in the cable within each complete loop of the roll.

4,006,290

SURFACE WAVE FREQUENCY SELECTIVE DEVICE
Richard A. Momberger, Onondaga, and G. Norman Williams, Seneca, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 12, 1974, Ser. No. 496,754

Int. Cl.² H04N 5/60

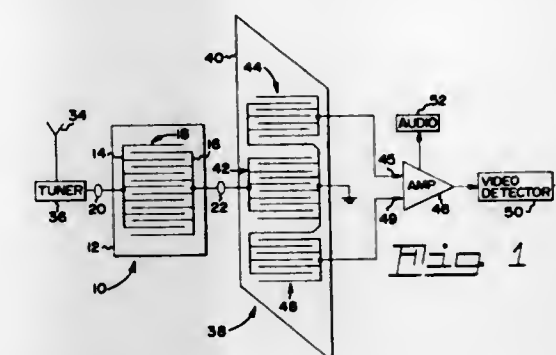
U.S. Cl. 358-196

9 Claims

1. An intermediate frequency circuit for a television receiver comprising:

- means for providing an intermediate frequency signal including an audio frequency component and a video frequency component;
- a surface wave frequency selective device including a substrate of piezoelectric material, a first comb of electrodes disposed on said substrate and connected to said means for providing an intermediate frequency signal, and a second comb of electrodes disposed on said substrate and interleaved with said first comb to form a single interdigiti-

tal transducer on said substrate for attenuating said audio frequency component by a predetermined amount relation to said video frequency component for providing a step in the frequency response characteristic of said inter-



mediate frequency circuit at the frequency of said audio component; and means connected to said second comb for receiving said intermediate frequency signal therefrom.

4,006,291

THREE DIMENSIONAL TELEVISION SYSTEM

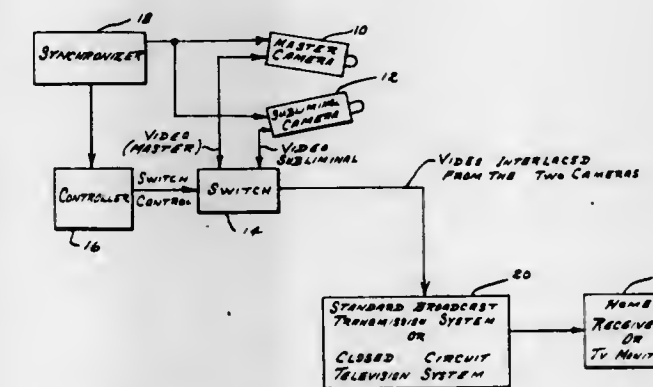
Donald J. Imsand, 12 Walnut Ave., Shalimar, Fla. 32579

Filed Feb. 22, 1974, Ser. No. 445,002

Int. Cl.² H04N 9/56

U.S. Cl. 358-92

6 Claims



1. A method of displaying by projecting a stereo pair of images to present a single three dimensional image to normal human perception comprising the steps of positioning a pair of video cameras in stereo relation to each other to view a scene, switching the video signal from first one camera and then the other camera, controlling the time interval that each of the cameras is operative so that one camera is active nearly all of the time while the other camera is active only briefly, synchronizing the video of the two cameras and switched video signals, and transmitting and displaying the switched video signals on a conventional television receiver thereby allowing the human visual perception process to interpret the switched signals as a single three dimensional image.

4,006,292

INFORMATION RECORDING AND REPRODUCING SYSTEM WITH PLURAL INFORMATION TRACKS WITHIN A SINGLE GROOVE

Louis F. Schaefer, Palo Alto, Calif., assignor to Sharp Corporation, Osaka, Japan

Filed Sept. 3, 1974, Ser. No. 502,559

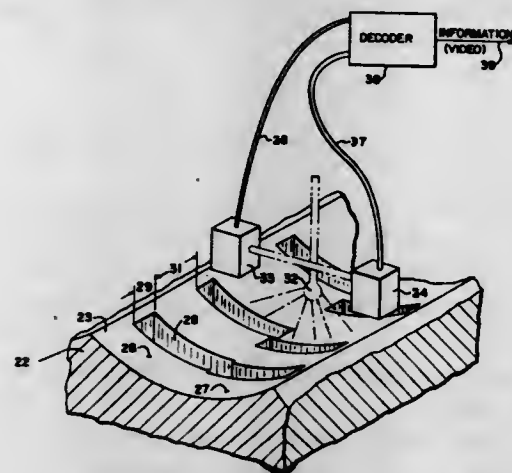
Int. Cl.² H04N 5/76; G11B 1/100

U.S. Cl. 358-128

2 Claims

1. An information recording and reproducing system having a high information rate comprising a disc storage medium having a recording groove and associated transducer means, the combination comprising: a pair of recording tracks formed

in said recording groove, means for receiving the information to be recorded, processing and encoding the information and recording portions thereof in each of said tracks as a plurality of pits disposed along said tracks with the spacing and size of said pits modulated in accordance with the input information, each of said tracks having a predetermined maximum infor-



mation rate capacity which is less than the high information rate, transducer means adapted to simultaneously scan each of said tracks and each providing output signals corresponding to the information on said tracks, and means for decoding the output of said transducer means and providing information at the original high information rate.

4,006,293

APPARATUS FOR READING A FLAT RECORD CARRIER WITH AN OPTICALLY READABLE INFORMATION STRUCTURE

Glabertus Bouwhuis; Josephus Johannes Maria Braat; Peter Ferdinand Greve, and Kornelis Antonie Immink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

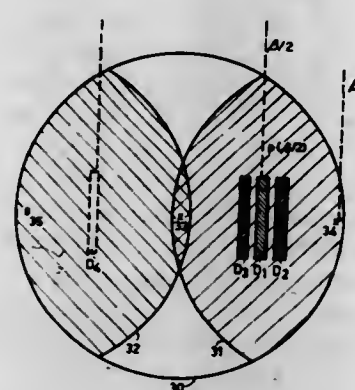
Filed Apr. 16, 1975, Ser. No. 568,727

Claims priority, application Netherlands, Feb. 28, 1975, 7502373

Int. Cl.² H04N 5/76; G11B 7/12

U.S. Cl. 358-128

10 Claims



1. An apparatus for reading a flat record carrier on which information, for example video and/or audio information, is stored in an optically readable track-shaped information structure, which apparatus comprises a radiation source, an objective system means for supplying radiation from the radiation source via the record carrier to radiation-sensitive information detection means for converting the read beam which is supplied by the radiation source and modulated by the information structure into an electric signal, and which apparatus further comprises a focussing detection means for providing a signal corresponding to the distance between the focal point of said read beam and the track-shaped structure measured along said read beam, and a centering detection means providing a signal corresponding to the eccentricity between the

center of the read beam and the center of a track on which said read beam is directed, said focussing detection means and centering detection means being connected to electronic circuits for deriving control signals for correcting the focussing of the objective system and respectively the centering of the read beam relative to a track portion to be read, characterized in that the centering detection means and the focussing detection means are constituted by a system of at least two radiation-sensitive detectors, which said at least two radiation sensitive detectors being disposed in the far field of the information structure at one side of a plane which is formed by the optical axis of the objective system means and a line which is parallel to the center line of the track portion to be read, said at least two radiation sensitive detectors being situated in an area around the point where the line which makes an angle of $\beta/2$ with the optical axis intersects the plane of the detectors, where β is the angle at which a first-order beam is diffracted in the lateral direction of the tracks.

4,006,294

TRANSDUCER HEAD ASSEMBLY WITH FLUID BEARING AND HEAD HEIGHT CONTROL SYSTEM

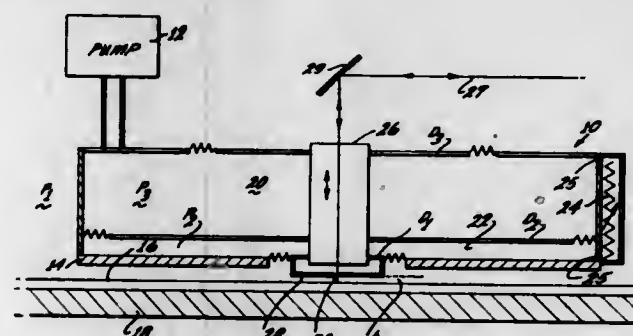
Lawrence S. Canino, Redondo Beach, Calif., assignor to MCA Disco-Vision, Inc., Universal City, Calif.

Filed May 27, 1975, Ser. No. 580,749

Int. Cl.² G11B 7/12, 21/20

U.S. Cl. 358-127

13 Claims



1. A fluid servomechanism for controlling the separation between the surface of a moving information-bearing medium and a relatively fixed transducer head used in sensing the information in the medium, said servomechanism and said surface being immersed in an ambient fluid, said fluid servomechanism comprising:

- a fixed and rigid housing positionable with an end wall thereof adjacent the surface of the medium, having a first chamber, and having a second chamber located between said first chamber and said end wall;
- a first diaphragm forming a portion of said end wall of said housing to establish a sealed movable wall portion separating said second chamber from the ambient fluid;
- a second diaphragm substantially parallel to said first diaphragm and separating said first chamber from the ambient fluid;
- a third diaphragm located inside said housing between said first and second diaphragms and substantially parallel to them, and between said first and second chambers, each diaphragm being deformable in a direction substantially perpendicular to the surface of the medium;
- rigid structural means connecting the deformable portions of said diaphragms constraining them to deform in the same direction by equal displacements, the transducer head being connected to said rigid structural means for movement therewith;
- an orifice attached to said first diaphragm for movement therewith, said orifice connecting said second chamber with the ambient fluid adjacent said orifice;
- a flow-restricting conduit joining said first chamber and said second chamber, having a flow resistance related in a predetermined way to the flow resistance of said orifice; and
- means for connecting a pump directly with said first cham-

ber for forcing fluid to flow in series through said pump, said first chamber, said flow-restricting conduit, said second chamber and said orifice.

4,006,295

METHOD OF DETECTING DEFECTS IN SIGNALS CORRESPONDING TO THE READ-OUT OF A DATA CARRIER AND SYSTEM FOR IMPLEMENTING SUCH A METHOD

Pierre Oprandl, and René Romeas, both of Paris, France, assignors to Thomson-Brandt, Paris, France

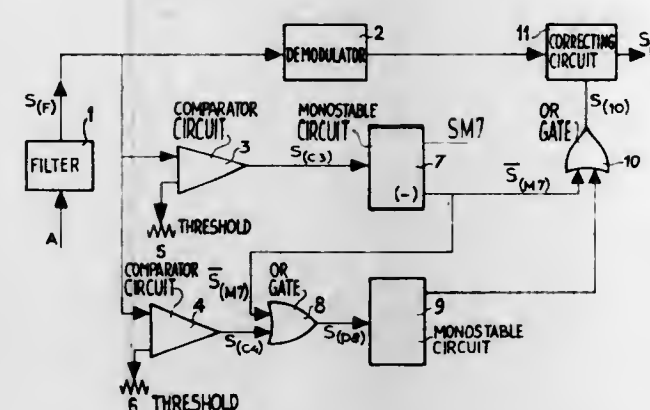
Filed July 21, 1975, Ser. No. 597,633

Claims priority, application France, July 23, 1974, 74.25492

Int. Cl.² H04N 5/76

U.S. Cl. 358-127

5 Claims



1. A method of detecting defects undergone by a read-out signal supplied from a reproducing system through the medium of a filter; said read-out signal being constituted by an angularly modulated carrier wave having a predetermined mean value of peak amplitude, and a frequency range extending above a predetermined lower frequency limit; said defects comprising drop-out and transients produced by said filter; said method comprising the steps of feeding said read-out signal to the respective first inputs of first and second comparator circuits; respectively biasing the second inputs of said first and second comparator circuits with a first and a second threshold voltage; adjusting said first threshold voltage below said mean value of peak amplitude; adjusting said second threshold voltage slightly above said mean value of peak amplitude; triggering a first monostable circuit with the first of said comparator circuits, said first monostable circuit having a relaxation duration higher than the reciprocal of said lower frequency limit; feeding the trigger input of a second monostable circuit with the output of a first OR gate having two inputs respectively supplied with signals from the complement output of said first monostable circuit and from the output of said second comparator circuit; and feeding a second OR gate with the signal supplied from said second monostable circuit and the signal supplied at said complement output for delivering a defect control signal.

4,006,296

METHOD OF AND APPARATUS FOR TESTING A TWO DIMENSIONAL PATTERN

Christopher Ernest Peterson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,440

Claims priority, application Netherlands, July 22, 1974, 7409850

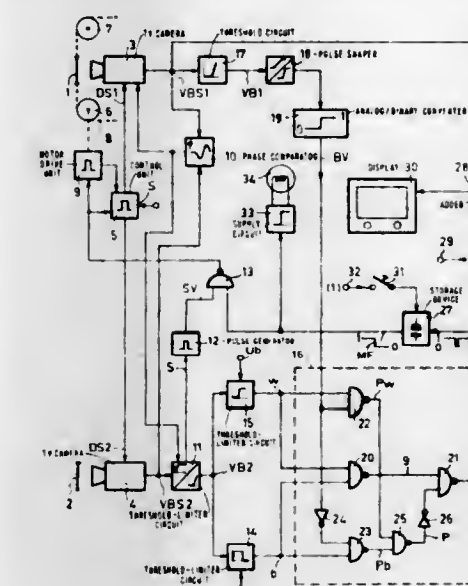
Int. Cl.² H04N 7/02

U.S. Cl. 358-106

11 Claims

2. Apparatus for inspecting a test object having a two-dimensional pattern by comparison thereof with a reference pattern comprising, first and second synchronized pick-up devices for scanning the test pattern and the reference pattern respectively, to derive first and second signals corresponding

to the respective patterns scanned, said reference pattern comprising, first, second and third pattern traces having different brightness values with said first trace having a brightness value intermediate the brightness values of the second and third traces, the second and third traces being narrower in width than corresponding traces in the test pattern, an analog-to-binary converter, means coupling the input of the analog-to-binary converter to said first pick-up device, first and second threshold circuits coupled to said second pick-up device, one threshold circuit having a pass band for signals corresponding to low brightness values and the other having a pass



4,006,297

TELEVISION SIGNAL CODING SYSTEM

Toshio Koga, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

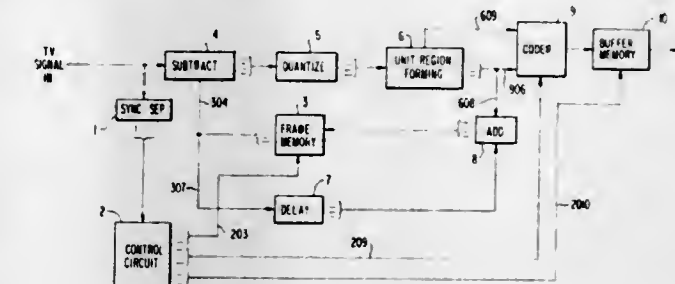
Filed Sept. 19, 1975, Ser. No. 614,986

Claims priority, application Japan, Sept. 20, 1974, 49-108550

Int. Cl.² H04N 7/12

U.S. Cl. 358-136

4 Claims



1. A television signal coding system for coding a television signal by the use of frame correlation techniques, said television signal consisting of a series of frames each defined by horizontal and vertical synchronizing signals and each representing a number of two-dimensionally arranged picture elements of an optical image to be transmitted, said coding system including means for sequentially comparing every two successive frames to produce a binary difference signal con-

sisting of significant and insignificant digits representing respectively that the difference of said frame-to-frame comparison is greater and smaller than a predetermined value for each said picture element, said binary difference signal being deviated into a series of unit regions each having a predetermined number of binary digits; wherein the improvement further comprises:

- first means responsive to said binary difference signal for generating a first or a second binary code for each said unit region depending on whether or not the unit region has said significant digits exceeding in number a predetermined value to designate significant regions;
- second means connected to said first means and responsive to said first and second binary codes for generating a demarcation code to divide said binary difference signal into groups each covering a predetermined number of said unit regions;
- third means connected to said second means and responsive to the code pattern consisting of said first and second binary codes included in each of said groups for generating a unit-region position code representing the position of said significant unit regions in each of said groups;
- fourth means connected to said third means for generating for each said significant unit regions a picture element position code representing the position of each significant bit included in said binary difference signal; and
- fifth means connected to receive the outputs of said second, third and fourth means for arranging in a predetermined order and in a time relationship said demarcation code, said unit-region position code, and said picture element position code.

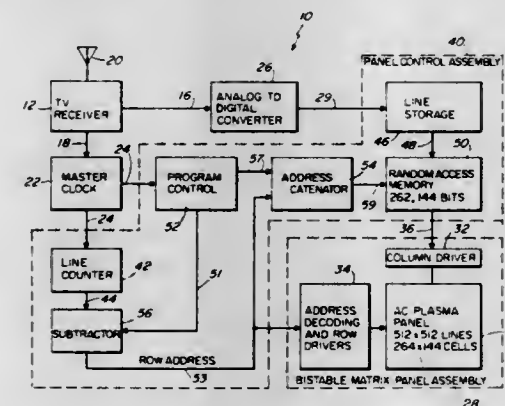
4,006,298

BISTABLE MATRIX TELEVISION DISPLAY SYSTEM
Vernon John Fowler, Billerica, and Bruce Conrad Anderson, Tewksbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 20, 1975, Ser. No. 579,172
Int. Cl.³ H04N 5/66

U.S. Cl. 358—240

13 Claims



1. A television display system of the type having a source of a baseband analog video signal defining real-time frames each having a pair of interlaced fields, each field having a plurality of lines containing a plurality of picture elements,

- a. an analog-to-digital converter receiving the video signal and generating an N bit digital word representative of the intensity of the video signal for each picture element,
- b. a control assembly receiving each digital word and in response thereto generating a sequence of output light pulse control signals for each word, the cumulative light pulse duration in time being directly proportional to the intensity of the analog video signal for each picture element, the sequence of light pulse control signals being effective to provide a full resolution, interlaced TV display, the sequence of control signals being such that the control signal corresponding to the least significant bit of the digital word occurs first and such that the control signal corresponding to the most significant bit of the

digital word occurs last, the control assembly having a storage memory for storing the N bits digital words and having a bit storage requirement no greater than the maximum number of display elements in the display panel, and

- c. a bistable matrix display panel receiving the sequence of signals to generate a full-resolution, interlaced display with a full range of gray levels displayed.

4,006,299

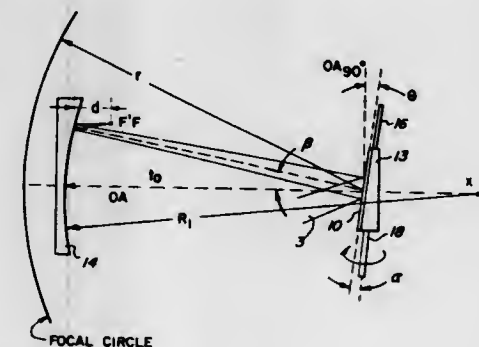
FLAT FIELD SCANNING SYSTEM

David A. Grafton, Santa Monica, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 11, 1974, Ser. No. 531,848
Int. Cl.³ H04N 1/02

U.S. Cl. 358—293

14 Claims



1. An optical scanning system comprising: means for providing a beam of light, rotatable planar reflective means for directing said beam upon rotation throughout a predetermined scan angle means for rotating said planar reflective means, and curved reflective means positioned adjacent said planar reflective means for imaging said beam as a spot and redirecting the beam directed thereto from said planar reflective means such that said spot traverses a flat focal plane; the plane of said planar reflective means being tilted at a first angle from an axis orthogonal to the optical axis of said curved reflective means, the axis of rotation of said planar reflective means being off-set at a second angle from the plane of said planar reflective means whereby said planar reflective means provides a linear traverse of said spot in the flat focal plane as said planar reflective means is rotated about its axis of rotation.

4,006,300

TWO-PIECE BACK FOR A CONSOLE TELEVISION RECEIVER

Melvin H. Boldt, Glenview; David P. Chuboff, North Barrington, and Robert W. Becker, Naperville, all of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

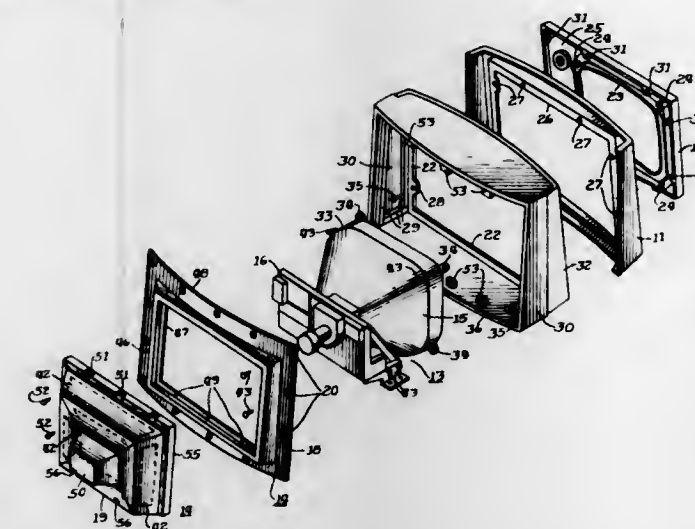
Filed Dec. 31, 1975, Ser. No. 645,489
Int. Cl.³ H01J 29/02

U.S. Cl. 358—254

7 Claims

1. A back for a television receiver comprising: a molded central portion including a generally rectangular peripheral section adapted to enclose a first receiver cabinet of similar dimension and an end bell section adapted to enclose the neck of an extending picture tube and assorted chassis parts;
- a formed portion including a generally rectangular outer edge dimensioned to enclose a second receiver cabinet, and an

inner edge in engagement with the outer edge of said molded portion; and



fastening means joining said molded and formed portions together.

4,006,301

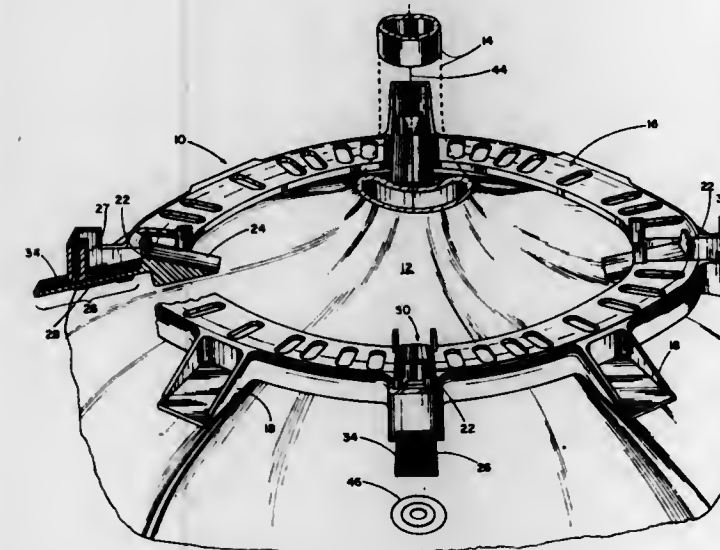
YOKE ADJUSTING APPARATUS FOR A COLOR TV PICTURE TUBE

Dennis S. Bubacz; Guenter F. Hoffmann, and Konrad L. Schliecke, all of Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 16, 1976, Ser. No. 649,892
Int. Cl.³ H04N 5/657

U.S. Cl. 358—248

7 Claims



1. A yoke adjusting apparatus for use with a color television picture tube having a faceplate and a funnel aligned on a tube central axis wherein said funnel has a neck which contains an inline electron gun assembly for emitting at least one stream of electrons, said neck being connected to a flared portion ending in a mouth to which said faceplate is attached, said funnel having about said neck near said flared portion a yoke which forms a magnetic field for deflecting said stream of electrons for proper convergence of said tube, said yoke being held by a yoke mount, said yoke adjusting apparatus comprising:

- a circumferential support about said funnel neck and attached to said flared portion of said funnel, and
- a tilt adjusting means carried by said circumferential support and having a wedge-shaped portion selectively positionable between said yoke mount and said flared portion of said funnel to vary the attitude of said yoke mount, and thus said yoke, relative to said tube axis, thereby causing a change in the magnitude of said magnetic field of said yoke relative to said tube axis, and
- locking means coupled between said tilt adjusting means and said circumferential support for engaging said tilt adjusting means to lock said wedge-shaped portion of said

tilt adjusting means in a selected position between said yoke mount and said flared portion of said funnel corresponding to a desired attitude of said yoke, and manually operable means for releasing said locking means to free said tilt adjusting means and thereby enable it to be retracted and the yoke readjusted.

4,006,302

SWITCHING ARRANGEMENT FOR EXTENDING THE RECEIVER STOP PULSE LENGTH IN TIME DIVISION MULTIPLEX TRANSMISSION

Konrad Reisinger, Zorneding, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

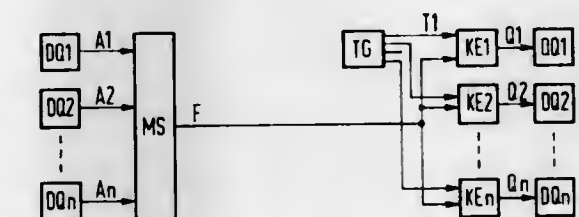
Filed Feb. 13, 1976, Ser. No. 658,121

Claims priority, application Germany, Mar. 13, 1975, 2511056

Int. Cl.³ H04L 5/00

U.S. Cl. 178—50

2 Claims



1. In a data transmission system having a switching arrangement for extending the receiver stop pulse length for time division multiplex (TDM) transmissions of telegraph signals on a character frame basis, each character frame having a start pulse, a number m code bits and one stop pulse, wherein a TDM signal is applied to a first bistable circuit and the output of the first bistable circuit is applied to a second bistable circuit from which a data signal is emitted to a data sink, the improvement comprising:

- shift register means having at least a number m+3 storage cells, parallel input terminals receiving a stop signal, a clock pulse input terminal receiving clock pulses to be applied to said shift register means and a serial input terminal receiving a second binary digit whenever no stop signal is present,
- gate means having input terminals for receiving an output signal from the m+3th storage cell of said shift register means and an output signal from said first bistable circuit, the gate means having an output terminal for producing stop signal,
- counter means for receiving said stop signal as a signal to be counted and the output signal from the m+3th storage cell of said shift register means as a reset signal, said counter means producing counter reading signals for indicating the reading of said counter means and means for producing phase shifted clock signals one of which is used as a function of the reading of said counter means for timing said second bistable circuit.

4,006,303

FILTERED TRANSITION DISTORTION CHANNEL QUALITY MONITOR

Peter Michael McManamon, Boulder, Colo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 29, 1975, Ser. No. 644,471

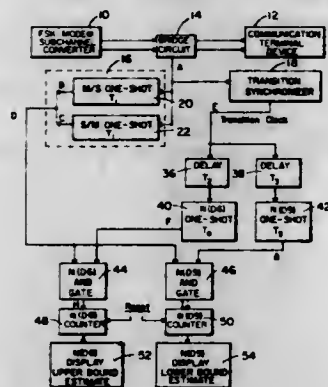
Int. Cl.³ H04L 25/06

U.S. Cl. 178—69 A

5 Claims

1. A DC transition monitor comprising: first means for providing a DC pulse train output including information bit DC transitions, which, when they occur, do so at integral multiples of the information bit period t and also including an unknown number of spurious DC transitions at unknown intervals;

second means connected to said first means for outputting a pulse in response to each DC transition occurring in said DC pulse train;
third means connected to said first means for outputting a pulse at the end of each said bit period t ;
fourth means for outputting a plurality of pulses, the leading edge of each of said plurality of pulses occurring after a predetermined time delay after the occurrence of each of



said third means pulses, said predetermined time delay being different for each of said plurality of pulses, and each of said plurality of pulses having different widths; and
N means each connected to said second means and to said fourth means for outputting a pulse each time there is a simultaneously occurring second means pulse and one of said fourth means plurality of pulses.

4,006,304

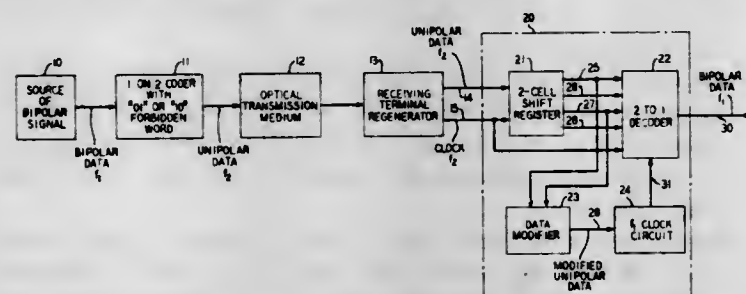
APPARATUS FOR WORD SYNCHRONIZATION IN AN OPTICAL COMMUNICATION SYSTEM

Darrell Dean Sell, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 10, 1975, Ser. No. 639,374

Int. Cl.² H04L 7/00

U.S. Cl. 178-69.1

4 Claims



1. Apparatus for decoding a binary pulse stream wherein binary digits have been encoded as binary words to represent the three levels in a bipolar signal and one of the binary words represents a forbidden word, comprising decoder means having a control input for decoding each of said binary words into a bipolar voltage level in response to a clocking pulse at its control input, means for generating energizing pulses in response to the detection of said forbidden word in said binary pulse stream, and a clocking circuit responsive to said energizing pulses for developing clocking pulses at the control input of said decoder means.

4,006,305

BLINKER PRACTICE LIGHT

Emmett A. Harratty, 966 W. 9th St., No. F., San Pedro, Calif. 90731

Filed Oct. 16, 1975, Ser. No. 623,270

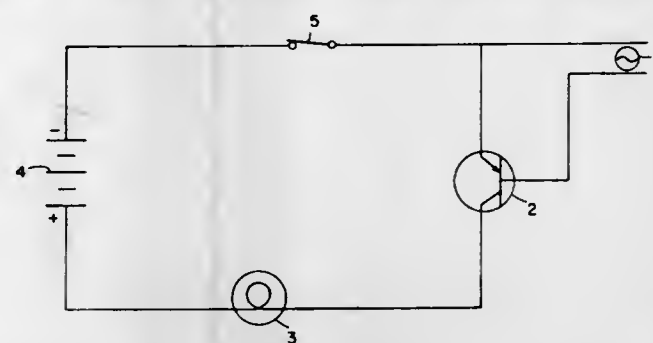
Int. Cl.² G09B 19/26; H04L 15/03

U.S. Cl. 178-115

1 Claim

1. A code practice blinker light consisting only of coupling means adapted to be coupled to a source of code signals, solid

state switch means, said switch means being connected to said coupling means, light means, battery means, said switch



means, said light means and said battery means being in series circuit, whereby code signals applied to said coupling means cause said light to go on and off.

4,006,306

AUDIO SIGNAL PROCESSING APPARATUS

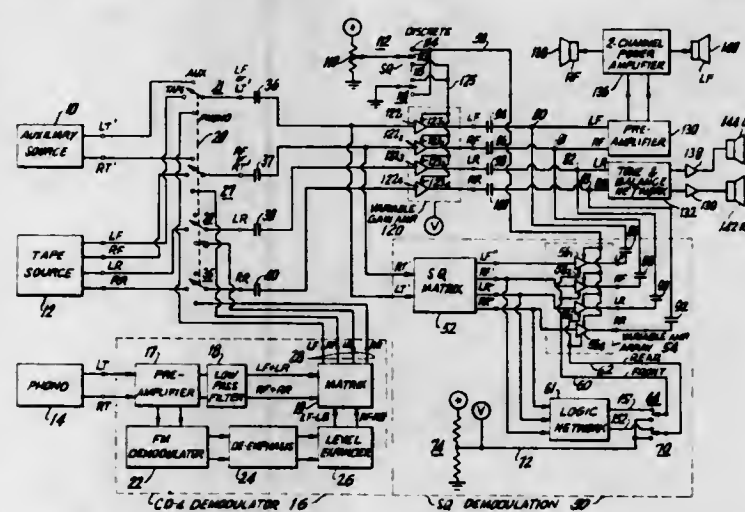
Norman Joseph Driscoll, Westwood, N.J., assignor to Yudin Industries, Inc., Murray Hill, N.J.

Filed Oct. 10, 1975, Ser. No. 621,534

Int. Cl.² H04R 5/00

U.S. Cl. 179-1 GQ

11 Claims



1. In combination, four conducting means, source and selector means for selectively supplying four channel discrete quadrasonic audio program signals to said four conducting means and for supplying four channel encoded signal information to a subset of said four conducting means, a first array of switched amplifiers each having input terminals connected to a different one of said four conducting means, demodulator means including decoding means for producing four channel signals from two input signals having inputs connected to said subset of said four conducting means, a second array of switched amplifiers each receiving a different one of said four demodulated four channel signals from said demodulator means, plural linear junction means each connected to the outputs of a different pair of switched amplifiers in said first and second amplifier arrays, and discrete-demodulated four channel program selection means including means for enabling one of said amplifier arrays and means for disabling the other of said amplifier arrays.

4,006,307

IMPULSE NOISE SUPPRESSION CIRCUIT

Daniel Daniels, Wheaton; Kermik Shoff Dunlap, Naperville; George Haugk, St. Charles, and Richard Barton Sanderson, Lake, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 9, 1975, Ser. No. 594,192

Int. Cl.² H03K 17/00

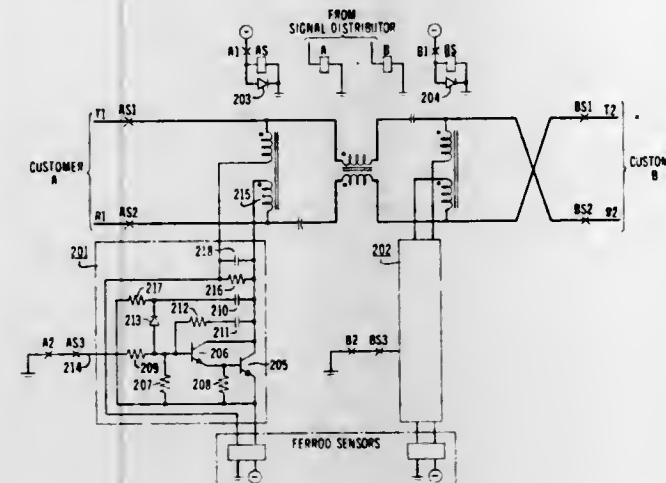
U.S. Cl. 179-1 P

4 Claims

1. A transmission circuit for a communication switching system comprising:
at least one port comprising first and second terminals;

a source of direct current power comprising a ground terminal and a battery terminal;

first and second conducting paths for interconnecting said ground and battery terminals to said first and second terminals respectively, each of said conducting paths comprising switching means and an inductor in series



therewith, and said conducting path for connecting said battery terminal to said second terminal further comprises potential control means for selectively ramping the rise and fall of the potential connected to said second terminal; and further switching means coordinated with said switching means in said first and second conducting paths for controlling said potential control means.

4,006,308

LOUDSPEAKER ARRANGEMENT

Karl Otto Pönsen, Connollystrasse 14, 8 Munich 40, Germany

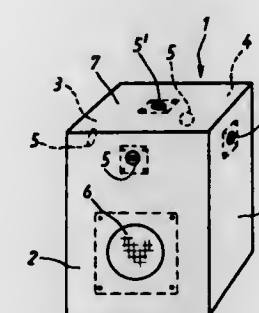
Filed July 22, 1975, Ser. No. 598,158

Claims priority, application Germany, July 25, 1974, 2435944

Int. Cl.² H04R 1/20

U.S. Cl. 179-1 E

14 Claims



1. A loudspeaker arrangement comprising an enclosure having a vertical axis and walls including a top wall; and a plurality of speakers including first-type speakers and at least one another type speaker, said first-type speakers having a high-frequency acoustic characteristic and said another type speaker having another frequency acoustic characteristic, said speakers having a high-frequency acoustic characteristic being mounted on said enclosure equi-angularly spaced from each other about said axis and so as to radiate sound signals in at least four directions orthogonal to said axis and at least one additional speaker having a high-frequency acoustic characteristic being mounted on said top wall of said enclosure and radiating sound signals only in the vertical direction, said speakers being so arranged as to radiate axis-symmetrically sound signals of different frequencies radiating by said speakers and to produce a uniform mixture of said sound signals.

4,006,309

VOICE OPERATED RELAY

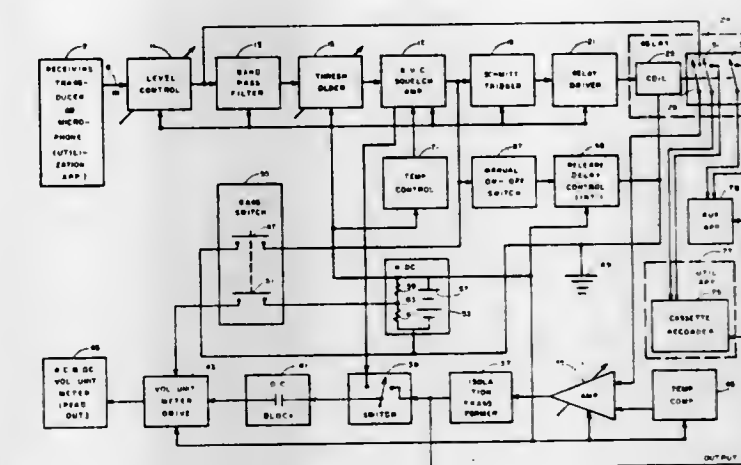
Millard S. Brickard, Jr., Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1975, Ser. No. 624,208

Int. Cl.² H03F 3/72

U.S. Cl. 179-1 VC

2 Claims



1. A voice operated relay system for controlling the actuation of, and data signal input to, utilization means having an actuation signal input connection and a data signal input connection, said system comprising:

input means for providing an audio frequency data signal;
an adjustable level control means, connected to said input means, for selectively attenuating said data signal to provide a level controlled data signal;
an adjustable gain output amplifier having its output connected to said data signal input connection of said utilization means;
relay means having first switch means for connecting a voltage source to said actuation signal connection of said utilization means, and having second switch means for connecting a portion of said level controlled data signal to said adjustable gain output amplifier;
bandpass filter means, connected to receive a portion of said level controlled data signal, for passing a level controlled and bandpass filtered signal;
adjustable threshold means, connected to said bandpass filter means and operative to pass only filtered signals exceeding a predetermined amplitude, for selectively adjusting the sensitivity of said system;
automatic gain control squelch amplifier means, connected to said threshold means and responsive to the signals passed thereby to provide automatic gain controlled signals as first and second outputs each corresponding to said signals passed by said threshold means;
Schmitt trigger means, responsive to said first output of said automatic gain control squelch amplifier means, for controlling actuation of said relay means;
a meter; and
a selector switch connected to said meter and operative between first and second positions to alternatively connect said meter to said second output of said automatic gain control squelch amplifier and to a portion of said output of said adjustable gain output amplifier;
whereby with said selector switch in one position said meter can be used in conjunction with said level control means and with said adjustable threshold means, and with said selector switch in the other position said meter can be used in conjunction with said adjustable gain amplifier.

4,006,310
NOISE-DISCRIMINATING VOICE-SWITCHED
TWO-WAY INTERCOM SYSTEM

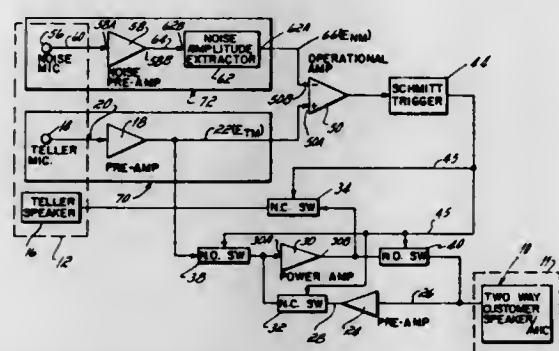
Robert S. Bayer, Newfoundland, N.J., assignor to The Mosler Safe Company, Hamilton, Ohio

Filed Jan. 15, 1976, Ser. No. 649,402

Int. Cl.² H04M 9/10

U.S. Cl. 179-1 H

10 Claims



1. An intercommunication system for a banking installation or the like comprising in combination:

customer speech transducing and sound reproduction means located at a customer location;

a teller speech microphone and a speaker located at a teller location subjected to ambient noise, said teller speech microphone and speaker being separate electrical components, said teller speech microphone being physically positioned at a first spatial point at said teller location accessible to said teller for facilitating placement of the mouth of said teller, which constitutes a source of teller speech, proximate said teller speech microphone when said teller wishes to speak;

power amplifier means with an input and an output for amplifying audio signals;

a teller speech preamplifier means connected to said teller speech microphone;

switch means interconnecting said teller speech preamplifier, said teller speaker and said customer speech transducing and sound reproduction means, said switch means being normally operative in a customer speech transmission mode to connect said customer speech transducing means to said power amplifier input and to connect said power amplifier output to said teller speaker to facilitate transmission of customer speech from said customer location to said teller location, said switch means being selectively operative in a teller speech transmission mode to connect said teller speech preamplifier to said power amplifier input and to connect said power amplifier output to said customer sound reproduction means to facilitate transmission of teller speech from said teller location to said customer location;

switch control means including:

a. a two state threshold detector having an output connected to said switch means, said threshold detector being normally operative in a customer state to place said switch means in said customer speech transmission mode and selectively operative in a teller state to place said switch means in said teller speech transmission mode,

b. a noise microphone located at said teller location at a second spatial point spaced from said first spatial point whereat said teller speech microphone is located,

c. a noise preamplifier connected to said noise microphone, d. noise amplitude extractor means connected to said noise preamplifier for providing an output signal having a level correlated to the amplitude of amplified noise output from said noise preamplifier, said output signal level being substantially independent of the frequency and phase of said amplified noise output from said noise preamplifier, and

e. control signal means responsive to the outputs of said noise amplitude extractor means and said teller speech preamplifier for providing a control signal to said thresh-

old detector when said outputs of said noise amplitude extractor means and said teller speech preamplifier bear a predetermined relation for switching said threshold detector to its teller state which in turn causes said switch means to switch to its teller speech transmission mode; said noise microphone, noise preamplifier and noise amplitude extractor means defining a noise channel, said teller speech microphone and teller speech preamplifier defining a teller speech channel; and

means establishing the amplifier gain and microphone sensitivity of said noise and teller speech channels to cause the locus of points of different sound source positions, whereat equal outputs of said noise and teller speech channels are produced by a sound source, to form a closed surface which envelopes said teller speech microphone while excluding from the interior thereof said noise microphone, whereby a noise source lying exteriorly of said closed surface cannot cause said outputs of said noise amplitude extractor means and teller speech preamplifier to bear said predetermined relation and produce said control signal to switch said threshold detector to its teller state and in turn switch said switch means to its teller speech transmission mode, and whereby further only a source of teller speech located within said closed surface in the absence of a noise source within said closed surface can cause said outputs of said noise amplitude extractor means and teller speech preamplifier to bear said predetermined relation to cause said threshold detector to switch to its teller state and in turn said switch means to switch to its teller speech transmission mode to facilitate transmission of teller speech from said teller location to said customer location.

4,006,311

STEREOPHONIC SOUND REPRODUCING APPARATUS
 Stig Carlsson, Torkel Knutssongatan 15, Stockholm, Sweden
 Continuation of Ser. No. 498,573, Aug. 19, 1974, abandoned.

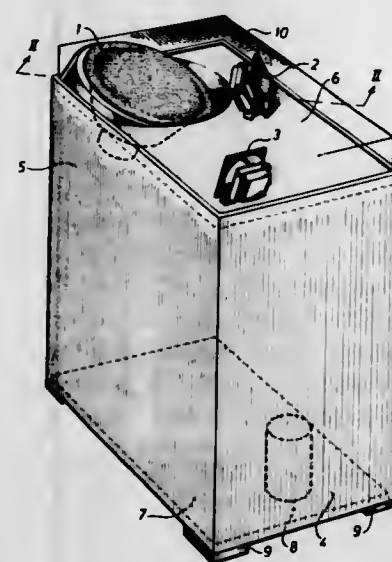
This application Feb. 11, 1976, Ser. No. 657,226

Claims priority, application Sweden, Aug. 24, 1973, 7311562

Int. Cl.² H04R 1/02, 5/02

U.S. Cl. 179-1 GA

7 Claims



1. A loudspeaker for use in a stereophonic or quadraphonic sound reproducing system in a room having at least one substantially vertical wall, comprising a casing having a front end and a rear end and intended to be placed with said rear end nearest to said vertical wall, at least one loudspeaker means arranged in said casing so as to provide, near said rear end of the casing, a midfrequency sound radiation source as well as a low frequency sound radiation source, and a plurality of loudspeaker means facing in widely diverging directions, of which loudspeaker means at least one is located near said front end of the casing and faces in a rearwardly direction, arranged to

radiate the high frequency components of the sound, said at least one loudspeaker means for the midfrequency range and at least one of said plurality of loudspeaker means for the high frequency range being oriented to face asymmetrically slantwise forwards and sideways towards a space located on one side of a vertical medial plane extending from the front end to the rear end of said casing at right angles to the rear wall of said casing, said at least one loudspeaker means for the midfrequency range facing in an upwardly direction, and said at least one of said plurality of loudspeaker means for the high frequency range being arranged to radiate at least substantially one-half of the total high frequency sound-energy flux of said plurality of loudspeaker means for the high frequency range.

7. A stereo loudspeaker system to be placed near a vertical sound reflecting wall in a room, said stereo loudspeaker system comprising a left-hand and a right-hand loudspeaker which are mirror images of one another with respect to a centered vertical plane extending transverse to said sound reflecting wall midway between the loudspeakers; each loudspeaker comprising a casing having a front end and a rear end and intended to be placed with said rear end nearest to said sound reflecting wall, high frequency radiating means comprising a plurality of loudspeaker means mounted on said casing and oriented to face in widely diverging directions, said plurality of loudspeaker means including at least one loudspeaker means which provides direct sound in the room and faces in a forwardly and sideways direction pointing slantwise towards said centered vertical plane, said plurality of loudspeaker means including at least another loudspeaker means which provides reflected sound in the room and faces in at least a rearwardly direction to cooperate with said sound reflecting wall, said at least one loudspeaker means which provides direct sound in the room radiating at least substantially one-half of the total sound-energy flux of said high frequency radiating means, and mid and low frequency radiating means comprising at least one loudspeaker means mounted to said casing, near said rear end of the casing, said at least one loudspeaker means for the midfrequency range being oriented to face in an upwardly and forwardly and sideways direction pointing slantwise towards said centered vertical plane.

4,006,312

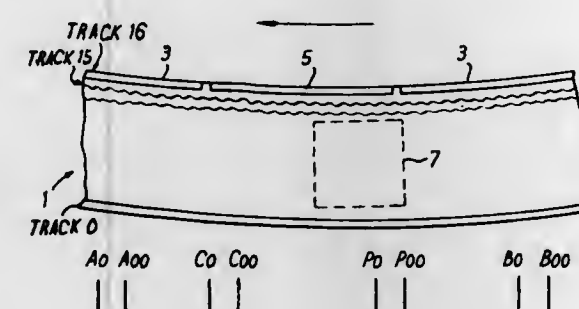
SOUND RECORDING AND REPRODUCING MACHINES
 Leonard Rubenstein, 27 Chessington Court, London N.3, and Stephen Perrin Robinson, Lyon Way, Frimley Road, Camberley, Surrey, both of England

Continuation-in-part of Ser. No. 523,535, Nov. 13, 1974, abandoned. This application Jan. 8, 1975, Ser. No. 539,591
 Claims priority, application United Kingdom, Nov. 14, 1973, 52793/73; May 14, 1974, 21368/74

Int. Cl.² H04M 11/00

U.S. Cl. 179-6 R

9 Claims



1. A sound recording and reproducing machine in which information is recorded on an endless recording medium in a series of tracks which extend lengthwise of the medium at locations mutually spaced in a direction laterally of the medium, the machine comprising sound recording and reproducing means, means for driving the recording medium along a predetermined path within which information is recorded on or reproduced from the medium by the recording and repro-

ducing means, and control means adapted, when a plurality of electrical signals each representing information are applied to the machine in sequence, to actuate the driving means and the sound recording and reproducing means so that the said tracks are formed in a predetermined order, and further adapted, when an electrical command signal for reproducing the information is applied to the machine, to actuate the driving means and the sound recording and reproducing means so that the recorded information is reproduced from the tracks in the reverse order from the order in which the tracks were formed.

4,006,313

TRANSMITTING AND REPRODUCING SYSTEM HAVING IMPROVED NOISE REDUCTION CHARACTERISTICS FOR QUADRAPHONIC AUDIO INFORMATION SIGNALS

Takeshi Matsudaira, Kamakura, and Shoichi Nakamura, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

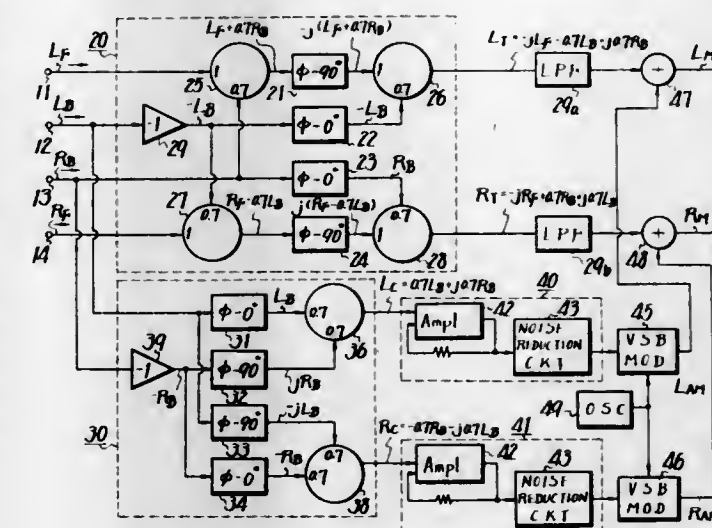
Filed Dec. 19, 1974, Ser. No. 534,299

Claims priority, application Japan, Dec. 20, 1973, 48-143326

Int. Cl.² G11B 3/74

U.S. Cl. 179-15 BT

13 Claims



1. A system in which multiple signals are selectively combined, said system comprising:

A. an encoder to receive at least first, second, and third signals and to combine said three signals in predetermined amplitude and phase relationship to produce an unmodulated signal;

B. a carrier source;

C. a vestigial side band modulator connected to said carrier source and connected to receive at least said second signal as a modulating signal at a predetermined phase and amplitude relative to the phase and amplitude of said second signal applied to said encoder and to modulate the carrier therewith; and

D. a combining circuit connected to said encoder and to said modulator to combine said unmodulated signal and the vestigially modulated signal as a composite signal.

4,006,314

DIGITAL INTERFACE FOR RESYNCHRONIZING DIGITAL SIGNALS

Joseph Henry Condon, Summit, and Robert Bruce Kleburtz, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1976, Ser. No. 653,349

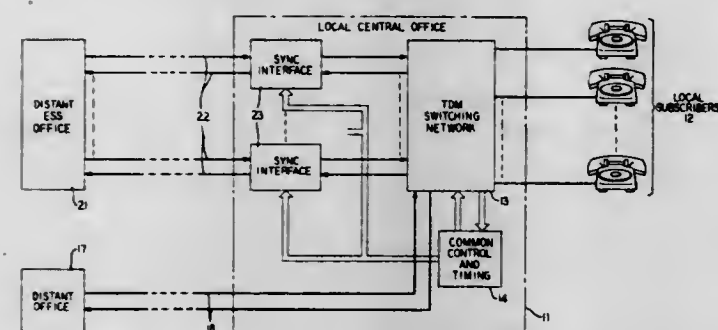
Int. Cl.² H04J 3/06

U.S. Cl. 179-15 BS

14 Claims

1. Apparatus for communicating digital signals comprising code groups between two digital systems wherein a first digital system is synchronized by a first time base and a second digital system is synchronized by a second time base independent of the first time base in frequency and phase, the apparatus comprising:

storing means in circuit relationship with the first digital system, the storing means receiving and retaining code groups derived from the code groups of the first digital system at a first rate synchronized in accordance with the first time base, accessing means for obtaining the contents of the storing means at a second rate synchronized in accordance with the second time base, the accessing means also controlling the occurrence of the code groups for the second digital system, timing means for measuring the relative occurrence of the code groups for the second digital system with respect to the occurrence of the code groups produced by the first digital system, multiplier means in circuit relationship with the storing means having variable gain controlled by the timing means, the multiplier means producing an output indica-



tive of the product of the quantized amplitude indicated by at least one code group from the first digital system and the gain of the multiplier means, adding means for combining the output of the multiplier means with selected contents of the storing means to produce the code groups for the second digital system wherein each code group is derived from at least one code group from the first digital system, and output means for supplying an interpolated signal comprising code groups produced by the adding means, the output means being synchronized to the accessing means so as to supply an interpolated signal compatible with the second digital system whereby the timing means and the multiplier means accommodates differences in frequency and phase between the first and second time bases by preserving substantially the same information content in the interpolated signal as that indicated by the digital signal from the first digital system.

4,006,315

INDUCTIVE-CARRIER COMMUNICATION SYSTEMS
William S. Halstead, Woodland Hills, Calif., assignor to Carrier Communications, Inc., New York, N.Y.

Division of Ser. No. 428,691, Dec. 27, 1973, Pat. No. 3,975,700, which is a continuation of Ser. No. 160,316, July 7, 1971, abandoned, which is a division of Ser. No. 632,699, April 21, 1967, Pat. No. 3,609,247. This application Aug. 7, 1975, Ser. No. 602,561

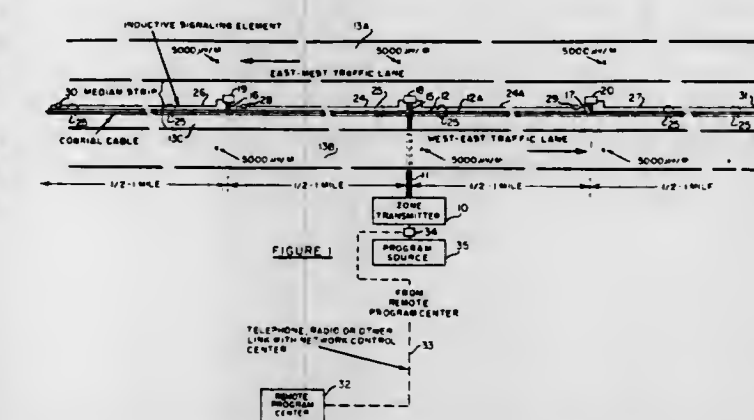
Int. Cl.² H04B 5/00

U.S. Cl. 179-82

27 Claims

1. A transportation route communication system of inductive-signaling type comprising a carrier-wave generator, means for modulating carrier-wave energy from said generator, means coupling the output of said generator to a coaxial cable having a center conductor and extending parallel to a transportation route served by the system, dielectric means about said center conductor, a conducting sheath formed about said dielectric means and held at ground potential, a second dielectric means about said sheath, a first inductive-signaling conductor formed along said second dielectric means extending for the length of a first transmission zone along said route, a first coupling means connecting said center conductor and said first inductive-signaling conductor

whereby a controlled amount of carrier-wave energy may be transferred from said center conductor to said first inductive-signaling conductor, a first terminating means at the end of said first inductive-signaling conductor, said first terminating means connecting the end of said inductive-signaling conductor to said conducting sheath at ground potential, a second inductive-signaling conductor formed along said dielectric means and extending for the length of a second transmission zone along said route spaced from said first transmission zone,



a second coupling means connecting said center conductor of said coaxial cable and said second inductive-signaling conductor whereby a controlled amount of carrier-wave energy may be transferred from said carrier conductor to said second inductive-signaling conductor, and a second terminating means at the end of said second inductive-signaling conductor, said second terminating means connecting the end of said second inductive-signaling conductor to the conducting sheath of said coaxial cable at ground potential.

4,006,316

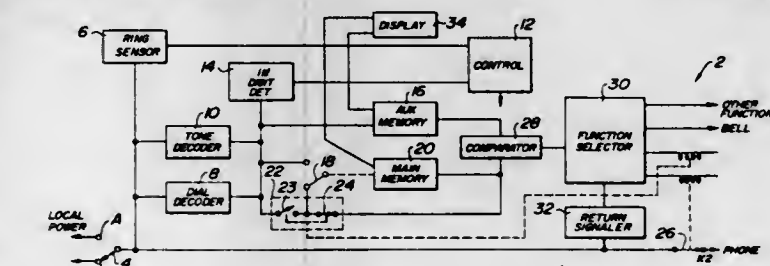
CODE-CONTROLLED DETECTION AND FUNCTION ACTUATING SYSTEM

Duane Ridgely Bolgiano, Bala Cynwyd, Pa., assignor to International Mobile Machines Corporation, Philadelphia, Pa. Continuation-in-part of Ser. No. 496,450, Aug. 12, 1974, Pat. No. 3,936,617. This application Oct. 28, 1975, Ser. No. 626,021

Int. Cl.² H04M 3/38

U.S. Cl. 179-84 R

11 Claims



1. A system for screening incoming signals to separate acceptable signals from unacceptable signals and to apply the acceptable signals to a function-generating means comprising: a signal transmitter, a signal receiver including a signalling means and a function-generating means in alternative normally-closed circuit with said transmitter, and a sensing means for opening the circuit to said signalling means and closing the circuit to said function-generating means upon passage to said sensing means of an initial signal from said transmitter; a detector and decoding means, operative when the circuit between said signal transmitter and said function-generating means is closed, for separating selected transmitted signals from unselected transmitted signals by filtering out the unselected signals, and serially converting the selected signals into data bits representing digits; a memory means comprising a main memory and an auxiliary memory, each adapted to serially pass digit-forming data bits therethrough, said auxiliary memory receiving data bits from said detector and decoding means;

a programming means for directly and selectively programming said main memory with selected digits; a comparator means for comparing the output of said auxiliary memory with the output of said main memory to obtain an acceptable signal when said outputs match; and means for transmitting said acceptable signal to said function-generating means.

4,006,317

ELECTROSTATIC TRANSDUCER AND ACOUSTIC AND ELECTRICAL SIGNAL INTEGRATOR

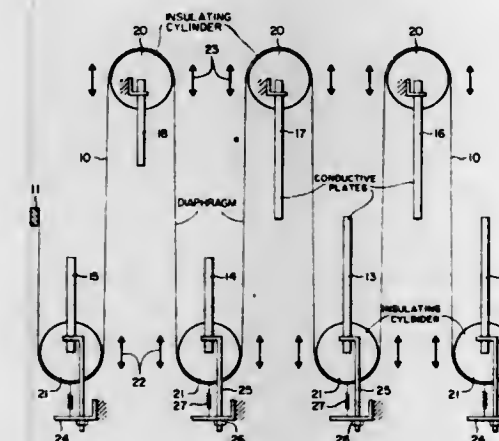
Miller L. Freeman, 4221 Kling St. No. 4, Burbank, Calif. 91505

Filed Feb. 14, 1975, Ser. No. 549,867

Int. Cl.² H04R 19/00

U.S. Cl. 179-111 R

17 Claims



2. An electrostatic transducer of the folded type arranged to be partially driven by electric signals and partially by acoustic waves, said transducer comprising:

- a plurality of electrically conductive plates disposed in substantially parallel spaced planes;
- an electrically conductive, flexible diaphragm forming a continuous loop, each of said plates extending only along a portion of the area of its associated diaphragm portion;
- means for spacing said diaphragm from and disposing it substantially parallel to said plates and for tensioning said diaphragm; and
- means for generating a steady electric field between said plates and said diaphragm and for applying an electric signal between alternate plates, whereby the diaphragm portions which are not coextensive with said plates are capable of being acoustically excited in phase with the diaphragm portions coextensive with said plates.

4,006,318

INERTIAL MICROPHONE SYSTEM

George J. Sebesta, Huntington Bay; Alan Hofer, Wantagh, and Richard W. Carlisle, Elmsford, all of N.Y., assignors to Dyna Magnetic Devices, Inc., Hicksville, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,996

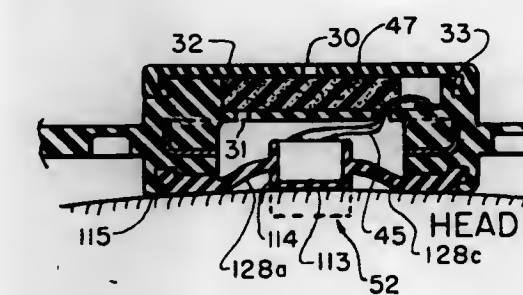
Int. Cl.² H04M 1/05; H04R 1/10

U.S. Cl. 179-121 C

6 Claims

1. A microphone adapted to be worn in contact with the head of a wearer to pick up the speech of the wearer and to severely attenuate ambient sounds, consisting of an inertial reaction transducer, an acoustical enclosure, support means for said transducer, and an acoustical labyrinth, the support means for said transducer including relatively thin compliant suspension means made from rubber-like elastomer material, the support means including a protuberance normally extending outward from the plane of the suspension means but

adapted to be deflected inwardly of the acoustical enclosure when said microphone is applied to the head of a wearer, said



acoustical labyrinth constituting acoustical filter means for excluding at least high frequency ambient sound.

4,006,319

FOREIGN POTENTIAL CHECKER

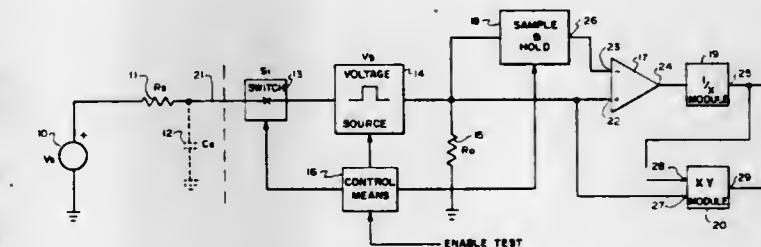
Todd H. Gartner, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 22, 1976, Ser. No. 651,310

Int. Cl.² H04B 3/46

U.S. Cl. 179-175.3 R

16 Claims



1. In a telephone system of the type having telephone lines and a switching network, wherein operating voltage sources are maintained on the lines to support telephone communication and wherein each line and the network combine to form an equivalent voltage source and an equivalent voltage source impedance, a monitoring system for indicating the magnitude of the real part of the equivalent voltage source impedance comprising:

- a voltage source coupled to a selected one of the lines and operable for providing a constant voltage in opposition to the equivalent source voltage;
- voltage sensing means coupled to the side of said voltage source opposite the selected line;
- control means for activating and causing said voltage source to provide said constant voltage for a predetermined period of time sufficient to cause a first steady state voltage to appear at said voltage sensing means and for deactivating said voltage source at the end of said predetermined period of time to cause a second steady state voltage to appear at said voltage sensing means;
- subtracting means coupled to said sensing means for determining the difference between the magnitudes of said first and second steady state voltages; and
- indicating means coupled to said subtracting means for providing an output voltage which is inversely related to said difference determined by said subtracting means and directly related to the real part of said equivalent source impedance for providing a direct indication of the magnitude of the real part of said equivalent source impedance.

4,006,320

FAULT LOCATING SYSTEM AND METHOD FOR TRANSMISSION LINES AND REPEATER STATIONS
Georg Märkl, Nurnberg, Germany, assignor to Tekade Felten & Guillaume Fernmeldeanlagen GmbH, Nurnberg, Germany

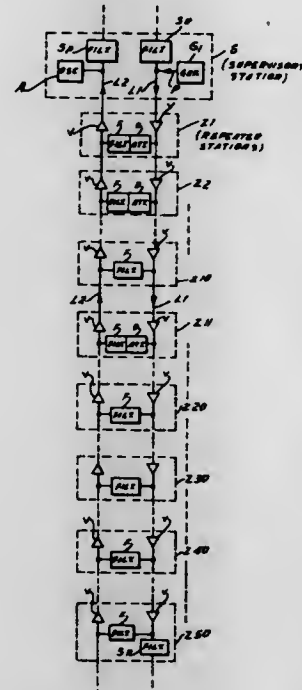
Filed July 25, 1975, Ser. No. 598,996

Claims priority, application Germany, July 27, 1974, 2436373

Int. Cl.² H04B 3/46

U.S. Cl. 179-175.31 R

20 Claims



1. A method of locating a fault in a four-wire two-way communications system comprised of a supervisory station, a four-wire transmission path leading away from the supervisory station, and a plurality of repeater stations spaced along the transmission path, the plurality of repeater stations being comprised of a lesser number of first repeater stations and a greater number of second repeater stations, the first repeater stations being interspersed among the second repeater stations, the method comprising, in combination, the steps of: at each first repeater station connecting between the outgoing and incoming lines a respective one of a plurality of first coupling networks each having the same first transfer function; at each second repeater station connecting between the outgoing and incoming lines a respective one of a plurality of second coupling networks each having the same second transfer function, different from the first transfer function; producing a waveform comprised of first pulses and distinguishable second pulses, the first pulses being interspersed among the second pulses in correspondence to the interspersing of the first repeater stations among the second repeater stations, the producing of the first pulses comprising applying a single test pulse to the outgoing line at the supervisory station and deriving all the first pulses from such single test pulse by permitting the single test pulse to travel from the supervisory station along the outgoing line to the individual first repeater stations, through the associated first coupling networks and back to the supervisory station along the incoming line with the different travel times of the single test pulse from and back to the supervisory station via the different ones of the first repeater stations accounting for the spacing of the first pulses within said waveform, the producing of the second pulses comprising applying a single test pulse to the outgoing line at the supervisory station and deriving all the second pulses from such single test pulse by permitting the single test pulse to travel from the supervisory station along the outgoing line to the individual second repeater stations, through the associated second coupling networks and back to the supervisory station along the incoming line with the different travel times of the single test pulse from and back to the supervisory station via the different

ones of the second repeater stations accounting for the spacing of the second pulses within said waveform, the fewer first pulses serving to facilitate counting of pulses in the waveform, the number of first and second pulses in the waveform being equal to the number of first and second repeater stations when no faults are present, when a fault is present the pulses missing from the waveform indicating which repeater stations are located beyond the fault.

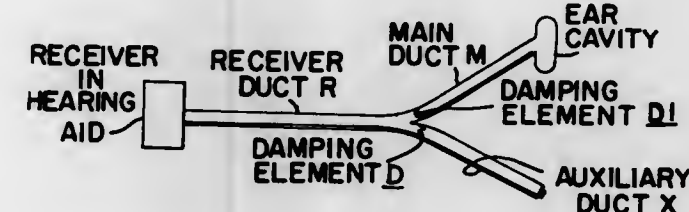
4,006,321

TRANSDUCER COUPLING SYSTEM
Elmer V. Carlson, Prospect Heights, Ill., assignor to Industrial Research Products, Inc., Elk Grove Village, Ill.
Continuation of Ser. No. 444,036, Feb. 20, 1974, abandoned.
This application June 14, 1976, Ser. No. 695,329

Int. Cl.² H04R 1/22, 25/00

U.S. Cl. 179-180

6 Claims



1. An acoustic transmission system for acoustically coupling to an associated transducer and providing a relatively smooth output response therefrom, said system comprising in combination, first duct means having one end acoustically coupling to the transducer and its other end open, said first duct means effecting a first acoustical impedance, second duct means having one end acoustically connected to said first duct means, the other end of said second duct means which is remote from the first duct means being acoustically blocked, acoustic damping means in said second duct means, and said acoustic damping means having the characteristic impedance of said second duct means.

4,006,322

AUXILIARY INTERLOCK SWITCH WITH INTERCHANGEABLE AND REVERSIBLE CHISEL-SHAPED CONTACTS AND SPRING BIASING MECHANISM

Paul M. Gallatin, Brookfield, and Edward A. Halbach, Milwaukee, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 22, 1975, Ser. No. 615,688

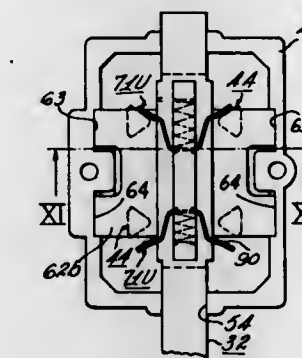
Int. Cl.² H01H 15/00, 1/12, 45/00

U.S. Cl. 200-16 A

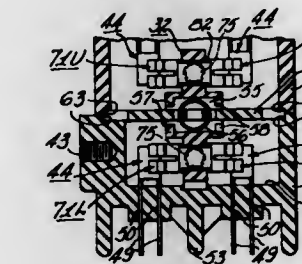
17 Claims

1. An electrical circuit making and breaking interlock switch comprising, in combination, a hollow insulating housing having at least two pair of stationary contact posts projecting inwardly from a wall thereof, an insulating contact carrier mounted for reciprocation through said housing and being accessible from the housing exterior, said contact carrier having a spring-receiving cavity therein and elongated first and second abutment-receiving apertures extending therethrough which register with opposite ends of said spring-receiving cavity, an abutment member adapted to be releasably assembled to said contact carrier and extend freely through one of said abutment-receiving apertures so that said contact carrier is movable relative thereto and having its ends in engagement with opposed walls of said housing to prevent movement thereof as said contact carrier reciprocates, a helical return spring compressed within said spring-receiving cavity and reacting at one end against said abutment member assembled within said one abutment-receiving

aperture to normally resiliently bias said contact carrier against reciprocation in one direction, and a pair of unitary metallic bridging contacts carried by said contact carrier each of which is adapted to engage and



terminal support and mating with the terminal support member to provide a firm union between the contact end and the terminal housing; an elongated threaded fastener within said terminal housing; a pressure plate carried by said elongated threaded fastener and restrained against rotation during turning movement of said elongated threaded fastener; said pressure plate having a wire contact surface opposing the terminal surface of said terminal member and being substantially parallel thereto to form a wire receiving mouth between the wire contact surface and the terminal surface; the wire contact surface being brought into contact with a wire when inserted between the wire contact surface and the terminal surface by rotation of said elongated threaded fastener to provide a direct contact between the wire and said terminal member in said switch cartridge.



bridge between the stationary contact posts of one of said pairs as said contact carrier reciprocates in one direction and to disengage them as said contact carrier reciprocates in the opposite direction.

4,006,323

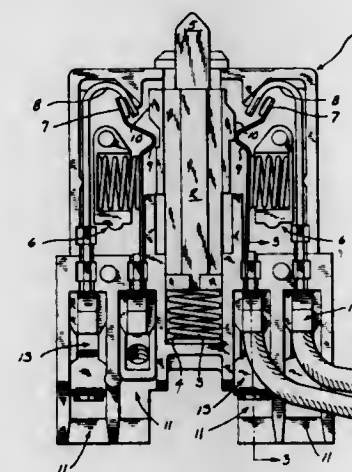
ELECTRICAL TERMINAL STRUCTURE
Terrance D. Nelson, Milwaukee, and Donald W. Kuntzsch, West Allis, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed May 21, 1975, Ser. No. 579,517

Int. Cl.² H01R 7/12

U.S. Cl. 200-284

7 Claims



1. A switch cartridge, the combination comprising: a plunger within the cartridge framework; a switch mounted within the cartridge framework to one side of the plunger and which is actuated by the axial movement thereof; said switch including a pair of contacts, one of which has a contact end, the contact end extending into a receptacle in the cartridge framework; a terminal member attached to the contact end and having a terminal surface within the receptacle; a terminal housing wedgedly retained within the receptacle and having an interior terminal support member which is configured to receive and retain said terminal member; said terminal member having a portion conforming to the

4,006,324
ELECTRICAL DISTRIBUTION PANEL LOCKOUT MEANS FOR SWITCH ACTUATORS

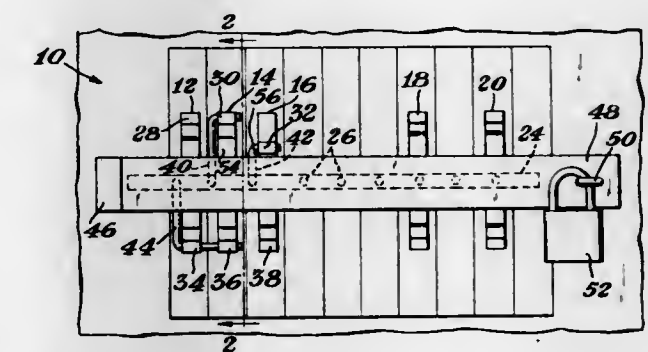
Arthur L. Leasher, Beaverton, and Lawrence F. Sanborn, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1975, Ser. No. 619,120

Int. Cl.² H01H 27/10

U.S. Cl. 200-42 T

8 Claims



1. In an electrical distribution box wherein there are a plurality of spaced apart vertical rows of horizontally disposed circuit breakers each of which has an end including an actuator element extending through the front cover plate of said box, each actuator element having a bore extending vertically therethrough the improvement comprising a bar-like member being secured to said front cover and disposed between a pair of vertical rows of circuit breakers, said bar-like member having an array of bores opening to the outwardly extending face of said bar-like member, a locking element having a rod-like arm part and first and second end parts, said first end part extending into the bore in an actuator element and said second end part extending into a bore in said bar-like member, and end secured bar cover plate means extending closely over said bar-like member.

4,006,325

OFFSET PIVOT GROUND SWITCH

Calvin E. Redfern, Portland, Oreg., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 19, 1975, Ser. No. 633,420

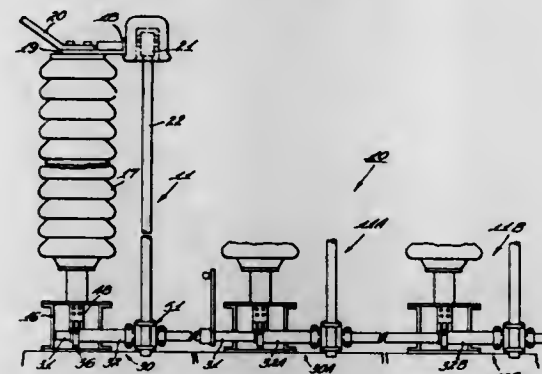
Int. Cl.² H01H 31/00

U.S. Cl. 200-48 A

10 Claims

1. In a disconnect ground switch comprising three individual switch assemblies, one per phase; a frame; an insulator for each phase switch, said insulators being carried by said frame; a fixed contact carried by each insulator; an interphase support shaft extending between said phase

switches, said interphase support shaft being carried by said frame for bodily movement about an axis; a blade switch for each phase switch, said blade switches being movable into and out of engagement with an associate, one of said fixed contacts; means operably connecting each blade switch to said interphase support shaft; and



actuating means operably connected to effect bodily movement of said interphase support shaft bodily about said axis,

whereby bodily movement of said interphase support shaft about said axis in one direction effects the bodily movement of said blade switches into engagement with said associated fixed contacts and the mass moving about the pivot axis serves as a counterbalance.

4,006,326

ABRASION SWITCH DEVICE FOR DETECTING LOW TIRE PRESSURE

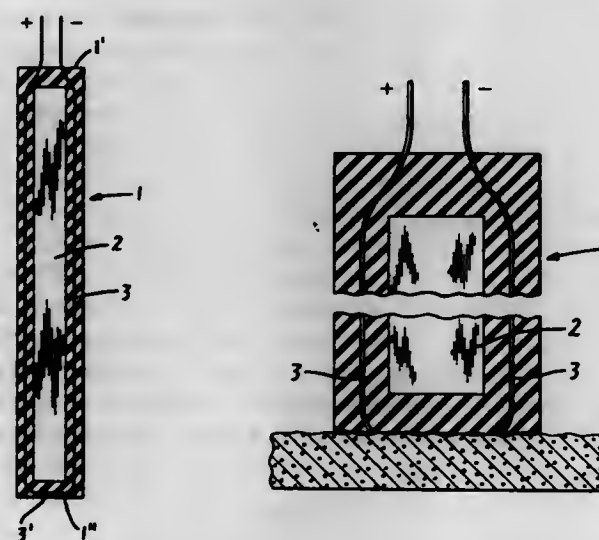
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raisin sociale Michelin & Cie, Clermont-Ferrand, France

Filed Dec. 23, 1974, Ser. No. 535,700

Claims priority, application France, Jan. 2, 1974, 74.00097
Int. Cl.² H01H 35/24, 3/16

U.S. Cl. 200—61.24

4 Claims



1. An alarm device for installation on an automotive vehicle or the like to signal a substantial drop in the inflation pressure of the tires on the wheels of said vehicle, said device comprising an electric circuit which can be in an open or closed condition, which is normally in the open condition, and a change to the closed condition of which can be detected and a flexible rod adapted to be fastened to a fixed, unsuspended part of the vehicle, said rod having a free end adapted to be directed towards the ground, said free end being normally spaced apart from the ground but coming into contact with the ground upon a substantial drop in inflation pressure, said device being characterized in that said electric circuit comprises two blade conductors located at said free end which are

covered with a layer of material of low resistance to wear by abrasion, said two blade conductors being separated from each other by a thin layer of an electrically insulating material which has a low melting point, said two blade conductors making contact with each other upon the wearing away, by contact with the ground, of said layer of material of low resistance to wear by abrasion and melting of said thin layer of electrically insulating material, whereby said circuit is closed.

4,006,327

PNEUMATIC TIRE PRESSURE SENSING SWITCH

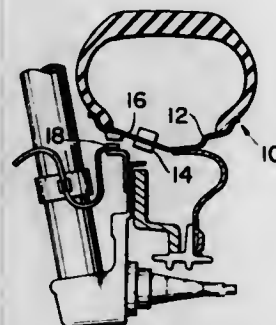
Tadashi Hayashi, Yokosuka, and Isao Nisimura, Nagaokakyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Omron Tateisi Electronics Co., Kyoto, both of Japan

Filed Jan. 29, 1975, Ser. No. 545,061

Int. Cl.² H01H 35/24

U.S. Cl. 200—61.25

18 Claims



1. A pneumatic tire sensor switch comprising:
a casing having a tubular section, said tubular section having one end and an opposite end;
a switch housing having a switch chamber mounted in said casing to close said one end of said tubular section;
a diaphragm extending transversely of said tubular section, said diaphragm defining a first and a second space inside of said tubular section, said first space being disposed between said switch housing and said diaphragm, said first space being adapted to communicate with the inside of a pneumatic tire, said second space being adapted to communicate with the ambient atmosphere;
a switch actuator mounted to said switch housing for movement relative thereto, said switch actuator being connected to said diaphragm to be moved thereby in response to variations in pressure in said first space;
means comprising an adjustable screw closing said opposite end of said tubular section;
a spring arranged within said second space resting on one side upon said adjustable screw and on the opposite side upon said switch actuator and opposing switch actuator movement in response to an increase in pressure on said diaphragm;
a fixed electrical contact disposed in said switch chamber;
a snap action plate having an H-shaped slot formed therein which thereby forms a pair of spaced end legs, a pair of spaced longitudinally contractable springy side legs which connect said end legs, and a pair of aligned central mounting extensible legs which are spaced between said side legs, which extend from central portions of said end legs toward each other, and which are spaced at their adjacent ends;
a movable electrical contact carried by one of the end legs of said snap action plate;
said adjacent ends of said central mounting legs of said snap action plate being operatively connected to said switch actuator so as to be movable thereby on movement of said switch actuator;
stop means mounted in said switch chamber for preventing movement of the other one of said end legs of said snap action plate out of a plane normal to the movement of said switch actuator;
said snap action plate being mounted in said switch cham-

ber and deformable between two principal conditions, one wherein said movable electrical contact is in engagement with said fixed electrical contact and the other wherein said movable contact is out of engagement with said fixed electrical contact; and
said adjustable screw, said spring, said switch actuator and said snap action plate being made of an electrically conductive material and serving as a conducting path for said movable electrical contact.

4,006,328

STEERING COLUMN MOUNTED MULTIPLE SWITCH ASSEMBLY

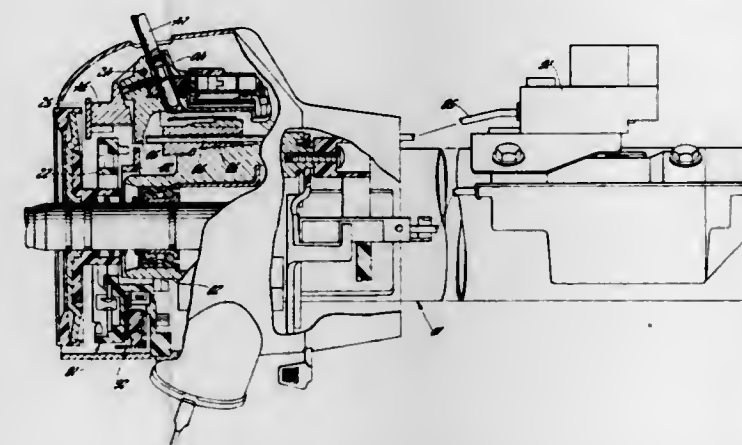
Dan R. Kimberlin, Frankenmuth, and Thomas J. Milton, Bay City, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 569,604

Int. Cl.² H01H 9/00, 3/16

U.S. Cl. 200—61.54

1 Claim



1. A steering column mounted multiple switch assembly having a common actuator means comprising
a support on the steering column,
a direction signal switch means mounted on the support having an operating portion mounted for rocking movement substantially about a first axis and including switch cancelling means on the operating portion, the operating portion comprising a molded generally annular element having an integral upstanding reinforcing rib,
a manually operable actuator means mounted on the support for rocking movement substantially about a second axis parallel to and laterally spaced from the first axis, the actuator means including a manually moveable actuator lever for controlling movement of the actuator means,
a transmission member comprising a rigid link having first and second ends, the link being fixedly secured at the first end to the actuator means for rocking movement therewith about the second axis so that the second end swings through an arc upon such rocking movement, the second end of the link extending to a region of the operating portion of the direction signal switch spaced from the first axis and terminating in a pair of spaced depending tangs loosely straddling the upstanding rib of the operating portion to effect rocking movement of the operating portion substantially about the first axis thereof upon rocking movement of the actuator means about the second axis,
auxiliary switch means carried by the steering column for actuation by movement of the actuator lever about a third axis,
and means mounting the actuator means for movement substantially about the third axis for operation of the auxiliary switch means
whereby selective movement of the actuator means about the second and third axes respectively, selectively actuates the respective switch means.

4,006,329

SWITCH FOR SENSING A SELECTED RATIO BETWEEN TWO DIFFERENT PRESSURES

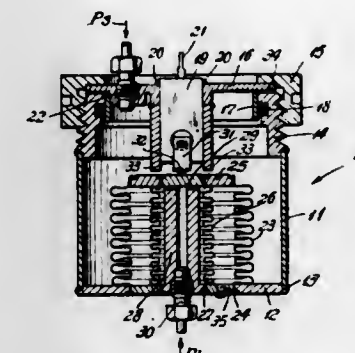
Robert R. Hellman, Bridgeport, and Marion T. Mikita, Milford, both of Conn., assignors to Westport Development & Mfg. Co. Inc., Milford, Conn.

Filed May 14, 1975, Ser. No. 577,537

Int. Cl.² H01H 35/32

U.S. Cl. 200—83 D

2 Claims



1. A differential pressure ratio device for providing an indication of the existence of at least one selected value of the ratio between the values of a small pressure and a large pressure comprising a closed housing having a base, a header having one surface and an opposite surface located within the housing, a first tubular bellows having one end completely secured to the base and its other end completely secured to the one surface of the header, a second bellows having one end completely secured to the base and its other end completely secured to the one surface of the header, said second bellows being smaller than said first bellows whereby they form a closed annular chamber with the base and the one surface of the header, means causing a set low absolute pressure to exist in the annular chamber, means adapted to introduce a large pressure into the interior of the second bellows to act on the one surface of the header enclosed by the second bellows, means adapted to introduce a small pressure into the closed housing to subject the opposite surface of the header thereto, means for providing an indication of at least one position of the header, the effective area of the opposite surface subjected to the small pressure being essentially equal to the selected value of the pressure ratio times the effective area of the one surface subjected to the large pressure within the second bellows, said means for providing an indication including an electrical switch having an actuator portion adapted to engage the opposite surface and terminals extending through the closed housing with the switch being located to be actuated at the position which the opposite surface of the header assumes at the selected value of the ratio and in which there are alterable means for adjusting the location of the switch with respect to the header, said alterable means including means forming the housing in two separable parts, one of said parts having the base to which the bellows carrying the header are secured, the other part having means for supporting the electrical switch and joining means for connecting the two parts to enable relative movement of the switch with respect to the header to enable adjustment of the location of the switch.

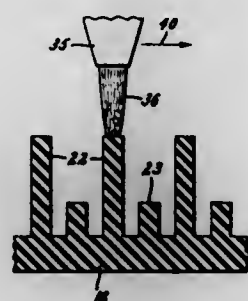
4,006,330

CIRCUIT BREAKER ARC CHUTE HAVING COMPONENTS OF REFRACTORY INORGANIC MATERIAL WITH SURFACES OF AN AMORPHOUS FUSED MATERIAL, A MAJOR PROPORTION OF WHICH IS SILICA, AND METHOD FOR MAKING SAME
 Richard M. Korte, West Chester, Pa., and John E. Zupko, Marlon, N.J., assignors to General Electric Company, Philadelphia, Pa.

Filed Apr. 16, 1975, Ser. No. 568,544
 Int. Cl.² H01H 33/08

U.S. Cl. 200—144 C

10 Claims



1. An arc chute for an electric circuit breaker comprising a portion for confining the arc formed upon circuit-breaker opening.

- said portion being of an electric insulating material comprising the heat and pressure reacted thermoset product of a mixture of chrysotile asbestos fibres, orthophosphoric acid, and silica sand;
- said silica sand being present in said mixture in an amount of between 23.5 and 30.5 percent by weight of the mixture;
- said phosphoric acid being present in said mixture in an amount of about 1/4 part by weight to each part by weight of asbestos fibres; and
- said asbestos fibre in the mixture being characterized by a fibre length sufficiently great as to preclude substantial warping of said arc-chute portion when cooled to room temperature following baking, and
- said insulating material prior to operation of said arc chute having a surface layer formed by subjecting the pre-existing surface of said material to arc-plasma flame treatment that converts the material at said surface to an amorphous fused material, the major proportion of which by weight is silica.

4,006,331

VACUUM INTERRUPTER FOR HIGH VOLTAGE APPLICATIONS

Donald W. Crouch, Newtown Square, Pa., assignor to General Electric Company, Philadelphia, Pa.

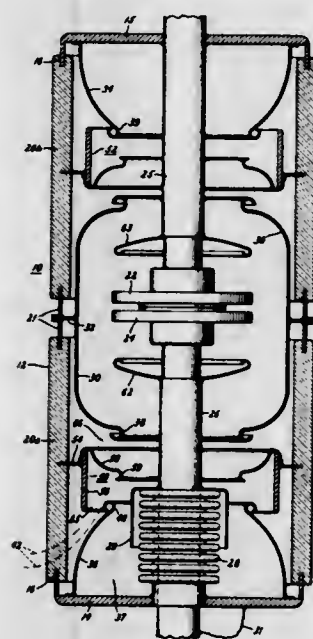
Filed Aug. 27, 1975, Ser. No. 608,368
 Int. Cl.² H01H 33/66

U.S. Cl. 200—144 B

5 Claims

- A vacuum-type circuit interrupter comprising:
 - a highly evacuated envelope comprising a tubular insulating housing and metal end caps at opposite ends of said housing,
 - a first contact generally radially centered in said insulating housing and a first conductive rod supporting said first contact and electrically connected to one of said end caps,
 - a second contact movable along the central longitudinal axis of said insulating housing between a closed position in engagement with said first contact and an open position displaced from said first contact to establish an arcing gap therebetween,
 - a second conductive contact rod supporting said second contact and electrically connected to the other of said end caps,

- a tubular metal central shield within said housing surrounding the arcing gap, normally electrically isolated from both of said contacts, and having first and second ends at its opposite extremities,
- a pair of tubular metal end shields respectively electrically connected to said end caps, a first one of said end shields surrounding said first contact rod and a second one of said end shields surrounding said second contact rod,
- a pair of tubular metal intermediate shields, a first one of which is disposed between said first end shield and said central shield and a second one of which is disposed between said second end shield and said central shield,
- said first intermediate shield normally being electrically isolated from said first end shield and said central shield, and said second intermediate shield normally being electrically isolated from said second end shield and said central shield,



- said first intermediate shield having one end adjacent to said first end of said central shield but spaced axially of said first contact rod from said first end of said central shield, with no axial overlap between said first intermediate shield and said central shield,
- said second intermediate shield having one end adjacent to said second end of said central shield but spaced axially of said second contact rod from said second end of said central shield, with no axial overlap between said second intermediate shield and said central shield,
- said first intermediate shield having a second end adjacent the inner end of said first end shield and surrounding said inner end of the first end shield in radially-spaced, axially-overlapping relation thereto,
- said second intermediate shield having a second end adjacent the inner end of said second end shield and surrounding said inner end of the second end shield in radially-spaced, axially-overlapping relation thereto.

4,006,332

CONVECTION HEATING APPARATUS FOR MULTI-PHASE GAS-TYPE CIRCUIT INTERRUPTERS

Ronald W. Crookston, Trafford, Pa.; Thomas E. Alverson, Brookfield, Ohio, and Otto H. Soles, North Huntingdon, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 11, 1974, Ser. No. 522,960
 Int. Cl.² H01H 33/54, 33/70

U.S. Cl. 200—148 E

7 Claims

- A multi-phase compressed-gas circuit-breaker installation comprising, in combination, a longitudinally extending high-pressure reservoir-tank having one or more baffles dis-

4,006,334

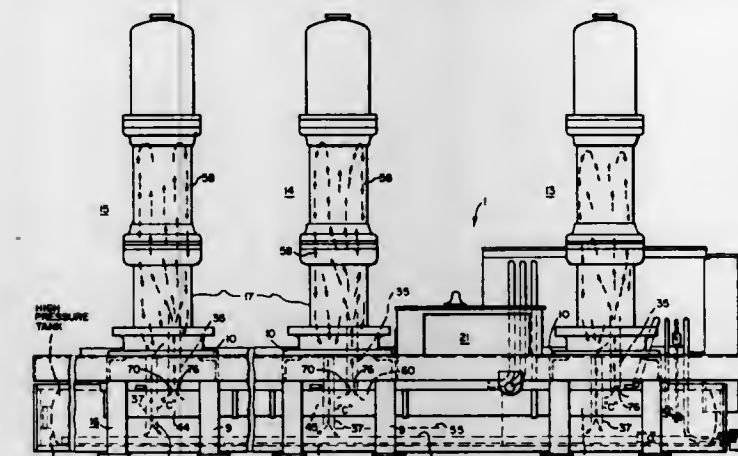
SAFETY SWITCH FOR POWER TOOL

William Frederick Robotham, St. Charles, and Larry D. Annis, Elgin, both of Ill., assignors to McGraw-Edison Company, Elgin, Ill.

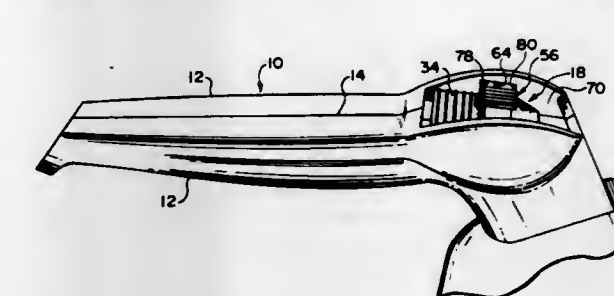
Filed Mar. 17, 1975, Ser. No. 558,634
 Int. Cl.² H01H 3/20

U.S. Cl. 200—157

4 Claims



posed transversely therein to define at least a pair of adjoining heating compartments, means for heating the gas disposed within said longitudinally extending high-pressure reservoir-tank, at least a pair of compressed-gas circuit-breaker modules extending upwardly from said high-pressure reservoir-tank, high-temperature and low-temperature pipes extending from said reservoir-tank upwardly into each respective circuit-



1. A safety switch device for use in a portable electric tool housing defining a hollow enclosure with an opening thereto, the combination comprising a slide element received in the housing enclosure and being exposed through the housing opening, a latch carried by the slide element for exposure outside the enclosure and for manual manipulation and means supporting the latch for movement relative to the slide element along a first direction between two operative positions, means to guide the slide element for movement relative to the housing in a second direction generally at right angles to the first mentioned direction between a retracted position and an intermediate position and then to guide the slide element for movement relative to the housing in a third direction generally normal to both the first and second mentioned directions to a depressed position, and on/off electrical switch and means in the housing for holding the switch within the enclosure, said switch having an actuator which in one position is indicative of a power off condition and in a second position is indicative of a power on condition and wherein the actuator is movable between the two positions, the slide element having a shoulder that is closely disposed to and overlaps the switch actuator when the slide element is in the intermediate position thereof and that engages and moves the switch actuator from the off position to the on position upon movement of the slide element to the depressed position, a spring normally biasing the slide element to the retracted position, a spring normally biasing the latch to one of said operative positions and said housing having a recess suited for receiving said latch in the one operative position when said slide element is in the retracted position, and the housing having a shoulder against which the latch in the one operative position abuts when the slide element is in the retracted position operable to preclude slide element movement therefrom without first manually shifting the latch from the one operative position to its other operative position.

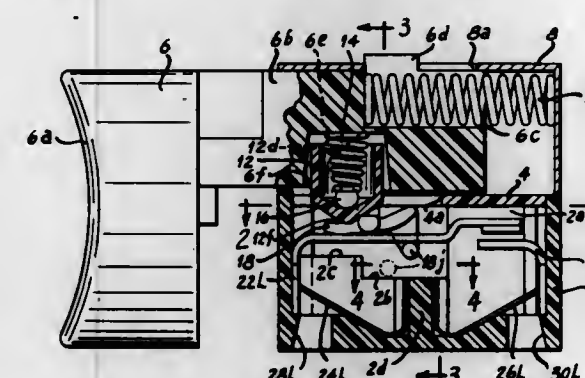
4,006,333

HIGHER RATED DOUBLE-POLE TRIGGER SWITCH
 Harold W. Hufts, New Berlin, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 11, 1975, Ser. No. 586,059
 Int. Cl.² H01H 9/06

U.S. Cl. 200—157

12 Claims



- An electric switch comprising: an insulating housing; stationary contact means mounted in said housing; flexible contact means mounted in said housing for engaging said stationary contact means; a resiliently biased switch operator mounted for movement in said housing; a resiliently biased plunger rockable with respect to and arranged for movement by said switch operator; and rockable contact actuator means having camming surfaces arranged for engagement by said plunger and rocking surfaces arranged for engaging said flexible contact means.

4,006,335

PUSH-BUTTON SWITCH

Carlton E. Sanford, East Providence, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

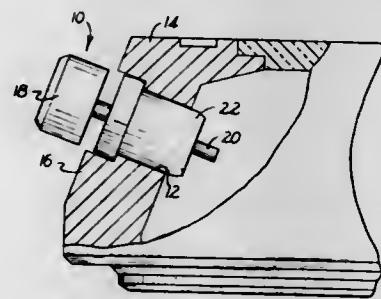
Filed Mar. 3, 1975, Ser. No. 554,386
 Int. Cl.² H01H 3/12

U.S. Cl. 200—159 B

6 Claims

- A push-button electrical switch comprising an electrically conductive body having an open-ended chamber formed at one end of the body and having a passage communicating with the chamber from the opposite end of the body, a fixed electrically conductive contact, electrically insulating spacer means secured in sealing relation to the body and to the fixed contact at the open end of the body chamber supporting the fixed contact extending from the body chamber through the open chamber end in electrically insulated relation to the body, spring contact means on said spacer means within the body

chamber having the perimeter of the spring contact means in electrical engagement with the body and having a central portion of the spring contact means normally disposed in selected spaced relation to the fixed contact, an elastomer diaphragm secured between the spring contact means and the body passage sealing the body chamber opposite from the



open end of the chamber, and an operating member slidable in the body passage and extending from the opposite end of the body to be manually moved for selectively pressing the diaphragm to move the central portion of the spring contact means into electrical engagement with the fixed contact to close an electrical circuit between the fixed contact and the electrically conductive body.

4,006,336

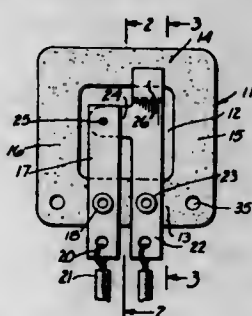
NORMALLY CLOSED WAFER THIN SWITCH

Robert E. Boyden, Bethel Island, Calif., assignor to Fred N. Schwend, Arcadia, Calif., a part interest
Filed June 2, 1975, Ser. No. 582,751

Int. Cl.² H01H 1/24

U.S. Cl. 200-246

5 Claims



1. A normally closed switch comprising a thin flat base plate of insulating material, said base plate having an opening therethrough and a peripheral portion surrounding said opening, a first elongate leaf spring contact, means securing said contact to the upper surface of said peripheral portion, a free end of said contact being aligned with said opening, a second elongate leaf spring contact, means securing said second contact to the upper surface of said peripheral portion, a free end of said second contact having a contact portion aligned with said opening and extending under said first contact and normally in engagement therewith, said free end of said second contact extending above the level of said upper surface of said base plate whereby to depress said contact portion into said opening to break said engagement when said free end of said second contact is depressed.

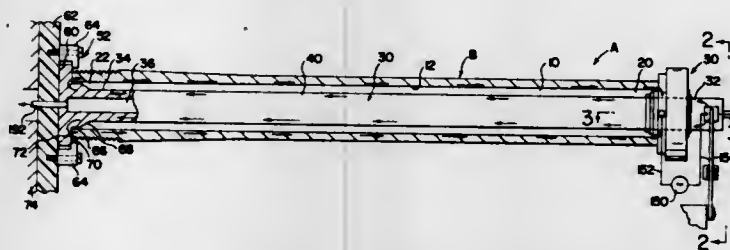
4,006,337
APPARATUS AND METHOD FOR HEATING A GUN
BARREL BORE

John H. Maxim, North Olmsted, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio
Filed Feb. 9, 1976, Ser. No. 656,354

Int. Cl.² H05B 5/08

U.S. Cl. 219-8.5

13 Claims



1. An apparatus for heating the elongated, generally cylindrical surface of the internal elongated bore of a gun barrel by combined induction and resistance heating preparatory to quench hardening of said cylindrical surface, said surface having a given diameter and a given length between first and second axially spaced ends, said apparatus comprising: an elongated, generally cylindrical inductor having first and second ends and an outer surface with a selected diameter only slightly smaller than said given diameter and a selected axial length at least as great as said given axial length; a first electrical connector means for electrically connecting said first end of said inductor with the first end of said cylindrical surface of said gun barrel; a second electrical connector means for electrically connecting said second end of said inductor with the second end of said cylindrical surface of said gun barrel; means for centering said outer surface of said inductor within said cylindrical surface of said gun barrel; and one of said electrical connecting means including an electrical circuit includes means for creating a high frequency alternating current flow in a path including said inductor and said gun barrel in electrical series whereby combined induction and resistance heating of said gun barrel is concentrated adjacent said cylindrical surface of said bore.

4,006,338

MICROWAVE HEATING APPARATUS WITH IMPROVED MULTIPLE COUPLERS AND SOLID STATE POWER SOURCE

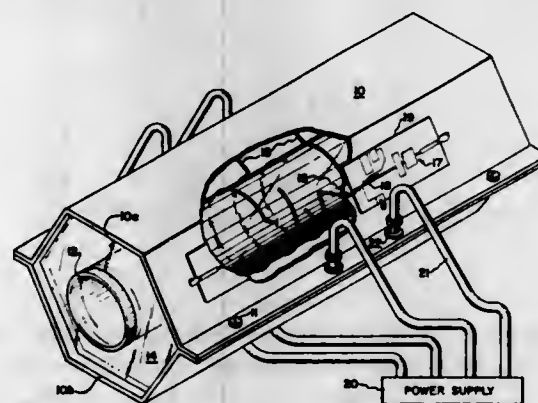
Rudolph A. Dehn, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,511

Int. Cl.² H05B 9/06

U.S. Cl. 219-10.55 F

17 Claims



1. A microwave heating apparatus comprising an electrically conductive tubular housing having transverse physical dimensions such that the tubular housing is cut off at a selected microwave frequency and does not propagate electromagnetic energy, a dielectric support member mounted centrally within said tubular housing and defining a body receiving space for a material body to be heated,

a plurality of electrically conductive, wire-like resonant energy couplers supported within said tubular housing each at least partially adjacent said dielectric support member, said couplers being spaced longitudinally and adjacent couplers being angularly staggered relative to one another in a predetermined arrangement whereby the electric fields from adjacent couplers are at least orthogonal and energy coupled to different regions of the material body is substantially absorbed thereby to provide isolation between the couplers, a plurality of independent solid state microwave oscillators for generating electromagnetic energy at approximately the selected frequency, and means for connecting each coupler to a different one of said microwave oscillators.

4,006,339

MICROWAVE HEATING APPARATUS WITH MULTIPLE COUPLING ELEMENTS AND MICROWAVE POWER SOURCES

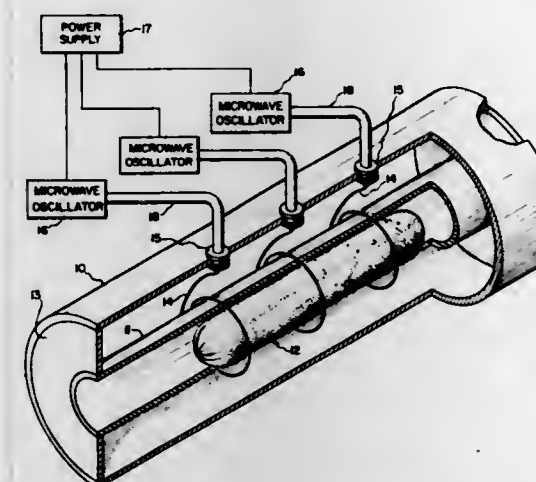
John W. Maurer, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,795

Int. Cl.² H05B 9/06

U.S. Cl. 219-10.55 F

14 Claims



1. A microwave heating apparatus comprising an electrically conductive enclosure tube having transverse physical dimensions such that the enclosure tube is cut off at a selected microwave frequency and does not propagate energy, a plurality of electrically conductive energy coupling elements mounted within said enclosure tube each with at least a portion thereof in close proximity to a body receiving space for a material body to be heated, a plurality of independent power sources for generating microwave energy at approximately the selected frequency, and means for connecting each coupling element to a different one of said power sources, said coupling elements being spaced from one another so that energy coupled to different regions of the material body being heated is substantially absorbed thereby to provide isolation between the coupling elements.

4,006,340

DEVICE FOR THE RAPID DEPOSITING OF OXIDES IN THIN LAYERS WHICH ADHERE WELL TO PLASTIC SUPPORTS

Guy Gorinas, Annecy, France, assignor to Compagnie Industrielle des Telecommunications Ctt-Alcatel, Paris, France

Filed Sept. 20, 1974, Ser. No. 507,845

Claims priority, application France, Sept. 28, 1973, 73.34821

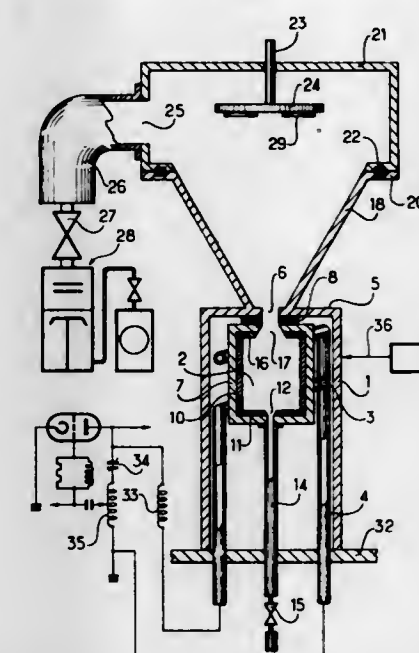
Int. Cl.² B23K 5/00

U.S. Cl. 219-121 P

2 Claims

1. In a device for the rapid depositing of thin even and adhesive layers of oxides on plastic substrates, said device comprising:

an enclosure, a pumping unit for providing a high vacuum to said enclosure, a source cavity cylinder internally lined with a layer of oxide to be deposited, a gas injection tube passing through the bottom of said cylinder, and means for subjecting said tube to gas under pressure, said cylinder having an axial circular opening therein facing the substrate, a hollow conductor tube in juxtaposition with said cylinder forming an excitation winding for said cylinder, means operably connected to said conductor tube for internally cooling said conductor tube; oscillating circuit means electrically connected to said conductor tube, and means to adjust said oscillating circuit means to thereby create a plasma arc; a plastic substrate; substrate support means disposed along the longitudinal axis of said axial circular opening in said cylinder, with said substrate support means supporting said substrate within said enclosure and facing said circular opening; the improvement wherein: said enclosure comprises a first cylindrical part closely



surrounding the source cavity cylinder and being concentric thereto, a truncated cone shaped element having the same axis of symmetry as the circular opening of the source cavity cylinder with the axial cross section defining an opening of 60° fixed to said cylindrical part and extending axially from said first part at said opening towards said substrate, a large diameter cylindrical element connected to the truncated cone shaped element remote from said opening, the diameter of said large diameter cylindrical element being equal to that of said truncated cone shaped element at its base and being connected thereto, means for stabilizing said arc; and wherein the substrate support means fixes said substrate at a distance from the axial circular opening of the source cavity which is greater than four times the diameter of said source cavity and the diameter of the axial circular opening of the source cavity, the diameter of the cavity cylinder, said pumping unit applies vacuum pressure to the enclosure, and said means for subjecting said gas injection tube to gas under pressure applies positive gas pressure to the source cavity, such that the pressure differential between the source cavity and the enclosure under vacuum pressure is on the order of 10 to facilitate deposition of oxide on said substrate at a very high speed without compromising uniformity of oxide deposition.

4,006,341

CARD COMPARING APPARATUS

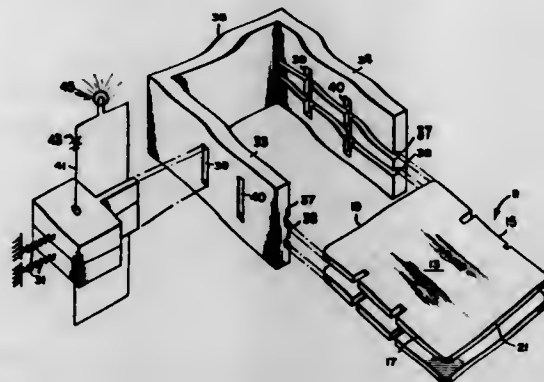
Alan M. Rubin, Aldan, Pa., assignor to John P. Glass, Essington, Pa.

Filed Aug. 27, 1971, Ser. No. 175,617

Int. Cl.² G06K 7/04, 19/04; B07C 3/10; G09F 3/02

U.S. Cl. 235-61.7 R

4 Claims



1. Card comparing apparatus comprising means for receiving a first and a second card in parallel spaced relationship, each of said cards having a predetermined number of notches along at least one of its edges, said notches being varied as to depth, and means for determining whether corresponding notches in the cards are of a predetermined depth relationship, said determining means including a pair of vertically disposed probes in sliding contact with each other, said probes being electrically insulating except for an electrical conductor positioned on each probe so that said conductors make electrical contact when the probes are in alignment, a series of slots in spaced-apart sidewalls, side probes being positioned in said slots, means for urging the probes inwardly to enter the notches in said cards, and signal means actuated by said electrical conductors when all corresponding probes are in alignment to complete an electrical circuit, said electrical conductors extending vertically through each probe.

4,006,342

CONTROL APPARATUS FOR DETERMINING USAGE TIME

Alexander Baumann, Velbert; Ulrich Juesten, Helligenhause, and Dieter Hannemann, Bochum, all of Germany, assignors to Schulte-Schlagbaum Aktiengesellschaft, Tonisheide, Germany

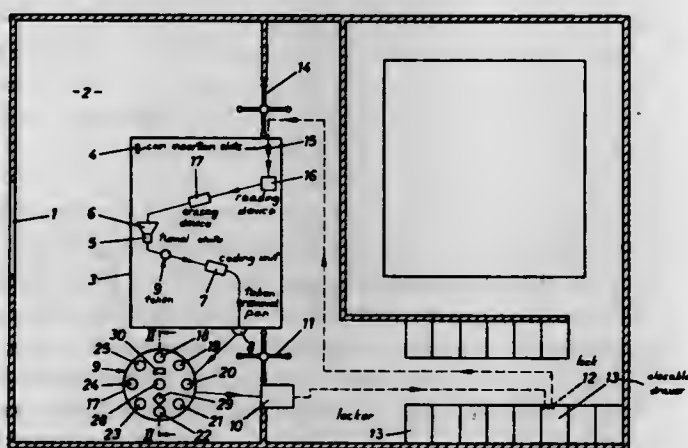
Filed Sept. 17, 1974, Ser. No. 506,893

Claims priority, application Germany, Sept. 17, 1973, 2346728; May 24, 1974, 2425143

Int. Cl.² G06K 7/08, 19/06; G07F 1/06

U.S. Cl. 235-61.11 D

7 Claims



1. A control apparatus comprising an information carrier and coding and read-out means for said information carrier, said means comprising a magnetic head, said information carrier being a token having two broad sides and in contactless

juxtaposition with said magnetic head rotating about an axis transverse to said broad sides, said apparatus being additionally formed with an insertion slot for causing said token to fall along a predetermined trajectory and further comprising:

a support for said token normally in the path of said trajectory and steerable out of said path, said token being formed with a central opening;

a rotatable token abutment disposed beyond said slot; and

a plunger having a cone-shaped end slidable towards said token abutment, said opening being penetrable by said cone-shaped end.

4,006,343

CODE READ-OUT MEANS

Yoshiteru Izura; Masaaki Tanaka, both of Toyonaka, and Seishi Sasaki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

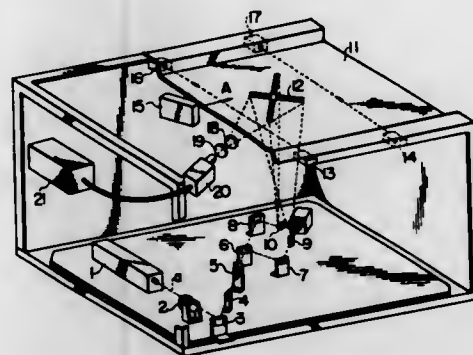
Filed Oct. 21, 1974, Ser. No. 516,679

Claims priority, application Japan, Oct. 23, 1973, 48-119588; Oct. 23, 1973, 48-119589; Feb. 26, 1974, 49-23193; Feb. 26, 1974, 49-23194; Mar. 4, 1974, 49-25420; Mar. 4, 1974, 49-25425; Mar. 4, 1974, 49-25433; Mar. 4, 1974, 49-25437

Int. Cl.² G06K 7/14; G01J 1/20; G06K 9/13

U.S. Cl. 235-61.11 E

6 Claims



1. Code read-out apparatus for reading out a code on a medium attached to an object comprising:

a laser beam source,

a plurality of reflecting mirrors each being separately rotatably mounted,

a power source for rotating said mirrors,

a plurality of sequentially interlocked gears interposed between said power source and said mirrors, the beam from said laser beam source impinging on said reflecting mirrors to generate a plurality of scanning laser beams,

a stage, said object being mounted on said stage and movable with respect thereto, said stage being slanted with respect to the horizontal so that the end thereof toward which said object moves is lower than the end at which said object enters said stage, said stage having a plurality of crossed slits therein through which said scanning laser beams may impinge upon said medium,

read-out means for receiving light reflected from said medium as a result of the scanning of said medium by said scanning laser beams,

detection means for detecting when said object is at a position on said stage where it may be illuminated by said scanning laser beams, and

interrupting means controlled by the output of said detection means, said interrupting means cutting off said laser beams when said object is not located at a position on said stage where it may be illuminated by said scanning laser beams.

4,006,344

MECHANICAL BINARY NUMBER ADDING AND SUBTRACTING APPARATUS

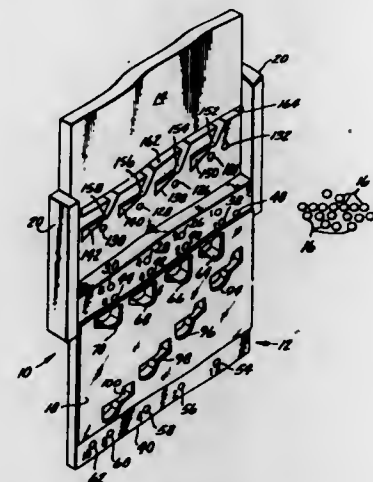
George F. Schutte, 2823 Blakeman Ave., Rowland Heights, Calif. 91745

Filed Feb. 17, 1976, Ser. No. 658,244

Int. Cl.² G06C 27/00

U.S. Cl. 235-68

21 Claims



1. A mechanical binary apparatus for operating on binary numbers, which comprises:

a. a number of similarly sized balls for representing binary "ones",

b. a first plate, said first plate including means for defining a first row of apertures through the first plate and enabling entry of a selected first binary number by inserting ones of said balls only in those first row apertures which are to correspond to binary "ones" of said first selected number and for defining a second row of apertures through the first plate, spaced from the first row of apertures, and enabling entry of a selected second binary number by inserting ones of said balls only in those second row apertures which are to correspond to binary "ones" of said second selected number and also for defining a third row of apertures through the first plate and spaced from the first and second rows of apertures for receiving balls from said first and second rows of apertures to indicate the binary sum of the two selected numbers,

c. a second plate cooperating with the first plate, and

d. means associated with the first and second plate for conducting at least some of the balls inserted into the first and second rows of apertures from said first and second rows to the third row of apertures in a manner causing the arrangement of conducted balls received by said third row to indicate those binary "ones" which represent the "ones" portion of the binary sum of said first and second selected binary numbers, said binary sum being thereby indicated by said third row,

said conducting means being responsive only to generally vertical movement of the first plate relative to the second plate after said plates are brought into sliding engagement in a predetermined manner.

4,006,345

SCHEDULING TOOL

R. W. Bengtson, Succasunna, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Mar. 27, 1975, Ser. No. 562,606

Int. Cl.² G06C 27/00; G09B 19/18

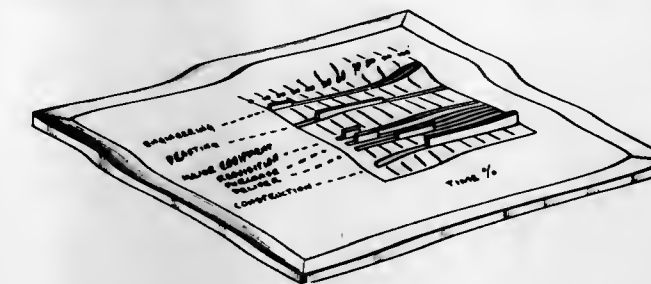
U.S. Cl. 235-69

1 Claim

1. A scheduling tool for establishing the estimated duration and the performance of a contract which includes several phases comprising:

a flat plate having a rectangular area;

a plurality of parallel bars extending upward from said plate each of said bars representing a particular phase of said contract, and extending over a length which is the portion of the length of said rectangular area corresponding to the percentage of the total time of performance of the contract which is necessary to complete the phase represented by the bar;



a plurality of overlay cards each having a plurality of slots which will permit said cards to be laid over said plate with said bars extending upward through said slots, said cards being calibrated so that each represents a contract of a different duration and the ends of said bars will show the beginning and ending time of each of said phases.

4,006,346

CONTROL METHOD INCLUDING FEEDFORWARD SIGNAL

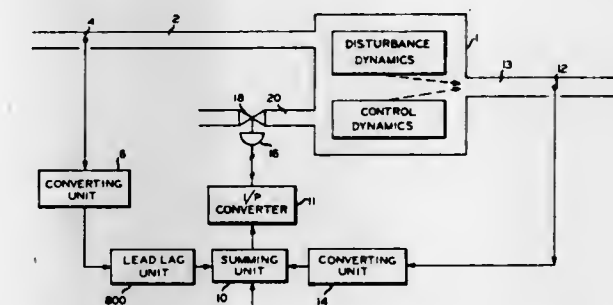
Troy J. Pemberton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 13, 1975, Ser. No. 631,580

Int. Cl.² G05D 07/06

U.S. Cl. 235-150.1

5 Claims



1. A method to control a process wherein at least one parameter of the process is influenced by a disturbance variable and by a manipulated variable which control method comprises:

a. automatically measuring said disturbance variable,

b. automatically generating a disturbance signal d_s as a function of time corresponding to said disturbance variable as measured,

c. converting said disturbance signal d_s in a computer into a feedforward signal c_s which is related to the disturbance signal d_s by the control equation

$$c_s = \frac{K_1}{K_2} \cdot \frac{T_2 \cdot L + 1}{T_1 \cdot L + 1} \cdot e^{-(D_d - D_c) \cdot L} \cdot d_s$$

wherein K_1 is the steady state gain of the process parameter caused by the unit change of the disturbance variable, K_2 is the steady state gain of process parameter caused by the unit change of the control variable, D_d is the dead time of the disturbance dynamics, D_c is the dead time of the control dynamics, L is the laplace transform operator, T_1 and T_2 are defined by the following relation with T_c and T_d :

$$\text{if } T_d > T_c,$$

$$T_2 = 0.47 T_c.$$

1)

-continued

$$T_1 = 0.47 T_d \left(\frac{T_c}{T_d} \right)^4$$

if $T_c > T_d$,

$$T_2 = \frac{1.1 (T_c - T_d)}{\left(\frac{T_c}{T_d} \right)^4 - 1}$$

$$T_1 = \frac{1.1 \left(\frac{T_c}{T_d} \right)^4 (T_c - T_d)}{\left(\frac{T_c}{T_d} \right)^4 - 1}$$

if $T_c = T_d$,

$$T_1 = T_2 = T_c = T_d$$

wherein T_c is the time constant of the control dynamics and T_d is the time constant of the disturbance dynamics, with the further provision that either $T_c = t_d$ or $D_d = d_c$; d. automatically converting said feedforward signal c_s into a corresponding control signal, and e. utilizing said control signal to adjust said manipulated variable.

4,006,347

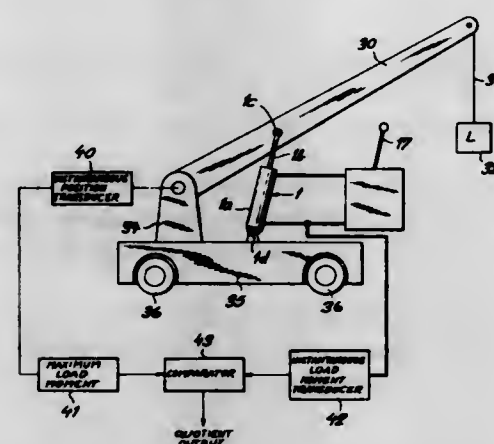
SYSTEM FOR A CRANE BOOM

Walter Hohmann, Essen-Werden, Germany, assignor to Kruger & Co. KG, Essen-Werden, Germany
Filed Jan. 23, 1976, Ser. No. 651,788
Claims priority, application Germany, Feb. 4, 1975, 2504455

Int. Cl.³ B66C 23/90; G06G 7/70

U.S. Cl. 235-150.2

10 Claims



1. In a drive for a crane having a boom, a manually actuable unit controlling the displacement of said boom, a drive unit controlled by said manually actuable unit for displacing said boom, and a monitoring unit for measuring the load moment on said boom, the improvement which comprises a logic element in said drive unit for controlling the speed of said boom, said monitoring unit comprising means for generating an output signal representing the quotient of the instantaneous load moment of said boom and the maximum permissible load moment for the instantaneous position thereof, and means for applying said output signal to said logic element for controlling the speed of said boom upon operation of said manually actuable unit to reduce said speed upon increase in the amplitude of said quotient.

4,006,348

APPARATUS FOR MONITORING TWO ELECTRIC QUANTITIES BY COMBINING THREE CONSECUTIVE SAMPLES OF EACH QUANTITY

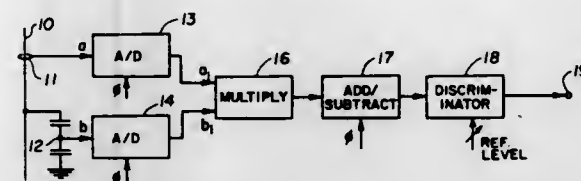
Tomoyoshi Ochiai, Takeshi Hayashi, and Mitsuhiro Furuse, all of Tokyo, Japan, assignors to Tokyo Denryoku Kabushiki Kaisha and Kabushiki Kaisha Meidensha, both of Tokyo, Japan

Filed Sept. 23, 1974, Ser. No. 508,629

Claims priority, application Japan, Oct. 1, 1973, 48-110856; Oct. 1, 1973, 48-110857
Int. Cl.³ G06F 15/20; G01R 13/02

U.S. Cl. 235-151.31

13 Claims



1. Apparatus for monitoring a variable derived from a first substantially sinusoidal electric quantity having a first period and a second substantially sinusoidal electric quantity having a second period nominally substantially equal to said first period, said variable being independent of time, comprising: a source of sampling pulses of a predetermined sampling period; two samplers responsive to said sampling pulses and respectively responsive to said first and second electric quantities for respectively deriving first and second discrete signals from said first and second electric quantities at individual sampling points defined by said sampling pulses, said first and second discrete signals being representative of samples of said first and second electric quantities, respectively; a multiplier unit coupled to said samplers for retaining a constant predetermined by said first and sampling periods and for calculating a first product of the samples represented by each pair of said discrete signals to produce a first product signal representative of said first product and a second product of said first product and said constant to produce a second product signal representative of said second product, one and the other of said pair being derived from said first and second electric signals, respectively; an add-subtract unit coupled to the output of said multiplier unit for holding the first and second product signals and for carrying out in response to said sampling pulses an algebraic addition of the first and second product signals produced by said multiplier unit in response to the discrete signals derived at three consecutive ones of said sampling points to produce a first result signal representative of said variable, said variable being further independent of phase relations between said sampling pulses and respective ones of said electric quantities; and a discriminator circuit coupled to said add-subtract unit and responsive to said first result signal for producing a second result signal when said variable exceeds a given reference value.

4,006,349

MONITORING APPARATUS FOR A PNEUMATIC CONVEYOR SYSTEM

Mark William Royston, La Mirada, Calif., assignor to Pacific Pneumatics, Inc., Santa Fe Springs, Calif.

Filed Oct. 23, 1975, Ser. No. 625,266

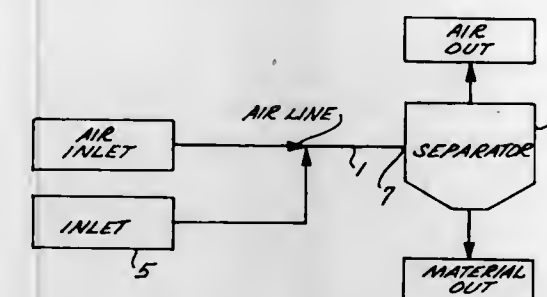
Int. Cl.³ G01N 15/06; G06F 15/20

U.S. Cl. 235-151.34

5 Claims

1. A system for measuring the flow of solids in a pneumatic conveying system having a conduit with an air inlet, a solids inlet, and a mixture outlet, the measuring system comprising:

transducer means coupled to the conduit for responding to a pneumatic pressure developed therein to produce a pressure-representing signal; means for sequentially sampling the pressure-representing signal to provide at different times a reference-value-representing signal and an operating-value-representing signal, the sampling means providing the reference-value-representing signal when only air flows through the conduit, and providing the operating-value-representing signal at a time when both air and solids flow through the conduit;



storage means for holding the reference-value-representing signal, the storage means providing the reference-value-representing signal it holds at the same time that the sampling means provides the operating-value-representing signal; and signal responsive means for determining the mass flow of solids on the basis of a linear function defined by first and second terms, the first term being proportional to the difference between the operating value and the reference value, and the second term being the reciprocal of the reference value.

4,006,350

METHOD FOR PERFORMING A SEPARATING ANALYSIS

Jan Jokl, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

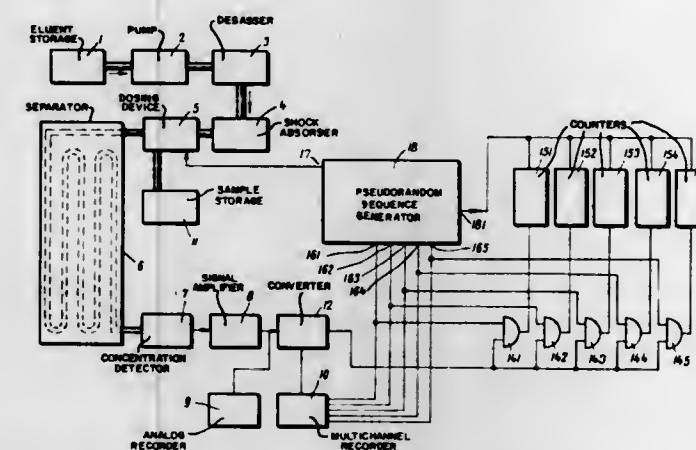
Filed Apr. 3, 1975, Ser. No. 564,675

Claims priority, application Czechoslovakia, Apr. 4, 1974, 2422/74

Int. Cl.³ B01D 15/08

U.S. Cl. 235-151.35

11 Claims



8. Apparatus for performing a separation analysis, comprising a separating column, a dosing device for dosing the sample to be analyzed connected to its inlet, a generator of pseudorandom sequences of orders for the dosing device, a detector connected to the output of the separating column, an amplifier, an analog-digital converter, a number of gates and counters, the control inlet of the dosing device connected with the first output of the generator of pseudorandom sequences of order, the output of the detector connected to the input of the amplifier, the output of which is connected with the input of

the analog-digital converter, the output of which is connected with inputs of electronic gates, the control inputs of which are connected with second outputs of the generator of pseudorandom sequences of orders, the outputs of the gates connected with inputs of counters.

4,006,351

RECURSIVE FILTER IMPLEMENTED AS A MATCHED CLUTTER FILTER

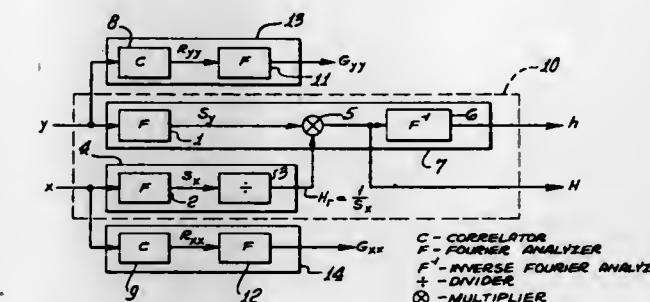
James Nickolas Constant, 1603 Danbury Drive, Claremont, Calif. 91711

Filed Nov. 11, 1974, Ser. No. 522,718

Int. Cl.³ G06F 15/34

U.S. Cl. 235-152

21 Claims



1. In a recursive (zeros and poles) filter implemented as a matched clutter filter having input signals y and x , the improvements comprising: first means having input signal x and providing at its output a signal representing the transfer function H_r of said recursive filter; and second means having input the signal y and signal H_r from said first means and providing at its output at least one of the convolution signal $y_0 = y * H_r$ and its frequency spectrum S_y .

4,006,352

EQUALIZER COMPRISING FIRST AND SECOND EQUALIZING MEANS AND TRAINABLE IN TWO STEPS

Yoichi Sato, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

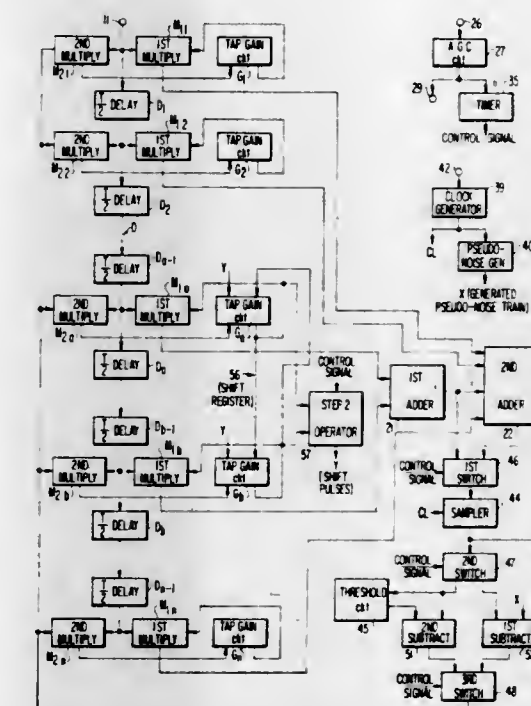
Filed Oct. 17, 1975, Ser. No. 623,221

Claims priority, application Japan, Oct. 18, 1974, 49-119402

Int. Cl.³ H03K 5/153; G06G 7/625

U.S. Cl. 235-152

15 Claims



1. An equalizer, supplied with signals produced in a trans-

mitter at a predetermined clock interval, for producing an equalized signal, said supplied signals including a first and a second pseudo-noise train successively produced in said transmitter, said first pseudo-noise train consisting of a series of partial trains, each of said partial trains having a first period and a predetermined pattern of pulses, said second pseudo-noise train having a second period longer than said first period, which comprises:

- a delay line having a plurality of taps for delaying said supplied signals by a total equal at least to said first period to produce delayed signals from the respective taps;
- a series of adjustable gain circuits connected to the respective taps and retaining adjustable gains for giving the adjustable gains to said delayed signals, respectively, to produce amplitude-varied signals;
- a noise generator for producing a generated pseudo-noise train consisting of said predetermined patterns of pulses; first equalizing means, supplied with said generated pseudo-noise train and the amplitude-varied signals produced in response to said first pseudo-noise train by those central ones of said adjustable gain circuits which are connected to consecutive ones of said taps at which said first pseudo-noise train is delayed by a delay equal in total to said first period, for adjusting the adjustable gains retained by said central adjustable gain circuits to make a thereby produced first output signal of said first equalizing means simulate said generated pseudo-noise train;
- cyclic permutation means for subjecting said adjusted gains to cyclic permutation in said central adjustable gain circuits to make those of said central adjustable gain circuits which are placed at a center portion of the series of said central adjustable gain circuits retain larger ones, in absolute values, of said adjusted gains; and
- second equalizing means supplied with the amplitude-varied signals produced in response to said second pseudo-noise train by all of said adjustable gain circuits for self-adaptively adjusting the adjustable gains retained by said all adjustable gain circuits to make a thereby produced second output signal of said second equalizing means become said equalized signal.

4,006,353

SIGNAL MULTIPLIER DEVICES

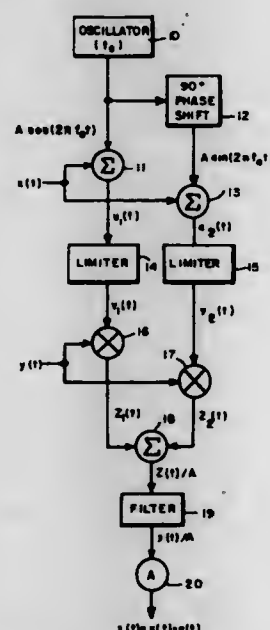
John N. Pierce, Lexington, Mass., assignor to Signatron, Inc., Lexington, Mass.

Filed Nov. 21, 1975, Ser. No. 634,051

Int. Cl.³ G06G 7/16

U.S. Cl. 235-194

25 Claims



1. A method for multiplying a first input signal and a second input signal, comprising the steps of generating at least one sinusoidal reference signal having a preselected frequency and a substantially constant amplitude greater than the maximum amplitude of said first input signal;

combining by addition said at least one reference signal and said first input signal to produce at least one intermediate signal;

limiting the amplitude of said at least one intermediate signal to a predetermined level and combining by multiplication said at least one limited amplitude signal and said second input signal to produce an unfiltered signal, and

filtering said unfiltered signal to produce a filtered signal proportional to the product of said first input signal and said second input signal.

4,006,354

LOW-PROFILE LIGHTING FIXTURE

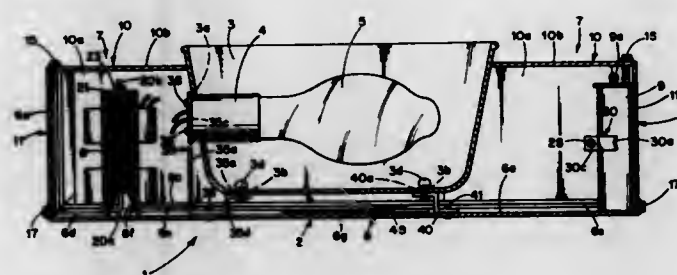
Hendrik A. J. deVos, Swansea, and Thomas W. Carvalho, Somerset, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 9, 1975, Ser. No. 594,316

Int. Cl.³ H05B 33/02; F21V 23/02

U.S. Cl. 240-51.11 R

16 Claims



1. A low-profile lighting fixture comprising: a generally-flat base member having a first end and a second end; a first end section attached to the base member at the first end thereof and defining a first housing; a power supply ballast transformer contained within the first housing defined by the first end section; a second end section attached to the base member at the second end thereof and defining a second housing; a power supply capacitor contained within the second housing defined by the second end section; a lamp-receiving socket; mounting means attached to the base member adjacent to one of the end sections and positioning the lamp-receiving socket in a generally horizontal orientation; and a reflector mounted to the base member in a common horizontal plane with the first and second end sections and intermediate to the first and second end sections, said reflector having an opening therein communicating with the interior of the reflector for the projection into the interior of the lamp-receiving socket.

4,006,355

LUMINAIRE

Sylvan R. Shemitz, Woodbridge, and Benjamin L. Stahlheber, Clinton, both of Conn., assignors to Sylvan R. Shemitz and Associates, Inc., New Haven, Conn.

Filed Dec. 26, 1974, Ser. No. 536,588

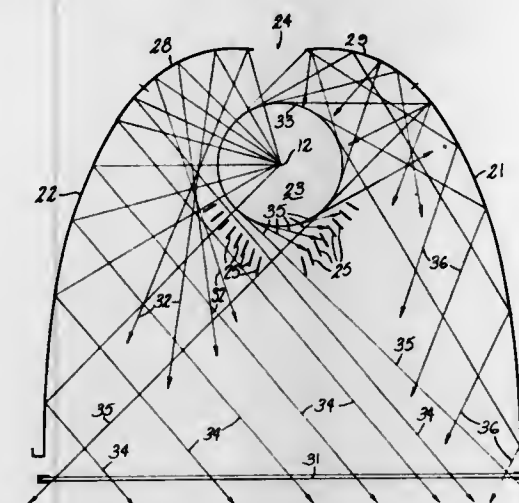
Int. Cl.³ H05B 33/02

U.S. Cl. 240-51.11 R

6 Claims

1. In a luminaire, the combination of: a light source in an envelope; parabolic reflecting surfaces disposed on at least two opposite sides of said light source so that their focal points substantially coincide, said light source being positioned approximately at said coincident focal points and portions of said reflecting surfaces being so positioned that reflections therefrom cross and provide maximum candlepower in the zones of about 25° to about 45° above nadir; and a plurality of light absorbing surfaces positioned between

said reflecting surfaces, close to said envelope and generally radially of said light source so as to cut off substantially all light emanating near tangentially from said envelope which would otherwise have reflected into the zones of about 45° to about 90° above nadir;



whereby veiling reflections are substantially eliminated in the zones about 0° to about 25° above nadir and direct glare is eliminated in the zones above about 45° above nadir.

4,006,356

RADIANT ENERGY TRACKING DEVICE

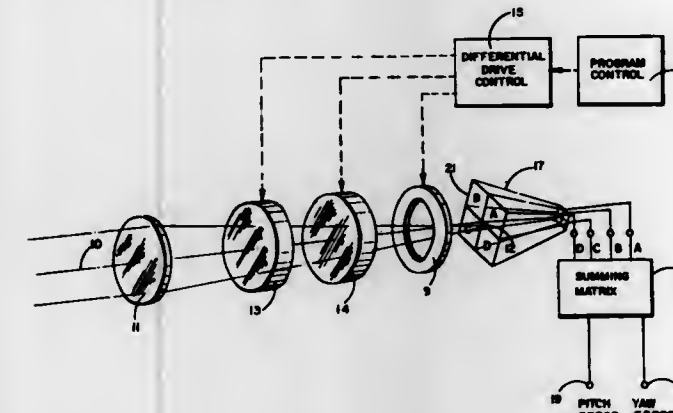
Jack L. Johnson, Corona del Mar, and Reno U. Pierotti, Costa Mesa, both of Calif., assignors to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Oct. 27, 1961, Ser. No. 148,092

Int. Cl.³ G01J 1/20; F41G 7/00

U.S. Cl. 250-203 R

5 Claims



1. In a radiant energy tracking device sensitive to radiation of scanned targets the combination of: optical focusing means having an optical axis for receiving modulated signal pulses reflected from a target and forming a target image at a focal point, means for nutating said image in the focal plane about said optical axis, detector means comprising four surfaces, each surface occupying a quadrant in the circle encompassed by said image as it nutates about said optical axis, said detector means providing an output pulse for each of said quadrants, the pulse width being indicative of the duration of said target image on each said surface, and summing means responsive to said output signals for providing signals proportional to the deviation of said target from said optical axis.

4,006,357

APPARATUS FOR DISPLAYING IMAGE OF SPECIMEN

Kimio Kanda, and Tadashi Ohtaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed July 5, 1974, Ser. No. 485,926

Claims priority, application Japan, July 9, 1973, 48-76632

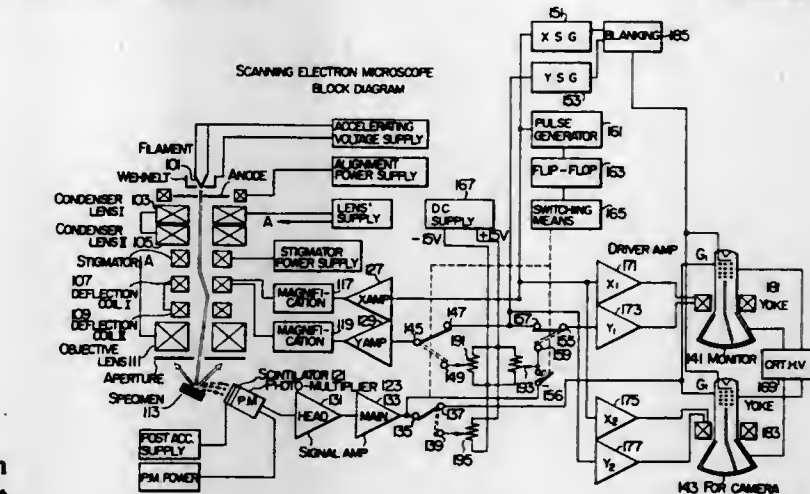
Disclosure was also published under second Trial Voluntary

Protest Program on Mar. 23, 1976

Int. Cl.³ H01J 37/26

U.S. Cl. 250-310

9 Claims



1. Apparatus for displaying an image of a specimen, comprising:

- a. means for producing and accelerating an electron beam to be projected on said specimen,
- b. first means for deflecting said accelerated electron beam in directions of X- and Y-axes to thereby scan a surface of said specimen,
- c. means for converting information representative of states or properties of said specimen resulting from said electron beam bombardment of said specimen into corresponding electrical specimen information signals,
- d. at least one cathode ray tube,
- e. second means coupled with said cathode ray tube for deflecting an electron beam thereof in directions of X- and Y-axes,
- f. brightness modulating means for producing an image of said specimen on a viewing face of said cathode ray tube in accordance with said electrical specimen information signals,
- g. third means for producing an output in response to at least said X-axis second deflection means, and
- h. fourth means responsive to said output from said third means for applying said electrical specimen information signals to said Y-axis second deflection means to thereby additionally produce on said viewing face of said cathode ray tube a wave form for aiding desired adjustments in the display of said image of said specimen.

4,006,358

METHOD AND APPARATUS FOR MEASURING THE AMOUNT OF MOISTURE THAT IS ASSOCIATED WITH A WEB OF MOVING MATERIAL

John J. Howarth, Monte Sereno, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed June 12, 1975, Ser. No. 586,347

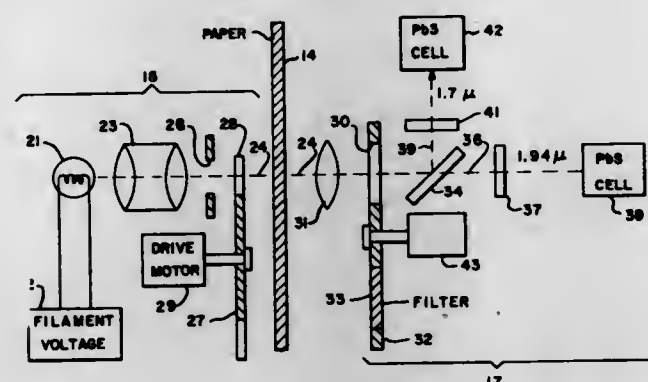
Int. Cl.³ G01N 3/34; G01N 21/34

U.S. Cl. 250-339

11 Claims

1. A method for measuring the amount of substance that is associated with a web of moving material where a radiation source emits a first spectral band of radiation that impinges on the material and is strongly sensitive to the substance in the material and a second spectral band of radiation which is less sensitive to said substance, and where first and second detection means are respectively responsive to the intensities of radiation of the first and second spectral bands which are reflected from or transmitted through the material, the method comprising the following steps:

- providing at least one sample of said material with a known amount of said substance;
- placing said sample between said radiation source and detectors and measuring the ratio of the radiation received by the first and second detector means;
- providing a filter which simulates a predetermined amount of substance the filter being spectrally similar to the frequency sensitivity of said substance to said radiation over a predetermined frequency band;



- placing said filter between said radiation source and detectors and measuring said ratio;
- determining the relationship between a change of sample ratios and a change of filter ratios due to placement of a successive plurality of nominal layers of a carrier containing some of said substance between said source and detectors; and
- utilizing the relationship of step (c) to provide a corrected ratio for an unknown sheet material.

4,006,359

PIPELINE CRAWLER

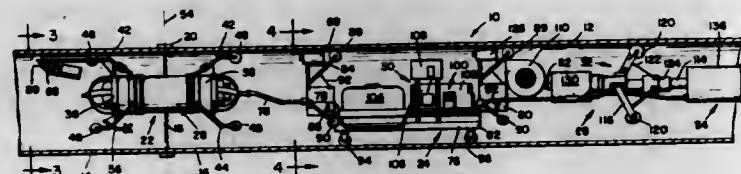
James R. Sullins, Tulsa, and Robert E. West, Catoosa, both of Okla., assignors to ABS Worldwide Technical Services, Inc., New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 79,859

Int. Cl.² G01N 21/00, 23/00; B61B 13/10

U.S. Cl. 250-358 P

13 Claims



- The combination of a self-propelled crawler for traveling through a pipeline, inspection means on said crawler for inspecting welds in the pipeline, control means on said crawler for controlling the operation of the crawler and of the inspection means on the crawler, said control means being effective to sense a weld and actuate said inspection means to inspect the welds, a first pickup on said crawler responsive to the presence of a marker on the outside of the pipeline, said pickup being coupled to the control means and effective to STOP the crawler when a marker is present, and a second pickup on said crawler positioned in advance of the first pickup and responsive to the presence of the marker on the outside of the pipeline, said second pickup being coupled to the control means and effective to START the crawler in a forward direction when a marker is positioned thereover.

4,006,360 METHOD OF DISCRIMINATING BETWEEN DYED PARTICLES AND BACKGROUND FLUORESCENCE OF THE DYE

William A. Mueller, Dedham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

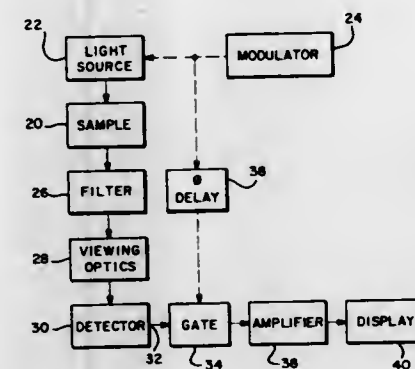
Continuation of Ser. No. 499,132, Aug. 21, 1974, abandoned.

This application Jan. 2, 1976, Ser. No. 646,324

Int. Cl.² G01M 21/38

U.S. Cl. 250-461 B

8 Claims



- Method of distinguishing between two species of fluorescent particles in a mixture of said species, which species have respectively different fluorescent quantum efficiencies and corresponding decay lifetimes, but fluoresce at substantially a common wavelength band, said method comprising the steps of substantially simultaneously irradiating said particles in said mixture with radiation capable of stimulating fluorescent emission from both said species, but not intense enough to cause bleaching; reducing the intensity of said radiation so as to permit fluorescent emission from both of said species to decay statistically; and measuring after a delay determined as a function of the shorter of said decay lifetimes following reduction of said radiation intensity, the intensity of said fluorescent emission at said wavelength band during a predetermined time interval.

4,006,361

X-RAY BEAM FLATTENER

Stanley O. Schriber, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

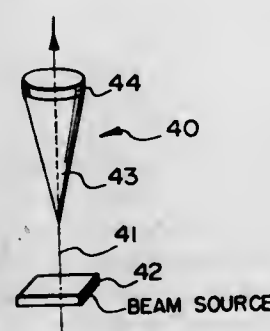
Filed Mar. 3, 1975, Ser. No. 555,047

Claims priority, application Canada, Dec. 18, 1974, 216333

Int. Cl.² H05G 3/00

U.S. Cl. 250-510

4 Claims



- In an X-ray apparatus having a beam source for producing a strongly forward peaked bremsstrahlung radiation beam about a central beam axis, said beam including photons with energies > 1 MeV, an X-ray beam flattener comprising: a low atomic number high density material on the central axis for preferentially attenuating low energy photons in the X-ray beam passing through said material, said material having a predetermined shape for attenuating the

radiation intensity of said beam in decreasing amounts as the angle from the central axis increases, wherein said low Z material has an atomic number $Z < 25$ and a density > 3.0 gm/cm³ and is selected from the group consisting of Al₂O₃, BeO, BeAl₂O₄, and SiC; and a thin layer of high Z material positioned in the forward direction with respect to said low Z material for absorbing low energy photons in said X-ray beam, wherein said high Z material has an atomic number $Z > 58$.

4,006,362

SHROUD FOR STORING RADIOACTIVE SPENT NUCLEAR FUEL CELLS

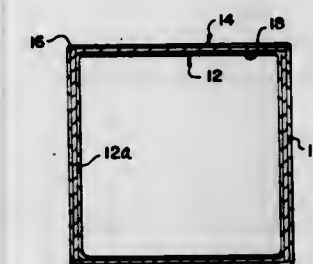
Leslie Mollon, Southfield, and Keith R. Ball, St. Clair Shores, both of Mich., assignors to Brooks & Perkins, Incorporated, Southfield, Mich.

Filed Nov. 17, 1975, Ser. No. 632,450

Int. Cl.² G21F 3/00; G21C 11/00

U.S. Cl. 250-518

26 Claims



- A generally tubular shroud for storing radioactive spent nuclear fuel cells in pools, said shroud being of uniform cross-section, said shroud comprising an outer tube, an inner tube within said outer tube, said tubes forming inner and outer spaced apart side walls of said shroud, and dimensioned to provide a uniform spacing between the inner and outer side walls thereof, and neutron absorbing panel material substantially filling the spaces between the inner and outer side walls of said shroud, the side walls of said tubes being in pressure contact with the sides of said panels.

4,006,363

GASEOUS INFRARED WAVEGUIDE MIXER

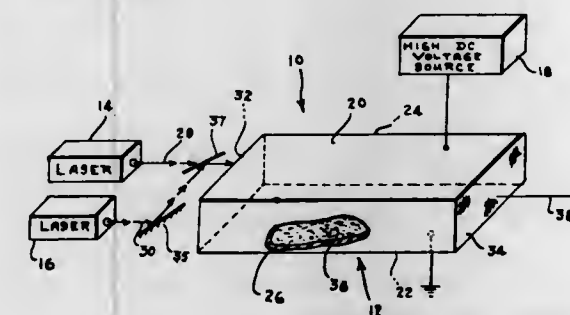
Howard R. Schlossberg, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,029

Int. Cl.² H03F 7/02

U.S. Cl. 307-88.3

12 Claims



- An infrared gaseous waveguide mixer comprising a laser source capable of producing a laser beam, a waveguide, said waveguide being of rectangular configuration having a pair of opposed metallic walls, a pair of opposed dielectric walls and an infrared window at each end thereof, said waveguide being in optical alignment with said laser beam, a DC source electrically connected to said metallic walls and a gas contained within said waveguide whereby said waveguide mixer produces an output of extremely high power.

955 O.G.-10

4,006,364

TOUCH PAD ARRANGEMENT FOR SIGNALLING ARRIVALS IN SWIMMING COMPETITIONS

Max Suter, Dotzigen, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

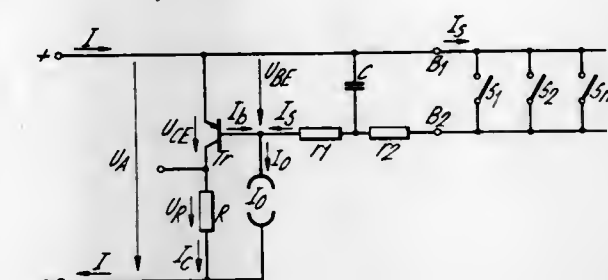
Filed Sept. 30, 1975, Ser. No. 618,037

Claims priority, application Switzerland, Oct. 16, 1974, 13856/74

Int. Cl.² G08B 5/22

U.S. Cl. 307-119

8 Claims



- A touch pad arrangement for signalling arrivals in swimming competitions by means of electrical contacts, each comprising two electrodes, wherein such contacts are arranged in parallel and coupled between the emitter and base of at least one associated transistor to thereby clamp a voltage across the contacts to a voltage below the decomposition voltage of the electrodes forming the contacts, said transistor being further connected in circuitry including an electric supply to amplify the voltage variation across the contact arising from the closing of a contact and at the same time to modulate the electric supply current in response to that voltage variation.

4,006,365

EXCLUSIVE OR INTEGRATED LOGIC CIRCUITS USING COMPLEMENTARY MOSFET TECHNOLOGY

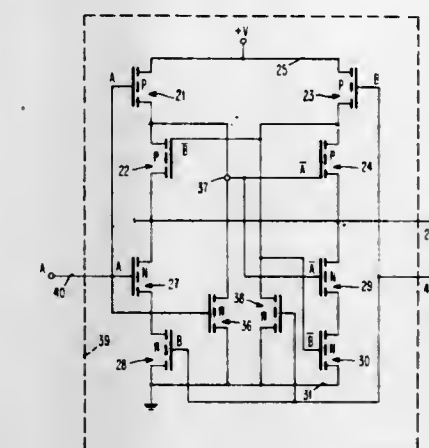
Claude Raymond Marzin, Fishkill, N.Y.; Claude Maurice Rougeaux, Paris, and Patrice Jean Claude Vernes, Mennecy, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,487

Int. Cl.² H03K 19/08

U.S. Cl. 307-205

8 Claims



- An Exclusive OR circuit comprising
 - a first, second, third, and fourth MOS inverters connected in a bridge circuit,
 - first and second MOS switching means coupled to the bridge circuit, the first switching means being coupled to the first and second inverters as the first side of the bridge circuit and the second switching means being coupled to the third and fourth inverters as the second side of the bridge circuit,
 - first and second potential sources connected to different ends of the bridge circuit,

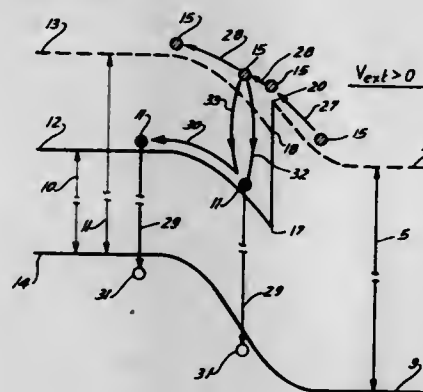
- d. means forming a gate discharge path from one side of the bridge circuit through an inverter of the other side of the bridge circuit to the output circuit,
- e. a first input signal coupled to the first and second inverters and to the first switching means,
- f. a second input signal coupled to the second and third inverters and to the second switching means, and
- g. an output circuit coupled to the bridge circuit, a first set of like first and second input signals operating the second inverter and a second set of like first and second input signals operating the fourth inverter to connect the first potential source to the output circuit and a first set of unlike first and second input signals operating the first inverter and a second set of unlike first and second input signals operating the third inverter to connect the second potential source to the output circuit thereby providing potentials definitive of the Exclusive OR function from the combination of first and second input signals.

4,006,366

SEMICONDUCTOR DEVICE WITH MEMORY EFFECT
 Iulian Basarab Petrescu-Prabova; Paul Constantin Mihalovici, and Cristian George Constantinescu, all of Bucharest, Romania, assignors to Institutul de Fizica, Bucharest, Romania
 Filed May 9, 1975, Ser. No. 576,137
 Claims priority, application Romania, Nov. 8, 1974, 80464
 Int. Cl.² H01L 29/205

U.S. Cl. 307—238

43 Claims



1. A semiconductor device with memory effect comprising: a semiconductor material body containing a p-n heterojunction between two p-type and n-type regions; the n-type region is made of a n-type indirect gap material and the p-type region is made of a p-type direct gap material; the indirect gap of said n-type material is wider than that indirect gap of said p-type material at the corresponding position in wavevector space; the indirect gap conduction band minima in said n-type material are higher in energy than the corresponding indirect gap conduction band minima in said p-type material, at said p-n heterojunction; said heterojunction exhibits a spike-notch structure in the indirect gap conduction band minima and a spike-notch structure in the direct gap conduction band minima; said heterojunction affording two mechanisms for electron flow from the n-type region to the p-type region including a slow mechanism and a fast mechanism and effecting switching from said slow mechanism and said fast mechanism, by avalanche filling of the direct notch with direct electrons, due to the enhancement of the electron-electron interaction; said interaction occurring between indirect electrons injected over the indirect spike and said direct electrons which already exist in the direct notch; said avalanche filling being produced when a critical value of the notch electron population is exceeded; the switching from said fast mechanism to said slow mechanism being effected by emptying of said direct notch due to the attenuation of said electron-electron interaction, said emptying being produced when said notch electron population decreases below a critical value; and

circuiting means for biasing said p-n heterojunction and coupling it with a load with a variable external voltage so that a current-voltage characteristic which exhibits two branches, the OFF branch and the ON branch, and a hysteresis loop is produced, the operating point being on said OFF branch of the current-voltage characteristic, when a critical point ON is exceeded, determined by a critical voltage level ON and by a critical level ON, the latter levels being correlated with an increase of said notch electron population over a critical value, the device switches on said ON branch of the current-voltage characteristic; the operating point being on said ON branch of the current-voltage characteristic and decreasing the bias, when a critical point OFF, determined by a critical voltage level OFF and a critical current level OFF is exceeded, the latter levels being correlated with a decrease of said notch electron population below a critical value, the device switches on said OFF branch of the current-voltage characteristic; said hysteresis loop being defined by said two branches of the current-voltage characteristic and by two load lines which pass through said ON and OFF critical points.

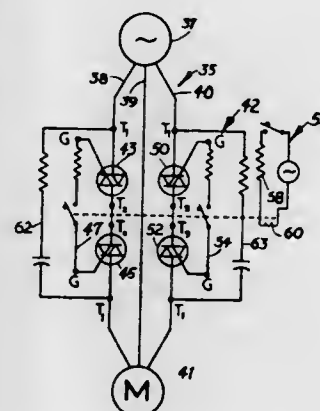
4,006,367

SOLID STATE ALTERNATING CURRENT SWITCHING DEVICE

Eduard Karl Ott, Bothell, Wash., assignor to Frontier Machinery Company, Walla Walla, Wash.
 Filed Nov. 13, 1974, Ser. No. 523,226
 Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
 Int. Cl.² H03K 17/60

U.S. Cl. 307—252 B

7 Claims



1. A solid state alternating current three phase power switching device for controlling a network between a three phase alternating current source having a predetermined peak voltage and a motor in which the network has a power line for each phase, comprising:
 pairs of series directly connected triacs mounted in at least two of the three power lines;
 each triac having a nonconducting state and a conducting state;
 wherein each triac has an individual breakover voltage less than the source peak voltage;
 wherein the sum of the breakover voltage of the triacs exceeds the source peak voltage;
 each triac having a gate terminal;
 isolated circuits interconnecting the gate terminals of each pair of triacs; and
 each circuit having conductive means for permitting a triac gate current to be conducted through the circuit between the gate terminals to change the pair of triacs from their nonconductive states to their conducting states to apply the source alternating current to the motor.

4,006,368

A.C. VOLTAGE REGULATOR INCLUDING BILATERAL THYRISTOR

Kazuo Ichikawa, Nagano, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

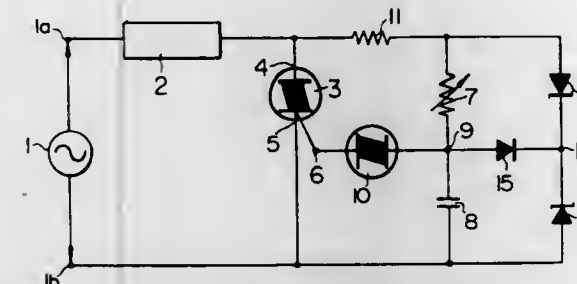
Filed Mar. 3, 1976, Ser. No. 663,222

Claims priority, application Japan, Mar. 4, 1975, 50-26386

Int. Cl.² H03K 17/72, 17/02

U.S. Cl. 307—252 B

1 Claim



1. A phase controlled a.c. voltage regulator employing a bilateral thyristor which is connected in series with a load across an a.c. source, and including a time constant circuit formed by a series combination of a variable resistor and a capacitor, the variable resistor having its one end connected with a first anode terminal of the thyristor, and one end of the capacitor being connected with a second anode terminal of the thyristor, with a junction between the resistor and the capacitor being connected with a gate terminal of the thyristor through a bilateral diode, characterized by the provision of a resistor connected between the first anode terminal of the thyristor and the variable resistor, and a pair of constant voltage diodes connected across the series circuit formed by the variable resistor and capacitor and having their junction connected with a junction between the variable resistor and capacitor through a diode.

4,006,369

CURRENT GENERATOR INCLUDING A RATE DISCRIMINATOR

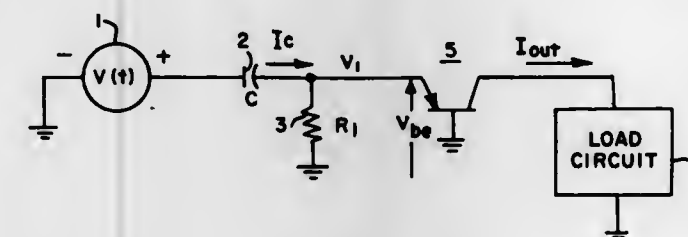
Keith Alan Taylor, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed June 9, 1975, Ser. No. 585,013

Int. Cl.² H03K 5/00; H03F 3/26

U.S. Cl. 307—261

4 Claims



1. An electronic circuit for providing additional current to the load of a push-pull amplifier during high-frequency operation of push-pull signals to compensate for limiting characteristics of the semiconductor devices of said amplifier, comprising:

input circuit means adapted for receiving said push-pull signals and producing an output current proportional to the rate of change thereof; and
 amplifier means including bias network means for passing said output current to said load, said bias network means holding said amplifier means off when said output current is less than a predetermined value and turning said amplifier means on when said output current exceeds a predetermined value.

4,006,370

FAST TURN-OFF CIRCUIT FOR POWER TRANSISTOR

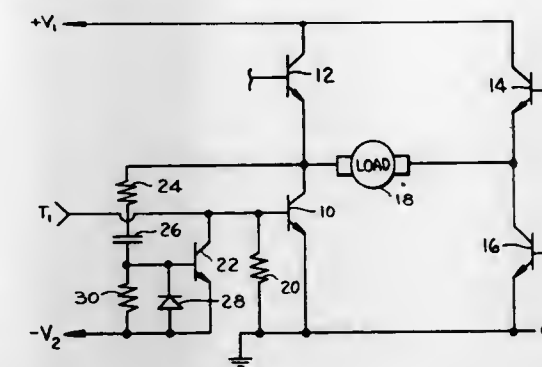
Irvin Leslie Erler, Waynesboro, Va., assignor to General Electric Company, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,985

Int. Cl.² H03K 3/33, 17/60

U.S. Cl. 307—300

2 Claims



1. In a system for energizing a load from a voltage source having first and second terminals, the combination comprising:

- a power transistor having an emitter, base and collector with its collector-to-emitter path connected in series with the load and between the terminals of the voltage source to provide a low impedance path for the load when a drive signal is received at said base; and
- regenerative feedback means coupled between said collector and base of said power transistor for only feeding back to said base a signal responsive to an increasing potential sensed at said collector to reduce the time necessary to turn off said power transistor, said feedback means comprising:
 - a second transistor having an emitter, base and collector, said collector of said second transistor being electrically coupled to said base of said power transistor;
 - transient circuit means including a series circuit combination of a resistor and a capacitor connected between said collector of said power transistor and said base of said second transistor for causing saturation of said second transistor when the voltage across the collector to emitter of said power transistor is in the process of increasing; and
 - a diode connected directly across the base-to-emitter of said second transistor in a reverse polarity relationship to protect a base-to-emitter junction of said second transistor from being destroyed by a reverse biasing feedback signal responsive to a decreasing potential at said collector of said power transistor when said power transistor is being driven into saturation by a signal applied to said base of said power transistor.

4,006,371

ELECTROACOUSTICAL TRANSDUCER COMPRISING PIEZOELECTRIC ELEMENT

Patric C. Quirke, Whitewater, Wis., assignor to Whitewater Electronics, Inc., Whitewater, Wis.

Continuation of Ser. No. 342,751, March 19, 1973. This application Mar. 20, 1975, Ser. No. 560,487

Int. Cl.² H01L 41/08

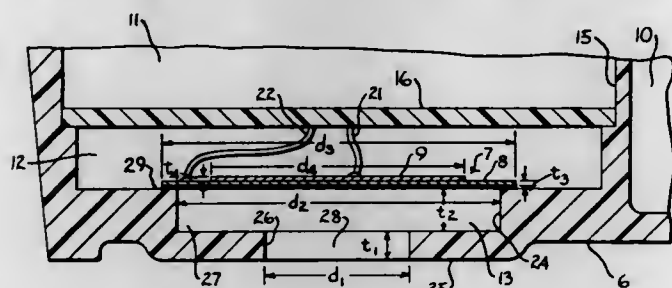
U.S. Cl. 310—8.2

3 Claims

1. An acoustic transducer that is substantially nondirectional and is adapted for response at substantially a predetermined frequency, said transducer being characterized by:

- A. a transducer element comprising a disc of piezoelectric material intimately bonded to a concentric diaphragm; and
- B. housing means to which the transducer element is bonded all around its edge and which cooperates with the transducer element to define a resonant acoustical cavity of which the transducer element comprises a rear wall, said housing means providing

1. an axially short rear cylindrical chamber concentric to the transducer element and having a diameter on the order of that of the transducer element, and
2. a smaller diameter front cylindrical chamber concentric to the rear cylindrical chamber and which opens unobstructedly at its rear end to the rear cylindrical chamber and at its front end to ambient medium; and



tric to the rear cylindrical chamber and which opens unobstructedly at its rear end to the rear cylindrical chamber and at its front end to ambient medium; and C. said housing means being dimensioned substantially in the relationship

$$f = \frac{cd_1}{2\pi d_2} \sqrt{\frac{1}{t_2^2 + t_1 + \sqrt{\frac{d_1^2}{1.5}}}} \quad .2$$

where

f is said predetermined frequency in Hz,
 c is the velocity of sound in the medium in which the transducer is adapted to operate,
 d_1 is the diameter of the front cylindrical chamber,
 d_2 is the diameter of the rear cylindrical chamber,
 t_1 is the axial dimension of the front cylindrical chamber, and
 t_2 is the axial dimension of the rear cylindrical chamber.

4,006,372

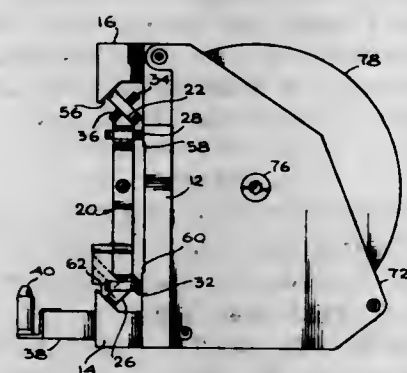
TRANSDUCER POSITIONER

Leon Henry Brown, Jr., Sylmar, and David H. Peters, Santa Monica, both of Calif., assignors to Wangco Incorporated, Los Angeles, Calif.

Filed Mar. 10, 1975, Ser. No. 557,109
 Int. Cl.² H02K 41/02

U.S. Cl. 310-13

16 Claims



1. Positioning apparatus including:
 - a carriage;
 - a back member having a reference surface;
 - an upper guide member connected to said back member and having a first inwardly sloping guide surface opposite said reference surface;
 - a lower guide member connected to said back member and having a second inwardly sloping guide surface also opposite said reference surface;
 - a single upper angled guide wheel spring-mounted on said carriage at an angle thereto in engagement with said first inwardly sloping guide surface;

first and second lower angled guide wheels mounted on said carriage at an angle thereto in engagement with said second inwardly sloping guide surface;
 an upper reference guide wheel carried by said carriage in engagement with said reference surface; and
 at least one lower reference guide wheel carried by said carriage in engagement with said reference surface.

4,006,373

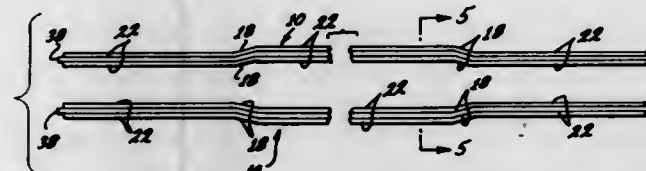
STAGGERED MOTOR CORE

James A. Ross, La Jolla, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Aug. 13, 1975, Ser. No. 604,253
 Int. Cl.² H02K 41/02

U.S. Cl. 310-13

4 Claims



1. An improved core for a linear induction motor comprising:
 - a pole piece portion having a plurality of spaced apart pole pieces along the length of said core, at least one of said plurality of pole pieces is laterally offset from an adjacent one of said plurality of pole pieces.

4,006,374

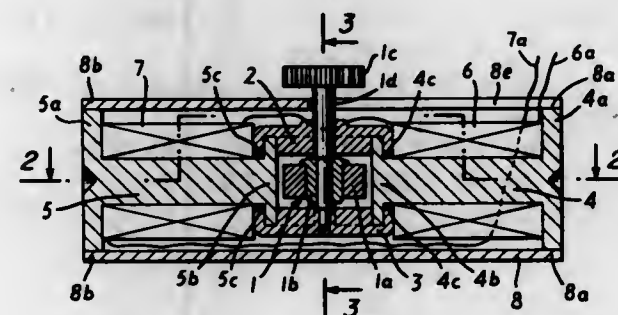
ELECTRIC MICRO MOTOR FOR A TIMEPIECE

Yasuichi Nakagawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Feb. 19, 1975, Ser. No. 550,929
 Int. Cl.² H02K 21/12

U.S. Cl. 310-40 MM

5 Claims



1. An electric micro motor for use in timepieces and the like comprising: a pair of magnetic stator pieces disposed in spaced-apart relationship from one another defining an opening therebetween, said stator pieces comprising elongated bodies having one concavely curved end portion and one other end portion, said elongated bodies being disposed in end-to-end relationship with their curved end portions spaced from and facing one another to define therebetween said opening; a coil winding wound on each said stator piece; a rotor having a permanent magnet portion and being disposed in said opening with its permanent magnet portion magnetically coupled to said stator pieces with an air gap therebetween; a pair of non-magnetic coupling members connected to and coupling together said stator pieces and having means rotatably mounting said rotor in said opening; and a magnetic enclosure member connected to said other end portions of said elongated bodies and defining with said stator pieces an enclosure enclosing said stator pieces, rotor and coupling members and forming with said magnetic stator pieces a closed magnetic circuit for the micro motor.

4,006,375

STEPPING MOTOR

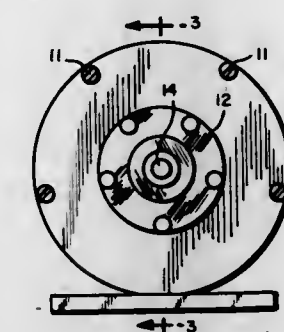
Frank Lyman, Jr., Cambridge, and William C. McDonald, Belmont, both of Mass., assignors to Cambridge Thermionic Corporation, Cambridge, Mass.

Continuation of Ser. No. 442,686, Feb. 14, 1974, abandoned.
 This application May 2, 1975, Ser. No. 573,922

Int. Cl.² H02K 37/00

U.S. Cl. 310-49 R

21 Claims



1. A multiphase rotary stepping motor comprising housing means; a shaft; bearing means associated with said housing means for rotatably mounting said shaft; a rotor secured to said shaft, said rotor having a plurality of equally spaced pole pieces extending radially therefrom; a stator fixedly mounted to said housing means, said stator having N groups of pairs of pole pieces separated by gaps, said rotor pole pieces being rotatably movable through said gaps, each of said groups having at least one coil associated therewith so that corresponding groups of said rotor pole pieces are capable of developing flux paths with said groups of stator pole pieces upon passage of current in the coils of said stator pole piece groups; the stator pole pieces in each of said groups thereof being angularly spaced from each other by a spacing equal to the spacing of said rotor pole pieces and said stator pole groups being separated from each other by N spacings that are not equal to the spacings of said rotor pole pieces, (N-1) of said N spacings being equal to each other and the remaining one of said N spacings being greater than that of said (N-1) spacings.

4,006,376

PHOTOTUBE HAVING IMPROVED ELECTRON COLLECTION EFFICIENCY

Richard Dale Faulkner, and Robert Edwin McHose, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 28, 1975, Ser. No. 554,099

Int. Cl.² H01J 39/04, 39/00

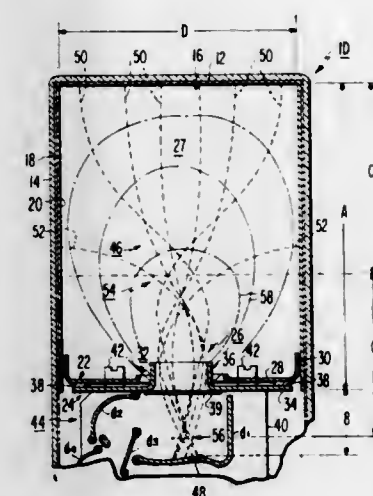
U.S. Cl. 313-95

4 Claims

1. An electron discharge tube comprising
 - a hermetically sealed evacuated envelope having a transparent faceplate portion with a transmissive photocathode on said faceplate portion having a substantially planar electron emissive surface within the interior of said envelope capable of emitting photoelectrons as an electron stream in response to radiation impinging thereon;
 - an elongated tubular portion extending from said faceplate portion;
 - electrical output means spaced from said photocathode capable of collecting said emitted electrons as an electron stream, and of providing an electrical output signal responsive to said collected electron stream, said means including an active surface collection region of an electrode upon which photoelectrons may be primarily accelerated to impinge;
 - a cylindrically shaped evacuated electron acceleration cavity between said photocathode and said active surface

collection region partially enclosed by a side wall surface of the tubular portion of the envelope;

- said side wall surface including a coating of a photocathode material capable of emitting photoelectrons in response to radiation impinging thereon, electrically connected to the photocathode;
- an electron lens system capable of generating an electric field which includes a series of field lines of equipotential, substantially tear-drop shaped, and symmetrical about a central axis within said cavity corresponding to a central axis of propagation of said photoelectrons therein; said lens having at least a pair of field forming electrodes, one of said electrodes coaxially mounted within the interior of said tubular portion of said envelope with a central opening covered by a wire mesh through which the photoelectrons may be accelerated to impinge upon said active surface region;



- one of said electrodes includes a planar major surface facing and substantially parallel with the electron emissive surface of said photocathode, with a tubular portion which extends toward the faceplate portion; and
- said lens being capable of focussing said photoelectrons as an electron bundle to intersect in sequence at least two spaced apart regions of said cavity in which electron trajectories associated with said accelerated photoelectrons are increasingly compressed, said electron trajectories defining a region of lessening compression between said spaced apart regions of increasing compression, the final region of compression including electron trajectories of significantly greater compression than that associated with said first region of compression, said active surface collection region being located substantially along a cross-sectional plane intersecting said electron bundle along said final region of compression.

4,006,377

FILTER ATTACHMENT FOR PARABOLIC REFLECTOR LAMPS

Walter J. Kosmatka, Niles, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,287

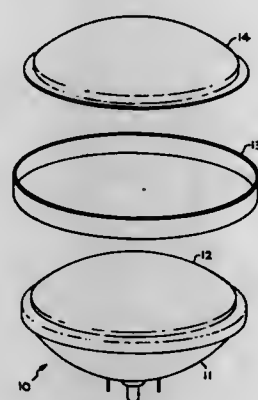
Int. Cl.² H01K 1/26

U.S. Cl. 313-112

6 Claims

1. A beam projection lamp comprising:
 - a concave reflector having a rim about the open end thereof;
 - filament means within said reflector for producing light;
 - a lens having the periphery thereof engaging the rim of said reflector;
 - filter means for selective light transmission positioned on the opposite side of said lens from said reflector; and

fastening means, comprising a section of heat-shrinkable plastic tubing conforming to the peripheries of said lens



and filter means and to said rim, for mechanically attaching and sealing said filter means to said lens and reflector.

4,006,378

OPTICAL COATING WITH SELECTABLE TRANSMITTANCE CHARACTERISTICS AND METHOD OF MAKING THE SAME

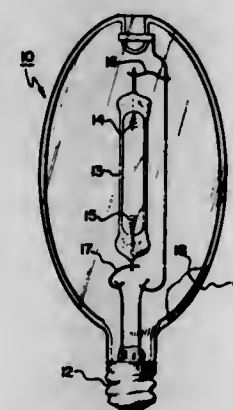
Seth D. Silverstein, and Jerome S. Prener, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,671

Int. Cl.² G02B 5/20; H01J 61/40

U.S. Cl. 313-112

10 Claims



1. In combination with a high intensity lamp including a source of radiant energy sealed within the lamp envelope and wherein said radiant energy is characterized by visible and ultraviolet radiation, the improvement comprising:

a layer of zinc oxide disposed on at least a selected portion of the inner surface of said lamp envelope, said layer having a thickness of between 500 and 10,000 Angstroms and the operating temperature of said layer being selected to cause said layer to exhibit a sharp absorption edge at a selected wavelength, whereby selected wavelengths of said ultraviolet radiation are absorbed while selected wavelengths of said visible radiation are transmitted.

6. An optical system comprising:

a source of radiant energy including visible and ultraviolet radiation;

a substantially transmissive member interposed in the path of said radiant energy; and

a layer of zinc oxide disposed on a selected surface of said member, said layer of zinc oxide having a thickness the operating temperature of said layer being selected to cause said layer to exhibit a sharp absorption edge at a selected wavelength.

4,006,379
CARBON ELECTRODES FOR AN ULTRAVIOLET ARC LAMP FOR USE IN A LIGHT-FASTNESS TESTER
Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan
Filed Dec. 19, 1975, Ser. No. 642,359
Int. Cl.² H01J 1/02, 1/14, 1/38, 1/48
U.S. Cl. 313-352

2 Claims



1. Carbon electrodes for an ultraviolet arc lamp used for light-fastness testing, said electrodes comprising:

an upper electrode in the shape of an elongated cylinder about 23 mm. in diameter, the cross-section of which has an exterior annular portion consisting of a carbonaceous material and an interior core portion consisting of a mixture of a carbonaceous material and potassium sulfate, the upper electrode having dispersed therethrough potassium chloride as a stabilizing agent; and

a lower electrode in the shape of an elongated cylindrical tube about 18.5 mm. in diameter and having a hollow interior about 1-2 mm. in diameter and being of a carbonaceous material having a high electrical conductivity and having dispersed therethrough potassium chloride as a stabilizing agent;

whereby when the upper and lower electrodes are placed with their ends opposed to each other and an alternating current at 135V and 16A is discharged thereacross, the discharge can be maintained stably for more than 50 hours and a stable light is continuously produced.

4,006,380
MOUNTING OF CARBON ELECTRODES ON A HOLDER OF AN ARC LAMP

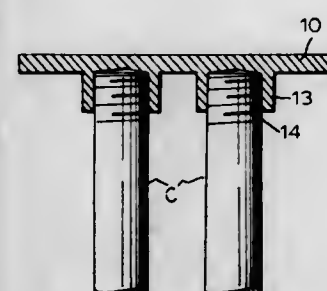
Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Oct. 31, 1975, Ser. No. 627,880

Int. Cl.² H01J 1/00, 1/104, 1/100

U.S. Cl. 313-357

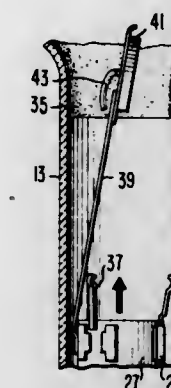
3 Claims



1. In combination, a plate-shaped holder for a plurality of carbon electrodes for use in an arc lamp for a weatherometer or a light fastness tester, said holder being of an electrically conductive material having a plurality of threaded portions projecting from the surface of said plate-shaped holder corresponding to the number of electrodes to be held thereon, and a plurality of carbon electrodes each having a threaded portion on one end thereof, said electrodes being mounted on said holder and electrically connected thereto solely by the threaded engagement with a corresponding threaded projection on said holder.

4,006,381
CRT WITH THERMALLY-SET GETTER SPRING
Earle Solomon Thall, Leola, Pa., assignor to RCA Corporation, New York, N.Y.
Filed Aug. 28, 1975, Ser. No. 608,563
Int. Cl.² H01J 31/00, 29/84
U.S. Cl. 313-481

5 Claims



1. A cathode-ray tube comprising an envelope, an electron-gun mount assembly in said envelope, a metal spring connected at one end to said mount assembly and a getter container connected at the other end of said spring, said container being urged toward the inner wall of said envelope by said spring, at least a portion of said metal spring consisting essentially of a nitinol metal alloy which can be thermally set to a prescribed first shape whereby said spring urges said container outwardly toward the inner wall of said envelope, then cold formed to a prescribed second shape, whereby said spring does not urge said container outwardly toward the inner wall of said envelope, and then when heated above predetermined temperatures reverts to said first shape.

4,006,382
MAGNETRON FILTER

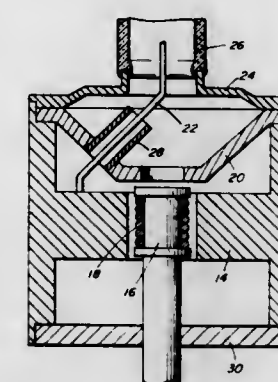
John R. Butler, Lexington, and Patricia M. Scott, Medford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 24, 1975, Ser. No. 616,225

Int. Cl.² H01J 25/50

U.S. Cl. 315-39.53

4 Claims



1. A magnetron comprising:

an evacuated envelope;

an anode member comprising a plurality of conductive vane members;

magnetic pole pieces positioned adjacent said anode member;

an output antenna probe member having one end attached to one of said vane members and extending through an aperture in one of said magnetic pole pieces;

a cylindrical conductive member encircling said probe member and attached to said apertured pole piece; and the length of the section of coaxial line formed by said probe and said conductive member having an overall length of approximately one quarter of wavelength of a

harmonic frequency of the frequency generated by said magnetron.

4,006,383
ELECTROLUMINESCENT DISPLAY PANEL WITH ENLARGED ACTIVE DISPLAY AREAS

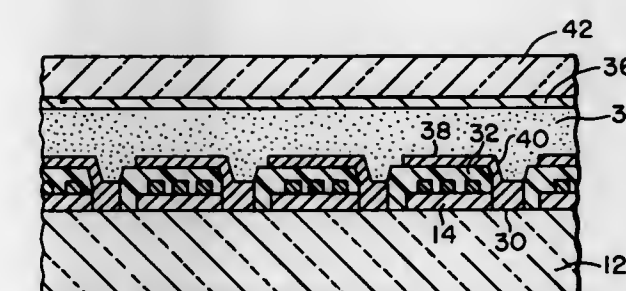
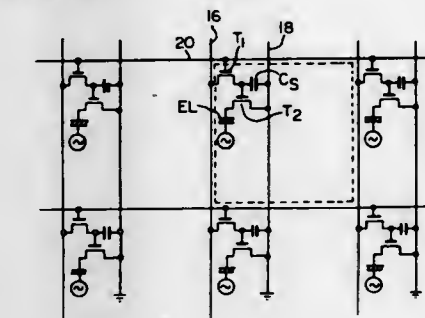
Fang-Chen Luo, Turtle Creek; Thomas P. Brody, and David H. Davies, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 28, 1975, Ser. No. 636,281

Int. Cl.² H05B 33/02

U.S. Cl. 315-169 TV

4 Claims



1. An electroluminescent display panel comprising an X-Y array of display elements each of which comprises integral thin film transistor switching and control circuit elements disposed on an insulative panel substrate and interconnected by drive signal buses, and each display element including an individual electroluminescent electrode disposed on the substrate, with an electrically insulative polymerized layer over the thin film elements and the signal buses, with the electroluminescent phosphor disposed over the entire panel area in contact with the individual electroluminescent electrodes and over the insulative polymerized layer, the improvement wherein the individual electroluminescent electrodes extend from the insulative substrate and cover a substantial portion of the insulative polymerized layer.

4,006,384
LEAD-LAG, SERIES-SEQUENCE STARTING AND OPERATING APPARATUS FOR THREE TO SIX FLUORESCENT LAMPS

Robert T. Elms, and Joseph C. Engel, both of Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1976, Ser. No. 646,795

Int. Cl.² H05B 41/232, 41/234

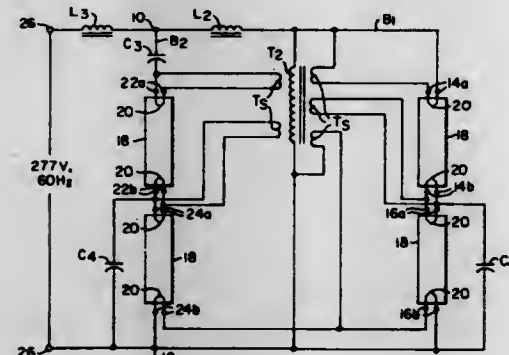
U.S. Cl. 315-323

20 Claims

1. Apparatus for starting and operating from an AC source of predetermined frequency and potential three, four, five or six low-pressure, positive-column elongated discharge lamp means each having electrode coils connected to an individual double contact member affixed to each end of each said elongated discharge lamp means, said apparatus comprising:

a. two parallel circuit branches connected across two common circuit points in said apparatus, one of said circuit branches comprising a first inductor means and from one

to three pairs of output terminal means across which the double contact members of some of said lamp means are adapted to be connected, with said first inductor means and said lamp means as connected in said one circuit branch being in series-circuit relationship, the other of said circuit branches comprising ballast capacitor means and from one to three pairs of output terminal means across which the double contact members of the remainder of said lamp means are adapted to be connected, with said ballast capacitor means and said lamp means as connected in said other circuit branch being in series-circuit relationship, said output terminal means in at least one of said circuit branches comprising two or three pairs of series-connected output terminals, each said pair of output terminals adapted to have the double contact members of one of said lamp means connected thereacross, and starting capacitor means connected in parallel with a portion of said series-connected output terminals



sequentially to apply the available starting potential across each individual pair of said series-connected output terminals upon energization of said apparatus thereby to sequentially start said lamp means as connected thereacross;

- b. input terminals adapted to be connected to said AC source of predetermined frequency and potential, second inductor ballast means connected between one of said input terminals and one of said common circuit points in said apparatus, the other of said common circuit points in said apparatus connected to the other of said input terminals, and said ballast capacitor means and said second inductor ballast means at said AC source predetermined frequency comprising a circuit which is at least partially resonant; and
- c. means for applying a small predetermined lamp electrode coil preheating potential to said output terminal means upon energization of said apparatus.

4,006,385

HORIZONTAL DEFLECTION CIRCUIT

Toshio Onodera, Kamakura, Japan, assignor to Sony Corporation, Tokyo, Japan

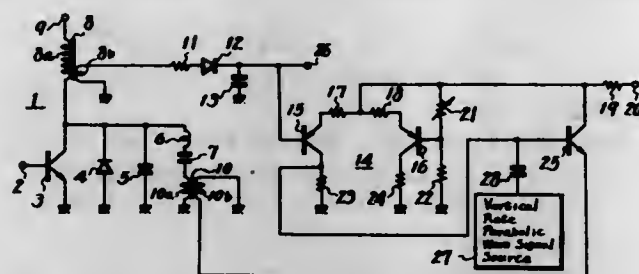
Filed Nov. 17, 1975, Ser. No. 632,807

Claims priority, application Japan, Nov. 29, 1974, 49-138012

Int. Cl.² H01J 29/70, 29/76

U.S. Cl. 315-400

6 Claims



1. A circuit arrangement for the horizontal deflection of a beam in a cathode ray tube comprising:
 - a. switching means with an output circuit means,

- b. a horizontal deflection coil connected to said output circuit means,
- c. means for supplying with a horizontal drive signal to switching means,
- d. variable impedance means connected in series to said horizontal deflection coil,
- e. detecting means connected to said switching means for detecting the level of an output signal of said switching means, and
- f. control means connected between said detecting means and said variable impedance means for controlling the impedance of said variable impedance means in response to the detected output of said detecting means so as to prevent a horizontal deflection current flowing through said horizontal deflection coil from undesirable variations.

4,006,386

MONITOR AND SAFETY DEVICE FOR COIL SHIFTING CIRCUIT

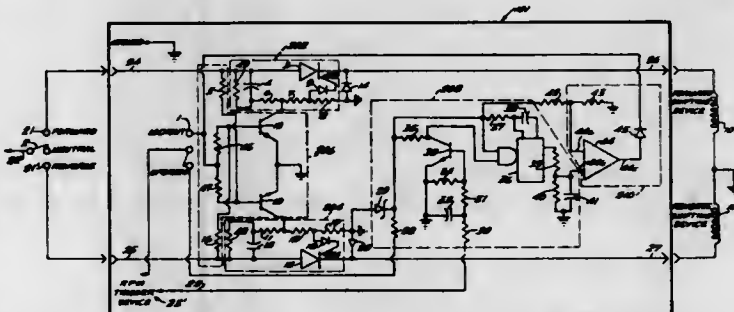
Gene Duggan, 4403 Cresthill Drive SW., Roanoke, Va. 24018

Filed June 10, 1975, Ser. No. 585,692

Int. Cl.² H01H 47/00

U.S. Cl. 317-5

4 Claims



1. An improvement for an electric coil shifting mechanism including means operatively connecting the coil shifting mechanism to a shaft to be turned, said mechanism being operatively connected in a main circuit, the improvement which comprises,

- a current monitoring means to automatically disengage the mechanism from said main circuit and a forward circuit control means and a rearward circuit control means,
- a cross coupled interlock circuit means interconnecting the forward control circuit and the rearward control circuit means, and
- an rpm detector circuit, and a speed interlock circuit means,
- said rpm detector circuit and speed interlock circuit means being operatively connected to said main circuit;
- said forward control circuit and the reverse control circuit each include silicon control rectifier circuit means including a resistor capacitor network and including a gate circuit network connected to the silicon control rectifiers, each RC network including a resistor divider and capacitors in series and each control circuit also including a discharge resistor in parallel with the respective associated capacitors of the RC network circuit means, said main circuit including a forward operating terminal and a rearward operating terminal and a forward shifting coil mechanism and a reverse shifting coil mechanism, in series with the respective forward and rearward operator terminals.

4,006,387

LOW POWER SOLID STATE THREE-PHASE OVERCURRENT/UNDERCURRENT PROTECTION CIRCUIT

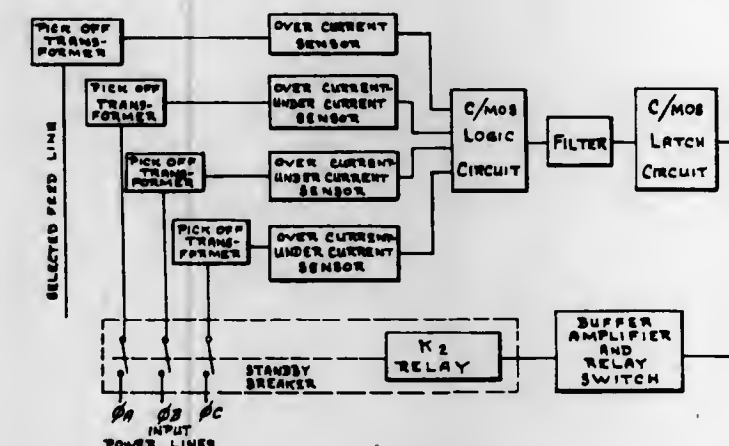
Joseph M. Hudak, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 22, 1975, Ser. No. 615,759

Int. Cl.² H02H 3/26

U.S. Cl. 317-27 R

3 Claims



1. A protection circuit for a three-phase electrical system comprising

- a pick-off transformer connected to each phase of the system power input circuit,
- an overcurrent/undercurrent sensing means connected to the secondary of each said pick-off transformer, each said overcurrent/undercurrent sensing means comprising a rectifier bridge, a slow response filter connected to the output of said rectifier bridge, a first operational amplifier connected to receive the output of said slow response filter, a first comparator means connected to the output of said first operational amplifier, a fast response filter connected to the output of said rectifier bridge, a second operational amplifier connected to receive the output of said fast response filter, and a second comparator means connected to the output of said second operational amplifier,
- a pick-off transformer connected to a selected system feed line,
- an overcurrent sensing means connected to the secondary of the feed line pick-off transformer, said overcurrent sensing means comprising a rectifier bridge, a slow response filter connected to the output of said rectifier bridge, an operational amplifier connected to receive the output of said slow response filter, and a comparator means connected to the output of said operational amplifier,
- a logic circuit having an output responsive to the outputs of said overcurrent/undercurrent and overcurrent sensing means,
- a standby breaker connected in said system power input circuit,
- actuator means responsive to the output of said logic circuit for operating said standby breaker and,
- a slow response filter connected to filter the output of said logic circuit.

4,006,388

THERMALLY CONTROLLED ELECTRONIC SYSTEM PACKAGE

Wesley E. Bartholomew, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 3, 1975, Ser. No. 554,789

Int. Cl.² H05K 7/20

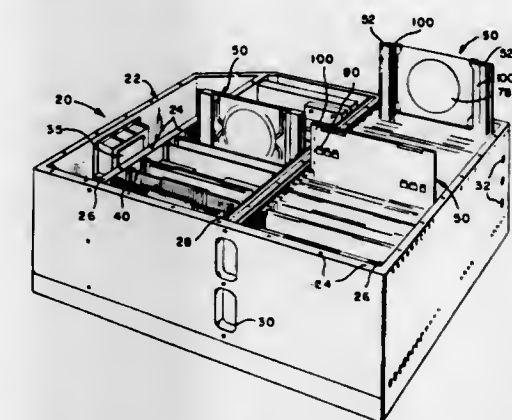
U.S. Cl. 317-100

14 Claims

1. A carrier mechanism for mounting electronic devices, such as large scale integrated wafers, hybrid packages and

discrete components, and for high thermal dissipation of heat generated by such electronic devices comprising:

- a chassis including integral structure for defining electrical contact receptacles and at least first and second plenums positioned in substantially parallel spaced alignment and separated from one another, said first plenum having means including spaced walls for receiving a coolant and said second plenum having means including spaced walls for exhausting the coolant, with one of said plenum walls of each of said first and second plenums opposing one another and having therein plenum wall holes facing one another respectively for receiving and exhausting the coolant, said electrical contact receptacles extending substantially between said opposing plenum walls having said plenum wall holes therein;
- a plurality of elongate guides secured to said plenum walls over said plenum wall holes, each comprising a pair of elongate receptacles of substantial U-shaped cross-sectional configuration facing one another and having guide holes therein aligned in communication with said plenum wall holes; and
- a plurality of electronic modules supporting said electronic devices and slidably received in and between said facing



U-shaped modules, each of said electronic modules including

- a mounting substrate of electrically insulating, high thermal conducting material having a generally rectangular configuration bounded by substantially parallel top and bottom edges, by a pair of substantially parallel side edges and by a pair of substantially parallel large area faces circumscribed by said edges, and having a plurality of contact pins extending along said bottom edge in electrical engagement with said electrical contact receptacles of said chassis,
- an electronic assembly of said electronic devices mounted on one of said large area faces and electrically coupled to said contact pins,
- a plurality of coolant fins directly secured to a second of said large area faces in high thermal contact therewith, and having coolant flow passages extending between said mounting substrate side edges, and
- a frame member secured to and supporting said mounting substrate around the periphery of its outer surface and received within said elongate guides, each of said frame members having therein openings aligned and communicating with said coolant flow passages and with said guide and plenum wall holes.

4,006,389

VARIABLE DISC CAPACITOR

Harvey R. Bruning, Millburn, N.J., assignor to North American Philips Corporation, New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,821

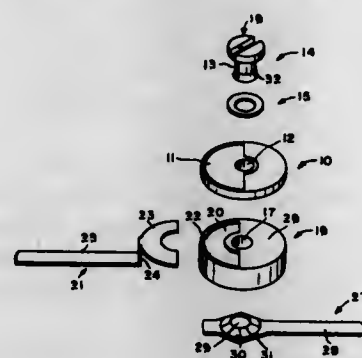
Int. Cl.² H01G 5/06

U.S. Cl. 317-249 D

8 Claims

1. A variable disk capacitor having first and second terminals comprising
 - a first disk of dielectric material and including a first electrode;

a second disk of dielectric material and including a second electrode; and
 means for pressing said first disk against said second disk, comprising
 a rivet having a shaft rotatably extending through said first and said second disks; and
 a monolithic spring clamp serving as one of said terminals; comprising an elongated strip including a portion having a convex proturbance extending at an angle approxi-



mately 45° with respect to said elongated strip on one side of said strip, said proturbance having an opening therein for receiving said extended shaft of said rivet and being cooperatively matable therewith in a direct physical contact by means of a conically shaped flaring portion of said rivet extending at an angle of approximately 45° with respect to said shaft and engaging the underside, concave portion of said proturbance in said strip having an extended portion in the plane of clamping relationship.

4,006,390

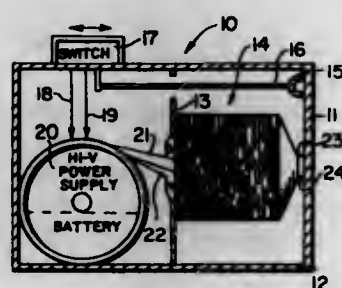
POCKET SIZED NON-LETHAL ELECTRICAL WEAPON
 Alfred B. Levine, 2924 Terrace Drive, Chevy Chase, Md. 20015

Filed Nov. 20, 1975, Ser. No. 633,905

Int. Cl.² B68B 11/00

U.S. Cl. 317-262 S

8 Claims



1. A non-lethal electrical shocking weapon that is self-powered and produces a high voltage shocking potential comprising:

a powering source and manually operated switching means, electrically conductive contactor probes interconnected to said powering source through said switching means, and through elongated electrical conductor means, and a deployable supporting member for said contactor probes that when not in use reposes within a small confined volume adjacent said powering source and when extended, serves to project said contactor probes to an extended position at a distance from said power source while supporting said probes in a manner that permits positioning by the user.

4,006,391

LINEARIZED PULSE WIDTH MODULATOR

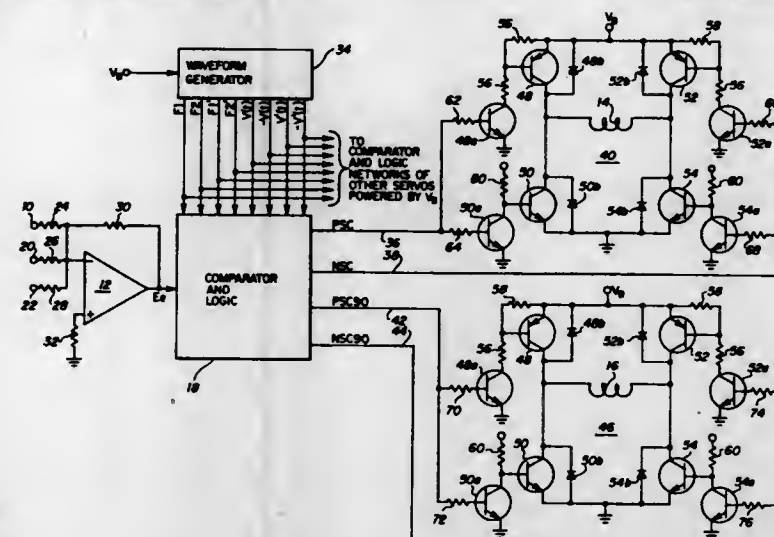
Charles S. Deering, Richardson, and William G. Redmond, Dallas, both of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Filed Dec. 20, 1974, Ser. No. 535,149

Int. Cl.² H02P 5/40

U.S. Cl. 318-227

26 Claims



1. A control system wherein an error signal indicates the torque and direction of rotation of a two phase servomotor having a reference winding and a control winding, comprising in combination:

means for generating a first periodic signal,
 means for generating a second periodic signal that is the inverse of the first signal and in response to the first periodic signal,
 first means for comparing the first periodic signal with a preestablished error signal and generating first and second enable signals,
 first means for combining the first and second enable signals with first and second square wave signals to generate first and second output signals,
 second means for comparing the error signal with the first and second periodic signals to generate first and second function signals, and
 second means for combining the first and second function signals with the first and second output signals to generate first and second periodic output pulses to the control and reference windings of the servomotor.

4,006,392

ELECTRONIC SLIDING DOOR

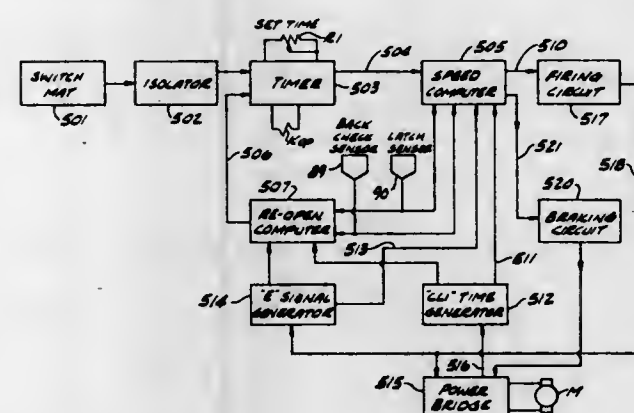
John C. Catlett, 8735 N. 72nd St., Milwaukee, Wis. 53223, and James A. Blake, 5354 S. 116th St., Hales Corners, Wis. 53130

Filed Sept. 2, 1975, Ser. No. 609,508

Int. Cl.² G05D 3/08

U.S. Cl. 318-266

11 Claims



1. An electronic door control system comprising a d.c. electric motor rotatable in one direction for opening a door

and in the opposite direction for closing the door, at least one semiconductor device for supplying d.c. power to the motor from an a.c. power source when said device is rendered conductive, polarity switching means for selecting the polarity of the d.c. power supplied to the motor thereby for controlling its direction of rotation, means for sensing the presence of an object near the door and operative to enable the conductivity of said semiconductor device and to cause the polarity switching means to select a first polarity of d.c. power supplied to the motor for a predetermined period thereby to open the door, means for causing the polarity switching means to select a second polarity of d.c. power supplied to the door after said door is opened thereby to close the door, and speed control means responsive to counterelectromotive force developed by the motor during its rotation for controllably varying the conductivity of said semiconductor device, said speed control means being operative in a sense tending normally to cause motor rotation to be maintained at a predetermined speed thereby to cause movement of the door at a predetermined speed.

4,006,393

MOTOR CONTROL SYSTEM USING A HEATED MEMBER TO PROVIDE MODULATION

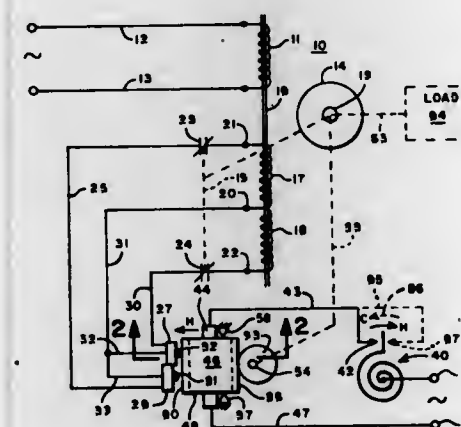
Curtis E. Westley, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 21, 1975, Ser. No. 569,725

Int. Cl.² G05B 11/01

U.S. Cl. 318-473

6 Claims



1. A modulating control system, including: bidirectional electric motor means adapted to be connected to a source of electric power to energize said motor means with said motor means including output means; said motor means including a first control circuit which when completed causes said motor means to operate in a first direction, and a second control circuit which when completed causes said motor to operate in a second direction; each of said control circuits including a safety limit switch to open circuit its associated control circuit in the event said motor means is caused to rotate to a predetermined safe limit; three position switch means including two snap switch means connected so as to have a center open position and two separate closed positions; said first control circuit completed through a first of said separate closed switch positions and said second control circuit completed through a second of said separate closed switch positions; thermally responsive means including electric heater means to cause said thermally responsive means to move when said electric heater means is energized; and said motor output means controlling said switch means in conjunction with the movement of said thermally responsive means; said thermally responsive means closing said switch means upon the temperature of said thermally responsive means changing to thereby cause said motor means to operate; said motor output means modulating and thereby causing said switch means to return to said center open position.

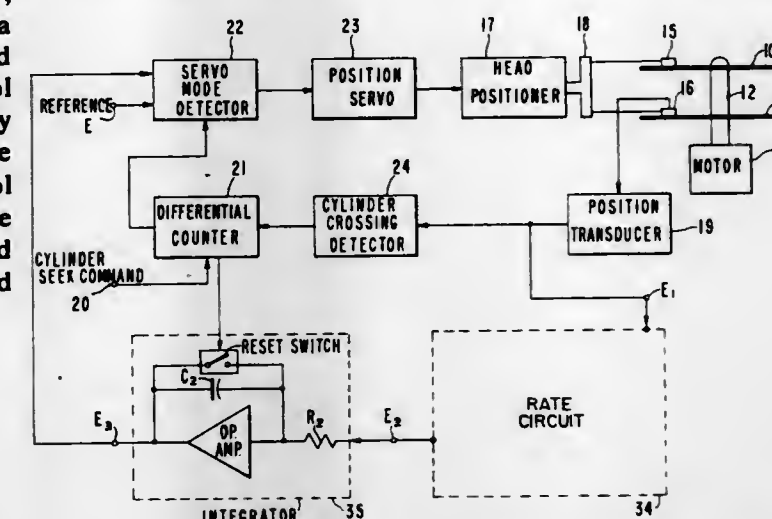
4,006,394

COARSE AND FINE CONTROL FOR POSITION SERVO
 John Cuda, Saratoga, and Frank J. Sordello, Los Gatos, both of Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 282,487, Dec. 21, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 524,766
 Int. Cl.² G05B 11/18

U.S. Cl. 318-594

4 Claims



1. In combination with a servo system for incrementally positioning a movable member, said servo system being rendered operative under coarse and fine operational modes in response to position signals received from a single position sensor, mode control means for switching the servo system from the coarse to the fine operational mode during deceleration of the movable member toward a selected one of a plurality of incremental positions with minimal settling time, including differentiating means connected to the position sensor for converting said position signals into a velocity signal during movement of the movable member past each of said incremental positions, integrating means connected to said differentiating means for integrating said velocity signal in response to approach of the movable member to said selected one of the positions to generate a mode control signal and detector means connected to the integrating means for detecting a predetermined signal level of said integrated velocity signal to switch the servo system to the fine operational mode, whereby bias effects imposed on the position signals do not influence switching of the servo system to the fine operational mode.

4,006,395

APPARATUS FOR THE CONTROL OF PHOTOSENSITIVE MATERIAL HANDLING AND CUTTING OPERATIONS IN COMPUTER OUTPUT MICROFILMERS

Jorgen Reesen, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,458

Int. Cl.² G05B 19/40; G03B 27/32

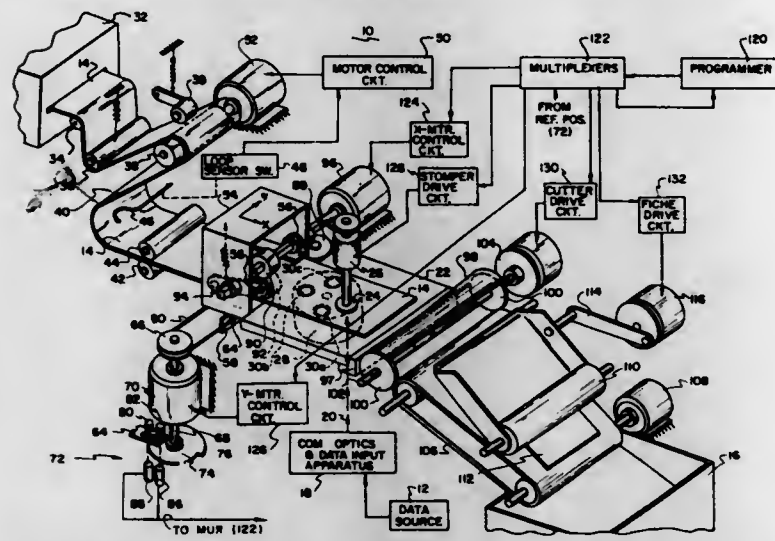
U.S. Cl. 318-685

13 Claims

1. For use in a computer output microfilmer which is adapted to record light images of frames in a sequence on successive image areas of a photosensitive material to form columns of recorded frames, the improvement comprising:

1. means for producing predetermined first and second sequences of control pulses,
 2. a first stepping motor operatively associated with such material and responsive to said first sequence of control pulses for moving the material laterally in a first direction across the width thereof to predetermined lateral positions,
 3. a second stepping motor operatively associated with the material and responsive to said second sequences of control pulses for moving the material in a second direction perpendicular to said first direction to predetermined positions along said second direction, whereby successive image areas of the material are located by said first and second motors for the recording of a light image of frames in a column,

4. means responsive to particular pulses from said sequence producing means for maintaining located image areas in position during the recording of light images of frames;
5. means coupled to said first motor for providing output signals which correspond to the location of image areas of the material along said first direction and applying said output signals to said sequence producing means which in response thereto provides a selected one of said first sequence of control pulses, and



6. means defining a loop path for the material spaced from said first and second motors to facilitate movement of material in said first and second directions by said first and second motors, respectively including:
- feeding means operatively associated with the material and adapted when actuated for feeding material into said loop path, and
 - loop sensing means for sensing the size of the loop of material in said loop path and for controlling the actuation and de-actuation of said feeding means to control the size of the loop of material.

4,006,396

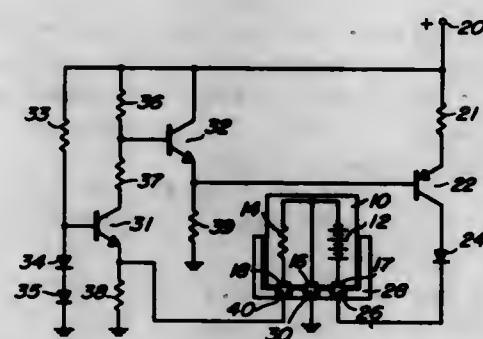
UNIVERSAL BATTERY CHARGING APPARATUS

Henry A. Bogut, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 434,526, Jan. 18, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 555,476
Int. Cl.² H02J 7/00

U.S. Cl. 320-2

20 Claims



1. A battery charging system having a charging path for charging batteries having a variety of different capacities requiring different optimum charging rates, said system including in combination,

- a charging rate sensing circuit, at least one battery cell having an optimum charging rate,
- a fixed resistor related to a predetermined charging rate of said cell approximating the optimum charging rate thereof, and
- battery terminals connected to said cell and to said fixed resistor to form a battery for connecting the battery into the battery charging system with only said cell in said charging path and said fixed resistor in said charging rate sensing circuit.

4,006,397

CONTROLLED BATTERY CHARGER SYSTEM

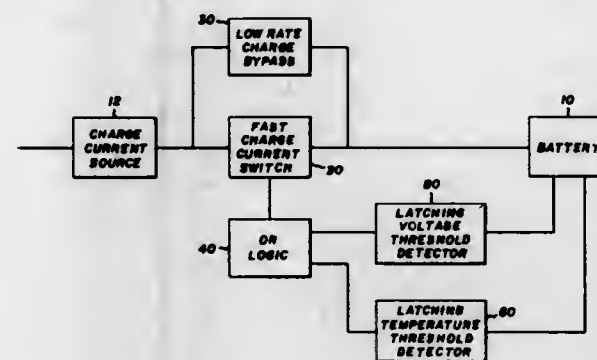
Arthur J. Catotti, John S. Hodgman, and Ferdinand H. Muller, all of Gainesville, Fla., assignors to General Electric Company, Columbus, Ohio

Filed Nov. 1, 1972, Ser. No. 302,908

Int. Cl.² H02J 7/04

U.S. Cl. 320-31

16 Claims



1. A battery charging system comprising:
- a rechargeable battery having at least one rechargeable cell;
 - a source of charging current, electrically coupled to said at least one cell, for supplying charging current to said at least one cell along a first circuit path;
 - temperature detecting means thermally coupled to said battery to monitor the temperature of said battery and to generate a signal in response thereto;
 - voltage detecting means electrically coupled to said at least one cell for sensing the voltage of said at least one cell and for providing a signal in response thereto;
 - switch means, electrically coupled in series in said path, having only two stable modes, said first mode being a conductive mode for transmitting said charge current therethrough at a substantially high uniform charging rate to said at least one cell and said second mode being a nonconductive mode for blocking the flow of said charge current therethrough;
 - control means, electrically coupled to said temperature and voltage detecting means and to said switch means, invariably responsive to a predetermined signal from either said temperature or voltage detecting means to abruptly switch said switch means from said conductive mode to said nonconductive mode, said predetermined signals from said voltage and temperature detecting means corresponding, respectively, to a voltage approximating full charge of said at least one cell and to a temperature beyond which damage to said at least one cell could occur.

4,006,398

EXCITATION SYSTEM FOR MULTI-PHASE INDUCTION GENERATOR

David James Gritter, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 15, 1975, Ser. No. 613,147

Int. Cl.² H02P 9/00

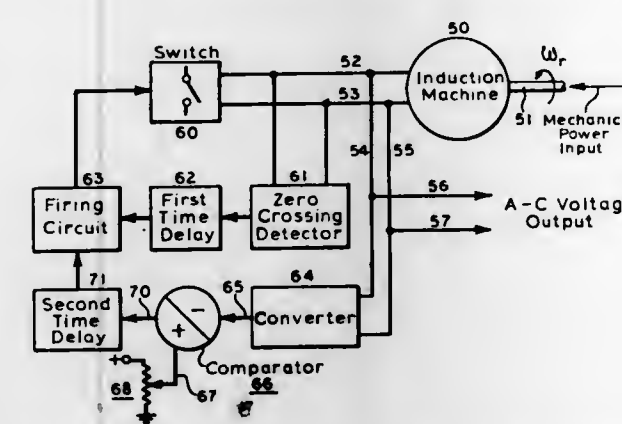
U.S. Cl. 322-47

5 Claims

1. A system for sustaining the magnetic field of a three-phase induction machine receiving input mechanical energy over a driven shaft and operating as a generator, which machine has at least three output terminals for providing an alternating output voltage, comprising:

- three power switches, respectively coupled to the induction machine output terminals for effectively shorting the machine terminals responsive to receipt of a control signal; and
- a control circuit, coupled to the three power switches, for

providing control signals to effect sequential closure of the power switches and shorting of the induction machine



terminals to transform at least some of the mechanical energy into electrical field energy.

4,006,399

INDUCTION GENERATOR EXCITATION SYSTEM

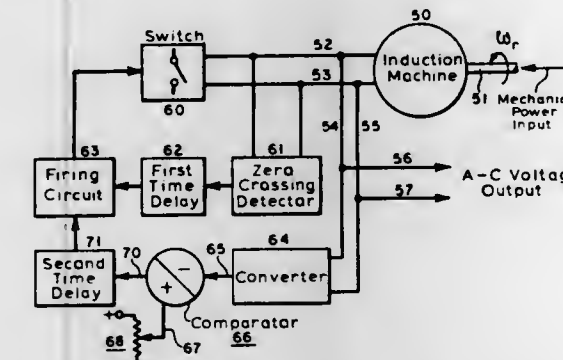
George Henry Studtmann, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 15, 1975, Ser. No. 613,148

Int. Cl.² H02P 9/00

U.S. Cl. 322-47

13 Claims



1. A system for sustaining the magnetic field of an induction machine receiving input mechanical energy and operating as a generator, which machine has a pair of output terminals for providing an a-c output voltage, comprising:

- switch means, having output connections coupled to the induction machine output terminals for effectively shorting the machine terminals responsive to receipt of a control signal; and
- a control circuit, coupled to the switch means, for providing the control signal to effect closure of the switch means and shorting of the induction machine terminals to transform some of the mechanical input energy into electrical field energy.

4,006,400

REFERENCE VOLTAGE REGULATOR

Darrell L. Fett, Scottsdale, Ariz.; David E. Fulkerson, and Marvin L. Geake, both of Minnetonka, Minn., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 26, 1975, Ser. No. 562,277

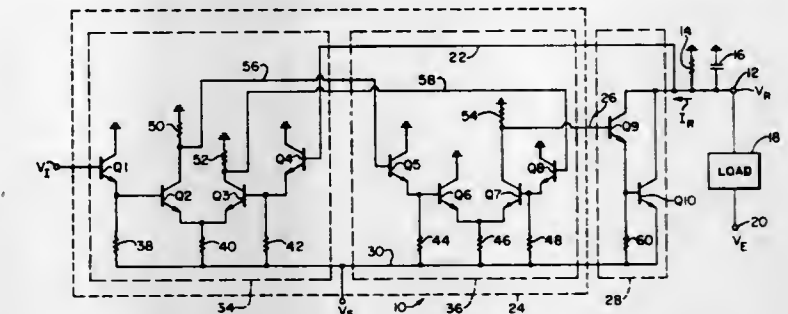
Int. Cl.² G05F 1/44

U.S. Cl. 323-19

6 Claims

1. A system for regulating voltage, said system comprising:
- means for referencing the voltage to be regulated;
 - means for comparing the referenced voltage to be regulated with a predefined voltage to be followed, said comparing means being operative to produce an error signal indicative of any difference between the compared voltages, said means for comparing voltages comprising a two stage differential amplifier, said first stage of amplification comprising:

means for receiving the input voltage conditions to said comparing means, wherein the input voltage conditions comprise the voltage to be regulated and the predefined voltage to be followed, said receiving means comprising a pair of emitter-follower transistors, each having a base connected to one of the input voltage conditions, and a pair of differentially connected transistors each of which is base-connected to a corresponding normally conductive emitter terminal of one of said pair of emitter-follower transistors within said means for receiving the input volt-



age conditions, said pair of differentially connected transistors both being conductive in response to a difference in the two voltages received by said pair of emitter-follower transistors, said pair of differentially connected transistors forming a double-ended differential output, and

means responsive to said error signal and attached to said referencing means for inducing a change in the voltage to be regulated as the same appears on said referencing means.

4,006,401

ELECTROMAGNETIC GENERATOR

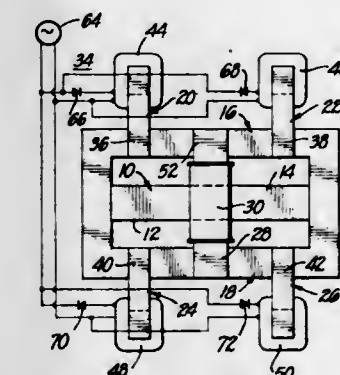
Eduardo Villasenor de Rivas, Los Angeles, Calif., assignor to Rene Villasenor de Rivas, Los Angeles, Calif.

Filed Dec. 12, 1975, Ser. No. 640,064

Int. Cl.² G05F 7/00

U.S. Cl. 323-92

4 Claims



1. An electromagnetic generator comprising:
- a permanent magnet having a north and a south pole;
 - first and second magnetic flux circuit means each including a highly permeable member between said north and south poles external to said permanent magnet;
 - first and second core members associated with each of said first and second magnetic flux circuit means and each including means for saturating a region of the highly permeable member of said associated flux circuit substantially normal to the direction of flux flow in said highly permeable member to selectively block flux flow from said magnet in said associated highly permeable member;
 - a third core member composed of a highly permeable material connected at opposite ends to said first and second magnetic flux circuit means between said first and second core members respectively;
 - a winding of electrically conductive material on said third core member for connection to an external load circuit; and

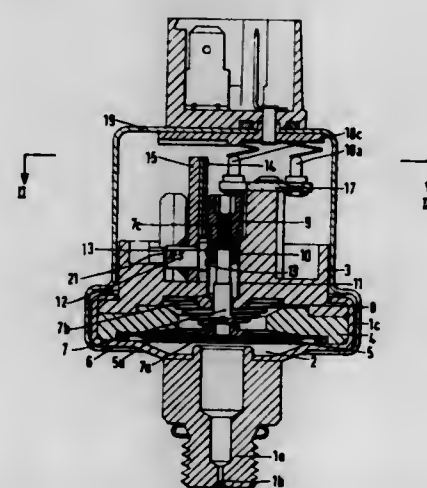
means for alternately operating said first core member and said second core member of said first and second flux circuit means respectively, and said second core member and said first core member of said first and second flux circuit means respectively whereby the direction of magnetic flux in said third core member from said permanent magnet is rapidly alternated to generate an alternating current in said winding for application to said load circuit.

4,006,402

DEVICE FOR REMOTE TRANSMITTING PRESSURE SIGNALS

Antonio Mincuzzi, Milan, Italy, assignor to Societe Internationale de Mecanique Industrielle, S.A., Luxembourg
Filed May 21, 1975, Ser. No. 579,428

Claims priority, application Italy, May 22, 1974, 23067/74
Int. Cl.² G01L 9/00; H01L 43/08
U.S. Cl. 323-94 H 14 Claims



1. In a device for remote transmitting pressure signals, of the type comprising a chamber delimited by a pressure-sensitive flexible membrane and in communication with the fluid, the pressure of which has to be measured, and a mechanical-electrical transducer in the form of a magneto-resistor immersed in a magnetic field, the flux of which varies in relation to the membrane movement, the improvement comprising in that a ferromagnetic core is mounted in an axially adjustable position on a support rod threaded on one end thereof which is axially slidable and controlled directly by the movements of said flexible membrane, a nut of non-magnetic material, screwed on to the threaded end of said support rod, said ferromagnetic core being in the form of a ring and integral with said nut, and in that at least one magnetoresistor is arranged near the travel path of said core and is immersed in a permanent magnetic field, the flux of which is influenced by the moving ferromagnetic core.

4,006,403

ENGINE PERFORMANCE ANALYZER

Dick Merlin Olsen, Pasadena; Charles H. Armstrong, and Gordon L. Brock, both of Huntington Beach, all of Calif., assignors to Clayton Manufacturing Company, El Monte, Calif.

Filed Apr. 11, 1975, Ser. No. 567,395
Int. Cl.² G01M 15/00

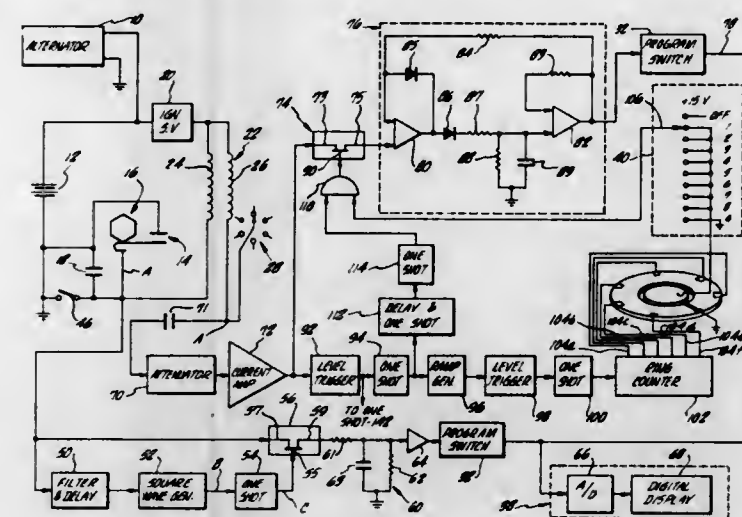
U.S. Cl. 324-15

28 Claims

1. In an apparatus for analyzing the operation of a multiple cylinder internal combustion engine having an igniter for providing an electrical discharge in each cylinder and an ignition system for supplying an ignition pulse to the igniter to cause the cylinders to fire in a given sequence, the combination which comprises:

means responsive to the occurrence of each ignition pulse for producing a spark line sampling signal for defining a sampling interval during the time interval of the sustained electrical discharge in each cylinder;

cylinder identification means coupled to the ignition system for generating a separate cylinder identification signal which corresponds with the time interval of the electrical discharge in each individual cylinder; and



means activated upon concurrence of the spark line sampling signal and a selected cylinder identification signal for providing a measure of the voltage supplied to the igniter of the selected cylinder during said sampling interval.

4,006,404

PULSED PLASMA PROBE

Edward P. Szczechewicz, Laurel, and Julian C. Holmes, Oxon Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1976, Ser. No. 653,880
Int. Cl.² G01J 1/00; G01N 27/00

U.S. Cl. 324-33

12 Claims



1. A device for plasma investigation for applying a voltage to a probe and measuring the current collected by said probe comprising:

generator means for providing a sweep voltage;
modulator means coupled to said generator means to provide a pulse-modulated voltage for application to said probe, the output of said modulator means being coupled to said probe; and
measuring means coupled to said probe to measure current collected by said probe.

4,006,405

METHOD AND APPARATUS FOR MEASURING PARAMETERS OF A CONDUCTIVE MATERIAL WHICH CAN BE USED IN INDEPENDENTLY DETERMINING THICKNESS AND CONDUCTIVITY

Ivan A. Greenwood, Stamford, Conn., and Donald S. Bayley, Bedford, N.Y., assignors to The Singer Company, Little Falls, N.J.

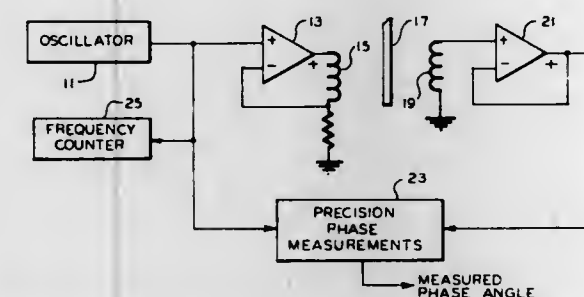
Filed Jan. 13, 1975, Ser. No. 540,624
Int. Cl.² G01R 33/12

U.S. Cl. 324-34 TK

9 Claims

1. Apparatus for measuring parameters which will permit computing at least one of the thickness and conductivity of a sheet of electrically conductive material without independent information of sheet thickness or sheet conductivity comprising:

- a transmitter coil physically located on one side of the sheet to be measured;
- means providing an alternating current drive to said transmitter coil;
- a receiver coil physically located on the opposite side of said sheet at a fixed distance from said transmitter coil;
- a preamplification means having a large input impedance, the input of said means coupled to said receiving coil;
- amplifying means having an input from said preamplifying means and providing an input to said means driving said transmitter coil;
- means for measuring the frequency of the input to said transmitter driving means, said apparatus being a closed loop system which will oscillate at a frequency determined by the phase shifts within the system;



- means in said amplifying means for introducing an additional phase shift into said loop; and
- means for selectively inserting said means for introducing an additional phase shift, whereby said system may be operated to take a first measurement with the phase shift within the system determined only by phase shifts without said additional phase shift, resulting in operation at a first frequency and may be operated with said additional phase shift in said system to operate at a different frequency whereby from said phase shifts and measured frequencies, parameters which will permit computing at least one of the thickness and conductivity of said sheet may be determined.

4,006,406

INDUCTIVELY OPERATED SENSOR FOR TESTING TECHNOLOGICAL QUANTITIES OF A FERROMAGNETIC WORK PIECE

Joachim Rodicker, Braunschweig, Germany, assignor to Volkswagenwerk AG., Wolfsburg, Germany

Continuation of Ser. No. 404,854, Oct. 10, 1973, abandoned.
This application Feb. 18, 1975, Ser. No. 550,385
Claims priority, application Germany, Oct. 26, 1973, 2252465

Int. Cl.² G01R 33/12

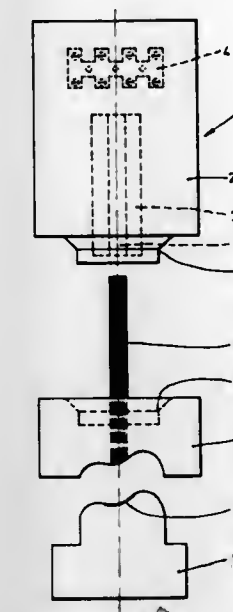
U.S. Cl. 324-34 R

9 Claims

1. An inductively operated sensor for the measurement of a property of a non-planar ferromagnetic workpiece, comprising

- a paramagnetic housing;
- a coil arrangement in said housing and including primary and secondary windings;
- a paramagnetic measuring head having a first side, and a second side which is provided with a measuring surface having a contour substantially matching the non-planar contour of a workpiece surface, a part of which is to be measured;
- a magnetic core mounted in said measuring head and having an endface which is exposed at said measuring surface for direct contact of said endface with said part of said workpiece surface when said measuring surface is placed into mating engagement with said workpiece surface, and an end portion projecting from said first side into operative association with said coil arrangement;
- cooperating coupling portions on said housing and first side

for detachably coupling said measuring head to said housing; and



electric terminals on said housing for connecting an electronic measuring device.

4,006,407

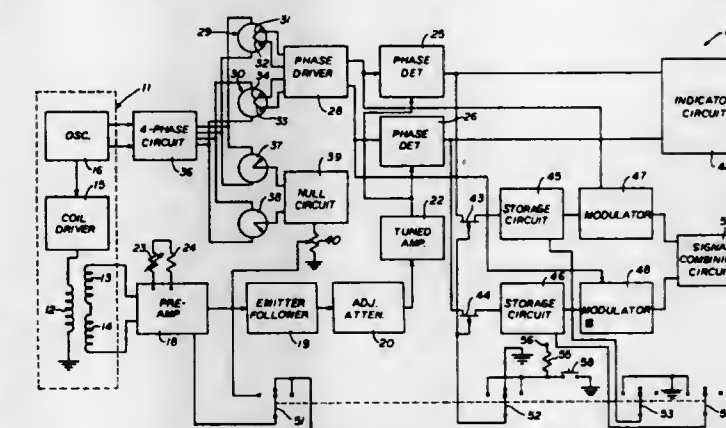
NON-DESTRUCTIVE TESTING SYSTEMS HAVING AUTOMATIC BALANCE AND SAMPLE AND HOLD OPERATIONAL MODES

John J. Flaherty, Elk Grove Village, and Eric J. Strauts, Chicago, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Mar. 10, 1975, Ser. No. 556,898
Int. Cl.² G01R 33/12

U.S. Cl. 324-40

10 Claims



1. In a non-destructive testing system comprising a probe circuit including probe means adapted to be placed in proximity to a part to develop an output signal according to characteristics of the part, indicating means, and signal processing means having input means coupled to said probe circuit to respond to said output signal thereof and having output means coupled to said indicating means, said signal processing means including circuit means responsive to at least a component of said probe circuit output signal to apply a corresponding drive signal to said indicating means, a predetermined value of said drive signal being operative to produce a reference null indication by said indicating means, said circuit means including automatic balancing means for maintaining said drive signal at an average value equal to said predetermined value irrespective of relatively slow changes in the average value of said probe circuit output signal component while allowing changes in said drive signal in response to rapid changes in said probe circuit output signal component, said circuit means further including sample and hold means including a switch manually operable between a sample position and a hold position, sample means operative in said sample position of said switch to develop a voltage corresponding to the existing value of said

ceived signal has an amplitude within the range of the two incrementally graduated reference signals connected as first inputs to the two adjacent comparators developing said difference of polarity therebetween.

4,006,413

FIELD INSTRUMENT FOR MEASUREMENT OF AC VOLTAGE FLUCTUATIONS

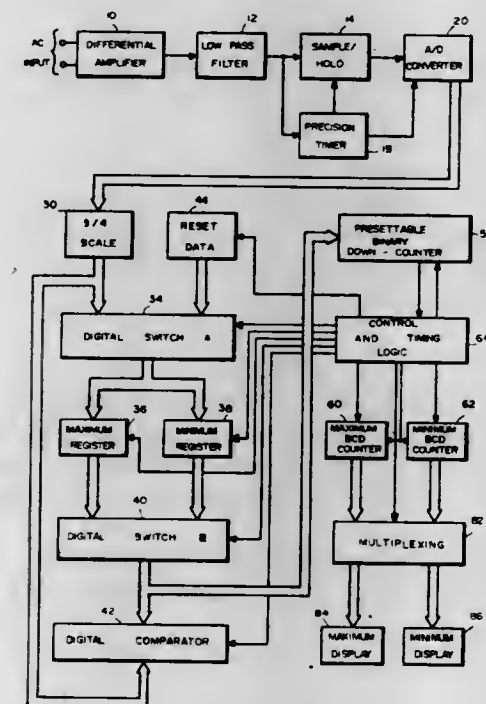
Jeffrey L. Silberberg, Baltimore, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Dec. 19, 1974, Ser. No. 534,237

Int. Cl.² G01R 19/16, 19/00

U.S. Cl. 324-103 P

9 Claims



9. A monitor for the determination and display of sag and surge voltage values of an AC power supply comprising: voltage input means for receiving an AC input signal from an AC power supply; an analog/digital converter means coupled to said input means for converting said AC input signal into a binary number; a digital comparator means coupled to said analog/digital converter for determining the sag and surge values of said AC input signal; maximum storage means coupled to said digital comparator for storing the binary number value of said surge value; minimum storage means distinct from said maximum storage means coupled to said digital comparator for storing the binary number value of said sag value; means coupled between each of said minimum and said maximum means and said comparator means, for indicating which binary number stored in the maximum storage means and said minimum storage means is to be compared with the binary number stored in said comparator; and output means coupled to said maximum storage means and to said minimum storage means for displaying sag and surge values.

4,006,414

INDICATING DEVICE

Robert Parker, Danville, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 69,399, Sept. 3, 1970, abandoned. This application Apr. 2, 1973, Ser. No. 346,877

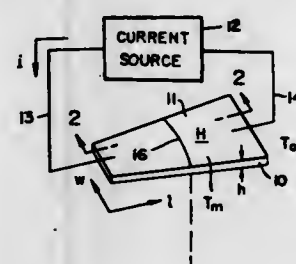
Int. Cl. G01r 31/00

U.S. Cl. 324-106

7 Claims

1. An indicating device comprising: a first thin foil-like

substrate comprising: material of low thermal and electrical conductivity having at least one tapered section; means for suspending at least a portion of said substrate in ambient gas at two ends; temperature indicating material carried by said substrate such material changing from one physical state to



another at a critical and predetermined temperature; means for coupling said substrate to a current source, said substrate having at least one temperature gradient along it wherein a sharp line of delineating appears on said indicating material between such material in its two states.

4,006,415

FAST RESET INTEGRATOR

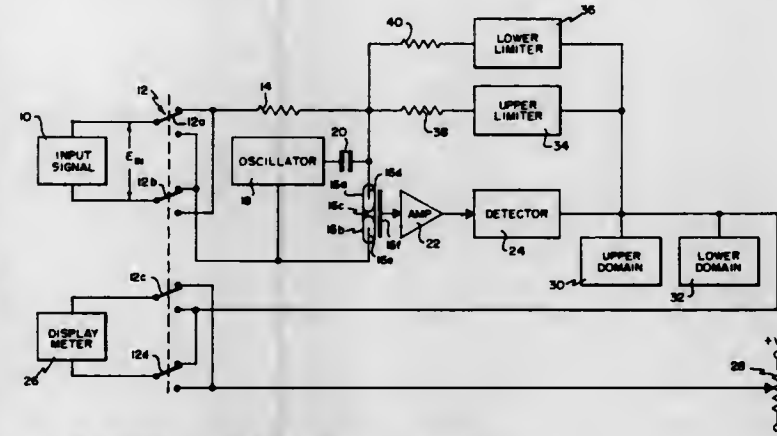
Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed May 12, 1975, Ser. No. 576,390

Int. Cl.² G04F 8/00

U.S. Cl. 324-182

17 Claims



3. A monitoring system comprising: an electrochemical integrating device for integrating an applied DC signal in a first direction in response to a signal applied thereto with a first polarity and in an opposite direction in response to a signal applied thereto with a second polarity; first switch means for coupling said DC signal to said integrating device with either said first polarity or said second polarity; means for reading the integrated value of said DC signal stored in said integrating device and producing an output DC voltage that varies in response to said integrated value; means for storing an output DC voltage read at the beginning of an integration cycle; and a display device to which are applied a first signal corresponding to the voltage stored by said output voltage storing means and a second signal corresponding to the output DC voltage from the integrating device, said display device having an output display that is a function of the difference between said first and second signals applied thereto.

4,006,416

DIGITAL COMMUNICATION SYSTEM

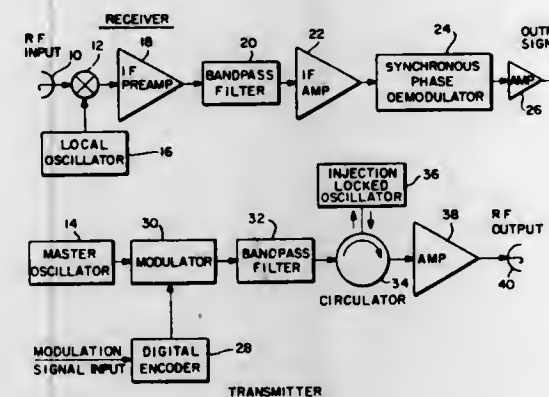
Harvey L. Pastan, Chestnut Hill, and Arthur H. Solomon, Winchester, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Jan. 31, 1975, Ser. No. 545,790

Int. Cl.² H04L 27/10, 3/00

U.S. Cl. 325-30

7 Claims



1. A digital communication system for use with an input multiple level signal having a plurality of discrete amplitude states and a time average of substantially zero amplitude, said multiple level signal being such that the signals representative of logical ones and the signals representative of logical zeros each individually have an overall zero average amplitude so that the multiple level signal has a zero average amplitude for all data conditions, the digital communication system comprising:

means for providing a carrier signal of predetermined frequency; means for providing said multiple level signal; signal modulation means operative in response to said multiple level signal and said carrier signal to provide a phase-modulated output signal directly corresponding to said multiple level signal, the phase states thereof being representative of logical ones and zeros and said phase-modulated signal being such that signals representative of logical ones and signals representative of logical zeros each individually have an overall zero average phase causing the phase-modulated signal to have a zero average phase and defining a zero reference state for all data conditions; means for transmitting said phase-modulated output signal; means for receiving said transmitted output signal; and demodulator means operative in response to only said received output signal and substantially independently of the data rate of said multiple level signal to directly reproduce said multiple level signal; said demodulator means including means employing the average zero phase of said received output signal as a baseband demodulation reference.

4,006,417

TACHOMETER

W. David Pace, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 12, 1975, Ser. No. 586,471

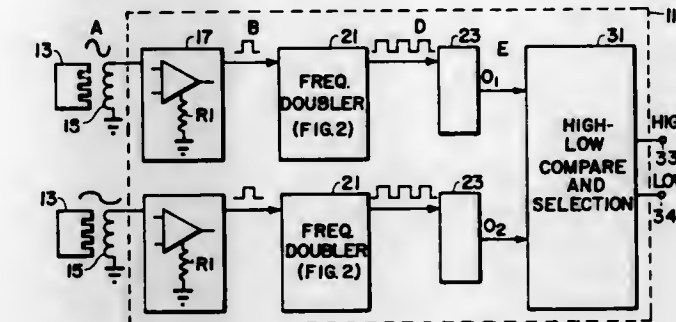
Int. Cl.² G01P 3/60, 3/48

U.S. Cl. 324-166

3 Claims

1. A tachometer for measuring and comparing the angular speed of a first and a second wheel of a vehicle, comprising: first and second means for sensing the angular speed of said first and said second wheel to generate a first and a second pulse train of varying repetition rates, said repetition rates being proportional to the angular velocity of said first and said second wheel respectively; first and second means for doubling the repetition rate of said first and said second pulse trains respectively and fixing the pulses of the frequency doubled pulse train to have same pulse width and amplitude;

means for integrating the frequency doubled first and second pulse trains respectively to generate a first and a second DC outputs which vary in amplitudes in proportion to the variation of the angular speed of said first and second wheel respectively; and



means for comparing and selecting the higher and the lower amplitudes of said first and second DC outputs and providing the higher amplitude output and the lower amplitude output separately.

4,006,418

QUATERNARY PHASE-SHIFT KEYING WITH TIME DELAYED CHANNEL

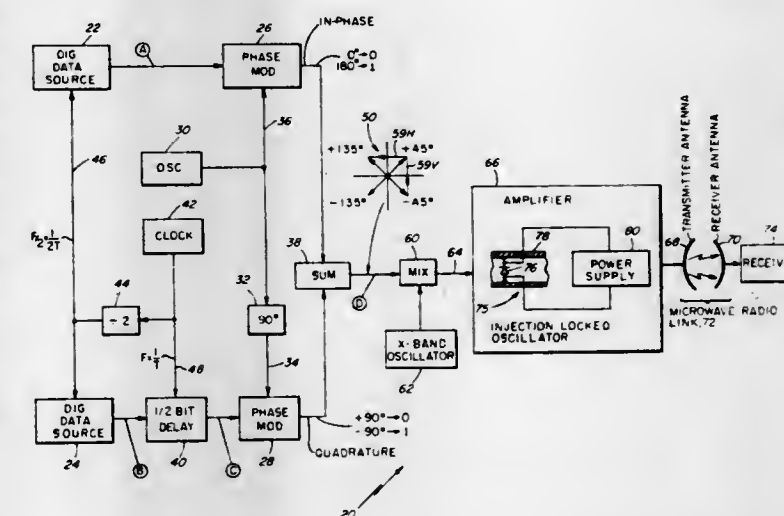
Nathan A. Liskov, Waltham; William J. Bickford, Weston, and Paul J. Tanzi, Wayland, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 14, 1975, Ser. No. 577,268

Int. Cl.² H04L 27/18

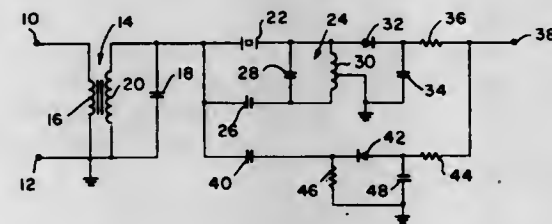
U.S. Cl. 325-163

5 Claims



1. A system for transmitting quaternary phase-modulated signals obtained from binary data signals of first and second sources thereof, the system comprising: means for delaying data of said second source relative to data of said first source by an amount equal to approximately one-half of the duration of one bit of said data; first means for phase modulating said data of said first source on a carrier signal; second means for phase modulating said delayed data on a second carrier signal having a phase quadrature relation to said first carrier signal; and means coupled to said first and said second phase modulating means for amplifying the sum of the outputs of said first and said second modulating means, said amplifying means comprising phaselocking oscillator means.

crystal filter means coupled to said input circuit means and having a predetermined voltage versus frequency characteristic including a portion wherein the voltage varies substantially linearly as a function of frequency, said crystal filter means including a crystal resonator having a series resonant frequency at a frequency higher than the frequencies corresponding to said substantially linear portion of said voltage versus frequency characteristic;



detector circuit means coupled to said crystal filter means for rectifying the output voltage from said crystal filter means; and
voltage level shifting means coupled between said input circuit means and said detector circuit means for algebraically combining the output voltage from said detector circuit means with a dc voltage such that the algebraic sum of said dc voltage and said output voltage from said detector circuit means is zero when the instantaneous frequency of said input signal is at said center frequency.

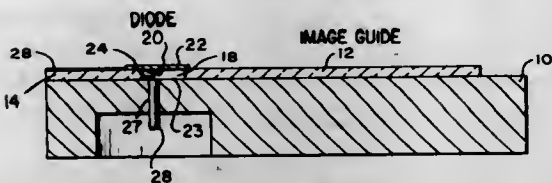
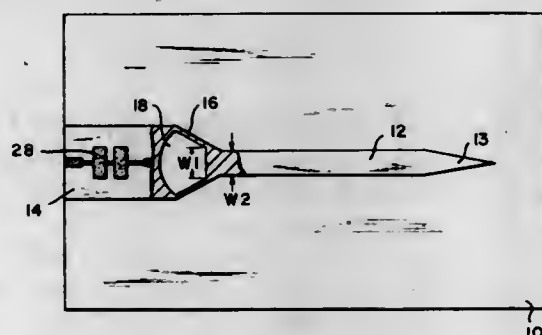
4,006,425

DIELECTRIC IMAGE GUIDE INTEGRATED MIXER/DETECTOR CIRCUIT

Yu-Wen Y. Chang, Los Alamitos; Hiromu J. Kuno, and Pei Y. Chao, both of Rancho Palos Verdes, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Mar. 22, 1976, Ser. No. 669,054
Int. Cl.² H03D 9/02; H01P 3/20

U.S. Cl. 329-160

10 Claims



6. An image integrated circuit including, in combination:
 - a. a metallic ground plane,
 - b. an image guide wave transmission section of predetermined height and width mounted on said ground plane,
 - c. an image guide transition section joined to said transmission section and having a cavity therein with an opening which is wider than the width of said transmission section, and
 - d. a diode mounted in said cavity for providing mixing or detection of microwave or millimeter wave energy received from said image guide transmission section.

4,006,426

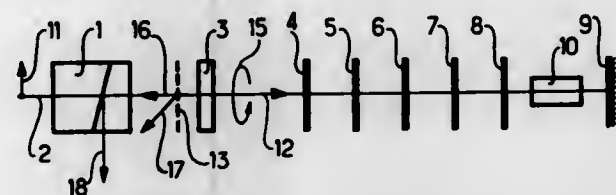
DEVICE FOR TREATING A LASER LIGHT PULSE

Bernard Lacour, Villebon-sur-Yvette, France, assignor to Compagnie Industrielle des Lasers, Marcoussis, France
Filed Dec. 1, 1975, Ser. No. 636,493

Claims priority, application France, Dec. 16, 1974, 74.41380
Int. Cl.² H01S 3/09

U.S. Cl. 330-4.3

3 Claims



1. A device for treating a laser light pulse propagating along an axis, said device comprising:
 - a polarizer centered on said axis for polarizing said light in a first plane;
 - an optical quarter wave plate centered on said axis and downstream of said polarizer for transforming the light transmitted by said polarizer into a circularly polarized light;
 - a plurality of semi-transparent mirrors centered on said axis and downstream of said optical quarter wave plate for sending a part of said circularly polarized light back to said optical quarter wave plate and to allow the other part to pass therethrough, so that after the crossing of that plate, that part of the light sent back to the plate is transformed into a light polarized in a second plane perpendicular to said first plane, said polarizer being capable of reflecting the polarized light in the second plane out of said axis; and
 - a reflector centered on said axis and downstream of said plurality of transparent mirrors for totally reflecting said light for sending back to said plurality of semi-transparent mirrors said other part of the light.

4,006,427

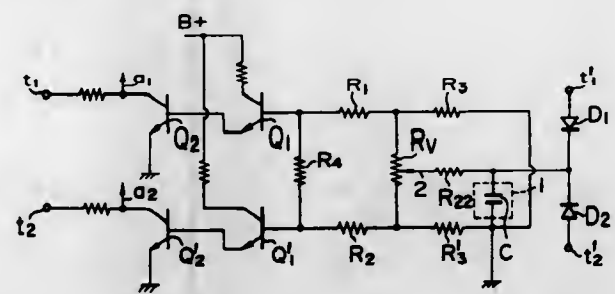
AUTOMATIC GAIN CONTROL CIRCUIT

Masao Nishikawa, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corporation, Japan
Filed Apr. 2, 1976, Ser. No. 673,045

Claims priority, application Japan, Aug. 22, 1975, 50-101802
Int. Cl.² H03G 3/30

U.S. Cl. 330-29

2 Claims



1. An automatic gain control circuit for recording systems or the like including two channels, wherein first and second variable impedance circuits each comprising at least one transistor are associated with said two channels respectively so that the gains of the respective channels can be controlled by changing the impedances of said variable impedance circuits in accordance with the base currents of said transistors, characterized in that a correcting variable resistor provided with a movable contact is connected at the opposite ends thereof to the bases of the transistors constituting said first and second variable impedance circuits respectively, said movable

contact being connected to one terminal of a control signal source the other end of which is connected to the opposite ends of said correcting variable resistor through a first shunt resistor and second shunt resistor respectively, and that a coupling resistor is connected between the bases of said transistors.

4,006,428

AMPLIFIER CIRCUIT HAVING INTEGRAL MEANS FOR DETECTING AND PREVENTING NON-LINEAR OPERATION

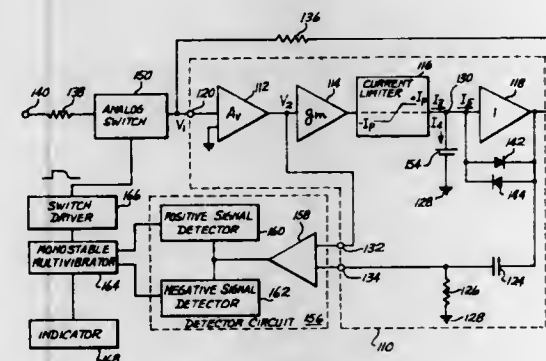
Donald G. Meyer, Mountlake Terrace, and James E. Fancher, Edmonds, both of Wash., assignors to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Jan. 8, 1976, Ser. No. 647,407

Int. Cl.² H03F 1/14

U.S. Cl. 330-51

21 Claims



1. An amplifier circuit having an input terminal for receiving electrical signals, an output terminal for supplying the signal produced by said amplifier circuit and means including first and second detection terminals operable for supplying a signal indicative of non-linear operation of said amplifier circuit comprising:

first amplification means, having an output terminal and an input terminal connected to said amplifier input terminal; means for supplying a signal to said first detection terminal that is proportional to the signal applied to said amplifier circuit input terminal;

voltage-to-current converter means for supplying a current proportional to the output signal voltage at said output terminal of said first amplification means;

current limiter means having an input terminal and responsive to the current supplied by said voltage-to-current converter means, said current limiter means having an output terminal and operable for supplying a first predetermined positive current when said current supplied by said voltage-to-current converter means is positive and of a magnitude that exceeds a predetermined value, and for supplying a second predetermined negative current when said current supplied by said voltage-to-current converter means is negative and of a magnitude that exceeds a predetermined value;

circuit means including a first capacitor, said circuit means connected between the output terminal of said current limiter means and a terminal of fixed potential;

second amplification means having an input terminal connected to said output terminal of said current limiter means, and an output terminal connected to said amplifier circuit output terminal, said second amplification means altering the current flow through said capacitor of said circuit means when said second amplification means operates nonlinearly; and

means responsive to the current flow through said first capacitor of said circuit means for supplying a signal to said second detection terminal that is proportional to said current flow through said capacitor.

4,006,429

HOMODYNE AUTOMATIC FREQUENCY CONTROL CIRCUIT

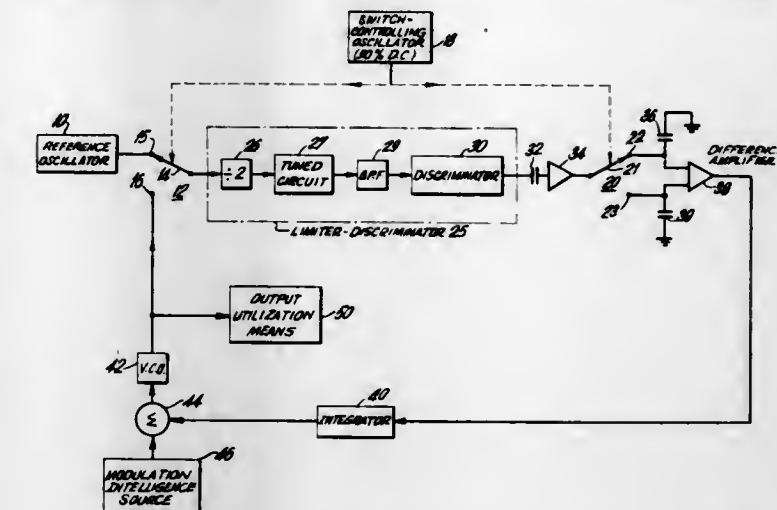
Daniel B. Talbot, Cornwell Heights, Pa., assignor to Jerrold Electronics Corporation, Horsham, Pa.

Filed Sept. 26, 1975, Ser. No. 617,143

Int. Cl.² H03B 3/10; H03C 3/00

U.S. Cl. 331-14

1 Claim



1. In combination, a reference oscillator, a controlled oscillator having an output port and a control port, a difference amplifier having first and second input ports and an output port connected to said control port of said controlled oscillator, first and second storage means connected to said first and second input terminals of said difference amplifier, frequency-to-voltage converter means, first controlled switching means for alternately connecting the input of said frequency-to-voltage converter means to said reference oscillator and to the output of said controlled oscillator, and second switching means operable in synchronization with said first switching means for alternately connecting the output of said frequency-to-voltage converter means to said first and second storage means, wherein said frequency-to-voltage converter means comprises a discriminator, and wherein said frequency-to-voltage converter means further comprises the cascaded connection of a frequency divider, tuned circuit, and band pass filter.

4,006,430

CIRCUIT ARRANGEMENT FOR CONVERTING A BRIDGE UNBALANCE INTO A FREQUENCY VARIATION

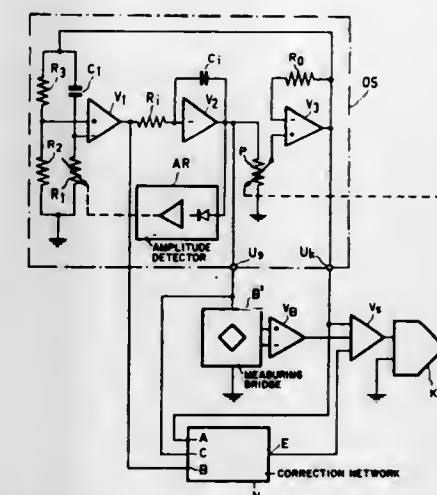
Dietrich Meyer-Ebrecht, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 8, 1975, Ser. No. 594,115

Claims priority, application Germany, July 10, 1974, 2433080
Int. Cl.² G01R 27/02; H03B 5/20

U.S. Cl. 331-65

15 Claims



1. A circuit for the conversion of an unbalance of a resistor

bridge into a frequency variation of an RC-oscillator which is proportional thereto comprising, a resistor bridge having input terminals coupled to a voltage supply terminal of the RC-oscillator, means connecting the output terminals of the bridge to the input terminals of a compensation amplifier, a first controllable resistor controlled by the output voltage of the compensation amplifier, a negative feedback operational amplifier having an input connected to the voltage supply terminal via the first controllable resistor, means connecting the first controllable resistor and the operational amplifier in circuit so as to form a part of a frequency determining network of the RC-oscillator, a further amplifier connected to the output of the operational amplifier via an all-pass network which includes three ohmic resistors and a capacitor, one of said network resistors comprising a second controllable resistor connected to a point of reference potential, means connecting the output of the further amplifier to the input of an integrator and an amplitude detector to the output of the integrator, means coupling the detector to the second controllable resistor of the all-pass network so that the detector controls the second controllable resistor in a manner such that the voltage at the output of the integrator is constant, means coupling the output of the integrator to said voltage supply terminal, at least one differentiation circuit and one integration circuit coupled to the oscillator, means coupling a compensation voltage developed at the output of the negative feedback operational amplifier to the input of the compensation amplifier, and means coupling the output voltages of the differentiation and integration circuits to the input of the compensation amplifier so as to be superimposed on the compensation voltage.

4,006,431

OPTICAL MOLECULAR AMPLIFIER

Dieter Rös, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

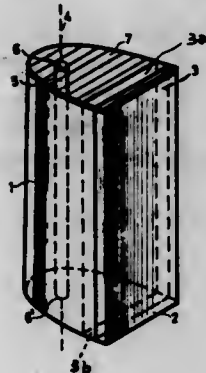
Continuation of Ser. No. 315,548, Dec. 15, 1972, abandoned, which is a continuation of Ser. No. 162,707, July 14, 1971, abandoned, which is a continuation of Ser. No. 806,043, March 7, 1969, abandoned, which is a continuation of Ser. No. 329,462, Dec. 10, 1963, abandoned. This application Oct. 12, 1973, Ser. No. 405,789

Claims priority, application Germany, Dec. 14, 1962, 82866

Int. Cl.² H01S 3/092

U.S. Cl. 331—94.5 P

1 Claim



1. A molecular amplifier comprising a body of optically stimutable material, a source of pumping light, a reflector device for concentrating the pumping light onto said body, said device having an open hollow mirror of a non-circular cross-section defining a main axis and a focal locus spaced on said axis inwardly from the opening of the mirror, said source being situated in the hollow of said mirror near said focal locus, said body being situated at a plane axially spaced from said focal locus and extending substantially perpendicularly to said axis and comprising a planar plate sealing the opening of the hollow mirror and reflecting on its outside surface, said light source and said body being in positions at which substantially all available light energy from said light source is sup-

plied to said body, and said device having a planar mirror covering the opening of said hollow mirror and extending substantially in a plane perpendicular to said axis, and output means coupled to said body for deriving energy therefrom.

4,006,432

INTEGRATED GRATING OUTPUT COUPLER IN DIODE LASERS

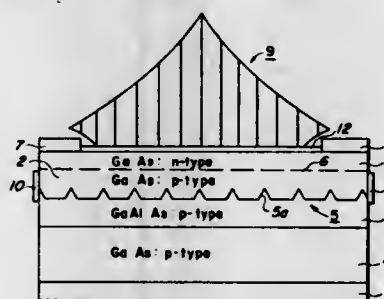
William Streifer, Palo Alto; Donald R. Scifres, Los Altos, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1974, Ser. No. 515,120

Int. Cl.² H01S 3/19, 3/081

U.S. Cl. 331—94.5 C

2 Claims



2. An electrically pumped, distributed feedback laser comprising:

a semiconductor body including a plurality of layers, pairs of said layers providing a plurality of junctions, one of said junctions being a rectifying junction, carriers injected under forward bias across said junction undergoing radiative recombination in one of said layers to generate stimulated coherent radiation,

one of said junctions being a non-planar heterojunction, said heterojunction providing a periodic perturbation of refractive index therealong, said perturbation interacting with at least a portion of said radiation to cause said radiation to be reflected by said periodic perturbation, said perturbation having a period equal to an integer number of wavelengths of said coherent radiation such that said reflected radiation is in phase and a portion of said coherent light exits said laser body at an angle to the plane of said rectifying junction, and

substantially 100% light reflecting means on sides of said active region layer perpendicular to said rectifying junction and non-light reflecting means on a surface of said body parallel to said rectifying junction.

4,006,433

BIAS/ERASE OSCILLATOR

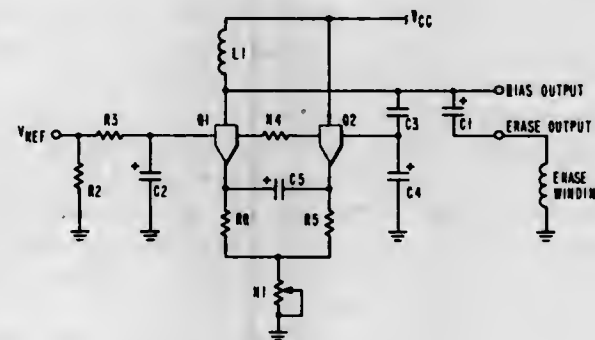
Alan Frank Higginbotham, and Kenneth Layton Jeffries, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,576

Int. Cl.² H03B 5/12

U.S. Cl. 331—117 R

5 Claims



1. An oscillator for providing low distortion sinusoidal sig-

nals for bias and erase in a battery operated magnetic recording apparatus, said oscillator comprising:

- a tank means for determining oscillation frequency, said tank means including an inductance comprising an erase winding, and a capacitive voltage divider comprising a combination of first and second capacitors connected in series with said inductance, said tank means having an output derived from between said first and second capacitors; and
- a differential pair of first and second transistors with said output of said tank means connected to the base of said first transistor, and an input to said tank means connected to the collector of said second transistor from between said first and second capacitors, and said inductance.

4,006,434

MICROSTRIP CIRCULATOR OPERATING IN THE PERIPHERAL MODE AND HAVING NON-UNIFORM BIASING MEANS

Pietro De Santis, and Floravante Pucci, both of Rome, Italy, assignors to Selenia-Industria Elettroniche Associate S.p.A., Rome, Italy

Continuation of Ser. No. 438,364, Jan. 31, 1974, abandoned.

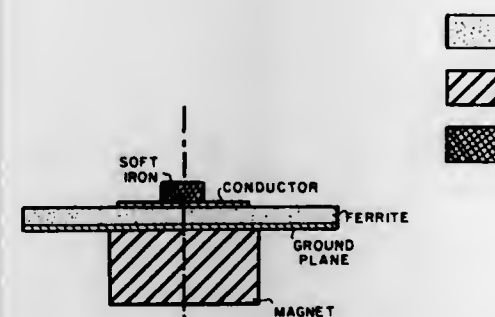
This application June 9, 1975, Ser. No. 585,189

Claims priority, application Italy, Jan. 31, 1973, 48000/73

Int. Cl.² H01P 1/38

U.S. Cl. 333—1.1

3 Claims



1. A micro-wave multigate planar circulator coordinating the TEM (Transverse Electro-Magnetic) and the peripheral modes of wave propagation, comprising:

- a member of ferro-magnetic material of substantially planar configuration and having a spatially non-uniform distribution of effective permeability;
- a micro-strip conductor disposed on one side of said member, and formed of a layer of conducting material and having the configuration of a central body and at least three tapered arms extending from said body for connection to external transmission lines;
- a ground planar conductor disposed on the opposite side of said member; and
- means for producing non-uniform magnetic biasing disposed on one side of said ground planar conductor for effecting said spatially non-uniform distribution of effective permeability of said member and producing magnetic tapering zones in said body and extending arms.

4,006,435

METHOD FOR FABRICATING A TEMPERATURE COMPENSATED SURFACE WAVE DEVICE

Sheldon J. Kerbel, Merrick, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Division of Ser. No. 535,890, Dec. 23, 1974. This application

Feb. 9, 1976, Ser. No. 656,476

Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/18

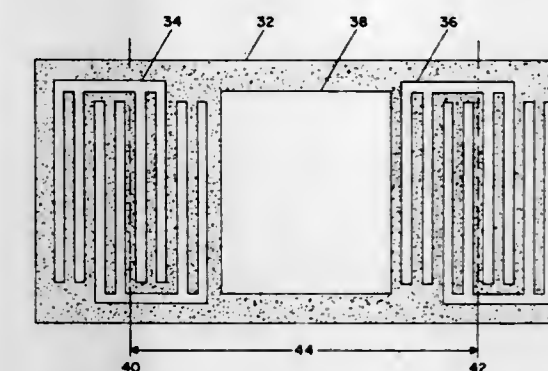
U.S. Cl. 333—30 R

1 Claim

1. A method for fabricating an acoustic surface wave device having an acceptable coefficient of propagation delay over a desired range of operating temperatures using a piezoelectric substrate which exhibits a substantial variation of propagation delay with temperature over said desired range, comprising:

depositing on said substrate transducer means, responsive to applied electric signals, for causing acoustic surface wave to propagate along a predetermined path on said substrate;

depositing on said substrate a conductive material having a selected thickness and selected area and disposed at least



partially in said predetermined path, for causing the temperature at which a zero temperature coefficient of propagation delay occurs to shift toward the center of said desired range of temperatures, whereby the resulting acoustic surface wave device has substantially less variation of propagation delay with temperature over said range than said substrate alone.

4,006,436

SURFACE ACOUSTIC WAVE DELAY LINES

John Stuart Heeks, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

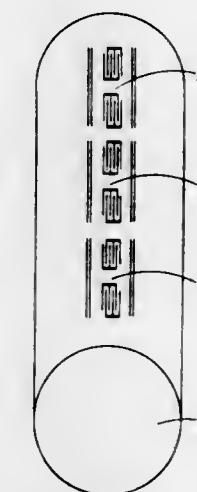
Filed Mar. 26, 1976, Ser. No. 670,926

Claims priority, application United Kingdom, May 20, 1975, 21462/75

Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/10

U.S. Cl. 333—30 R

12 Claims



1. A surface acoustic wave delay line comprising:

- a cylindrical body of piezoelectric material;
- a pair of separate input and output transducers arranged on the surface of said cylindrical body and adjacent one another on a straight line parallel to the cylindrical axis, said transducers being so oriented that the propagation paths associated therewith are normal to said straight line; and
- two directional coupler devices each having a predetermined coupling coefficient located on either side of said pair of transducers so as to provide mutual coupling between acoustic waves in both propagation paths associated with said transducers.

4,006,437

FREQUENCY FILTER

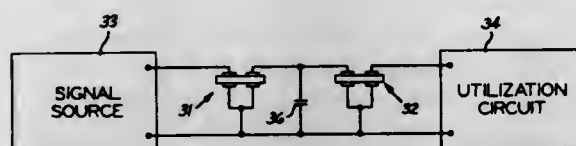
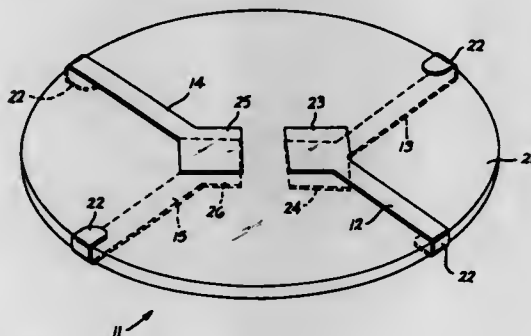
Harold A. Simpson, North Andover, Mass., and Edwin C. Thompson, West Epping, N.H., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, Inc., New York, N.Y.

Filed June 27, 1975, Ser. No. 590,901

Int. Cl.² H03H 7/08, 9/02

U.S. Cl. 333-72

3 Claims



1. A frequency band-pass filter which comprises: at least two electromechanical crystal devices having metallic electrodes formed on opposite sides of separate crystal wafers, said crystal devices being capacitively coupled in cascade relationship;
- at least two of said electromechanical crystal devices being formed on respective ones of the crystal wafers of different thicknesses so that said crystal devices have fundamental frequency bands which are different from one another; and
- each of said electromechanical crystal devices having one overtone frequency band that is coincident with one overtone frequency band of each of the other electromechanical crystal devices so that said crystal devices pass only the coincident overtone frequency band while suppressing all other frequencies.

4,006,438

ELECTRO-ACOUSTIC SURFACE-WAVE FILTER DEVICE

Glenn Edward Bennett, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 18, 1975, Ser. No. 605,584

Int. Cl.² H03H 9/04, 9/26, 9/32; H01L 41/10

U.S. Cl. 333-72

15 Claims



1. A transducer for an electro-acoustic surface-wave device, said transducer having center frequency f_c , and a frequency domain spectral response, $H(f)$, which has a time domain impulse response, $h(t)$, including:
 - a. a central group of interdigitated fingers, taken separately producing a central pulse having a Fourier transform with

- maximum near f_c and a frequency bandwidth B between the two null response points closest to f_c ; and
- b. a first pair of flanking finger groups producing pulses spaced approximately $1.5/B$ from the center of said central pulse, the energy in each pulse of said pairs of flanking pulses being a predetermined fraction less than one of the energy in said central pulse.

4,006,439

CIRCUIT INTERRUPTER HAVING AN INSULATED BRIDGING CONTACT

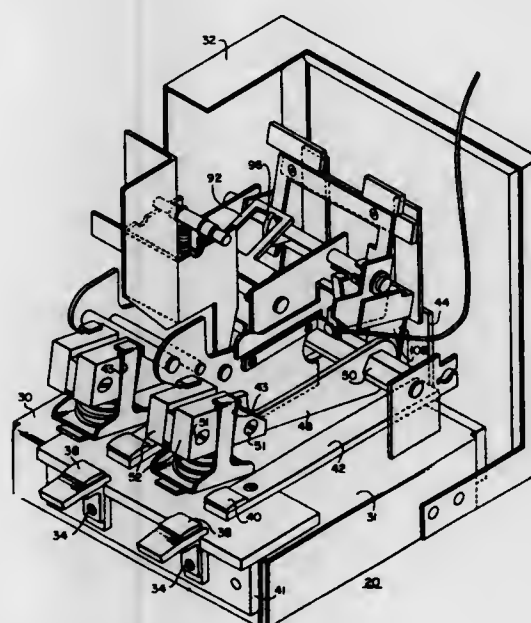
Raymond E. Wien, Penn Township; Eugene H. Seldling, Monroeville, and Nicholas A. Tomasic, Plum Boro, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1975, Ser. No. 612,608

Int. Cl.² H01H 83/00

U.S. Cl. 335-15

15 Claims



1. A circuit interrupter comprising:
 - a first stationary contact;
 - a second stationary contact separated from said first stationary contact;
 - bridging contact means;
 - an elongated contact arm, having said bridging contact means connected thereto, pivotal about an axis between a closed position wherein said bridging contact means completes an electric circuit between said first stationary contact and said second stationary contact and an open position wherein said bridging contact means is spaced apart from said first stationary contact and said second stationary contact;
 - insulating means connected to the free end of said elongated contact arm disposed between said elongated contact arm and said bridging contact means to support said bridging contact means in an insulating relationship from said elongated contact arm;
 - primary latch means connected to said elongated contact arm having a latching position latching said elongated contact arm in the closed position;
 - a secondary latch having a latched position keeping said primary latch means in the latching position; and,
 - bimetal actuating means responsive to current flow for unlatching said secondary latch when current flow through the circuit interrupter exceeds a trip level for a predetermined period of time whereby said primary latch is released and said elongated contact arm can move to the open position.

4,006,440

TERMINAL STRUCTURE FOR ELECTROMAGNETIC CONTACTOR

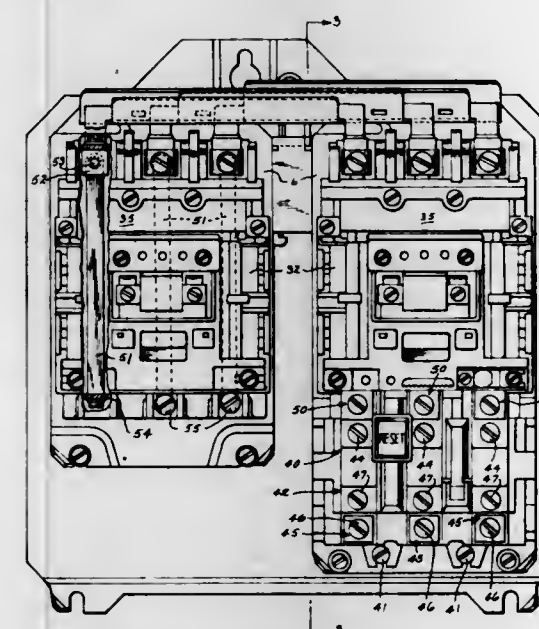
Lawrence A. Burton, Oconomowoc; Peter Heuser, Hales Corners; Marquis B. Robinson, Milwaukee; Dennis Trendel, Mukwonago, and Donald V. Zunft, Greendale, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed July 21, 1975, Ser. No. 597,555

Int. Cl.² H01H 50/04

U.S. Cl. 335-132

2 Claims



1. In an electrical switch having a base which slidably supports an actuator for motion along a vertical axis, an electromagnet mounted to the base and being operable to slide the actuator upward along said axis when energized, a set of movable contacts mounted to said actuator, and two sets of stationary contacts mounted to said base within a contact enclosure which is disposed above said electromagnet, the improvement therein comprising:
 - a set of contactor input terminals mounted to said contact enclosure and electrically connected to one of said sets of stationary contacts;
 - a first set of contactor output terminals mounted to said contact enclosure and electrically connected to the other set of stationary contacts;
 - a second set of contactor output terminals mounted to said base and disposed beneath said electromagnet;
 - a set of bus bars mounted to said base and electrically connected to said second set of stationary contacts and said other set of contactor output terminals, said bus bars extending downward from their connection with said stationary contacts behind said electromagnet; and
 - a set of overload relays mounted beneath the base and connected directly to said second set of contactor output terminals.

4,006,441

PEDAL-OPERATED VOLUME CONTROL

Philip C. Goodrich, 12571 Lincoln St., Grand Haven, Mich. 49417

Filed Dec. 24, 1975, Ser. No. 644,181

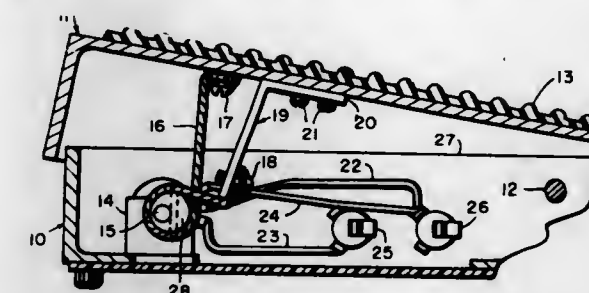
Int. Cl.² H01C 10/00

U.S. Cl. 338-153

4 Claims

1. A controller for an electrical circuit, said controller including a frame, an actuator moveably mounted on said frame, rotary potentiometer means having a control shaft and secured to said frame, and cable means operably associating said actuator and said potentiometer whereby movement of said actuator induces rotation of said potentiometer shaft, wherein the improvement comprises:
 - a sheave means secured to said control shaft, said sheave means having a hole receiving said control shaft, and

having a peripheral cable-receiving surface disposed at a varying radius from the axis of said hole providing a



gradient to the rate of rotation of said shaft with respect to the movement of said actuator.

4,006,442

ELECTRONIC TUNING ELEMENT ASSEMBLY

Yasunori Mega, Wakuya, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

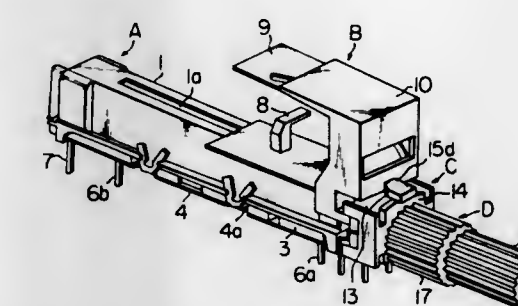
Filed Sept. 11, 1975, Ser. No. 612,496

Claims priority, application Japan, Sept. 17, 1974, 49-111887

Int. Cl.² H01C 10/50

U.S. Cl. 338-180

10 Claims



1. An electronic tuning element assembly comprising, in combination:
 - a variable tuning resistor having a straight resistance element with contacts at the ends thereof, a slider linearly movable along the resistance element and a threaded shaft screwably extending through the slider so that rotation of the shaft causes linear movement of the slider, a flexible ribbon connected at one end to the slider and a guide member, the ribbon slidably extending through the guide member; and
 - a rotary tuning band switch detachably fixed to the guide member, the shaft extending through the switch coaxially therewith, the switch having a rotary control member, a movable contact fixed for rotation with the rotary control member and a plurality of fixed contacts with which the movable contact is engageable.

4,006,443

COMPOSITION RESISTOR WITH AN INTEGRAL THERMAL FUSE

Allan V. Kouchich, Milwaukee, and Robert Marshall, Mequon, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 11, 1975, Ser. No. 612,313

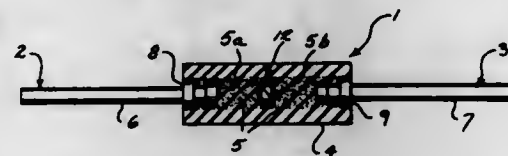
Int. Cl.² H01C 13/00

U.S. Cl. 338-215

15 Claims

1. In a resistor having a sleeve made of an electrically insulating material which is filled with a carbon composition resistance material and having a pair of terminal electrodes disposed at its ends to provide a conductive path therebetween through the resistance material, the improvement therein comprising a thermal fuse insert which is disposed within said sleeve and within the conductive path formed by said resistance material, said thermal fuse insert including: a substrate made of an electrically insulating material; a pair of electrodes

disposed on opposite sides of said substrate; a through path formed in said substrate between said electrodes; and a fuse link disposed within said through path and electrically connected to said electrodes to provide electrical continuity



therebetween at normal operating temperatures, said fuse link being responsive to the heat generated by the resistance material when current flows therethrough to open circuit when a predetermined temperature is reached.

4,006,444

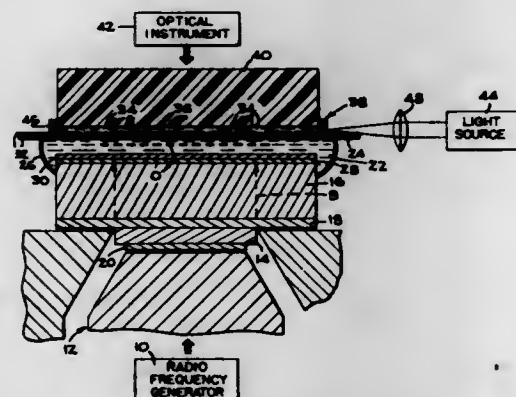
ACOUSTIC IMAGING APPARATUS

Calvin F. Quate, Los Altos Hill, and James A. Cunningham, Redondo Beach, both of Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Feb. 12, 1974, Ser. No. 441,802

Int. Cl.² H04B 11/00

U.S. Cl. 340-15



1. Acoustic imaging apparatus which comprises means for generating an acoustic wave beam along a predetermined path, means supporting an object to be imaged in said acoustic beam path, a plurality of visible particles suspended throughout a fluid medium for displacement in the beam path beyond the object in proportion to the intensity of radiation pressure resultant from the acoustic energy, said particles being suspended in a thin layer of liquid disposed between enclosing layers of material whose optical indices of refraction are less than that of the suspending liquid, to define an optical waveguide and means for directing light through said liquid layer between said enclosing material layers, whereby essentially only light reflected from said particles will form an optical image of said object.

4,006,445

APPARATUS FOR AND METHODS OF SEISMIC PROSPECTING

Mark Ian Howell, Bristol, England, assignor to Electrolocation Limited, Bristol, England

Filed Nov. 3, 1975, Ser. No. 628,429

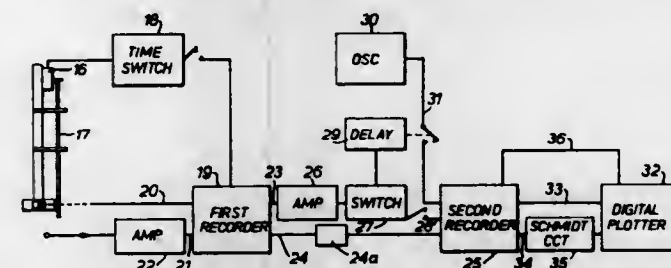
Int. Cl.² G01V 1/26

U.S. Cl. 340-15.5 TC

16 Claims

1. A method of seismic prospecting wherein the subterranean response from a single generated impulse is recorded into two channels the first channel providing datum information, i.e., a signal corresponding to said impulse, and the

second channel providing signals corresponding to reflections of said impulse, wherein the played back second channel signals are re-recorded in a continuation of the second channel, and the played back impulse signal from the first channel is used to initiate said re-recording and switch into a continuation of the first channel a continuous tone which is recorded as



a tone burst simultaneously with the re-recording of the second channel signals, and wherein the re-recorded second channel signals are played back with the tone burst and visual tracings are made from the played back re-recorded second channel signals over the period of said burst, each play back being made at an equal or slower speed than the associated recording.

4,006,446

RAPCON-CONTROL TOWER COORDINATION SYSTEM

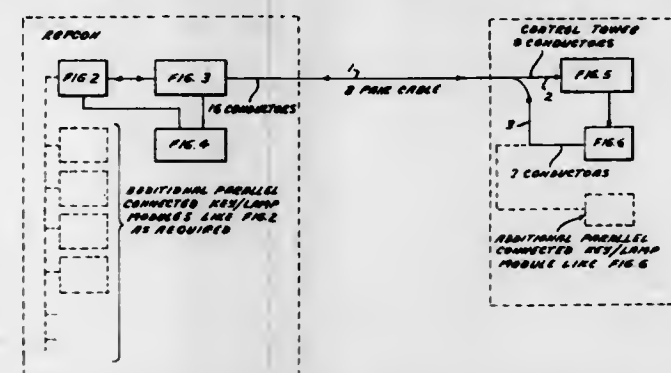
James K. White, Wilmington, Del., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,526

Int. Cl.² G08G 1/12; G08B 25/00

U.S. Cl. 340-23

6 Claims



1. A system for communication between the RAPCON and the control tower at an airport based on visual indications, said system comprising: a transmission link between the RAPCON and the control tower; like keyboards at the RAPCON and the control tower, each keyboard having like primary and secondary rows of three illuminable keys color coded C₁, C₂, and C₃, C₃ being the color of the central key; means responsive to the actuation of any primary or secondary key at the RAPCON to produce a flashing illumination of that key and the corresponding key at the control tower; means responsive to actuation of the said corresponding key at the control tower to steady the illumination of both keys; means operative during flashing or steady illumination of said keys to prevent cancellation of the illumination by further actuation of said corresponding key at the control tower; means responsive to the reactivation of any illuminated key at the RAPCON to cancel the illumination of that key and the corresponding key at the control tower; means responsive to actuation of a primary or secondary key of color C₂ at the RAPCON to cancel the illumination of the primary key of color C₁ at both the RAPCON and the control tower; means responsive to the actuation of the primary or secondary key of color C₃ at the RAPCON to cancel the illumination of the primary key of color C₂ at both the RAPCON and the control tower; and means responsive to cancellation of the illumination of any primary key to transfer the illumination status of the secondary key of the same color to the primary key.

4,006,447

AUDIBILITY-CONTROL SYSTEM FOR RADIO RECEIVER

Jean-Raymond Narbaitz-Jaureguy, and Henri Billottet, both of Paris, France, assignors to Thomson-CSF, Paris, France

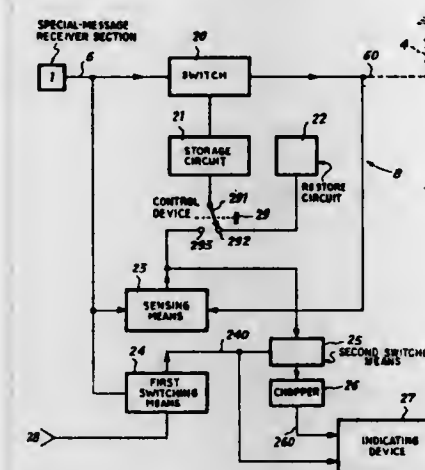
Filed June 12, 1974, Ser. No. 478,681

Claims priority, application France, June 14, 1973, 73.21705

Int. Cl.² G08G 1/00

U.S. Cl. 340-33

19 Claims



1. In a radio receiver having a first section for picking up special messages and a second section for picking up a normal radio program, electroacoustic transducer means for audibly reproducing information represented by incoming electromagnetic signals, and changeover means with a first position and a second position for connecting said transducer means to said first and said second section, respectively, the combination therewith of sensing means connected to said first section for detecting the presence of incoming special message signals, and indicator means independent of said transducer means controlled by said sensing means and by said changeover means for revealing the arrival of said special message signals in said second position of said changeover means.

4,006,448

CENTRALIZED MONITOR SYSTEM FOR MOTOR VEHICLES

Hiroshi Aral, and Jun Ohta, both of Akhi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

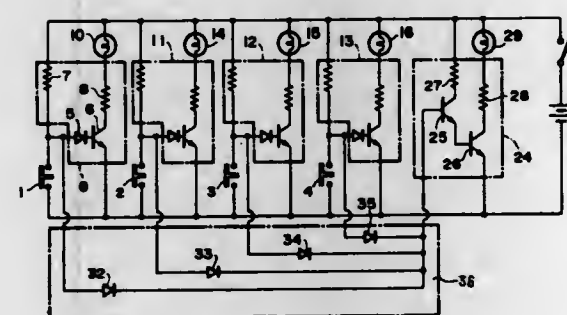
Filed May 19, 1975, Ser. No. 578,964

Claims priority, application Japan, Jan. 14, 1975, 50-6592

Int. Cl.² B60Q 1/00

U.S. Cl. 340-52 F

8 Claims



1. A centralized monitor system for motor vehicles comprising a plurality of sensors which are applied respectively to a plurality of vehicle components for individually monitoring the operating conditions of said plurality of vehicle components respectively, each of said sensors being operative to assume a first operating state when its associated vehicle component is in a predetermined normal operating condition and being operative to assume a second operating state when the operating condition of said component departs from said predetermined normal operating condition, a plurality of indicators one for each of said components being monitored, a plurality of switching circuits

each of which has an input that is connected to a respective one of said plurality of sensors and an output that is connected to a respective one of said plurality of component indicators, a power source connected to each of said plurality of interconnected switching circuits and component indicators for energizing a selected one of said component indicators through its associated switching circuit when the sensor connected to said associated switching circuit assumes its second operating state, a further indicator adapted to be energized independently of said component indicators for providing a general warning indicative of the fact that at least one of said vehicle components has departed from its normal operating condition, a further switching circuit for selectively connecting said further indicator to said power source, and control means for controlling the operating state of said further switching circuit thereby to control the energization of said further indicator, said control means comprising an OR circuit having a plurality of input terminals and a single output terminal, said single output terminal being connected to said further switching circuit, and said plurality of input terminals being connected respectively to said plurality of sensors at the input sides of said plurality of switching circuits whereby the signal state at each of said input terminals and at said single output terminal is directly dependent upon the operating state of each sensor connected to each of said input terminals and is independent of the operating conditions of any of the plurality of interconnected switching circuits and component indicators respectively associated with said sensors.

4,006,449

INFORMATION DETECTOR FOR A TIRE WHEEL

Momoki Sumi, Tokyo, Japan, assignor to Momoki Sumi, Tokyo and Shunichi Hishikawa, Kobe, both of, Japan

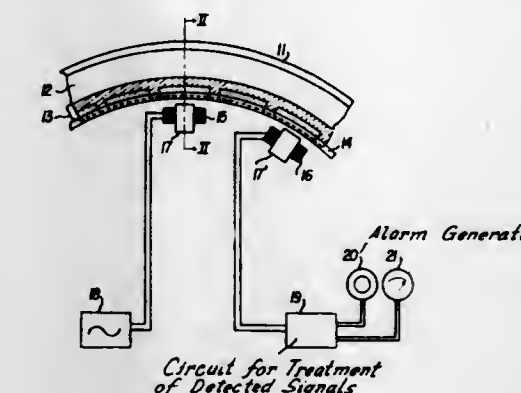
Filed July 8, 1975, Ser. No. 594,050

Claims priority, application Japan, July 12, 1974, 49-82455[U]

Int. Cl.² B60C 23/02

U.S. Cl. 340-58

12 Claims



1. An information detector for a tire wheel comprising: at least one coil mounted for rotation and being coiled about the circumference of the wheel, said coil being formed by parallel portions in a conductor which are doubled back so that said parallel portions are adjacent one another but are separated by a uniform space extending about the circumference of the wheel, said parallel portions on opposite sides of said space normally conducting in opposite directions; a detection means connected to said coil for rotation and arranged to vary electric conductivity of said coil for rotation in accordance with a parameter of the wheel; two fixed separate coils opposed in a gap to the parallel portions of said coil for rotation, the first of which is for electromagnetic coupling a signal to the coil for rotation and the second of which is for detecting the signal via electromagnetic coupling, with said coil for rotation, said fixed separate coils being positioned in close relation to said parallel portions and oriented such that their axes extend substantially through said uniform space; an oscillator arranged to supply said signals connected to

the first fixed coil; and an indicating means having a circuit connected to the second fixed coil for treatment of the signal detected by said second fixed coil.

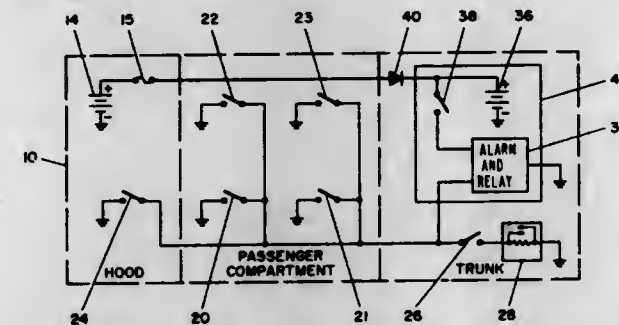
4,006,450

VEHICLE BURGLAR ALARM WITH INTERIOR CONTROL SWITCH

Gerd Ofenleger, Pleasant Acres, East Waterboro, Maine 04030
Filed Oct. 8, 1974, Ser. No. 513,103
Int. Cl.² B60R 25/10

U.S. Cl. 340-63

8 Claims



1. A vehicle burglar alarm system, usable in a vehicle having a passenger compartment and at least one non-passenger compartment, comprising:

- an alarm circuit, comprising:
 - alarm means, responsive to an applied electrical voltage, for signalling an alarm;
 - means for supplying said electrical voltage;
 - first switching means, responsive to the opening of said passenger compartment, for applying said electrical voltage to said alarm signalling means; and
 - second switching means, closed in response to the opening of said non-passenger compartment, for applying said electrical voltage to said alarm signalling means when closed;
- control switching means located in said non-passenger compartment, for selectively opening or closing said alarm circuit;
- and a single time delay for delaying application of said electrical voltage to said alarm means for a selected time after closing of said control switching means when said second switching means is closed, and also for delaying application of said electrical voltage to said alarm means for a selected time after closing of said second switching means when said control switching means is closed.

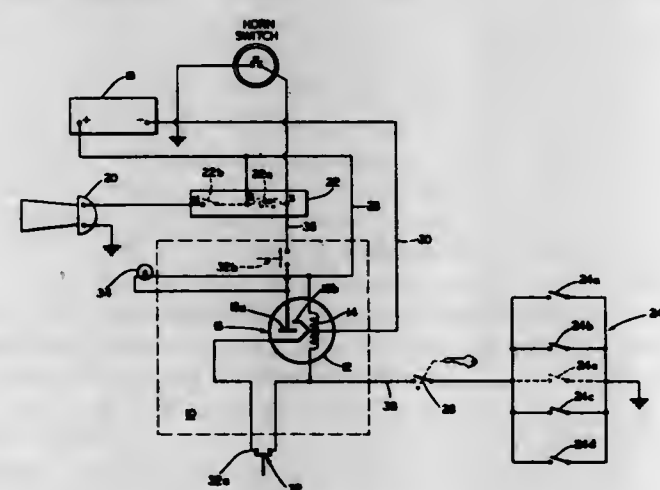
4,006,451

MODULAR ALARM CIRCUIT

Humberto Noble, 5875 Castle Lake, San Antonio, Tex. 78218
Filed Oct. 3, 1974, Ser. No. 511,527
Int. Cl.² B60R 25/10; G08B 13/08

U.S. Cl. 340-63

5 Claims



1. An alarm circuit responsive to unauthorized entry into an automobile, said automobile including a battery and horn means powered by said battery, and normally open switch means responsive to entry of said vehicle, said switch means

being mounted to be responsive to an opening of an access member of the automobile, comprising:

- a thermostatic relay including an electrical heating element and a set of normally open thermally responsive contacts, said contacts closing in a first period of time in response to heat generated by said heating element when said element is electrically energized, said contacts having sufficient thermal retention to remain closed for a second period of time greater than said first period of time after said element is de-energized;
- a first electrical circuit including, in series, said battery, said switch means and said heating element, closing of said switch means causing a current flow from said battery through said heating element for heating said element;
- a second circuit including, in series, said battery, said thermally responsive contacts and said horn means;
- a key operated switch mounted to the exterior of said automobile and connected in series to said switch means in said second electrical circuit; and
- dashboard mounted, auxiliary, manually activated push-button switch means bypassing said entry responsive switch means and said key operated switch for electrically energizing said heating element.

4,006,452

ELECTRICAL ALARM DEVICE FOR MOTORCYCLES

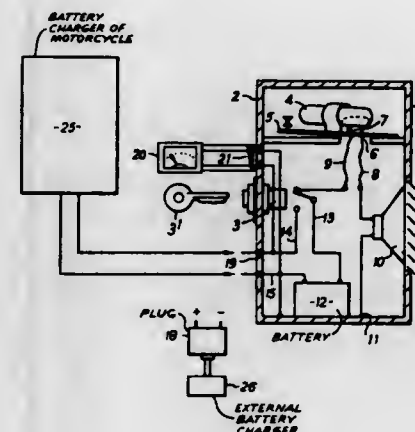
Pierre Giacino, 91 Boulevard Longchamps, Marseille 1, France
Filed Oct. 7, 1974, Ser. No. 512,508

Claims priority, application France, Oct. 12, 1973, 73.36966

Int. Cl.² B60R 25/10

U.S. Cl. 340-65

3 Claims



1. An electrical alarm device for motorcycles which comprises:

- a casing for mounting integrally on a motorcycle
- a key-operable switch mounted in the wall of said casing for operation by a key from the exterior, said key-operable switch having a first operable state and a second alternative operable state
- a mercury tilt switch mounted in said casing and positioned for non-completion of its circuit when the casing is tilted, and for completion of its circuit when the casing is upright,
- an electric battery disposed in said casing,
- an electrically operable alarm in said casing,
- a two-pole current outlet in the wall of said casing, said key-operable switch in said first operable state completing a circuit including said battery, said tilt switch and said electric alarm, said key-operable switch in said second operable state completing a circuit from said battery to said two-pole current outlet.

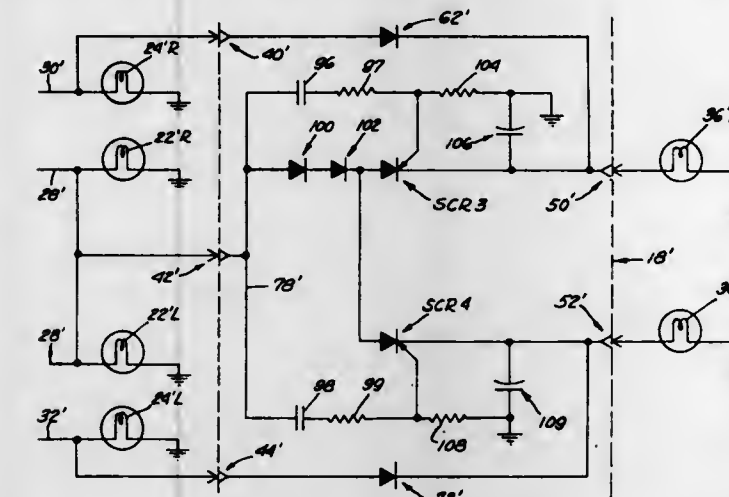
4,006,453

DUAL DIRECTIONAL AND BRAKE LIGHT CONTROL FOR TRAILERS

Richard C. Bryant, 5017 Wheeler, LaVerne, Calif. 91750
Continuation-in-part of Ser. No. 510,791, Sept. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 341,628, March 14, 1973, abandoned. This application Aug. 21, 1975, Ser. No. 606,704
Int. Cl.² B60Q 1/38

U.S. Cl. 340-67

8 Claims



1. A device for adapting combined brake- and turn-signal lights of a trailer to independent brake-signal and turn-signal lights on an associated towing vehicle, said towing vehicle having right- and left-turn flasher signal circuits and a brake-signal circuit, said trailer having right-hand and left-hand signal lights, each of which has a common filament for brake- and turn-signals, said device comprising:

- first switching means connected to both said right-turn flasher signal circuit and said brake-signal circuit on the vehicle, and also connected to said right-hand turn-and-brake signal light on the trailer;
 - second switching means connected to both said left-turn flasher signal circuit and to said brake-signal circuit on the vehicle, and also connected to said left-hand turn-and-brake signal light on the trailer;
 - each of said switching means being operable to transmit current from the corresponding turn flasher signal circuit or the brake signal circuit of the towing vehicle to the associated turn-and-brake signal light on the trailer when only one of said signal circuits on the vehicle is operating; and
 - each of said switching means being operable, responsive to the combined electrical current from both the brake signal circuit and the corresponding turn flasher signal circuit on the vehicle to switch current alternately on and off to the associated turn-and-brake signal light of the trailer, when both the brakes and turn signal flasher are operating;
- the other turn-and-brake signal light on the trailer remaining continuously illuminated by current from the brake-signal circuit of the vehicle.

4,006,454

ANALOG TO DIGITAL CONVERTER FOR ASYNCHRONOUS DETECTOR

Kermit Myles Bezeke, Schaumburg; James Robert Johannsen, Hanover Park, and Ronald Howard Chapman, Wheaton, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 7, 1975, Ser. No. 575,301

Int. Cl.² H03K 5/18; G08C 25/00; H03K 5/13

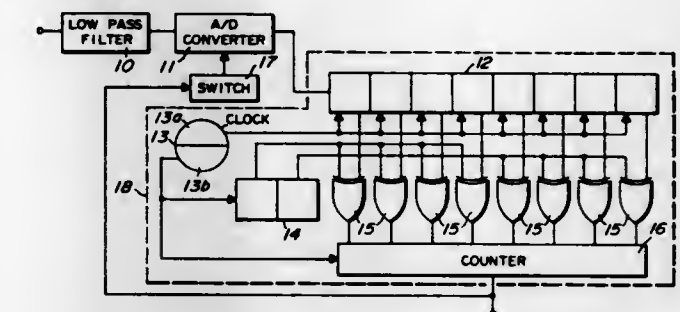
U.S. Cl. 340-146.1 R

19 Claims

1. In combination with an asynchronous detector for detecting a particular digital word within a train of signals wherein the train of signals includes bits, each bit having a predetermined period, and the detector samples each bit a plurality of times, compares the samples to a stored predetermined word and provides a comparison signal in response to a predetermined number of correlations between the samples and the

stored word, an analog to digital converter comprising:

- signal conditioning means having input means for receiving analog signals, output means coupled to the detector and having first and second modes of operation, for converting the received analog signals to digital signals in both modes of operation and inserting periodic error pulses in the digital signals when a digital pulse extends beyond a predetermined time in the first mode of operation; and



- switch means coupled to said signal conditioning means for switching said signal conditioning means between the first and second modes of operation, said switch means including input means coupled to the detector for receiving the comparison signal therefrom and switching said signal conditioning means from the first to the second mode of operation in response thereto.

4,006,455

ERROR CORRECTION SYSTEM IN A PROGRAMMABLE CALCULATOR

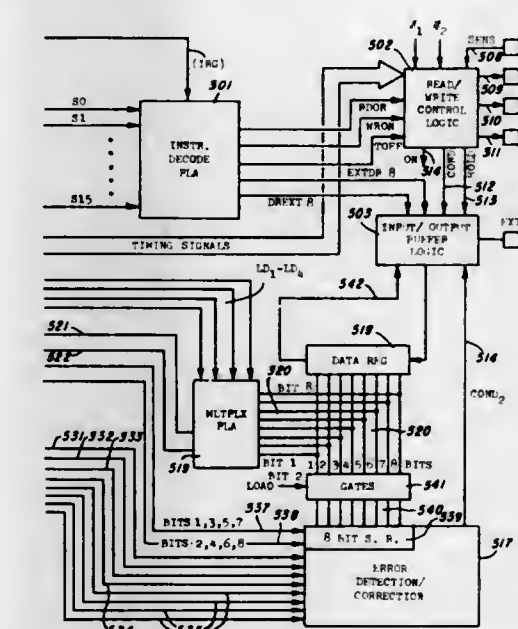
Stephen P. Hamilton, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 10, 1975, Ser. No. 622,288

Int. Cl.² G06K 5/00

U.S. Cl. 340-146.1 F

10 Claims



1. In a system for reading binary data from a recorded storage media wherein said binary data is stored on a pair of tracks of said storage media with transitions of alternating polarity being stored on a first of said tracks indicative of a first binary state and transitions of alternating polarity being stored on the second of said tracks indicative of a second binary state, an error correction system comprising:

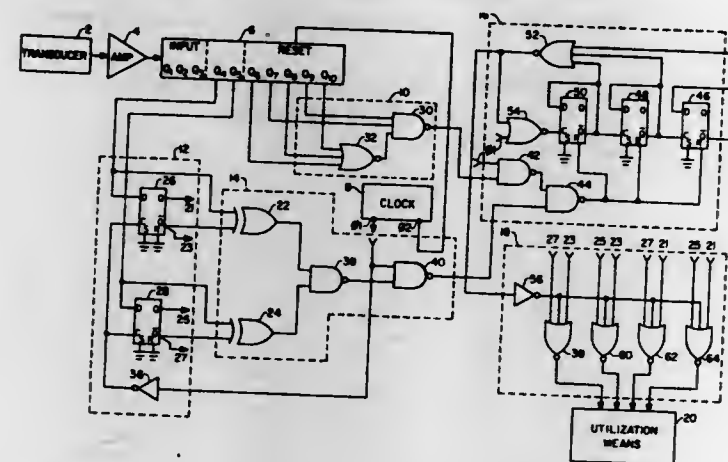
- signal receiving means for separately receiving the polarities of the transitions recorded on said first and second tracks;
- first means coupled to said signal receiving means for generating a binary bit for each recorded transition, the state of said bit being set to said first binary state for each transition received from said first track and to said second binary state for each transition received from said second track;
- second means coupled to said signal receiving means for

4,006,462 DIGITAL REMOTE CONTROL SYSTEM WITH SIGNAL VERIFICATION

Robert R. Podowski, Elmhurst, and Johnny Collins, Harvey, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 10, 1975, Ser. No. 556,760
Int. Cl.² H04Q 9/16; G06F 11/00
U.S. Cl. 340-168 B

4 Claims



1. A control device in which control signals of predetermined minimum duration and predetermined different individual frequencies selectively activate a plurality of utilization means, comprising:

- receiving means receiving signals;
- verification means coupled to said receiving means for verifying the presence of received signals of said predetermined minimum duration by repetitively sampling and determining the frequency of said signals;
- said verification means including a clock controlled first counter for counting the frequency of said received signals, storage means for storing each frequency count, and comparison means for comparing each frequency count with the immediately preceding frequency count; and
- decoding means coupled between said verification means and said utilization means and responsive to a first predetermined number of verified samples of said received signal for selectively activating said utilization means in accordance with the frequency of said received signal.

4,006,463 COMPUTER-PRINT DEVICE CODE CONVERTER

Jimmy C. Hanks, Corpus Christi, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,888
Int. Cl.² B41J 1/60
U.S. Cl. 340-172.5

7 Claims



1. A data converter for accepting first electrical signals indicative of a particular combination of tilt and rotational positions of a typewriter ball having a plurality of alpha-numeric characters and symbols, for accepting second electrical signals indicative of the upper or lower case condition of an alphabetical character that might be located at such particular combination of tilt and rotational positions of the typewriter ball, and for converting said first and second electrical signals to a binary bit coded electrical signal indicative of the alpha-numeric character or symbol located at such particular combination of tilt and rotational positions of the typewriter ball, comprising:

- a. means for providing a case control signal in response to

said second electrical signals, said case control signal being of a first level in response to said second electrical signals indicating an upper case condition of an alphabetical character and of a second level in response to said second electrical signals indicating a lower case condition of an alphabetical character,

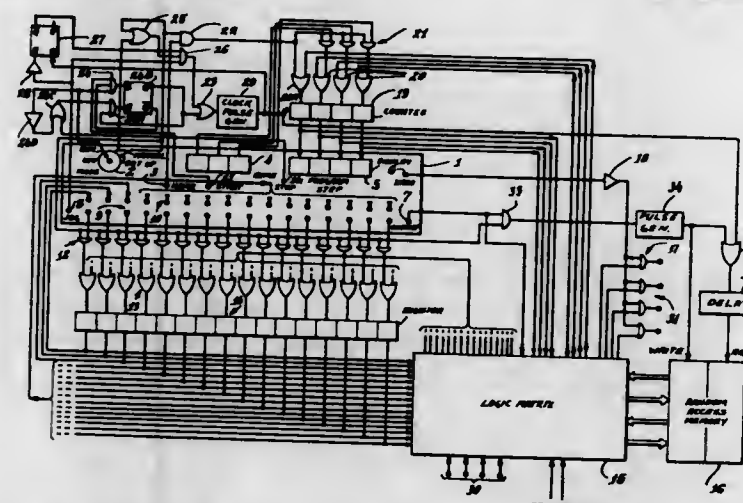
- b. means responsive to said case control signal for decoding said first electrical signals to provide a binary bit coded signal indicative of the alpha-numeric character or symbol and the upper or lower case of the character represented by such particular combination of tilt and rotational positions of a typewriter ball,
- c. means responsive to said second electrical signals for generating a first control signal for enabling said decoding means, and
- d. means for delaying said first control signal for a time interval sufficient to allow oscillatory transients associated with said first electrical signals to die away before the decoding of said first electrical signals.

4,006,464 INDUSTRIAL PROCESS CONTROLLER

William F. Landell, Saugerties, N.Y., assignor to FX Systems, Inc., Kingston, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,256
Int. Cl.² G06F 3/02, 15/02
U.S. Cl. 340-172.5

6 Claims



1. An industrial process controller having run, manual, and set-up modes wherein process control digital information words may be stored and recalled, each word being associated with one of a plurality of numerically ordered program steps, the controller being capable of operating on one program step at any given time and comprising:

- a panel,
- manually operated MODE switch means on said panel for selecting one of said run, manual and set-up modes,
- manually operated HOME switch means on said panel for numerically selecting any one of said ordered program steps,
- signal operating sequencing means for setting said controller to sequentially operate on said plurality of program steps in response to a RUN signal,
- PROGRAM STEP display means on said panel for numerically displaying a current program step on which said controller is operating,
- manually operated HOME COMMAND switch means on said panel for setting the industrial process controller to said manually selected program step,
- a COMMAND storage register means comprising a plurality of storage elements,
- a plurality of manually operated PROGRAMMING switches on said panel, each of said PROGRAMMING switches corresponding to a bit of one of said digital words and being connected to a separate storage element of said COMMAND storage register means in response to said set-up mode of said controller,
- a randomly accessible memory means for storing digital words in locations corresponding to said program steps,

manually operated CONNECT switch means on said panel and operable in said set-up mode for storing in said memory means a digital word from said storage register means selected with said PROGRAMMING switches in a storage location of said random access memory corresponding to said program step,

a plurality of output terminals connected to said controller for providing signals for a process being controlled, means connected to said storage register means and to said output terminal means responsive to a first plurality of said digital words in said register for providing defined output signals on said output terminal means,

manually operated START switch means on said panel and functional in said RUN MODE for providing said RUN signal, thereby automatically sequentially setting said controller to each of said program steps,

means responsive to said RUN and MANUAL modes of said controller and to the setting of the controller to a particular program step for reading the digital word corresponding to said particular program step into said storage register means whereby said output terminals are sequentially provided with signals corresponding to the digital words manually selected with said programming switches,

means responsive to a second plurality of said words for setting said controller to a program step directed by said second plurality of words, and

manually operated JOG switch means on said panel and functional in said MANUAL and SET-UP modes of said controller for selectively setting the controller to the next sequential program step.

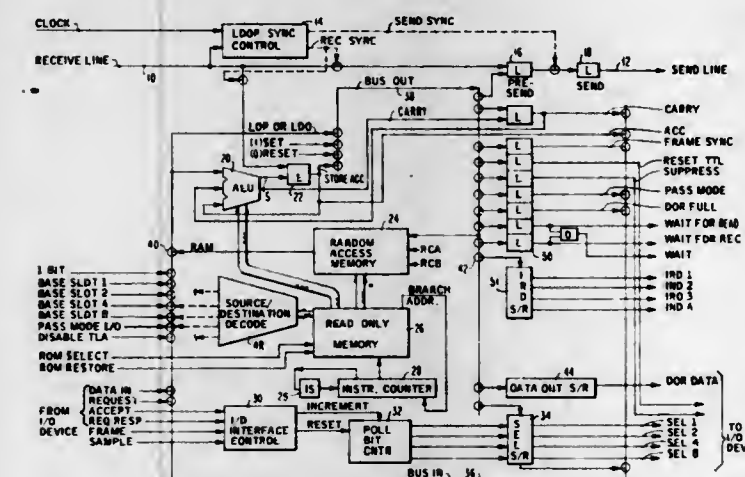
4,006,465 APPARATUS FOR CONTROL AND DATA TRANSFER BETWEEN A SERIAL DATA TRANSMISSION MEDIUM AND A PLURALITY OF DEVICES

Jon L. Cross, San Jose; Merle Edward Homan, Los Gatos; Guenther Keith Machol, Saratoga; Richard La Verne Malm, Los Gatos, and Larry Eugene Svelund, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 14, 1975, Ser. No. 577,495
Int. Cl.² G06F 9/16

U.S. Cl. 340-172.5

29 Claims



1. Apparatus for use in establishing and maintaining communication with a controlling module (which transmits data and control commands serially by bit over a serial transmission medium) and one or more I/O modules comprising:

- an arithmetic unit;
- a buffer;
- first means connecting said buffer to said arithmetic unit for enabling the storing in said buffer of the result of an arithmetic operation performed by said arithmetic unit;
- second means connecting said buffer to said serial transmission medium for providing a second input to said buffer for enabling the storing, in said buffer, of a bit of data received over said transmission medium;

a plurality of source data paths connected to respective sources of data, including data from said I/O modules; an input bus operatively connected to said arithmetic unit; source switching means connected to said source data paths and said input bus, energizable for connecting selected ones of said source data paths to said input bus; and stored program control means, connected to said arithmetic unit and to said switching means, including means for storing sequential program instructions, said instructions including arithmetic instructions executable by said arithmetic unit, to perform arithmetic operations and control instructions for selectively energizing said switching means to thereby connect selected source data paths to said input bus in accordance with control information contained in said instructions.

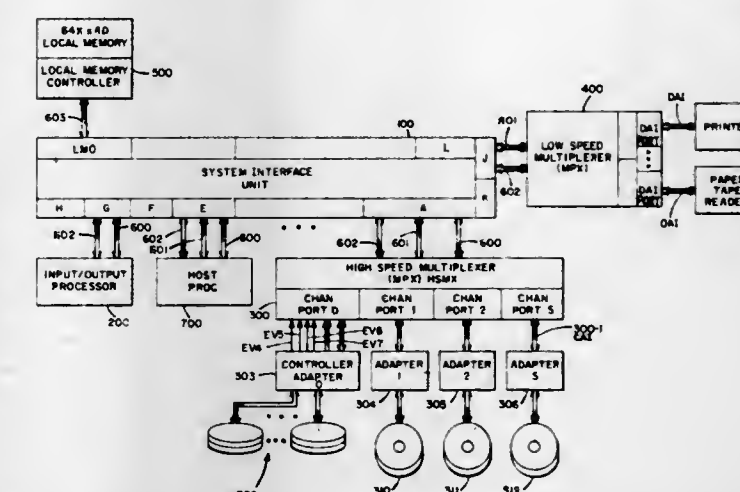
4,006,466 PROGRAMMABLE INTERFACE APPARATUS AND METHOD

Garvin Wesley Patterson, Glendale; William A. Shelly, Phoenix; Jaime Calle, Glendale, and Earnest M. Monahan, Phoenix, all of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 26, 1975, Ser. No. 562,364
Int. Cl.² G06F 1/00

U.S. Cl. 340-172.5

24 Claims



1. An input/output system for controlling input/output data transfer operations of a plurality of peripheral devices, said system comprising:

- a memory means;
- processor means, said processor means including means for generating commands during said data transfer operations involving said plurality of peripheral devices;
- multiplexer means;
- means interconnecting said memory means, said processor means and said multiplexer means for communication on a priority basis;
- said multiplexer means including at least one adapter port coupled to said plurality of peripheral devices, said multiplexer means comprising:
- a plurality of registers arranged for storing interrupt control information transferred by said commands pertinent to the processing of said input/output operations by said multiplexer means;
- a first one of said registers containing coded signals specifying a numerical value used for identifying one of a plurality of interrupt routines executed by said processor means to process interrupt event signals received from said devices and a second one of said registers containing coded signals specifying numerical values for identifying a plurality of levels of priority to be given by said multiplexer means to said plurality of interrupt event signals received from said device;
- interrupt logic means coupled to receive said event signals from said adapter port;

priority network means coupled to said logic means and to said second register, said priority means being operative to generate signals indicating the request having highest priority in accordance with interrupt event signals received from said logic means, said highest priority being defined in accordance with said values stored in said second register; and,

output register means being operatively coupled to said priority network means and to said plurality of registers, said priority network means generating signals causing signals representative of the contents of said first register and one of said values stored in said second register corresponding to the event signal having the highest priority to be applied to said output register means for transfer to said interconnecting means as a part of an interrupt request.

4,006,467

ERROR-CORRECTIBLE BIT-ORGANIZED RAM SYSTEM

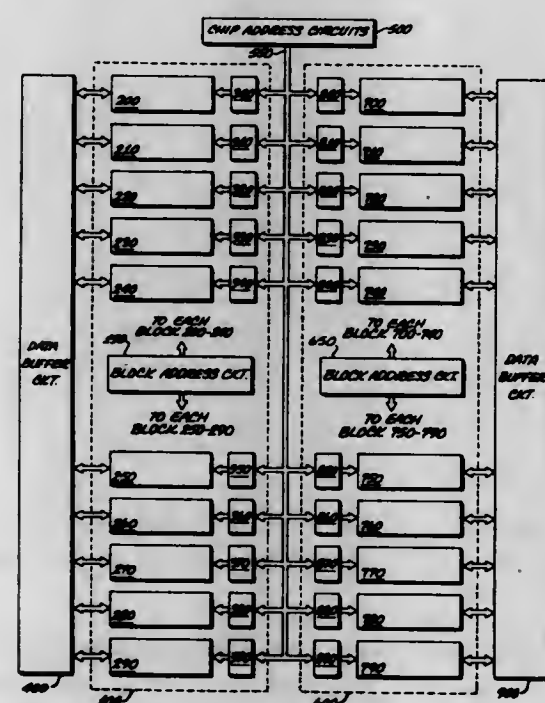
David A. Bowman, Glendale, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Nov. 14, 1975, Ser. No. 632,127

Int. Cl.² G11C 11/40

U.S. Cl. 340-173 R

9 Claims



1. A memory organization for random access memory (RAM) chips comprising:

- chip address means for providing first signals;
- block address means for providing second signals; and
- memory means, connected to said chip address means and said block address means, said memory means including:
 - a plurality of blocks of said RAM chips, each of said blocks responsive to said second signals for selecting one of said RAM chips; and
 - a plurality of driver circuits corresponding to said plurality of RAM chip blocks each of said driver circuits responsive to said first signals for providing a set of third signals to the chips within said corresponding block, said third signal selecting a location within said RAM chips for accessing;

data bussing means;

data buffer means coupled by said data bussing means to said blocks for transmitting data to and from said blocks; and

enabling means coupled to said chip addressing means to said block addressing means, and to said buffering means for enabling their operation.

4,006,468

DYNAMIC MEMORY INITIALIZING APPARATUS

Marvin K. Webster, Glendale, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

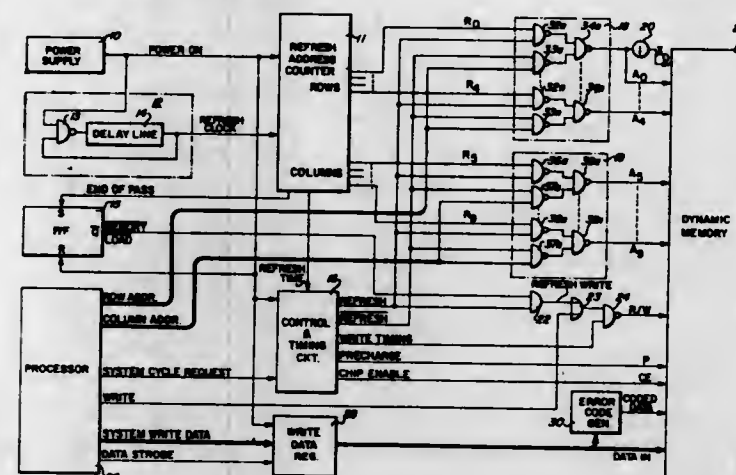
Continuation of Ser. No. 386,128, Aug. 6, 1973, abandoned.

This application Sept. 2, 1975, Ser. No. 609,754

Int. Cl.² G11C 7/00

U.S. Cl. 340-173 DR

4 Claims



1. In a dynamic memory having a plurality of memory cells arranged in an array of m columns and n rows where m and n are integers; a power supply for said memory; a write data register; control and timing means, said memory adapted upon the application to it of appropriate signals from the control and timing means to write data stored in the write data register into a given cell, to read data from a given cell, and to restore the data stored in a given cell; clock means for producing clock signals; address means responsive to said clock signals for sequentially producing row address signals and a refresh time signal; the control and timing means responsive to said refresh time signal producing a refresh signal; said memory, in response to row address signals being gated to it in response to a refresh signal and other appropriate signals being applied to the memory, restoring the data stored in the cells of the row corresponding to said row address signals; said address signals, refresh signal and other appropriate signals being applied to the memory at a frequency such that the data stored in all the cells of the array are refreshed while the data stored in the memory cells has a high probability of being valid;

the improvements comprising:

- providing said address means with the capability of sequentially producing column address signals;
- means responsive to each refresh signal for gating said column address signals to said memory;
- and initializing circuit means responsive to the energizing of said power supply for enabling the control and timing means to cause data from the write data register to be written into the cell corresponding to the row and column address signals applied to the memory each time a refresh signal is produced until all the cells of the array have data written into them, whereupon said initializing circuit means no longer causes data to be written into said memory when a refresh signal is produced.

4,006,469

DATA STORAGE CELL WITH TRANSISTORS OPERATING AT DIFFERENT THRESHOLD VOLTAGES

Gerald W. Leecham, Centerville, Va.; Sylvester F. Minter, III, Wheaton, Md., and Augustus J. Sassa, Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1975, Ser. No. 641,328

Int. Cl.² G11C 11/40

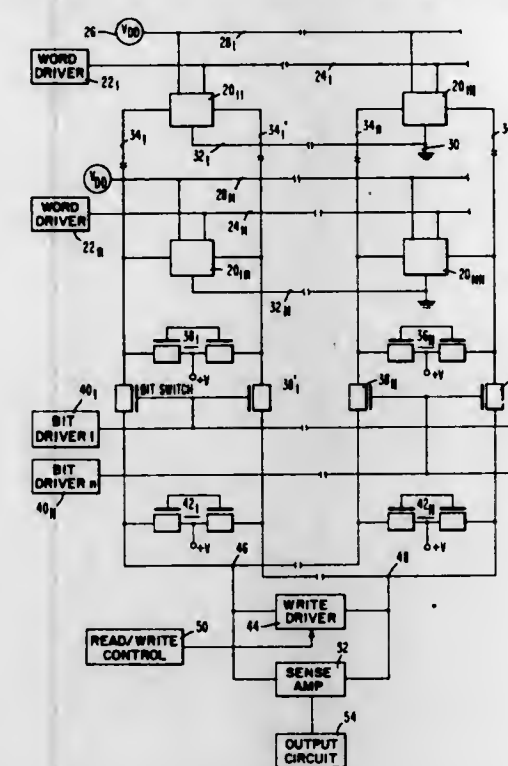
U.S. Cl. 340-173 R

15 Claims

14. A semiconductor device comprising

- a semiconductor substrate,
- b. first, second and third sets of transistors formed in the substrate in first and second groups,

- c. diffusion rails formed in the substrate between the first and second groups and serving as bit lines connected to the third transistor in each group,
- d. first metalization disposed on the substrate and connected to the first set of transistors for supplying power to the groups of transistors,
- e. second metalization disposed on the substrate and con-



ected to the second set of transistors as a power return for the groups of transistors,

- f. third metalization disposed on the substrate for interconnecting the second set of devices as a storage circuit, and
- g. fourth metalization disposed on the substrate and connected to the first and third sets of devices for controlling the power to the storage circuits and the connection of the third set of devices to the bit lines.

4,006,470

READ-ONLY MEMORY

Hajime Mitani, Komae, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

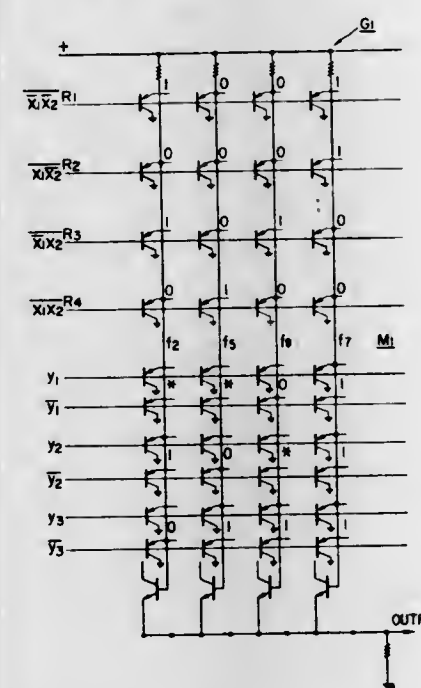
Filed June 30, 1975, Ser. No. 591,717

Claims priority, application Japan, July 3, 1974, 49-76074

Int. Cl.² G11C 11/36

U.S. Cl. 340-173 SP

3 Claims



1. A read-only memory comprising:

a set of memory cells defining a matrix and having pluralities of row and column conductors;

multiplexer means including at least one merged column and having a plurality of outputs and first and second pluralities of inputs, said first inputs being coupled respectively to said column conductors of said set of memory cells; and

row selector means having first and second groups of outputs for providing selection signals to select desired locations of said memory matrix, said first group of outputs being coupled respectively to said row conductors of said set of memory cells, and said second group of outputs being coupled respectively to said second plurality of inputs of said multiplexer means, wherein a row selection of said memory matrix is provided at said plurality of outputs of said multiplexer means.

4,006,471

EMERGENCY EXIT LOCK SYSTEM FOR DOORS

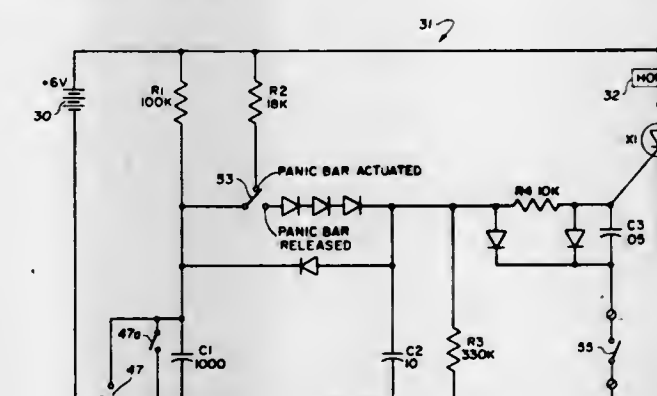
Michael Pappas, Irvington, N.J., assignor to Detex Corporation, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,922

Int. Cl.² G08B 13/08

U.S. Cl. 340-274 R

11 Claims



1. Exit and entry control lock apparatus for doors comprising, in combination:

- a. a latchbolt for releasably holding the door in closed position;
- b. dead latch means for securing the latchbolt against release;
- c. first and second independently operable dead latch release actuators, said second release actuator comprising:
 - i. a control member movable between active and inactive positions, and
 - ii. a mode control member movable between two positions to secure the control member selectively in either of its positions;
- d. a panic bar connected to the first release actuator;
- e. a key-actuated means connected to the second release actuator;
- f. an alarm and energizing means therefor;
- g. an alarm-energizing control switch connected to be actuated upon actuation of the panic bar; and
- h. alarm-disabling switch means coupled to said key-actuated means to disable the alarm-energizing means.

4,006,472

AIRCRAFT ALTITUDE ALERTING DEVICE

Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed May 7, 1975, Ser. No. 575,161

Int. Cl.² G08B 5/36

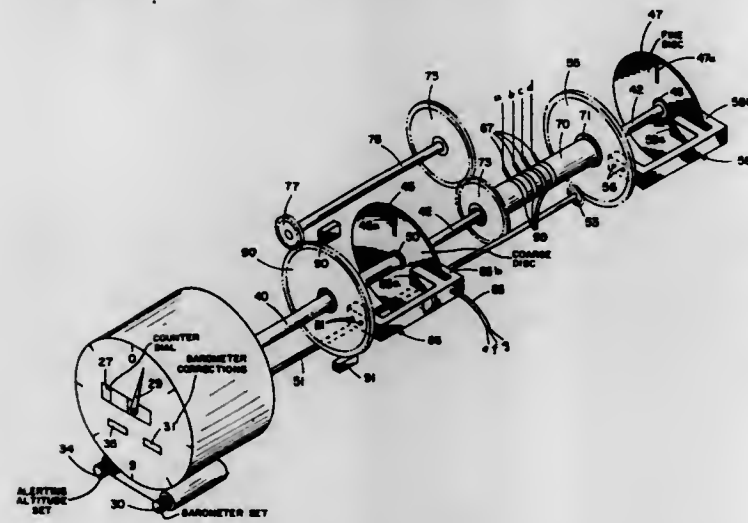
U.S. Cl. 340-181

4 Claims

3. An altitude alerting device mounted in an aircraft for providing a signal indicating when the aircraft has reached a predetermined altitude comprising:

- an altimeter having an indicator mechanism providing a mechanical signal in accordance with aircraft altitude,

altitude marker means comprising first and second discs, each of said discs having a radial slot formed therein, means for supporting said discs for rotation about a predetermined axis, said discs being rotatably driven by said mechanical signal to position said slots about said predetermined axis in accordance with aircraft altitude, sensor means comprising first and second photo-electric detectors positioned proximate to said first and second discs respectively, said first and second detectors and discs representing "coarse" and "fine" altitude positions respectively,



means for setting said photo-electric detectors in positions about said predetermined axis relative to said discs in accordance with said predetermined altitude, signaling means for generating said signal indicating that the aircraft has reached the predetermined altitude, coincidence detector means responsive to simultaneous outputs from both of said photo-electric detectors for actuating said signaling means when both said first photo-electric detector and said first disc are in corresponding positions about said axis and said second photo-electric detector and said second disc are in corresponding positions about said axis.

4,006,473

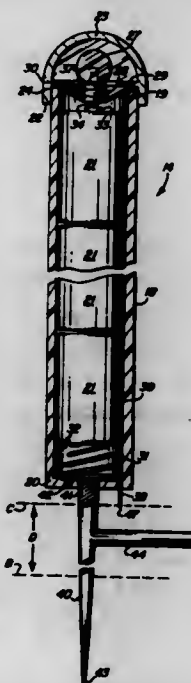
IRRIGATION SIGNAL

Gerald T. Civalier, P.O. Box 6822, Phoenix, Ariz. 85009
Filed Sept. 2, 1975, Ser. No. 609,308

Int. Cl.² G08B 21/00

U.S. Cl. 340—244 C

4 Claims



1. An electric signalling device for emitting a perceptible signal when a liquid has risen to a predetermined height above a selected surface, said signalling device comprising:

- a housing having a source of electrical energy therein;
- electrically activated means for emitting a perceptible signal carried by said housing and having an activation circuit connected to said source of electrical energy;
- an electrically conductive probe communicating with said signal emitting means and having the lower end thereof depending from said housing; and
- an electrically conductive support depending from said housing for supporting the lower end of said probe at a predetermined distance above said surface, said probe and support forming a part of said circuit and defining a generally horizontal gap therebetween whereby a predetermined increase in liquid level will close said gap and thereby establishing said circuit activating said perceptible signal.

4,006,474

VIDEO GAME REBOUND APPARATUS

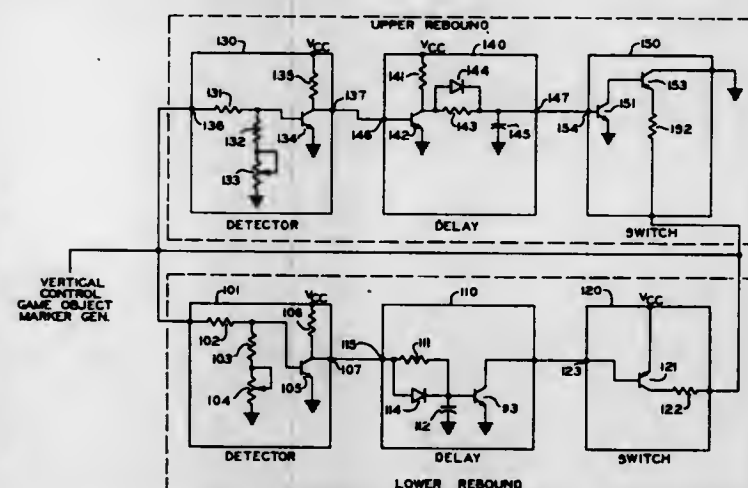
Jeffrey Reed Lukkarila, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 18, 1976, Ser. No. 668,108

Int. Cl.² H04N 7/02

U.S. Cl. 340—324 AD

11 Claims



1. Apparatus for providing a rebound function in a video game comprising means for detecting the presence of a game object marker near a boundary; and means for forcing said game object marker to move away from said boundary with a diminishing velocity when said game object marker is coincident with said boundary marker.

4,006,475

DIGITAL-TO-ANALOG CONVERTER WITH DIGITALLY DISTRIBUTED AMPLITUDE SUPPLEMENT

James Charles Candy, Convent Station; Stanley Leon Freeny, Middletown, and William Herbert Ninke, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

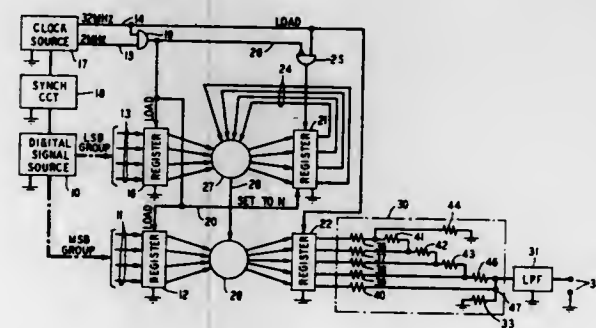
Continuation of Ser. No. 421,678, Dec. 4, 1973, abandoned.

This application July 18, 1975, Ser. No. 597,087

Int. Cl.² H03K 13/02

U.S. Cl. 340—347 DA

21 Claims



1. In combination,

means for producing an analog signal corresponding in magnitude to each of the values that can be represented by a most significant bit group of a multibit pulse coded character, and means, responsive to a less significant bit group of the same character, for temporarily altering said most significant bit group value at an input to said producing means, and thereby altering said magnitude, by a predetermined amount and at plural times during persistence of said character, the total number of alterations in said magnitude, during the persistence time of said character, being determined by the value of said less significant bit group and independent of the value of said most significant bit group, and the duration of each alteration being for a predetermined discrete subinterval of the persistence time of said character.

4,006,476

CHANGEABLE DISPLAY APPARATUS

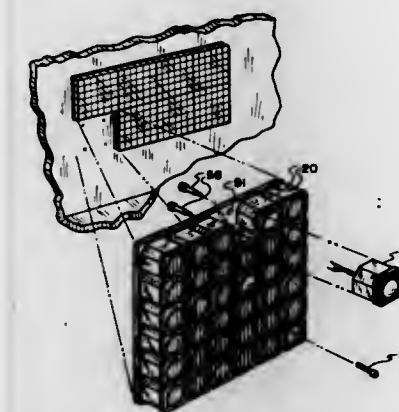
Russell H. Romney, P.O. Box 15657, Salt Lake City, Utah 84115

Filed May 9, 1975, Ser. No. 576,127

Int. Cl.² G08B 5/00

U.S. Cl. 340—373

10 Claims



1. Apparatus for displaying intelligence in groups of intelligible symbols such as alphabetic and/or numerical symbols and the like, which comprises, in combination:

- A multiplicity of similar modules mounted adjacent each other in rows and columns and each adapted to selectively display at least one of said symbols, said multiplicity of modules presenting a substantially continuous viewing area, in which
- each module comprises a plurality of individually changeable display elements assembled in multiple rows and columns in the module and wherein each element comprises a hollow housing consisting primarily of a pair of interchangeable and similar housing parts having a common plane base and adapted to be assembled on a diagonal plane perpendicular to said base to present an essentially square viewing face except for slight truncations at corners to provide access to mounting bolts or equivalent in said base,
- a rotatable face piece pivotally mounted in each of said housings adapted to present selectively a relatively visible or light-showing face or a relatively non-visible or dark face, in which each face piece incorporates a permanent magnet, and
- an electromagnet mounted within each said housing and comprising an iron core and a coil for selectively rotating said face piece in response to control signal from an electric power source, whereby selected ones of said face pieces in a module are turned to display an intelligible symbol in said module.

4,006,477

PULSE COHERENT TRANSPONDER WITH PRECISION FREQUENCY OFFSET

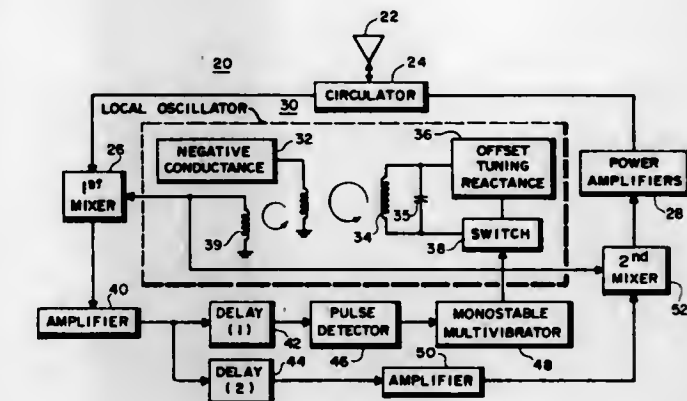
Russell R. Yost, Jr., Phoenix, and Eric J. Carlson, Mesa, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,700

Int. Cl.² G01S 9/58

U.S. Cl. 343—6.8 R

13 Claims



1. Radar transponder apparatus for receiving a sequence of interrogation pulses and generating reply pulses that are phase coherent with the interrogation pulses but delayed in time and offset in frequency, by a precise amount, including in combination:

- means for providing a reference signal at a first predetermined frequency, said means being of continuous operation;
- means for down-converting the interrogation pulses to intermediate frequency signal information in the presence of said reference signal at said first predetermined frequency;
- means for delaying said intermediate frequency signal information for a predetermined time interval;
- means receiving said intermediate frequency signal information from said down-converting means, which is coupled to said means for providing a reference signal, for causing the frequency of said reference signal produced thereby to be incremented by a fixed, predetermined amount, the instantaneous phase of said incremented frequency reference signal being related to the instantaneous phase of said reference signal at said first predetermined frequency with said relationship being substantially invariant from pulse-to-pulse of the sequence of received interrogation pulses; and
- means for up-converting said delayed intermediate frequency signal information in the presence of said reference signal at said incremented frequency, said up-converted signal information being a sequence of reply pulses offset in frequency but phase coherent with said received interrogation pulses.

4,006,478

SECURITY DEVICE

Bernard L. Lewis, 1673 Magnolia Ave., Winter Park, Fla. 32789, and Dean D. Howard, 4230 Oak Lane, Oxon Hill, Md. 20021

Filed Aug. 15, 1958, Ser. No. 755,361

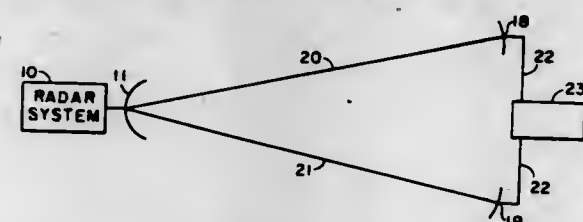
Int. Cl.² G01S 7/38

U.S. Cl. 343—18 E

7 Claims

1. In a signal jamming device, first and second transducers physically displaced relative to each other said transducers having substantially identical signal coupling characteristics on the basis of direction to a selected distant object, means for coupling said transducers whereby signals received by one

transducer are emitted by the other and vice versa, and differential impedance means connected to said means for coupling



for producing phase shift of signals emitted by one transducer relative to signals emitted by the other transducer.

4,006,479

METHOD FOR DISPERSING METALLIC PARTICLES IN A DIELECTRIC BINDER

Donald J. LaCombe, De Wht, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 4, 1969, Ser. No. 798,263

Int. Cl.² H01Q 17/00

U.S. Cl. 343-18 A

6 Claims

4. A radar energy absorbing material comprising a solid, homogeneous blend of sub-micron sized, finely divided metal particles, a finely divided dielectric material and a resinous binder.

4,006,480

ANTENNA WINDOW ASSEMBLY FOR ABLATIVE HEAT SHIELDS

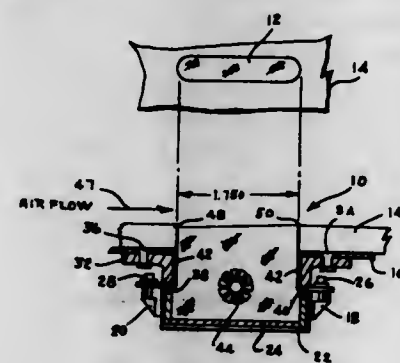
Raymond O. Charette, Fountain Valley, and Hank A. Konczak, Costa Mesa, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 3, 1976, Ser. No. 655,029

Int. Cl.² H01Q 1/42

U.S. Cl. 343-705

1 Claim



1. An antenna window assembly for ablative heat shields having a support member and an aperture comprising: an ablative heat resistant window capable of passing radio frequency electromagnetic radiation, said window having a shape compatible with a heat shield aperture; a plurality of bracket means adapted to be affixed to the heat shield support member; retainer means attached to the said bracket means adjacent said window; and a support means abutting the window at one end connected between at least two retainer means whereby the leading edge of said window does not extend into the air flow over the heat shield and the trailing edge of the window extends beyond the heat shield into the said air flow.

4,006,481 UNDERGROUND, TIME DOMAIN, ELECTROMAGNETIC REFLECTOMETRY FOR DIGGING APPARATUS

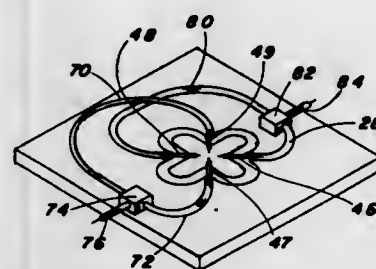
Jonathan D. Young, Worthington; Curtis W. Davis, III, Columbus; Leon Peters, Jr., Columbus, and Ross Caldecott, Columbus, all of Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Dec. 10, 1975, Ser. No. 639,249

Int. Cl.² H01Q 13/10

U.S. Cl. 343-770

27 Claims



1. A broad bandwidth slot antenna comprising: a conductive ground plane element configured having an inwardly disposed opening of select profile; conductive element means situated within said ground plane element opening and configured having a periphery cooperating with said ground plane element to define a slot arrangement exhibiting a surface pattern having symmetry about two orthogonal axes at the surface of the conductive ground plane element, said pattern having the form of four orthogonally arranged loops; a lossy, non-conductive absorber comprising a ceramic having carbon particles distributed therein situated within said slot arrangement; and including a plurality of loading resistors, for terminating portions of said slot in its characteristic impedance, symmetrically spaced from the apexes and shunted across said slot.

4,006,482

PATTERN PRINTING APPARATUS

Christopher Edmund James Heath; Anthony David Paton, and David Anthony Reeve, all of Cambridge, England, assignors to Imperial Chemical Industries Limited, London, England

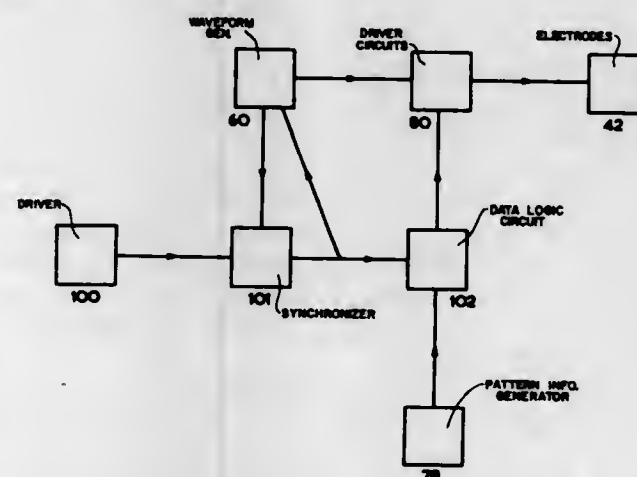
Filed May 1, 1975, Ser. No. 573,605

Claims priority, application United Kingdom, May 6, 1974, 19809/74

Int. Cl.² G01D 15/18

U.S. Cl. 346-75

1 Claim



1. A circuit for controlling printing apparatus of the type adapted to print by depositing small drops of printing liquid in accordance with a pattern information signal on a surface to be printed during relative movement caused by surface drive means between the apparatus and said surface, comprising a

row of printing guns extending transversely to said direction of relative movement, each gun having an orifice, printing liquid supply means for supplying printing liquid under pressure to the orifice to form a jet of printing liquid directed towards the location in the apparatus of the said surface, means for imparting regularly spaced variations in the cross section of the jet to stimulate drop formation, charge electrode means located adjacent the position in the jet path of drop separation to effect charging of drops formed in the jet path, drop deflection means for providing a substantially constant electrostatic field through which pass the drops formed in the jet path thereby to deflect electrically charged drops to an extent dependent upon the charge levels on the drops, and drop intercepting means for intercepting uncharged drops, said circuit comprising waveform generating means for making available to the charge electrode means of each printing gun a voltage waveform of constant period, the magnitude of said voltage at corresponding times during each period thereof being the same and the period being sufficient to span the formation of a plurality of drops in each jet path, electrical means for controlling in accordance with the pattern information signal the application of said waveform, at moments appropriate to the charging of the drops during each period of said waveform, to charge electrode means of any of the printing guns thereby to determine whether drops formed in the jet paths of those printing guns are charged or not, and a synchronizer for producing, in response to a first input signal from the surface drive means indicating the movement of said surface through a predetermined distance and a second input signal from said waveform generating means at the end of each of said waveforms, an output signal initiating the formation of the next of said waveforms and permitting the passage of the pattern information to said electrical means.

4,006,483

RECORDING CHART

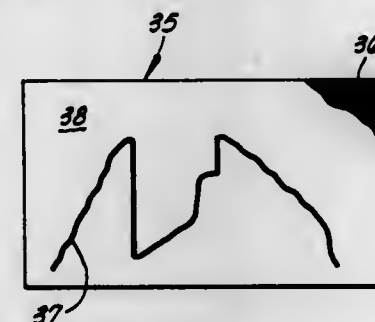
Harold Eugene Box, P.O. Box 782, Liberal, Kans. 76901

Filed Aug. 18, 1975, Ser. No. 605,610

Int. Cl.² G01D 15/34

U.S. Cl. 346-77 R

2 Claims



1. A chart for use with a device having a marking stylus for inscribing scores representing recordings on said chart which comprises:

a flat dark-colored flexible sheet of a size and shape adapted to be installed in said device, one side of said sheet having a uniform layer of light-colored high temperature paint composition applied thereto so that said marking stylus inscribes dark-colored scores in a light-colored background on said chart, said light-colored high temperature resistant paint composition being comprised of titanium dioxide present in said composition in an amount of about 9.2% by weight, magnesium silicate present in an amount of about 9.2% by weight, silicone resin present in an amount of about 9.2% by weight and hydrocarbon liquid solvent present in said composition in an amount of about 72.4% by weight.

4,006,484

CAMERA SYSTEMS FOR PROVIDING PRECISE EXPOSURES WITH DIGITAL LIGHT MEASUREMENT

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

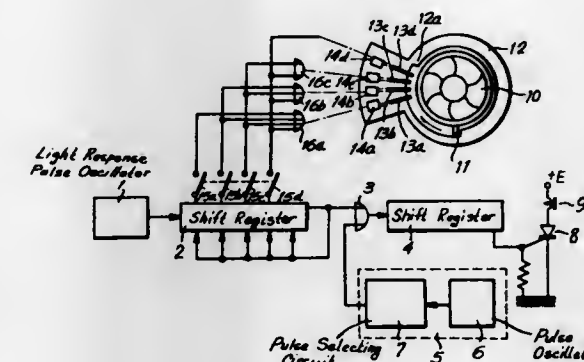
Continuation-in-part of Ser. No. 576,021, May 9, 1975. This application May 27, 1975, Ser. No. 580,698

Claims priority, application Japan, May 31, 1974, 49-62131; June 17, 1974, 49-68869; Sept. 3, 1974, 49-100578; Sept. 9, 1974, 49-103660

Int. Cl.² G03B 7/08

U.S. Cl. 354-23 D

18 Claims

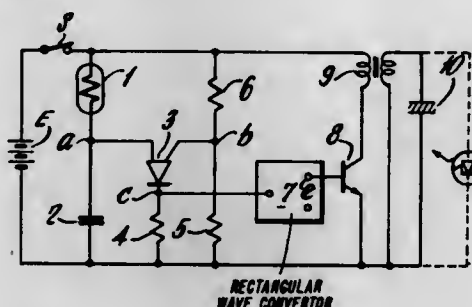


1. In a camera, diaphragm means for determining the magnitude of the exposure aperture through which film in the camera is exposed, shutter means for determining the time during which film in the camera is exposed, said diaphragm means and shutter means forming a pair of means for participating in the determination of the extent to which film in the camera is exposed, said pair of means including one means which is adjustable and preliminarily set to remain normally at a given adjusted position during exposure of the film, and the other of said means being automatically operable in accordance with light intensity, light-responsive means for responding to the light intensity and for providing in accordance therewith a quantity the magnitude of which corresponds to the light intensity, digital memory means having a series of digital positions at least one of which is close to but does not necessarily coincide precisely with the magnitude of said quantity, said digital memory means being operatively connected to said light-responsive means for memorizing said magnitude of said quantity at least approximately by way of said one digital position which is close thereto, detecting means operatively connected with said digital memory means for detecting at least approximately the difference between the magnitude of a quantity corresponding precisely to said one digital position of said digital memory means and the actual magnitude of a quantity corresponding more precisely to the light intensity to which said light-responsive means responds, adjusting means operatively connected to said one adjustable means for adjusting the latter in accord with said difference, if any, detected by said detecting means, so as to provide at said one means a compensating adjustment according to said difference, and said digital memory means being operatively connected with the other of said means for operating the latter according to said one digital position which is close to the magnitude of a quantity corresponding to said light intensity, whereby if the latter magnitude does not coincide precisely with said one digital position the compensating adjustment of said one means will provide for film in the camera an exposure more accurate than that which would be achieved without said compensating adjustment.

4,006,485
LUMINANCE CONTROLLED INDICATOR IN CAMERA VIEW FINDER

Akio Yamashiki, Tondabayashi, and Masahio Kitaura, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 406,745, Oct. 15, 1973, abandoned.
This application May 27, 1975, Ser. No. 581,305
Claims priority, application Japan, Oct. 19, 1972, 47-104924

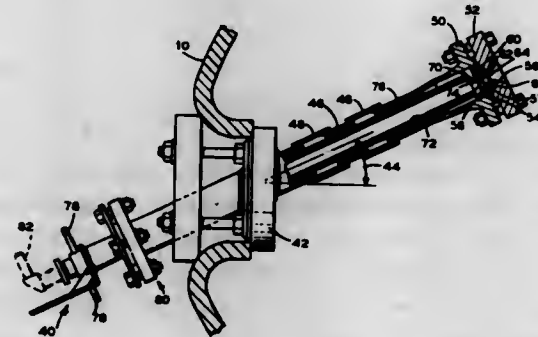
Int. Cl.² G03B 17/20; G01J 1/32
U.S. Cl. 354—53 16 Claims



1. In a camera including a view finder, a device for controlling the luminance of a frequency responsive luminous indicator observable through said view finder comprising:
means for generating an oscillating electrical signal to intermittently energize said luminous indicator at a frequency in which said luminous indicator is observed as being continuously energized; and
means including a photosensitive element exposed to scene light for transmitting the output of said photosensitive element to control the camera exposure;
said generating means including means for varying the frequency of the oscillating signal of said generating means in response to said output of the photosensitive element to increase and decrease said frequency as the scene brightness in the view finder increases and decreases respectively whereby the luminance of the indicator which is observed as continuous is variable in conformity with the scene brightness.

4,006,486
OPTICAL VIEWING, PHOTOGRAPHIC DEVICE FOR VAPOR GENERATOR

Jesse Glispin Vaughn, Wadsworth, Ohio, and Steven Douglas Vander Kamp, Midland, Mich., assignors to The Babcock & Wilcox Company, New York, N.Y.
Filed Sept. 19, 1975, Ser. No. 615,143
Int. Cl.² G03B 29/00; F22D 1/00
U.S. Cl. 354—76 5 Claims

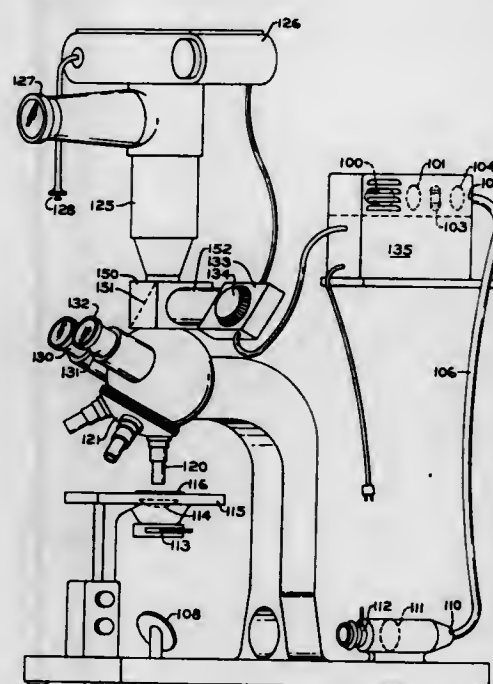


1. In combination with a drum having an upper steam space and a lower water space, steam and water separating means disposed within the drum, incandescent lamp means disposed within the drum to illuminate the interior thereof, and a device for viewing the illuminated interior, said device having con-

centrically spaced inner and outer tubes extending into the drum, an annular plate mounted on the outer tube end within the drum, said plate defining a viewing port fitted with a glass window and including a transparent mica shield fronting the drum interior, said inner tube end within the drum being capped by a fish eye lens facing the glass window, and an eye piece being attached to the inner tube end outside the drum, a sleeve interposed between the inner and outer tubes to define an annular passageway surrounding said inner tube, and means for circulating a cooling fluid through said passageway.

4,006,487
PHOTOMICROGRAPHIC ILLUMINATOR
Raymond P. Allen, 2242 Sourek Road, Akron, Ohio 44313
Division of Ser. No. 524,036, Nov. 15, 1974, abandoned. This application Sept. 30, 1975, Ser. No. 618,019
Int. Cl.² G03B 17/48

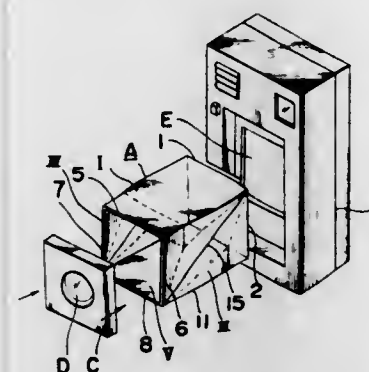
U.S. Cl. 354—79 10 Claims



1. A photomicrographic instrument comprising:
a. a compound microscope equipped with a camera,
b. a stage for said microscope for positioning an object to be photographed,
c. A Kohler microscope illuminating system for illuminating said object, including at least a collecting lens, a field stop diaphragm, a condenser diaphragm, and a condenser lens,
d. a fiber optic with one end at the entrance pupil of the illuminating system, facing the illuminating system,
e. illumination means comprising at least one light source, which illumination means are capable collectively of providing light of low intensity and of high intensity at different sequential times,
f. said illumination means being arranged to direct the light to the fiber optic end remote from the entrance pupil of the illuminating system, and
g. control means for limiting the total radiant energy of the high intensity light in the camera in response to an integrating light sensor in the microscope optical system.

4,006,488
BELLOWS FOR USE IN A FOLDABLE CAMERA
Makoto Kuboshima, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Sept. 4, 1975, Ser. No. 610,349
Claims priority, application Japan, Sept. 5, 1974, 49-102625

Int. Cl.² G03B 17/04
U.S. Cl. 354—187 10 Claims



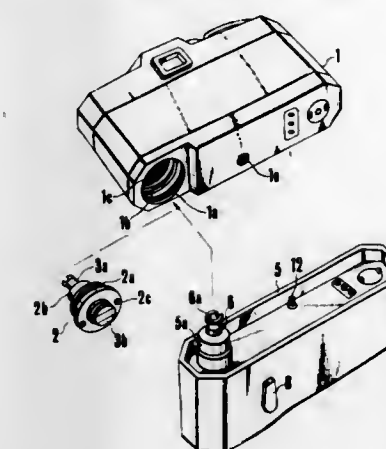
1. In a foldable camera with a bellows which is made of light proof material taking a shape of a hollow tube of rectangular cross section and of a hexahedral prism in the expanded configuration with top, right-side, left-side and bottom planes and openings at the both ends thereof and being symmetrical with respect to the light axis of the bellows, and being affixed between the exposure frame of a camera body and the lens mount of a lens at said openings, respectively, the improvement wherein the bellows comprises in combination; first outward folding lines provided along all edges of bellows in each of said planes to permit folding of each of said planes toward the exposure frame or lens mount, a second inward folding line provided on the top plane to fold the top plane in two to raise the lens mount against the exposure frame, a third inward folding line provided on the bottom plane parallel with and adjacent to the edge affixed to the exposure frame to fold the bottom plane in two to bow the lens mount against the exposure frame, at least one pair of fourth outward folding lines, each extending diagonally from the upper corner of each of the side planes at the side of the exposure frame to the bottom edge of the same plane and being symmetrical with each other to form at least one triangle, and a set of fifth inward and outward folding lines provided on both the side planes to fold the side planes in association with the folding of said top and bottom planes about said first to fourth lines so as to pile up the bellows material about said first and fourth lines between the exposure frame and lens mount.

4,006,489
FILM REWINDER MOUNTABLE ON CAMERA
Hiroshi Aizawa, Machida; Tomonori Iwashita, Chofu; Tadahide Fukushima, Tokyo; Yukio Iura, Yokosuka; Masanori Uchidoi, Kawasaki, and Susumu Kozuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 22, 1975, Ser. No. 579,877
Claims priority, application Japan, May 29, 1974, 49-61558[U]

Int. Cl.² G03B 1/00
U.S. Cl. 354—214 5 Claims

1. Camera apparatus comprising a housing having an exterior surface and an interior surface, said housing forming a compartment for a film magazine, said housing having a film winding hole therein extending from the exterior surface to the interior surface and opening into said compartment, means selectively connectable to said housing and insertable through said film winding hole into said compartment for rewinding the film in a film magazine, said means comprising a manual rewinding device and an electrically operated rewinding device, each of said manual rewinding device and electrically operated rewinding device comprising a rewinding

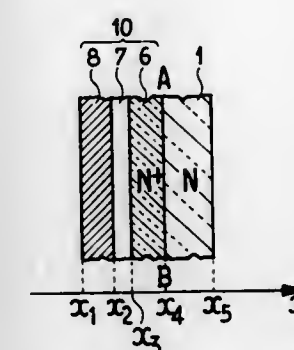
shaft for selectively extending through said film rewinding hole and a rewind coupling part on the end of each said re-



winding shaft capable of being located within said compartment and arranged to be releasably connected to the film magazine.

4,006,490
CATHODE FOR GUNN DIODE AND GUNN DIODE COMPRISING SUCH A CATHODE
Paul-Cyril Moutou, and Jean-Jacques Godart, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Nov. 28, 1975, Ser. No. 636,292
Claims priority, application France, Nov. 29, 1974, 74.39190

Int. Cl.² H01L 47/02
U.S. Cl. 357—3 4 Claims

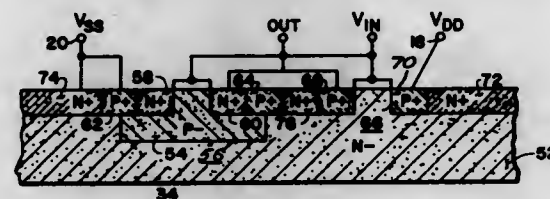


1. A cathode for a Gunn diode comprising an active zone formed by Gallium Arsenide of a given type of conductivity, and comprising in combination two layers cooperating with one another, and situated between said active zone and a metallic deposit serving as cathode contact: the first of these layers deposited on said active zone being formed of Gallium Arsenide, having the same type of conductivity as that forming the active zone conductivity and having a strong doping concentration, and said second being formed of amorphous germanium.

4,006,491
INTEGRATED CIRCUIT HAVING INTERNAL MAIN SUPPLY VOLTAGE REGULATOR
Allan A. Alaspa, and Robert R. Beutler, Tempe, Ariz., assignors to Motorola, Inc., Chicago, Ill.
Filed May 15, 1975, Ser. No. 577,968
Int. Cl.² H01L 29/78, 27/02, 29/34; H03K 3/26
U.S. Cl. 357—23 2 Claims

1. A complementary field-effect transistor integrated circuit semiconductor chip comprising a first internal portion of complementary field-effect transistor circuitry having collapsed guard rings therein and a second peripheral portion of complementary field-effect transistor circuitry having non-collapsed guard rings therein, said collapsed guard rings in-

cluding guard rings substantially contiguous with source and drain regions of said field-effect transistors of said first internal portion and of opposite conductivity type to said source and drain regions in said first internal portion, said non-col-



lapsed guard rings including guard rings substantially spaced from source and drain regions of said field-effect transistors of said second peripheral portion and of opposite conductivity type to said source and drain regions in said second peripheral portion.

4,006,492

HIGH DENSITY SEMICONDUCTOR CHIP ORGANIZATION

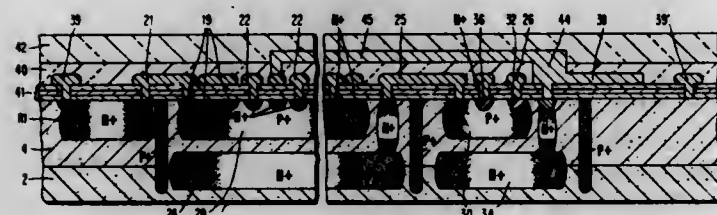
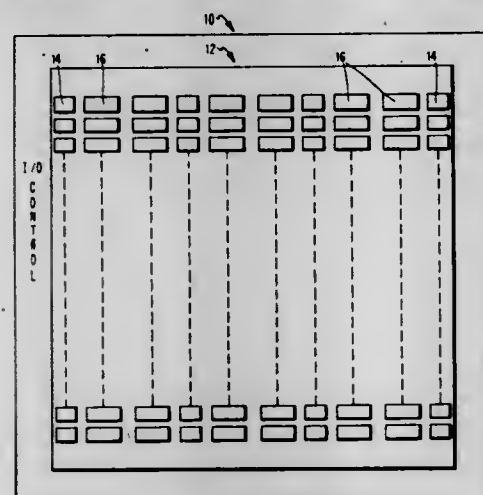
Edward Baxter Eichelberger, Parady Station, and Gordon Jay Robbins, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,231

Int. Cl.² H01L 27/10, 29/06, 23/48

U.S. Cl. 357-45

25 Claims



1. In a semiconductor, integrated circuit chip structure including a plurality of regions of different conductivity types extending into said chip to provide transistors and other circuit elements which are arranged into a plurality of substantially rectangular logic circuit units, the improvement comprising:

first and second groups of said logic circuit units disposed in said semiconductor substrate in at least first and second columnar arrays, respectively; each said unit being generally elongated in a direction transverse to the array direction and narrow in the array direction, the units in said first group being substantially longer than the units in said second group; said units containing selectable input signal regions, reference potential terminals, output signal terminals at corresponding fixed positions and input signal terminals at selected ones of said input signal regions; and first and second groups of conductive channels over the surface of said substrate and insulated therefrom by at least one layer of electrically insulative material, said conductive channels disposed in a direction substantially parallel to said array direction; said first and second groups of conductive channels being connected to said selected input signal terminals of said first and second groups of logic units, respectively.

4,006,493

TAPE CASSETTE

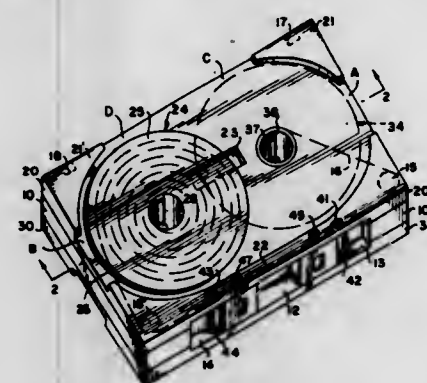
Martin E. Gerry, 13452 Winthrop St., Santa Ana, Calif. 92705

Filed May 19, 1975, Ser. No. 579,004

Int. Cl.² G11B 23/04, 15/30

U.S. Cl. 360-132

12 Claims



1. A tape cassette, comprising in combination: a cassette case comprising a first cover and a second cover substantially parallel to the first cover and a hollow body interposed between and adapted to said covers, the first cover having a first aperture and a first orifice therethrough substantially in line with each other, the second cover having a second aperture and a second orifice therethrough substantially in line with each other; and a pair of first and second oppositely disposed disks external to said case and parallel to said covers, the first disk having a first elongated shaft integral therewith extending orthogonally therefrom and terminating in a first annular portion, said first annular portion extending through the first aperture and fitted for rotation in said second orifice, the second disk having a second elongated shaft integral therewith extending orthogonally therefrom and terminating in a second annular portion, said second annular portion extending through the second aperture and fitted for rotation in said first orifice.

DESIGN PATENTS

GRANTED FEBRUARY 1, 1977

ERRATA

For	See
CLASS	PATENT NO.
011-156	243,269
015-015	243,270
015-029	243,275
019-035	243,276
026-014 B	243,279
015-007	243,281
015-009	243,282

DESIGNS

FEBRUARY 1, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

243,209
PLUME

Saul E. Fisher, 14 Elizabeth St., Buckhannon, W. Va. 26201
Filed Jan. 20, 1975, Ser. No. 542,263
Term of patent 14 years
Int. Cl. D2—03

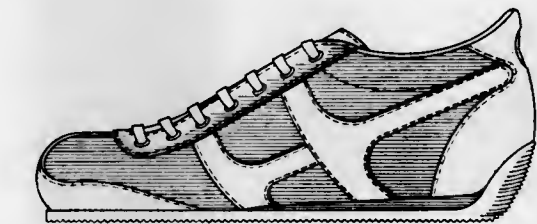
U.S. Cl. D2—263



243,211
ATHLETIC SHOE

Robert J. Gamm, Olivette, Mo., assignor to Trans-World Shoe Import Co., Inc.
Filed Feb. 10, 1975, Ser. No. 548,877
Term of patent 14 years
Int. Cl. D2—04

U.S. Cl. D2—309



243,212
CHAIR

James A. Downey, 133 Tiller, Midwest City, Okla. 73110
Filed Sept. 2, 1975, Ser. No. 609,141
Term of patent 14 years
Int. Cl. D6—01

U.S. Cl. D6—12



243,210
BOOT

James F. Summa, Naugatuck, and John R. White, Woodbridge, both of Conn., assignors to Uniroyal Inc.
Filed Apr. 16, 1975, Ser. No. 568,484
Term of patent 14 years
Int. Cl. D2—04

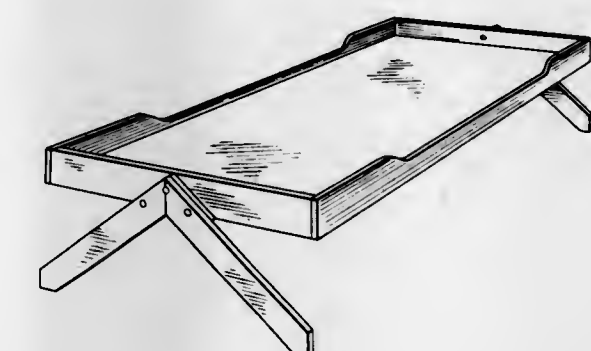
U.S. Cl. D2—272



243,213
CHILD'S COT

Joseph Kormos, 892 Herberton Place, Burlington, Ontario, Canada
Filed May 5, 1975, Ser. No. 574,422
Claims priority, application Canada, Feb. 3, 1975, 302751
Term of patent 14 years
Int. Cl. D6—01

U.S. Cl. D6—14



243,214
CLOTHES TREE

Nancy B. Werger, 4530 N. 23rd Ave. Apt. 23, Phoenix, Ariz. 85015

Filed Aug. 18, 1975, Ser. No. 605,651
Term of patent 14 years
Int. Cl. D6-00

U.S. Cl. D6-28



243,216
ROCKING CHAIR

Robert P. Elshy, Floyds Knobs; John R. Strange, Orleans, and Walter S. Heazlett, Jr., Floyds Knobs, all of Ind., assignors to Paoli Chair Company, Inc., Paoli, Ind.

Filed June 6, 1975, Ser. No. 584,416
Term of patent 14 years
Int. Cl. D6-01

U.S. Cl. D6-49

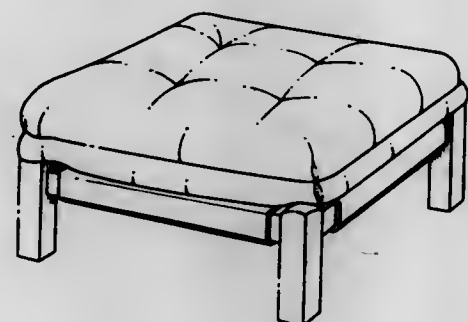


243,215
OTTOMAN

Thomas Winrow, Fort Myers, Fla., assignor to Futorian Corporation, Amsterdam, N.Y.
Division of Ser. No. 532,570, Dec. 13, 1974, Pat. No. Des. 237,923.

This application Sept. 16, 1975, Ser. No. 614,055
Term of patent 14 years
Int. Cl. D6-01

U.S. Cl. D6-36



243,217
SOFA

Ernest E. Warsaw, 5665 Downey Road, Vernon, Calif. 90058
Filed Jan. 9, 1975, Ser. No. 539,574

Term of patent 14 years
Int. Cl. D6-01

U.S. Cl. D6-63

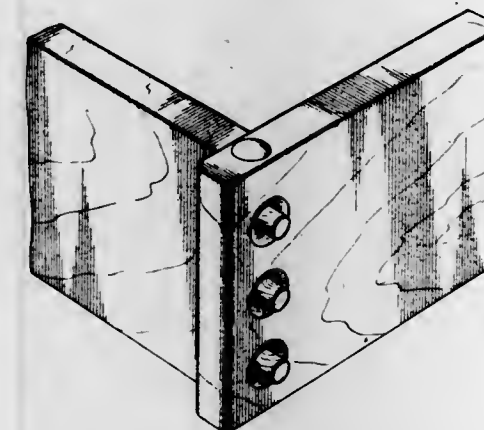


243,218
BED FRAME

Richard M. Baker, 1368 Berkley St., Anaheim, Calif. 92804
Filed Oct. 18, 1974, Ser. No. 516,013

Term of patent 14 years
Int. Cl. D6-01

U.S. Cl. D6-84

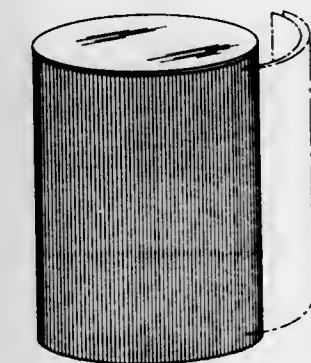


243,220
CARD HOLDER

Velma H. Binion, 1022 Whittier, St. Louis, Mo. 63113
Filed Aug. 27, 1975, Ser. No. 608,154

Term of patent 14 years
Int. Cl. D6-148

U.S. Cl. D6-148

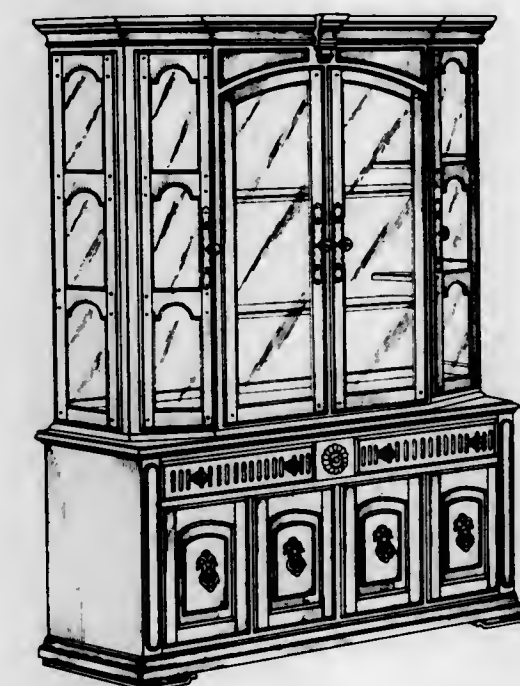


243,221
TWO-PIECE PROVINCIAL STYLE BREAKFRONT OR THE LIKE

Joseph E. Adkinson, Chevy Chase, Md., assignor to Wilfred G. Caldwell, Arlington, Va.

Filed Apr. 23, 1974, Ser. No. 463,284
Term of patent 14 years
Int. Cl. D6-04

U.S. Cl. D6-154

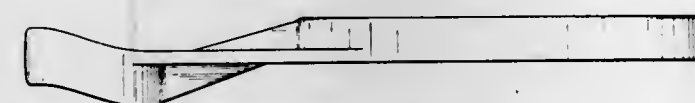
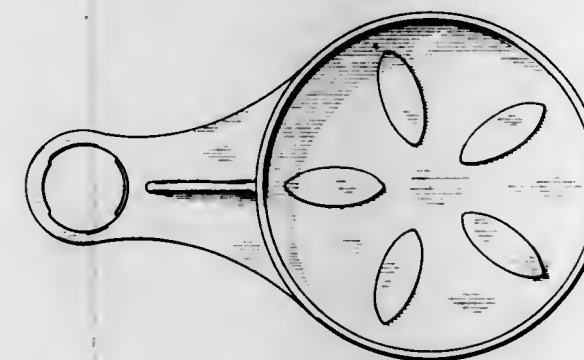


243,219
SHELF FOR POTTED PLANT STAND

Melvin L. Jeffries, 7306 E. 27th Place, Tulsa, Okla. 74129
Filed Jan. 15, 1976, Ser. No. 649,345

Term of patent 14 years
Int. Cl. D6-04

U.S. Cl. D6-136

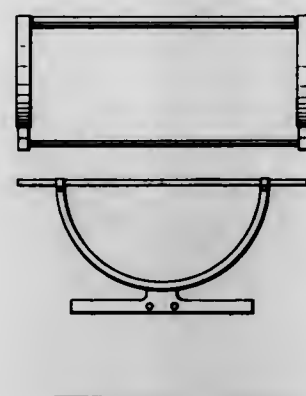


243,222
TABLE

Jose A. Lopez, Miami, Fla., assignor to Camilo Muebles, Inc., Coral Gables, Fla.

Filed June 13, 1975, Ser. No. 586,716
Term of patent 14 years
Int. Cl. D6-03

U.S. Cl. D6-177

243,225
SPOON

Thomas Oliver Gorsuch, 305 Summer St., Somerville, Mass. 02144

Filed June 20, 1975, Ser. No. 588,962
Term of patent 14 years
Int. Cl. D7-03

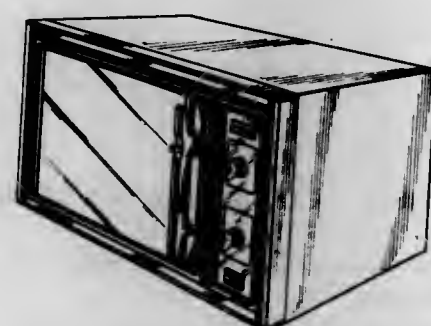
U.S. Cl. D7-151

243,223
ELECTRONIC COOKING RANGE

Yoshio Suganoya, and Takao Miyake, both of Osaka, Japan, assignors to Sharp Corporation

Filed June 16, 1972, Ser. No. 255,324
The portion of the term of this patent subsequent to Sept. 4, 1987, has been disclaimed.
Term of patent 14 years
Int. Cl. D7-04

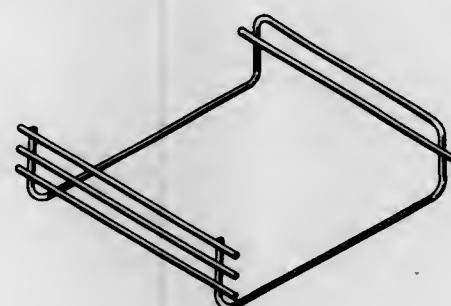
U.S. Cl. D7-128

243,226
FIREPLACE GRATE OR THE LIKE

Donald R. Kerstetter, R.D. No. 1, Cameron County, Emporium, Pa. 15834

Filed May 29, 1975, Ser. No. 581,810
Term of patent 14 years
Int. Cl. D7-08

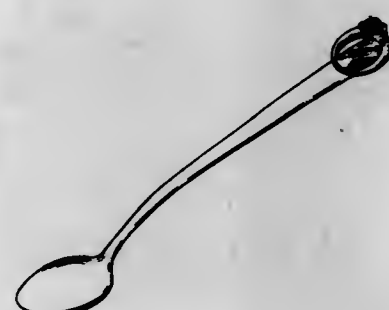
U.S. Cl. D7-207

243,224
SPOON

Thomas Oliver Gorsuch, 305 Summer St., Somerville, Mass. 02144

Filed May 29, 1975, Ser. No. 581,899
Term of patent 14 years
Int. Cl. D7-03

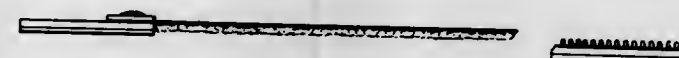
U.S. Cl. D7-143

243,227
SEPARABLE STRAP FASTENER

Robert L. Schattner, Baltimore, Md., assignor to Omnimed, Inc., Burlington, N.J.

Filed June 27, 1974, Ser. No. 483,714
Term of patent 14 years
Int. Cl. D8-08

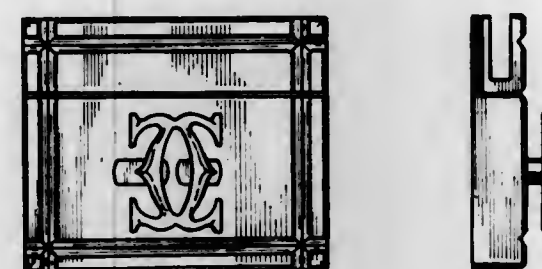
U.S. Cl. D8-129

243,228
SEPARABLE LOCK FOR LUGGAGE OR THE LIKE

Alain D. Perrin, Boulogne, France, assignor to Les Must de Cartier-France, Paris, France

Filed May 2, 1975, Ser. No. 573,941
Claims priority, application France, Nov. 4, 1974, 74.30658
Term of patent 14 years
Int. Cl. D8-07

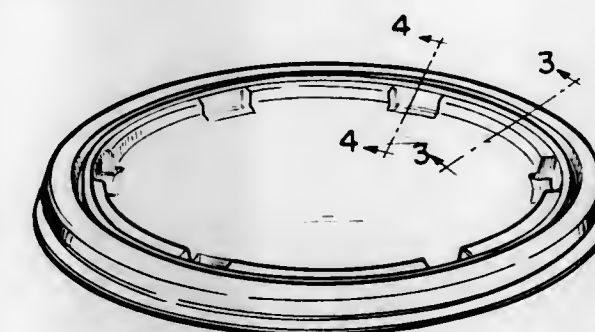
U.S. Cl. D8-129

243,231
DRINKING CUP LID OR THE LIKE

G. Kenneth Smith, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 28, 1975, Ser. No. 599,749
Term of patent 14 years
Int. Cl. D9-99

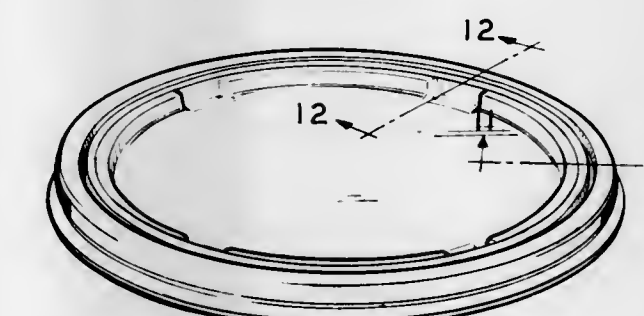
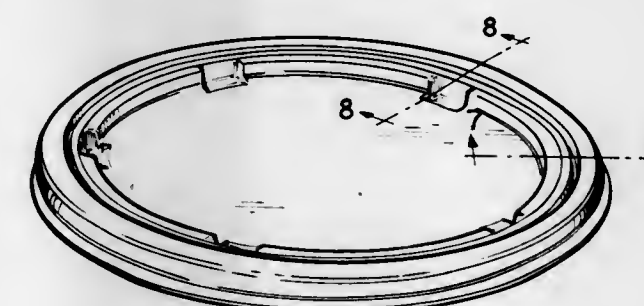
U.S. Cl. D9-267

243,229
BOTTLE OR SIMILAR ARTICLE

John W. McDonald, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed Sept. 25, 1975, Ser. No. 616,856
Term of patent 14 years
Int. Cl. D9-01

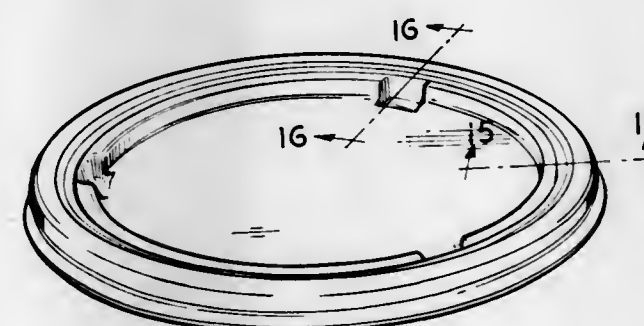
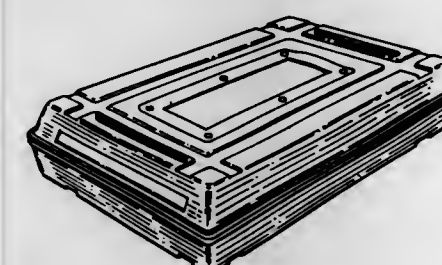
U.S. Cl. D9-157

243,230
SHIPPING CONTAINER

Wayne E. Kleiner, Mohrsville, Pa., assignor to W. R. Grace & Co., Cryovac Division, Duncan, S.C.

Filed May 19, 1975, Ser. No. 578,683
Term of patent 14 years
Int. Cl. D9-03

U.S. Cl. D9-182



243,232

MOTORCYCLE CHAIN WEAR MEASURING GAGE

Frederick J. Kuenzig, 16 Bob White Way, Simsbury, Conn. 06070

Filed Sept. 16, 1974, Ser. No. 506,727

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-73

243,234
CAR

Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault

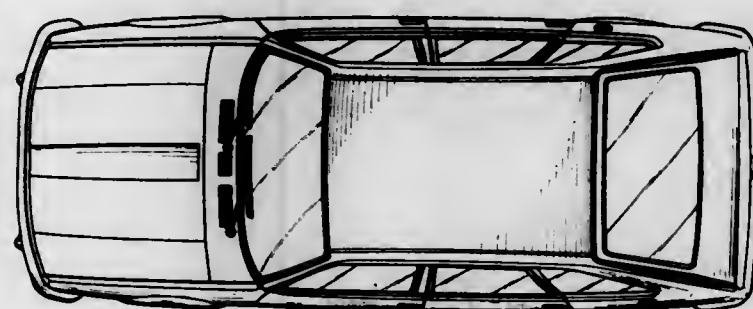
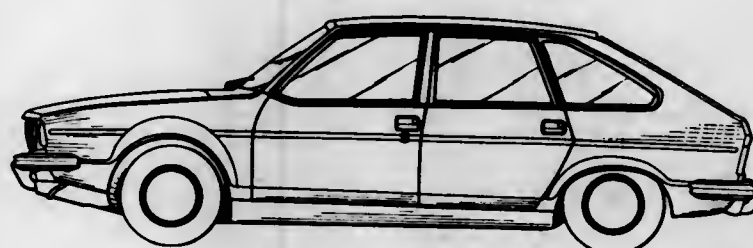
Filed July 21, 1975, Ser. No. 597,811

Claims priority, application France, Jan. 29, 1975, 75.73559

Term of patent 14 years

Int. Cl. D12-08

U.S. Cl. D12-91



243,233

BICYCLE FENDER REFLECTOR

Frank P. Briando, and Rudolph L. Schwinn, both of Niles, Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.

Filed Mar. 17, 1975, Ser. No. 559,266

Term of patent 14 years

Int. Cl. D10-06

U.S. Cl. D10-111



243,235

COMBINED VEHICLE WITH MOUNTED SIGN

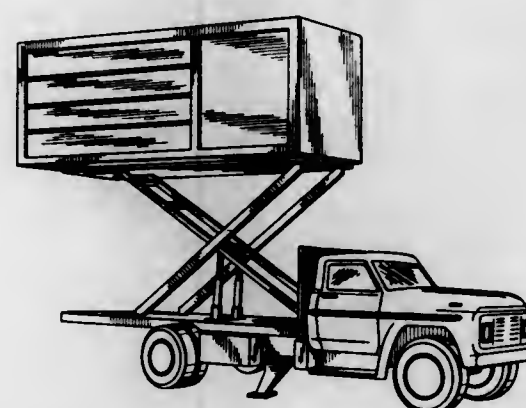
Seymour Buxton, Riverside, Calif., assignor to Desert Outdoor Advertising, Inc., Riverside, Calif.

Filed Oct. 24, 1975, Ser. No. 625,465

Term of patent 14 years

Int. Cl. D12-08

U.S. Cl. D12-96



243,236

AIR BOX FOR BICYCLES

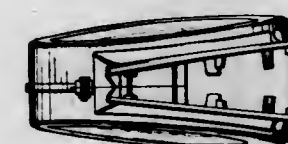
Roy R. Vachon, Rolling Hills, and John C. Bacardi, Harbor City, both of Calif., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 541,314, Jan. 15, 1975. This application Feb. 27, 1976, Ser. No. 661,972

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-114



243,238

ELECTROPHOTOGRAPHIC COPIER-DUPPLICATOR

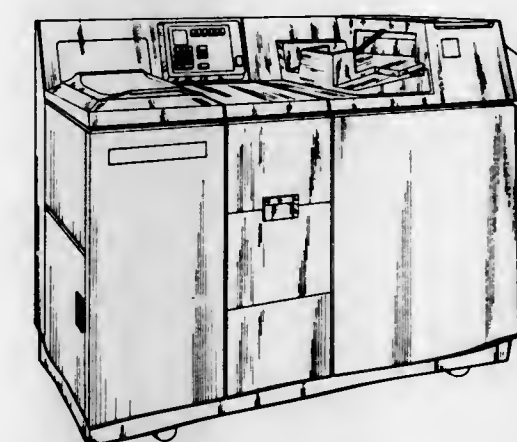
Richard J. Olson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,926

Term of patent 14 years

Int. Cl. D16-3

U.S. Cl. D16-30



243,237

EYEGLASS FRAME

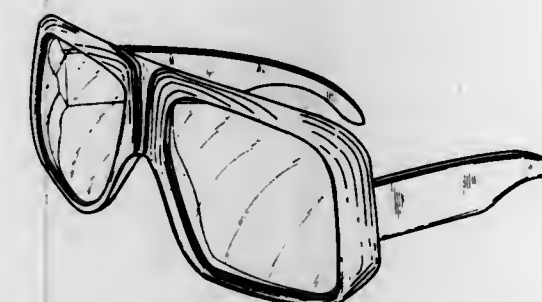
Elfriede Teufelhart, Vienna, Austria, assignor to Optyl Corporation, Norwood, N.J.

Filed Oct. 21, 1975, Ser. No. 624,329

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,239

SPRINKLER BASE

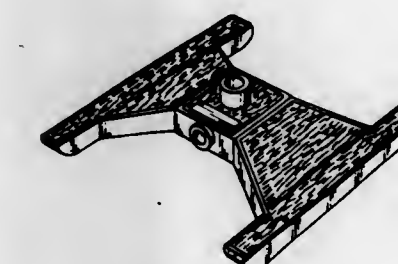
William C. Hutton, Worthington; Dale P. Hugo, and Carl A. Rivasi, both of Columbus, all of Ohio, assignors to Amerace Corporation, New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,620

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-7

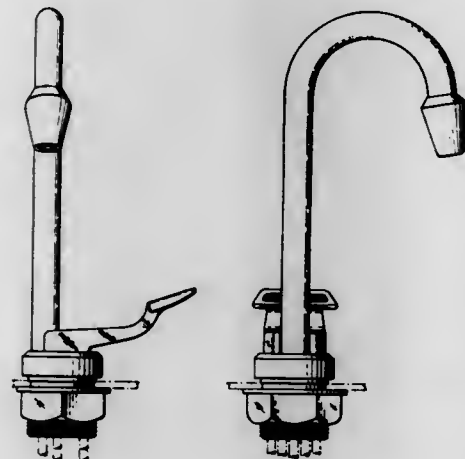


243,240
FAUCET

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to Emerson Electric Co. (H & H Thermostats Division), Cedar Grove, N.J.

Filed Jan. 6, 1976, Ser. No. 646,910
Term of patent 14 years
Int. Cl. D23-01

U.S. Cl. D23-25

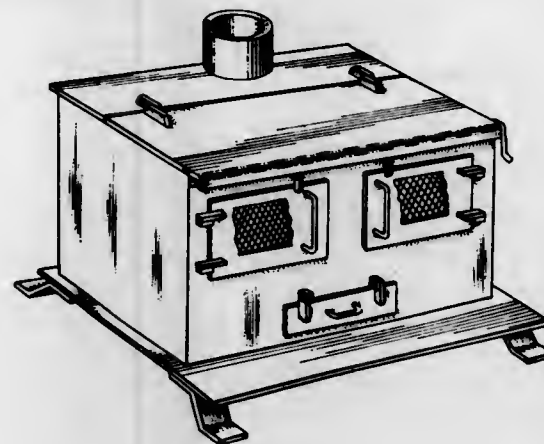


243,242
WOOD BURNING STOVE

Lawrence J. Antone, Star Route, Dalton, Mass. 01226
Filed Feb. 6, 1975, Ser. No. 547,567

Term of patent 14 years
Int. Cl. D23-03

U.S. Cl. D23-93

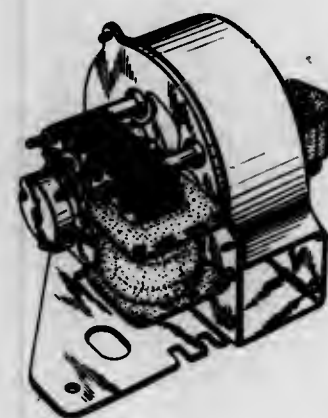


243,243
COMBINED BLOWER AND MOTOR WITH SPEED
REDUCTION MEANS THEREFOR

Mutunori Nagao, Katano, and Mitsuaki Utsumi, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 23, 1973, Ser. No. 418,653
Term of patent 14 years
Int. Cl. D23-04; D13-01

U.S. Cl. D23-162

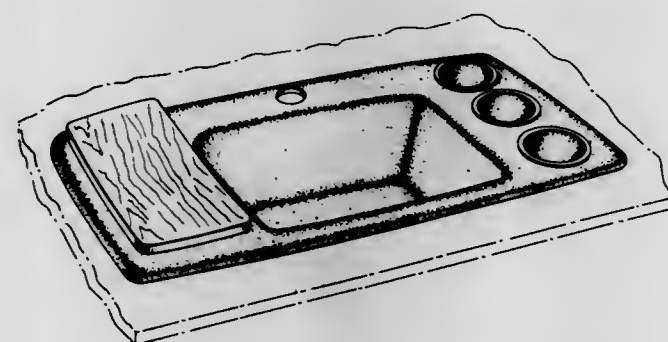


243,241
SINK

Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Mar. 27, 1975, Ser. No. 562,441
Term of patent 14 years
Int. Cl. D23-02

U.S. Cl. D23-58

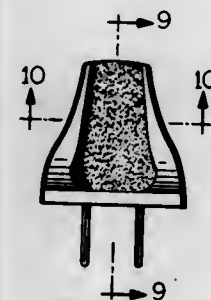


243,244
ELECTRIC PLUG

Joan Klatil Creamer, Warwick, R.I., assignor to General Electric Company

Filed Apr. 24, 1975, Ser. No. 571,172
Term of patent 14 years
Int. Cl. D13-03

U.S. Cl. D26-1 B



243,245
POWER MODULE FOR ELECTRONIC ENGINE IGNITION
SYSTEMS

Craig S. Beshore, 753 Puma Canyon Lane, Glendora, Calif. 91740

Filed Sept. 10, 1975, Ser. No. 611,982
Term of patent 14 years
Int. Cl. D13-03

U.S. Cl. D26-1 R

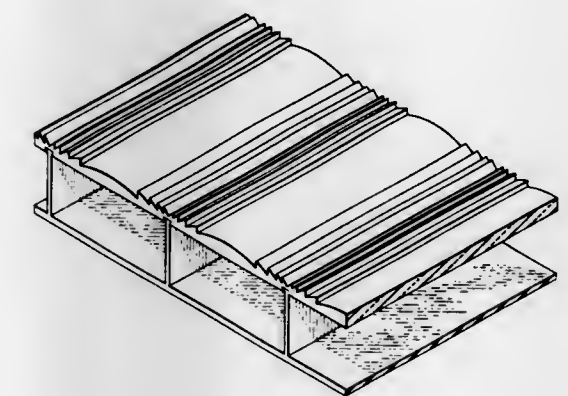


243,247
CONDENSED MULTIPLE CONVERGENCE LINEAR
OPTICAL AND RECEIVER PLATE FOR SOLAR
CONVERSION OR THE LIKE

Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752

Filed Dec. 1, 1975, Ser. No. 636,781
Term of patent 14 years
Int. Cl. D13-02; D26-05

U.S. Cl. D26-1 R

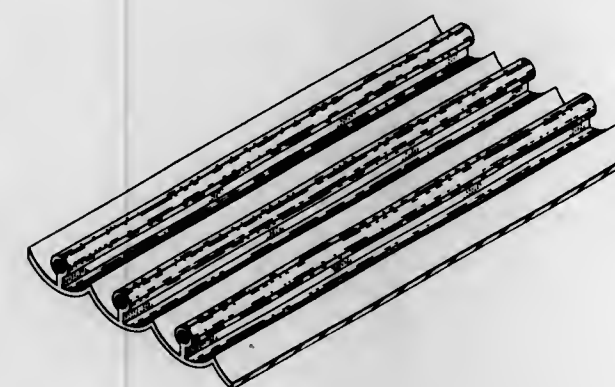


243,246
MULTIPLE CONVERGENCE REFLECTIVE LINEAR
OPTICAL AND RECEIVER PLATE FOR SOLAR
CONVERSION OR THE LIKE

Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752

Filed Dec. 1, 1975, Ser. No. 636,761
Term of patent 14 years
Int. Cl. D13-02; D26-05

U.S. Cl. D26-1 R

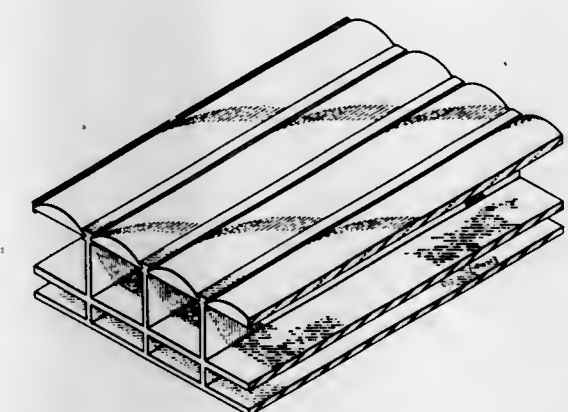


243,248
INTERCHANGEABLE ONE DIMENSIONAL
CONVERGENCE LENS SOLAR RADIATION
INTENSIFICATION AND CONVECTIVE RECEIVER

Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752

Filed Jan. 21, 1976, Ser. No. 651,098
Term of patent 14 years
Int. Cl. D13-02; D26-05

U.S. Cl. D26-1 R



243,249

ELECTRONIC CALCULATING MACHINE

Shigetoshi Hazama, and Masafumi Yamagami, both of Osaka, Japan, assignors to Sharp Corporation

Filed May 27, 1975, Ser. No. 580,833

Claims priority, application Japan, Nov. 29, 1974, 49-42789

Term of patent 14 years

Int. Cl. D18-01

U.S. Cl. D26-5 C



243,251

ELECTRONIC CALCULATING MACHINE

Shigetoshi Hazama, and Junichi Sakamoto, both of Osaka, Japan, assignors to Sharp Corporation

Filed Aug. 21, 1975, Ser. No. 606,713

Claims priority, application Japan, Feb. 26, 1975, 50-7850

Term of patent 14 years

Int. Cl. D18-01

U.S. Cl. D26-5 C



243,252

LOUDSPEAKER GRILLE

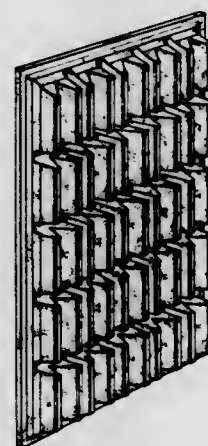
Fred C. Tushinsky, Sun Valley, Calif., assignor to Marantz Company, Inc., Chatsworth, Calif.

Filed June 11, 1975, Ser. No. 586,044

Term of patent 3½ years

Int. Cl. D14-99, 01

U.S. Cl. D26-14 G



243,250

ELECTRONIC CALCULATING MACHINE

Shigetoshi Hazama, Osaka, Japan, assignor to Sharp Corporation

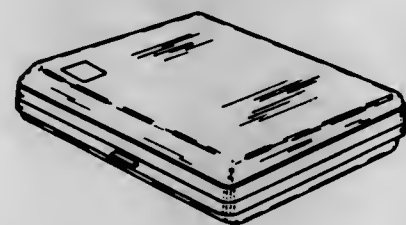
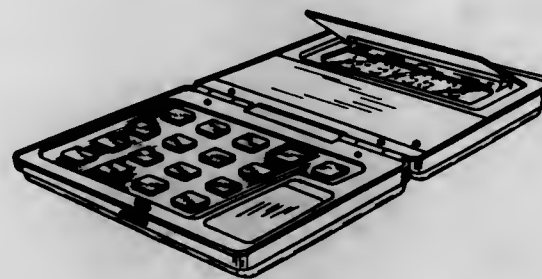
Filed July 18, 1975, Ser. No. 597,000

Claims priority, application Japan, Jan. 22, 1975, 50-3159

Term of patent 14 years

Int. Cl. D18-01

U.S. Cl. D26-5 C



243,253

LOUDSPEAKER GRILLE

John R. Ballantyne, Sun Valley, Calif., assignor to Superscope, Inc., Chatsworth, Calif.

Filed June 11, 1975, Ser. No. 586,045

Term of patent 14 years

Int. Cl. D14-99, 01

U.S. Cl. D26-14 G



243,254

COMPUTER OR SIMILAR ARTICLE

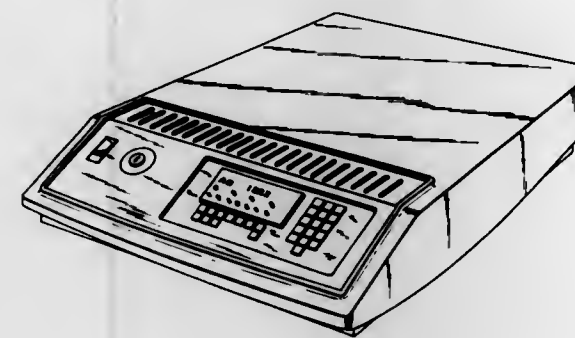
Dennis C. Coon, Acton, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jan. 19, 1976, Ser. No. 650,205

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D26-5 C



243,257

SMOKING PIPE WITH SWIVEL STEM

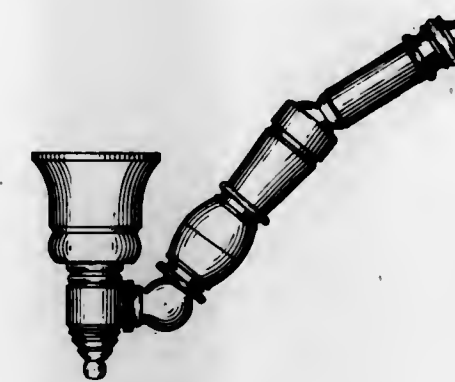
David Segal, 906 Gordon Terrace, Winnetka, Ill. 60093

Filed Sept. 5, 1975, Ser. No. 610,620

Term of patent 7 years

Int. Cl. D27-02

U.S. Cl. D27-3



243,255

COMBINED AMPLIFIER AND TUNER

Yoshinobu Asai, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

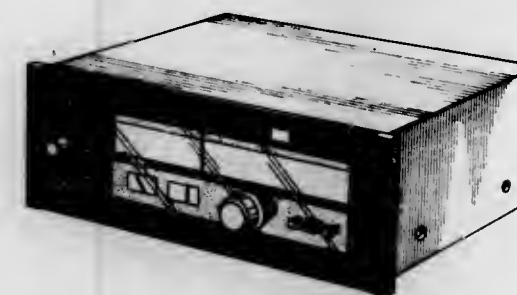
Filed June 18, 1975, Ser. No. 588,116

Claims priority, application Japan, Jan. 10, 1975, 50-002041

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D26-14 L



243,258

SMOKING PIPE OR SIMILAR ARTICLE

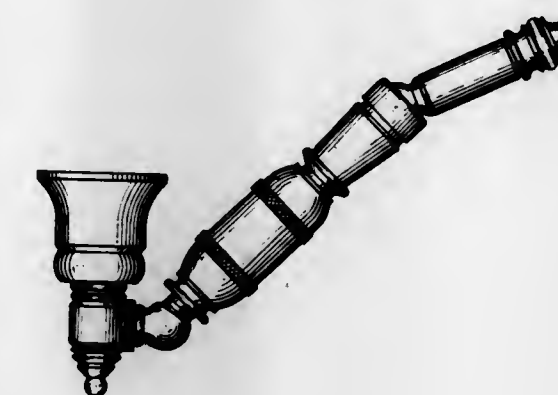
David Segal, 906 Gordon Terrace, Winnetka, Ill. 60093

Filed Sept. 5, 1975, Ser. No. 610,621

Term of patent 7 years

Int. Cl. D27-02

U.S. Cl. D27-3



243,256

WATER PIPE CASING

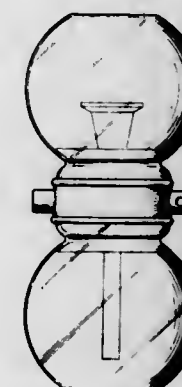
George F. Grihalva, 641 S. Fairview St., Santa Ana, Calif. 92704

Filed Nov. 20, 1974, Ser. No. 525,488

Term of patent 14 years

Int. Cl. D27-02

U.S. Cl. D27-3



243,259

MICROORGANISM CULTURE TRAY

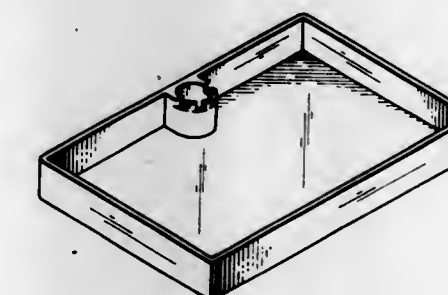
John E. Martin, Jr., Atlanta, Ga., and Richard Land Jackson, Jr., Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 18, 1974, Ser. No. 451,843

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D32-1 A



243,260

DOLL OR SIMILAR ARTICLE

Dolores Wycalls, 2360 Sandra Road, Palm Springs, Calif. 92262

Filed Sept. 15, 1975, Ser. No. 613,268

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-4 R



243,261

BATON

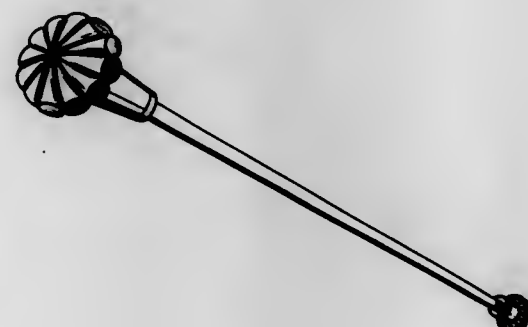
Donald L. Sartell, 300 S. Wright Road, Janesville, Wis. 53545

Filed July 3, 1975, Ser. No. 592,972

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 BC



243,262

GAME TARGET

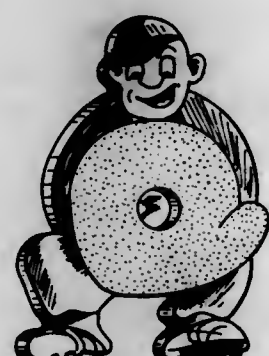
Stanley Laut, 1253 E. 73rd St., Brooklyn, N.Y. 11234

Filed Sept. 15, 1975, Ser. No. 613,431

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 PP



243,263

SNOW SKATE

Jeffrey M. Koblick, Hennepin County, Minn., assignor to K-tel International, Inc., Minn.

Filed Sept. 29, 1975, Ser. No. 617,388

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-14 D



243,264

SNOW SKI

Jeffrey M. Koblick, Hennepin County, Minn., assignor to K-tel International, Inc., Minn.

Filed Sept. 29, 1975, Ser. No. 617,389

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-14 D



243,265

SKI POLE

Jeffrey M. Koblick, Hennepin County, Minn., assignor to K-tel International, Inc.

Filed Sept. 29, 1975, Ser. No. 617,390

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-14 D



243,266

TOY LOADER

Jack L. Breneman, Orchard Park, N.Y., assignor to The John Louis Baumgartner, 9111 Springhill Lane, Greenbelt, Md. 20770

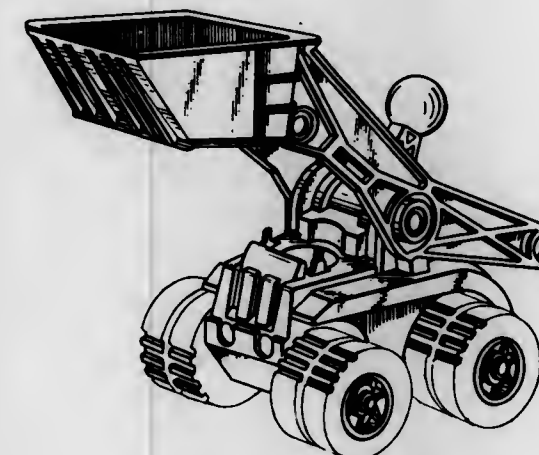
Filed July 18, 1974, Ser. No. 489,485

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-15 AJ



243,267

TOY DIGGER

Jack L. Breneman, Orchard Park, and Jeffrey T. Samson, East Aurora, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

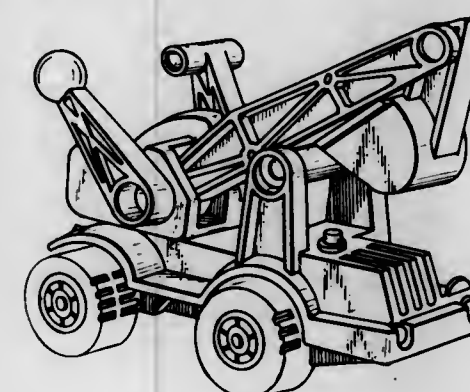
Filed July 31, 1974, Ser. No. 493,254

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-15 AJ



243,268

ROCKING TOY

Julian B. Pearce, Rte. 3, Box 8B, Lyons, Ga. 30436

Filed June 10, 1975, Ser. No. 585,466

Term of patent 14 years

Int. Cl. D21-03

U.S. Cl. D34-15 AE



243,269

PLANTER

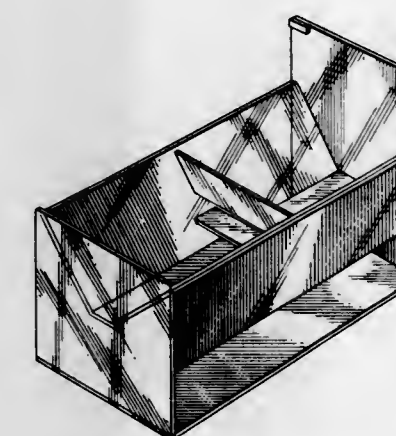
John Louis Baumgartner, 9111 Springhill Lane, Greenbelt, Md. 20770

Filed Mar. 31, 1976, Ser. No. 672,393

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-156



243,270

COMBINED SELF-PROPELLED TRACTOR WITH LAWN MOWER APPARATUS

Hans Tage Alfred Ehrlin, and Christian Gunnar Haggstam, both of Tranas, Sweden, assignors to Stiga AB, Tranas, Sweden

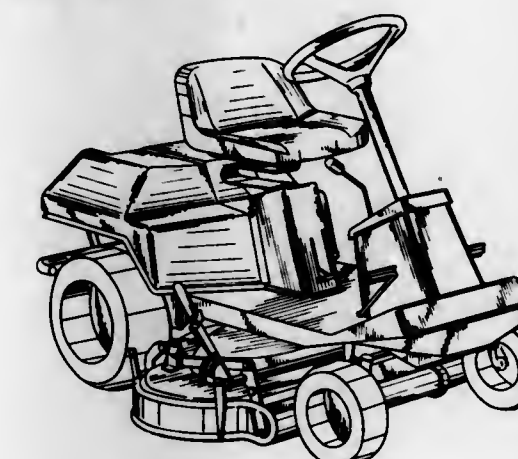
Filed Dec. 18, 1974, Ser. No. 533,784

Claims priority, application Sweden, June 26, 1974, 741062

Term of patent 14 years

Int. Cl. D15-03

U.S. Cl. D15-15



243,271

COMBINED FLOOR LAMP AND CONTAINER FOR KNITTING AND SEWING ARTICLES

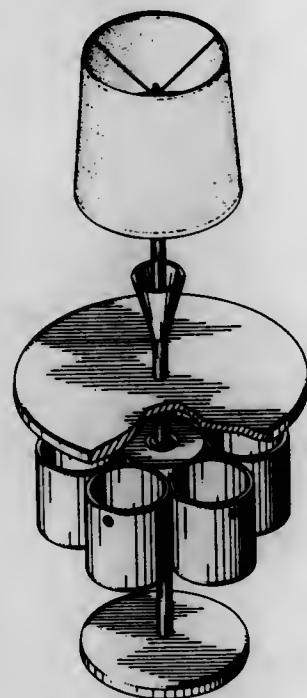
Quindora Jan McCuiston, 16016 N. 70th Drive, Peoria, Ariz. 85345

Filed Apr. 16, 1975, Ser. No. 568,791

Term of patent 14 years

Int. Cl. D26-05

U.S. Cl. D48-20 D



243,272

PORTABLE ELECTRIC LIGHT

Tadahide Okuno, and Masahiro Karaki, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

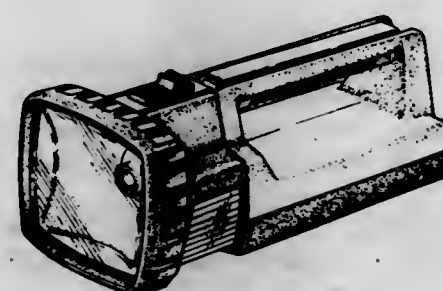
Filed Dec. 13, 1974, Ser. No. 532,487

Claims priority, application Japan, June 19, 1974, 49-20646

Term of patent 14 years

Int. Cl. D26-02

U.S. Cl. D48-24 R



243,273

MOBILE HOME TAIL LIGHT ASSEMBLY

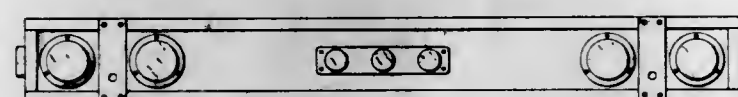
Robert W. Braucht, Jersey Shore, Pa., assignor to Capital Housing, Inc., Avis, Pa.

Filed Aug. 20, 1975, Ser. No. 606,626

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D48-32 R



243,274

AUXILIARY LIGHT FOR VEHICLE HAVING ATTACHED PLOWBLADE

Marc L. Miceli, Lyndhurst, Ohio, assignor to Meyer Products, Inc., Cleveland, Ohio

Filed Jan. 19, 1976, Ser. No. 650,273

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D48-32 R



243,275

CULTIVATOR TINE

Cornelis van der Lely, 7, Bruchsehl, Zug, Switzerland

Filed Nov. 21, 1975, Ser. No. 634,237

Term of patent 14 years

Int. Cl. D15-03

U.S. Cl. D15-29



243,276

POTTERS WHEEL

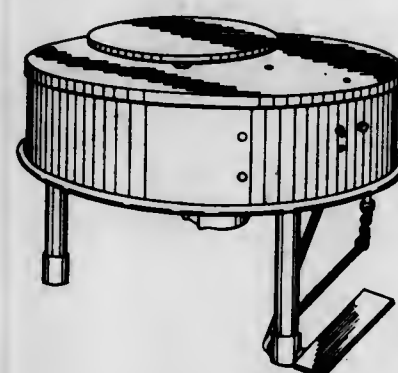
Paul E. Soldner, P.O. Box 917, Aspen, Colo. 81611

Filed Aug. 25, 1975, Ser. No. 607,343

Term of patent 7 years

Int. Cl. D15-09

U.S. Cl. D19-35



243,277

TELEVISION RECEIVER

Shinichi Sugihara, Saita; Minoru Ando, Uji; Hiroaki Nishiyori, Kyoto; Eiichi Arai, Toyonaka; Fumio Tanaka, Takatsuki, and Takaharu Kabetani, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

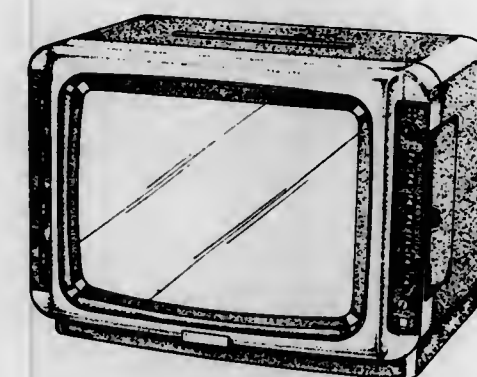
Filed Dec. 17, 1974, Ser. No. 533,463

Claims priority, application Japan, June 20, 1974, 49-20870

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D56-4 D



243,279

REUSABLE MICROFILM CARTRIDGE

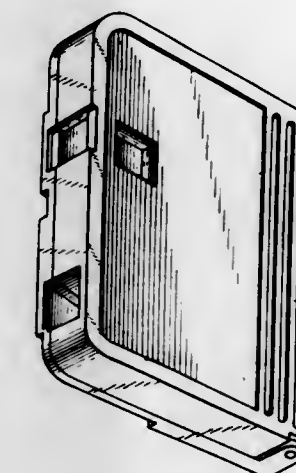
George W. Bookless, and Casimir S. Samczyk, both of Franklin Park, Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 9, 1973, Ser. No. 404,465

Term of patent 14 years

Int. Cl. D16-05

U.S. Cl. D26-14 B



243,280

PRINTING SUBSYSTEM

Joseph Paul Taylor, and David Graham Moore, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,879

Term of patent 14 years

Int. Cl. D18-02

U.S. Cl. D64-11 R



243,278

SHEET OF PAPER TOWELING

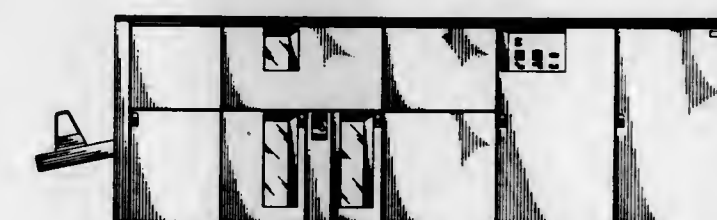
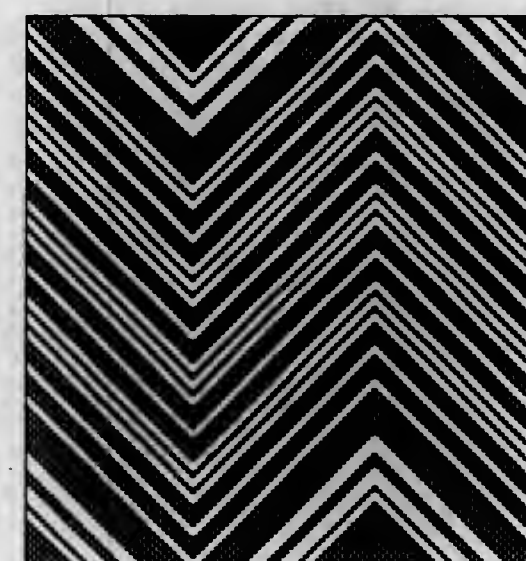
Donald T. Appleman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 30, 1974, Ser. No. 502,253

Term of patent 14 years

Int. Cl. D5-06

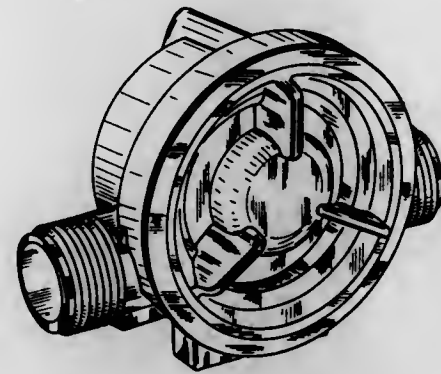
U.S. Cl. D59-2 B



243,281
PUMP

Ramon Pareja, Minneapolis, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed July 10, 1975, Ser. No. 594,793
Term of patent 14 years
Int. Cl. D15-02

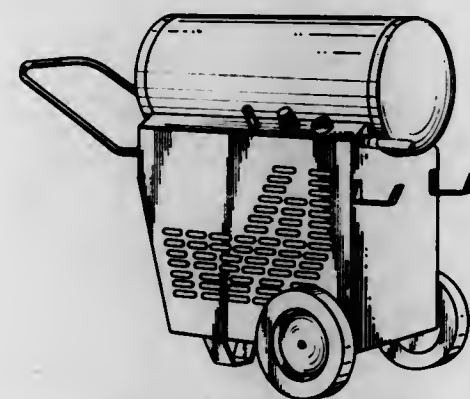
U.S. Cl. D15-7



243,282
PORTABLE AIR COMPRESSOR

Thomas I. Burenga, 360 N. Park, Richland Center, Wis. 53581
Filed Sept. 4, 1975, Ser. No. 610,099
Term of patent 14 years
Int. Cl. D15-02

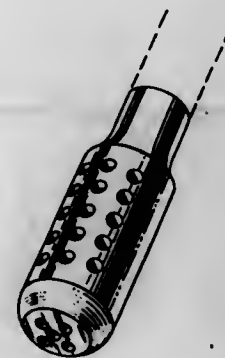
U.S. Cl. D15-9



243,283
MEDICAL SUCTION INSTRUMENT TIP

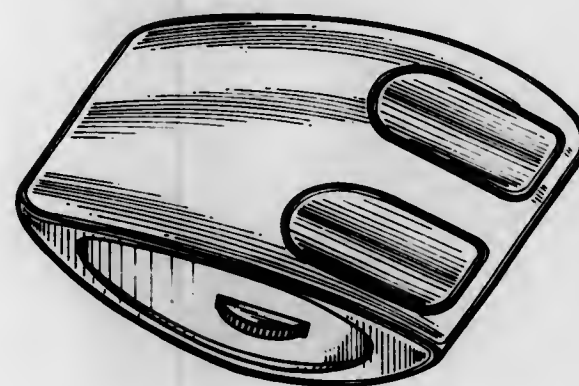
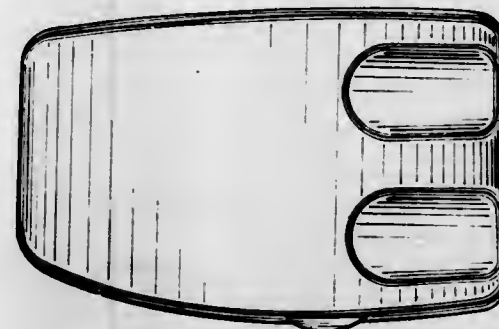
Charles A. Lahay, Fayette, Ala., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 6, 1975, Ser. No. 547,514
The portion of the term of this patent subsequent to Oct. 19, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D24-99

U.S. Cl. D83-12 A



243,284
GALVANIC BIOFEEDBACK SKIN RESPONSE DEVICE
Harold Keith Myers, 4300 DeMaisonneuve Blvd. W., Montreal, Quebec, Canada
Filed Apr. 17, 1975, Ser. No. 569,092
Term of patent 14 years
Int. Cl. D24-02

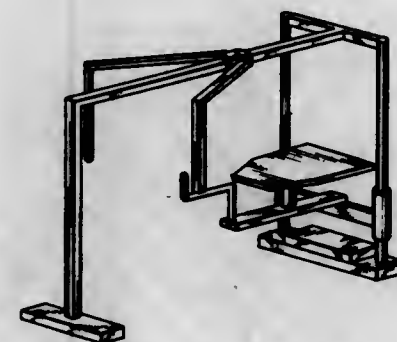
U.S. Cl. D83-1 F



243,285
ORTHOPEDIC SURGICAL TABLE

Robert Langren, 3280 Sterling Ave., Alameda, Calif. 94501
Filed May 12, 1975, Ser. No. 576,893
Term of patent 14 years
Int. Cl. D24-01

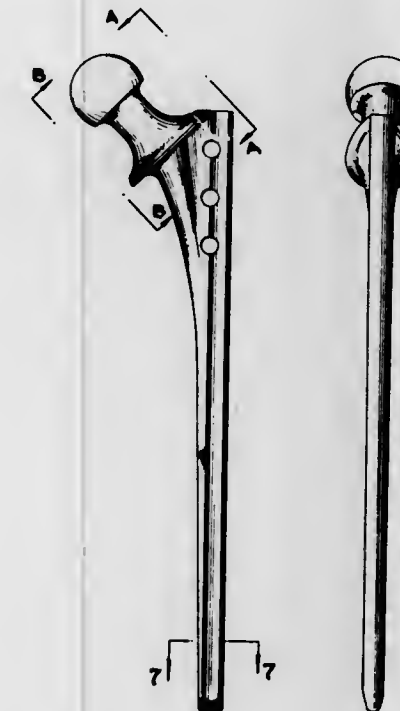
U.S. Cl. D83-1 D



243,286
FEMORAL HIP PROSTHESIS COMPONENT FOR TOTAL AND SUB-TOTAL HIP REPLACEMENT SYSTEMS
William Minor Deyerle, 2222 Monument Ave., Richmond, Va. 23220

Filed June 2, 1975, Ser. No. 582,971
Term of patent 14 years
Int. Cl. D24-03

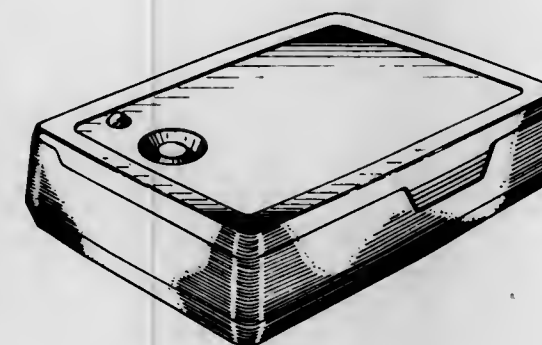
U.S. Cl. D83-1 E



243,287
DISINFECTING APPARATUS FOR HYDROPHILIC CONTACT LENSES
Paul A. Hoogesteger, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 18, 1975, Ser. No. 597,126
Term of patent 14 years
Int. Cl. D24-02

U.S. Cl. D83-1 W



243,288
ORTHOPTIC THERAPY BAR WITH PRISMS
Arthur Jampolsky, Belvedere; Richard J. Kapash, San Rafael; Merton C. Flom; Anthony J. Adams, both of Oakland, and Larry A. Spitzberg, San Rafael, all of Calif., assignors to Optical Sciences Group, Inc., San Rafael, Calif.
Filed Oct. 9, 1975, Ser. No. 620,977
Term of patent 14 years
Int. Cl. D24-02

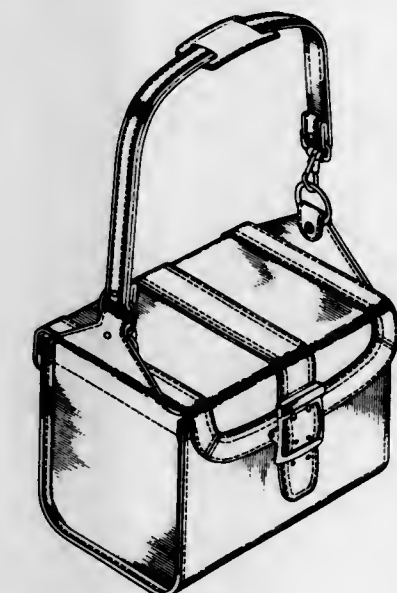
U.S. Cl. D83-12 R



243,289
TRAIN CASE
Daniel Solomon, Denver, Colo., and Thomas D. Tweedie, Monrovia, Calif., assignors to Samsonite Corporation, Denver, Colo.

Filed Mar. 17, 1975, Ser. No. 560,962
Term of patent 14 years
Int. Cl. D3-01

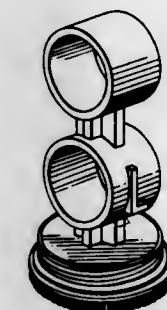
U.S. Cl. D87-5 C



243,290
CONTACT LENS CARRIER
Samuel Loshaek, Chicago, Ill., assignor to Wesley-Jessen Inc., Chicago, Ill.

Filed Jan. 29, 1975, Ser. No. 545,139
Term of patent 14 years
Int. Cl. D3-02

U.S. Cl. D87-9



LIST OF PATENTEEES

TO WHOM

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(in accordance with city and telephone directory practice).

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- Aanstad, Ola J., to Westinghouse Electric Corporation. Method and apparatus for controlling a steam turbine. 4,005,581, Cl. 60-660.000.
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- Abbott Laboratories: See—
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- Adams, Kenneth: See—
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- Childress, Scott J., to American Home Products Corporation. Systemic treatment of psoriasis. 4,006,250, Cl. 424-326.000.
- Chin, Clinton G.: See—
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- Chiselko, John J.; and Hulbert, William H., to Egan Machinery Company. Method for additive feeding. 4,006,209, Cl. 264-211.000.
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- Christensen, Robert I.; and Gould, George D., to Chevron Research Company. Process for the production of low-sulfur-content hydrocarbon mixtures. 4,006,076, Cl. 208-211.000.
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- Chrysler Corporation: See—
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- Chuboff, David P.: See—
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- Ciba-Geigy AG: See—
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- Civalier, Gerald T. Irrigation signal. 4,006,473, Cl. 340-244.00C.

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- Clay, Scott Douglas. Vacuum hair cutter. 4,005,526, Cl. 30-133.000.
- Clayton Manufacturing Company: See—
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- Cofe, Daniel B.; Chia, Enrique Calixta; Burnitt, John E.; and Kaltenberg, Theodor W., to Southwire Company. Apparatus for continuous pickling of cast rod. 4,005,744, Cl. 164-270.000.
- Cohen, William A., to Sphero International Co. Transmission with continuously variable speed ratio. 4,005,618, Cl. 74-640.000.
- Colato, Albert E.; and Formo, Jerome L., to Anchor Hocking Corporation. Apparatus for storing, refrigerating and heating food items. 4,005,745, Cl. 165-2.000.
- Colautti, Franco, to Kinglor Motor S.p.A. Means for withdrawing sponge iron from retorts. 4,005,857, Cl. 266-191.000.
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- Colgate-Palmolive Company: See—
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- Collins, Samuel H.: See—
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- Colson, James G.: See—
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- Combustion Engineering, Inc.: See—
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- Comfort Products, Inc.: See—
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- Commercial Resins Company: See—
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- Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: See—
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- Compagnie Industrielle des Lasers: See—
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- Compagnie Industrielle des Telecommunications Cit-Alcatel: See—
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- Continental Gummi-Werke Aktiengesellschaft: See—
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- Coon, James A. File forming press. 4,005,597, Cl. 72-380.000.
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- Corbiere, Claude. Textured yarn. 4,005,569, Cl. 57-140.00J.
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- Corona, Stephen C.: See—
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- Coulter, Raymond Arthur, to AMP Incorporated. Vacuum cleaner hose terminal applicator. 4,005,517, Cl. 29-748.000.
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- Courtot, Louis B., to Weatherhead Company, The. Tilt responsive valve. 4,005,724, Cl. 137-38.000.
- Courtright, Dennis R.: See—
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- CPC International Inc.: See—
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- Craddy, Richard Adrian, to Masson Scott Thrissell Engineering Limited. Rotary cutter drums. 4,005,627, Cl. 83-674.000.
- Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. [1,3-Dihydroxy-2-substituted and 2,2-disubstituted-indanyloxy-(or thio)alkanoic acids. 4,006,180, Cl. 260-473.00F.
- Crawford, William V., to Phillips Petroleum Company. Pipe end reforming apparatus. 4,005,968, Cl. 425-384.000.
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- Crockett, Robert R., to Engineered Metal Products Company, Inc. Picker. 4,005,782, Cl. 214-1.0BB.
- Crookston, Ronald W.; Alverson, Thomas E.; and Soles, Otto H., to Westinghouse Electric Corporation. Convection heating apparatus for multi-phase gas-type circuit interrupters. 4,006,332, Cl. 200-148.00E.
- Cross, Jon L.; Homan, Merle Edward; Machol, Guenther Keith; Malm, Richard La Verne; and Svelund, Larry Eugene, to International Business Machines Corporation. Apparatus for control and data transfer between a serial data transmission medium and a plurality of devices. 4,006,465, Cl. 340-172.500.
- Crosslen, Louis John, to Frank Mayer & Associates, Inc. Display case for use with a merchandise display rack. 4,005,775, Cl. 206-45.180.
- Crouch, Donald W., to General Electric Company. Vacuum interrupter for high voltage applications. 4,006,331, Cl. 200-144.00B.
- Crouch, William B., to Texaco Inc. Manufacture of gaseous mixtures comprising hydrogen and carbon monoxide. 4,006,100, Cl. 252-373.000.
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- Dahms, Harald. Method and apparatus for colorimetric analysis. 4,005,983, Cl. 23-230.00R.
- Dahms, Wolfgang, to Schering Aktiengesellschaft. Method of improving the tarnish resistance of silver. 4,006,026, Cl. 106-14.000.
- Daicel, Ltd.: See—
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- DeLille, Richard A.; Cuman, William A.; and DeGryse, Gentiel M., to Gulf & Western Industries, Inc. Magnetic return mechanism. 4,005,819, Cl. 235-144.0ME.
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- GTE Sylvania Incorporated: See—
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- Jager, Horst; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of 1-aminoanthraquinone. 4,006,170, Cl. 260-378.000.
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McInerney, Charles E., to Garrett Corporation, The. Method and apparatus for turbocharger control. 4,005,578, Cl. 60-602.000.

McKay, Robert S. Toy vehicle-aircraft combination. 4,005,543, Cl. 46-81.000.

McKenry, Robert J.; and College, Michael A., to Kennametal Inc. Impact or demolition tool. 4,005,906, Cl. 299-91.000.

McKenzie, John K.: See—
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McKerrow, George Clement: See—
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McLaughlin, William L.; Levine, Harry; and Rosenstein, Marvin, to United States of America, Health, Education and Welfare. Photographic polymeric composition containing a leuco dye cyanide. 4,006,023, Cl. 96-90.00R.

McLean, Nathan Cosh, to C.D.B. Europ. Hank dyeing. 4,005,590, Cl. 68-5.00D.

McManamon, Peter Michael, to United States of America, Navy. Filtered transition distortion channel quality monitor. 4,006,303, Cl. 178-69.00A.

McNiff, Edward J., Jr.: See—
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Mega, Yasunori, to Alps Electric Co., Ltd. Electronic tuning element assembly. 4,006,442, Cl. 338-180.000.

Meguerian, Garbis H.; Hirschberg, Eugene H.; and Rakowsky, Frederick W., to Standard Oil Company (Indiana). Catalyst for treating exhaust gas from internal combustion engine. 4,006,103, Cl. 252-438.000.

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Mermoz, Henri, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Means for improving the signal/noise ratio of signals picked up by aerials comprising several elements. 4,006,421, Cl. 325-474.000.

Merrifield, D. Bruce; Pawlak, Joseph A.; and Colson, James G., to Hooker Chemicals & Plastics Corporation. Amine phosphite antioxidants. 4,006,117, Cl. 260-45.9NP.

Merrifield, Daniel B., to Healthways. Easily released belt fastener. 4,005,508, Cl. 24-193.000.

Mesek, Frederick K., to Johnson & Johnson. Disposable diaper having tab fasteners provided with a pull string and attached to release surfaces on diaper facing. 4,005,713, Cl. 128-287.000.

Messner, Rudolf; and Weisser, Walter, to Martin Brinkmann AG. Hand device for making cigarettes. 4,005,716, Cl. 131-70.000.

Metalgesellschaft Aktiengesellschaft: See—
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Sparwald, Volker, 4,006,066.

Metzger, Julio, to E. R. Squibb & Sons, Inc. Purification of nystatin. 4,006,222, Cl. 424-123.000.

Meumann, Hans: See—
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Meussdoerffer, Johann Nikolaus: See—
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Meyer, Donald G.; and Fancher, James E., to John Fluke Mfg. Co., Inc. Amplifier circuit having integral means for detecting and preventing non-linear operation. 4,006,428, Cl. 330-51.000.

Meyer-Ebrecht, Dietrich, to U.S. Philips Corporation. Circuit arrangement for converting a bridge unbalance into a frequency variation. 4,006,430, Cl. 331-65.000.

Meyer, Willy: See—
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Michael, Donald S., to Mikron Instrument Company, Inc. Remote reading infrared thermometer. 4,005,605, Cl. 73-355.00R.

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Michalczyk, Georg; and Gluzek, Karl-Heinz, to Deutsche Texaco Aktiengesellschaft. Process for converting γ -butyrolactone into tetrahydrofuran. 4,006,104, Cl. 252-465.000.

Michalczyk, Georg; and Gluzek, Karl-Heinz, to Deutsche Texaco Aktiengesellschaft. Process for converting maleic anhydride to γ -butyrolactone. 4,006,165, Cl. 260-343.600.

Michals, Theodore T. Bumper impact divertor. 4,005,891, Cl. 293-84.000.

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Miles Laboratories, Inc.: See—
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Minolta Camera Kabushiki Kaisha: See—
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Minsky, Norman C., to Dart Industries Inc. Lid mount. 4,005,798, Cl. 220-85.00C.

Mitarai, Hajime, to Canon Kabushiki Kaisha. Read-only memory. 4,006,470, Cl. 340-173.0SP.

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Miyamoto, Eddie Kakuo. Adapter with thread protector. 4,005,735, Cl. 138-96.00R.

Miyamoto, Kazuo; Koide, Hideo; and Suzuki, Isao, to Rhythm Watch Company, Limited. Leaf-type digital clock. 4,005,570, Cl. 58-16.00D.

Miyashita, Tsuneo; Sano, Kazuo; Sasaguri, Kyoji; Ishihara, Kazuo; and Hironaka, Shunichi, to Nippon Kokan Kabushiki Kaisha. Device for making high temperature reformed gas. 4,005,986, Cl. 23-288.00R.

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Model, Ernst; von der Crone, Jost; and Pugin, Andre, to Ciba-Geigy Corporation. Iminoindolinone pigments. 4,006,162, Cl. 260-325.0PH.

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Moore, Bruce H.; and Houk, Richard D., to Samuel Moore and Company. Motion transfer system. 4,005,614, Cl. 74-501.00R.

Moore, Donn F., to Computer Peripherals, Inc. Print hammer. 4,005,650, Cl. 101-111.000.

Moore, Robert G. Maternity supporter. 4,005,715, Cl. 128-579.00R.

Moore, Robert R. Adjustable strap assembly. 4,005,506, Cl. 24-68.00E.

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Moritz, Karl-Ludwig; and Schundehutte, Karl-Heinz, to Bayer Aktiengesellschaft. Azo dyestuffs containing aminopyridone coupling component. 4,006,128, Cl. 260-156.000.

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Morrison, Robert C.: See—
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Morse, William E., Jr. Lightweight pasture harrow. 4,005,756, Cl. 172-643.000.

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Murphy Pacific Marine Salvage Co.: See—
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Musser, Malcolm E. Bag storing and dispensing apparatus. 4,005,801, Cl. 221-56.000.

Mutch, Henry, to Rohr Industries, Inc. Target thrust reverser. 4,005,836, Cl. 244-110.00B.

Muusse, Jay H., to Tuff-Ten Corporation. Method and apparatus for casting extrusion dies. 4,005,511, Cl. 29-33.00C.

Muzyka, Donald R.; and Schlosser, Donald K., to Carpenter Technology Corporation. Controlled expansion alloy. 4,006,011, Cl. 75-122.000.

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Nadelson, Jeffrey, to Sandoz, Inc. Alkyl-p-ivaloylbenzylaminomethylbenzophenones. 4,006,248, Cl. 424-316.000.

Nafissi-Varchei, Mohammad Mehdi, to Schering Corporation. Certain benzothiazoles used in the treatment of helminthiasis. 4,006,242, Cl. 424-270.000.

Nahon, Abraham S. Plant support. 4,005,548, Cl. 47-45.000.

Nakagawa, Yasuichi, to Kabushiki Kaisha Daini Seikosha. Electric micro motor for a timepiece. 4,006,374, Cl. 310-40.00M.

Nakamura, Nobutaka; and Saeki, Yukio, to Sumitomo Durez Company, Ltd. Method for preventing gelation of thermosetting resins in waste water. 4,006,081, Cl. 210-58.000.

Nakamura, Shoichi: See—
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Narbais-Jaureguay, Jean-Raymond; and Billottet, Henri, to Thomson-CSF. Audibility-control system for radio receiver. 4,006,447, Cl. 340-33.000.

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Nelson, Terrance D.; and Kuntzsch, Donald W., to Allen-Bradley Company. Electrical terminal structure. 4,006,323, Cl. 200-284.000.

Nerenberg, Robert W.; and Herzog, Frank B., to Interstate Folding Box Company, The. Carton with self-contained reinforced handle. 4,005,815, Cl. 229-52.00B.

Nestor, Charles R., to General Motors Corporation. Universal wedge base lamp socket. 4,005,924, Cl. 339-17.00D.

Netteland, Loyal G.; and Heintz, Clifford E., to A-T-O Inc. Apparatus for endothermal absorption of carbon dioxide. 4,005,708, Cl. 128-142.00R.

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New Hampshire Ball Bearings, Inc.: See—
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Newkirk, Lawrence R.; and Valencia, Flavio A., to United States of America, Energy Research and Development Administration. Superconductors. 4,005,990, Cl. 29-196.000.

Newman, Howard, to American Cyanamid Company. Substituted 1,2,4-triazole carboxamides. 4,006,159, Cl. 260-308.00R.

Newman, Paul, to Rolls-Royce (1971) Limited. Surface coating for machine elements having rubbing surfaces. 4,005,914, Cl. 308-9.000.

NGK Spark Plug Co., Ltd.: See—
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Nichibei Fuji Cycle Co., Ltd.: See—
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Niebylski, Leonard M.; and Rifkin, Ellis B., to Ethyl Corporation. Novel gasoline compositions and additives therefor. 4,005,992, Cl. 44-68.000.

Niebylski, Leonard M.; and Rifkin, Ellis B., to Ethyl Corporation. Novel gasoline compositions. 4,005,993, Cl. 44-68.000.

Niederprum, Hans; Klein, Heinz Gunter; and Meusadoerffer, Johann

Nikolaus, to Bayer Aktiengesellschaft. Process for the electrodeposition of chrome plate using fluorine-containing wetting agents. 4,006,064, Cl. 204-51.000.

Nikkel, Willem A., to Westvaco Corporation. Corrugating station assembly guide. 4,005,529, Cl. 33-181.00R.

Ninagawa, Yoichi; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Co., Ltd. Isomerization of the unsaturated alcohols. 4,006,193, Cl. 260-617.00R.

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Nishikawa, Masao, to Shin-Shirasuna Electric Corporation. Automatic gain control circuit. 4,006,427, Cl. 330-29.000.

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Masaki, Kenji; and Saito, Masaaki, 4,005,693.

Nissin Kogyo Kabushiki Kaisha: See—
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Nitsch, J. Leonard. Holder and shear ledger plate for package tying machines. 4,005,563, Cl. 53-138.00A.

Nobile, Humberto. Modular alarm circuit. 4,006,451, Cl. 340-63.000.

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera systems for providing precise exposures with digital light measurement. 4,006,484, Cl. 354-23.00D.

Noda, Ichiro: See—
Sano, Konosuke; Matsuda, Keizo; Mitsugi, Koji; Yamada, Kazuhiko; Tamura, Fumihide; Yasuda, Naohiko; and Noda, Ichiro, 4,006,057.

Noda, Taizo, to Kohshoh Limited. Plastic clip. 4,005,510, Cl. 24-250.00R.

Noe, John B., to Plasmatronics Company, The. Electronic ignition system. 4,005,694, Cl. 123-148.00E.

Nofziger, Neil B., to Owens-Illinois, Inc. Sealing glass compositions and pastes and use thereof. 4,006,028, Cl. 106-47.00R.

Nohira, Hidetaka; Besaho, Hironori; and Sakai, Yasuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine exhaust manifold with cylindrical built-in catalyst container. 4,005,576, Cl. 60-302.000.

Nohira, Hidetaka; and Sugiura, Masatoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor arranged for recirculating exhaust gases. 4,005,692, Cl. 123-119.00A.

Noll, Klaus-Reinhold: See—
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Norton, Joseph R.; and Scisson, Sidney E. Fluid operated rotor. 4,005,947, Cl. 416-197.00A.

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- Reisinger, Konrad, to Siemens Aktiengesellschaft. Switching arrangement for extending the receiver stop pulse length in time division multiplex transmission. 4,006,302, Cl. 178-50.000.
- Reistad, Arne M., Jr.: See—
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- Relander, John Henrik: See—
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- Remington Arms Company, Inc.: See—
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- Rensland, Thomas E.; Clawson, Robert C.; and Karp, Alexander A., to Steelcase, Inc. Chair base arm end cap. 4,005,841, Cl. 248-188.700.
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- Rettore, Roberto; and Gatta, Giorgio, to Montecatini Edison S.p.A. Process for the chlorination of vinyl polymers. 4,006,126, Cl. 526-17.000.
- Reynard, Kennard A.; and Gerber, Arthur H., to Horizons Incorporated. A division of Horizons Research Incorporated. Curable polyphosphazenes. 4,006,125, Cl. 260-77.5AQ.
- Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft: See—
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- Richardson Company, The: See—
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- Richardson, Ralph G.; and Vitron, William J., to Hoover Ball and Bearing Company. Pillow block and apparatus for making same. 4,005,917, Cl. 308-72.000.
- Richmond, James W., to Stryker Corporation. Solution bottle holder. 4,005,844, Cl. 248-311.300.
- Rickel, William R.; and Mueller, Dale Edward, to Whirlpool Corporation. Hose connector for automatic washer. 4,005,882, Cl. 285-194.000.
- Riddel, John W., to General Motors Corporation. Pressure control valve. 4,005,733, Cl. 137-625.400.
- Riedel, Franz: See—
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- Rifkin, Ellis B.: See—
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- Rigney, John T. Automobile anti-glare shield. 4,005,899, Cl. 296-97.00E.
- Rischert, Karl; and Drossler, Peter. Ski-pole grip having releasable strap attachment. 4,005,872, Cl. 280-11.37H.
- Robbins, Gordon Jay: See—
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- Roberson, Cletis L., to Owens-Corning Fiberglas Corporation. Method of producing a sliver-like fibrous element. 4,005,505, Cl. 19-150.000.
- Robert Bosch G.m.b.H.: See—
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- Roberts, Danvern R., to Chagra, Lee A., a part interest. Corona discharge detection system for detecting the presence of any corona discharge in an electrical system. 4,006,410, Cl. 324-52.000.
- Robinson, Ian George, to Blythe Colours (Australia) Proprietary Ltd. Oxidation enhancing-vitreous enamel coating on metal substrate and composition therefor. 4,006,279, Cl. 428-432.000.
- Robinson, Marion M., to Kanematsu-Gosho (U.S.A.), Inc. Gun trigger mechanism. 4,005,540, Cl. 42-69.00R.
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- Smale, Charles H., to General Motors Corporation. Recuperative mounting. 4,005,573, Cl. 60-39.320.
- Smith Brothers Wood Products Inc.: See—
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- Smith, David F. Type of adhesive cement and certain improved products made possible thereby. 4,005,706, Cl. 128-90.000.
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- Smith, Joel E., to Smith, Joel E. Fish claw. 4,005,897, Cl. 294-115.000.
- Smith, Leroy H., Jr., to United States of America, National Aeronautics and Space Administration. Reverse pitch fan with divided splitter. 4,005,574, Cl. 60-226.00A.
- Smith, Richard A.; and Haney, Thomas E., to General Foods Corporation. Instant pudding composition and process. 4,006,262, Cl. 426-573.000.
- Smith, Robert K.: See—
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- SmithKline Corporation: See—
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- Societe Honeywell Bull (Societe Anonyme): See—
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- Societe Internationale de Mecanique Industrielle, S.A.: See—
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- Societe Suisse pour l'Industrie Horlogere Management Services S.A.: See—
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- Sodemann, Heinrich; Hauschulz, Bruno; and Althoff, Gunther, to Phenolchemie GmbH. Process for the preparation of aralkyl monohydroperoxides. 4,006,191, Cl. 260-610.00B.
- Soles, Otto H.: See—
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- Sollerud, Soren Elov Mauritz, to Tetra Pak Developpement SA. Apparatus for connecting together parts of foam plastics. 4,005,975, Cl. 425-500.000.
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- Sommer, August; and Wessendorf, Richard, to Veba Chemie AG. Process for purifying glyoxal. 4,006,189, Cl. 260-601.00R.
- Sommers, Alex, to Bearingwall Systems Inc. Invertible apparatus for molding a concrete panel. 4,005,972, Cl. 425-439.000.
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- Stevens, Violette L., to Dow Chemical Company, The. Polymercaptoesters of polyglycidols. 4,006,068, Cl. 204-159.110.
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- Stickney, Dwight R.; Simmons, William S.; Nichol, Charles A.; Hitchings, George H.; and Elion, Gertrude B., to Burroughs Wellcome Co. Treating CNS lymphoma. 4,006,235, Cl. 424-251.000.
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MacKenzie, Burton Thornley, Jr.; Prober, Maurice; and Wilkus, Edward Vincent, 4,006,283.

Williams, Alban, to Wheelabrator-Frye, Inc. Abrasive control valve. 4,005,727, Cl. 137-269.000.

Williams, David J.; Limburg, William W.; and Pearson, James M., to Xerox Corporation. Photoconductive composition, article and process. 4,006,017, Cl. 96-1.00R.

Williams, G. Norman: See—
Mombberger, Richard A.; and Williams, G. Norman, 4,006,290.

Williams, Walter L. Debris-retrieving cane. 4,005,892, Cl. 294-1.00R.

Willus, Charles Arthur: See—
Charlton, Andrew Paul; Lewis, Kenneth Dan; Willus, Charles Arthur; and Nyrop, Per, 4,005,817.

Wilson, Charles A.: See—
Villo, Joseph P., deceased; Villo, Jean, co-executrix; Fidelity Bank, co-executor, The; and Wilson, Charles A., 4,005,740.

Wilson, Leslie Henry. Transport vehicle. 4,005,784, Cl. 214-6.00B.

Wilson, Peggy M.: See—
Birk, Silvia C.; Collins, Samuel H.; and Wilson, Peggy M., 4,005,749.

Wilson, Ralph S.; and Albright, Charles E. Depth gauge. 4,005,527, Cl. 33-111.000.

Wimmer, Jack D., to International Telephone and Telegraph Corporation. Vacuum-tight metal-to-metal seal. 4,005,920, Cl. 316-19.000.

Winchell, David Allen, to Baxter Travenol Laboratories, Inc. Supplemental medication indication cap for solution containers and the like. 4,005,739, Cl. 150-8.000.

Wise, Walter R.; Allen, Ellsworth J.; and Fisher, Donald K., to Garlock Inc. Tape roll and core. 4,005,829, Cl. 242-68.500.

Wizemann, Kurt; and Pfiz, Manfred, to J. Wizemann & Co. Piston-pin for liquid cooled pistons. 4,005,686, Cl. 123-41.380.

Wohlrab, Hans Chr., to PSC Technology Inc. Apparatus for executing light control operations in a bidirectional film printer. 4,005,934, Cl. 355-88.000.

Wojtowicz, John A.: See—
Tobin, John H.; and Wojtowicz, John A., 4,006,185.

Wolfs, Wolfgang: See—
Behr, Erich; and Wolfs, Wolfgang, 4,006,120.

Wolff, Emanuel. Elapsed time reminder with conversion of calendar days into elapsed time. 4,005,571, Cl. 58-39.500.

Wolinski, Leon E.; Endress, Arthur R.; and Teloh, David W., to Pratt & Lambert, Inc. Washable and dry-cleanable raised printing on fabrics. 4,006,273, Cl. 427-278.000.

Woller, Laszlo: See—
Tamas, Karoly; and Woller, Laszlo, 4,006,265.

Woltersdorf, Otto W., Jr.: See—
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,006,180.

Woodall, Jerry MacPherson: See—
Cuomo, Jerome John; Woodall, Jerry MacPherson; and Ziegler, James Francis, 4,005,698.

Woodward, Henry Edwin, to National Research Development Corporation. Injectors for the fuel injection systems of internal combustion engines. 4,005,826, Cl. 239-533.800.

Woomer, William H.: See—
Goodley, George F.; Woomer, William H.; Inamdar, Udaykumar B.; and Gallagher, Robert L., 4,005,647.

Worms, Karl-Heinz: See—
Ploger, Walter; Schindler, Norbert; and Worms, Karl-Heinz, 4,006,182.

Xerox Corporation: See—
Adams, James E.; and Haas, Werner E. L., 4,005,929.

Grafton, David A., 4,006,299.

Gundlach, Robert W., 4,005,654.

Karam, Ronald E., 4,006,019.

Kidd, Wayne L.; and Corona, Stephen C., 4,005,940.

Kurz, Philip, deceased; and Kurz, Jessie M., executrix, 4,006,267.

Polastri, John D., 4,006,020.

Streifer, William; Scifres, Donald R.; and Burnham, Robert D., 4,006,432.

Williams, David J.; Limburg, William W.; and Pearson, James M., 4,006,017.

Yaeger, Michael Joseph. Card game. 4,005,867, Cl. 273-135.00R.

Yaginuma, Nakatsugu: See—
Hiratsuka, Nobuo; and Yaginuma, Nakatsugu, 4,006,069.

Yamada, Kazuhiko: See—
Sano, Konosuke; Matsuda, Keizo; Mitsugi, Koji; Yamada, Kazuhiko; Tamura, Fumihide; Yasuda, Naohiko; and Noda, Ichiro, 4,006,057.

Yamada, Michinobu: See—
Uebayasi, Yosataka; Kumon, Hiroshi; Yamada, Michinobu; and Oe, Yoshikazu, 4,005,991.

Yamagiwa, Kazuo: See—
Kuniyoshi, Yasunobu; and Yamagiwa, Kazuo, 4,006,423.

Yamanishi, Akio; and Kitaura, Mashio, to Minolta Camera Kabushiki Kaisha. Luminance controlled indicator in camera view finder. 4,006,485, Cl. 354-53.000.

Yamashita, Hiroshi; Sekikawa, Nobuyoshi; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Sensitizing a granular dispersion of a color generator and an organic halogen compound by heat. 4,006,021, Cl. 96-27.00E.

Yamashita, Kazutaka: See—
Sakaguchi, Kahei; Minakata, Masaaki; Yamashita, Kazutaka; and Sugimoto, Fumiko, 4,006,272.

Yamashita, Tatsuji: See—
Isa, Hiroshi; Mandai, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Yamashita, Tatsuji, 4,006,199.

Yamazaki, Tadakatsu. Safety pushpin. 4,005,507, Cl. 24-150.00R.

Yamazaki, Tatsuya, to Ryobi, Ltd. Structure relating to bail arm of spinning reel for fishing. 4,005,832, Cl. 242-84.21R.

Yanagida, Koichiro: See—
Yoshida, Akitoshi; Yanagida, Koichiro; and Maruyama, Tadanobu, 4,006,030.

Yanaka, Mikiro: See—
Enomoto, Satoru; Takita, Hitoshi; Yanaka, Mikiro; Mukaida, Yutaka; and Wada, Hisayuki, 4,006,192.

Yang, Kuo S., to Eli Lilly and Company. Crystalline form of sodium O-formylcefamandole. 4,006,138, Cl. 260-243.00C.

Yao, Hsin C.: See—
Gandhi, Haren S.; Shelef, Mordecai; Stepien, Henryk K.; and Yao, Hsin C., 4,006,102.

Yasuda, Naohiko: See—
Sano, Konosuke; Matsuda, Keizo; Mitsugi, Koji; Yamada, Kazuhiko; Tamura, Fumihide; Yasuda, Naohiko; and Noda, Ichiro, 4,006,057.

Yasumoto, Michio. Dental floss holder. 4,005,721, Cl. 132-91.000.

Yeshin, Leon, to Electrohome Limited. Making silicone rubber molds from reclaimed cured silicone rubber particles and liquid uncured silicone rubber. 4,006,207, Cl. 264-108.000.

Yohana, Andrew I.: See—
Doyle, Richard H.; Morabito, Salvatore L.; Yohana, Andrew I.; and Novak, Raymond F., 4,005,812.

Yoshida, Akitoshi; Yanagida, Koichiro; and Maruyama, Tadanobu, to Nissan Chemical Industries, Ltd. Method of preventing deterioration of inorganic substrate surface. 4,006,030, Cl. 106-74.000.

Yoshida, Mitsutaka; and Sakai, Masao, to NGK Spark Plug Co., Ltd. Self sealable glassy resistor composition for a resistor sealed spark plug. 4,006,106, Cl. 252-513.000.

Yost, Russell R., Jr.; and Carlson, Eric J., to Motorola, Inc. Pulse coherent transponder with precision frequency offset. 4,006,477, Cl. 343-6.80R.

Young, Fred M., to Young Radiator Company. Sectional heat exchanger. 4,005,746, Cl. 165-69.000.

Young, Jonathan D.; Davis, Curtis W., III; Peters, Leon, Jr.; and Caldecott, Ross, to Ohio State University, The. Underground, time domain, electromagnetic reflectometry for digging apparatus. 4,006,481, Cl. 343-770.000.

Young Radiator Company: See—
Young, Fred M., 4,005,746.

Yudin Industries, Inc.: See—
Driscoll, Norman Joseph, 4,006,306.

Zabotin, Ivan Ivanovich: See—
Nurimanov, Myalik Khaysanovich; Kharlamov, Vitaly Afanasievich; and Zabotin, Ivan Ivanovich, 4,005,643.

Zahnradfabrik Friedrichshafen AG: See—
Dach, Hansjorg; and Marion, Robert, 4,005,620.

Zambrow, John L.; Hempel, Rudolph M.; and Feng, Louis T., to Borg-Warner Corporation. Production of high density powdered metal parts. 4,006,016, Cl. 75-221.000.

Zaninovich, John; and Stipich, Ante, to Campbell Industries. Passive stabilization system for ships. 4,005,670, Cl. 114-125.000.

Zeddies, Armand Al; and Muettteris, Andrew John, to Abbott Laboratories. Parenteral apparatus with one-way valve. 4,005,710, Cl. 128-214.00R.

Zeidler, Ulrich, to Henkel & Cie G.m.b.H. Process for continuous preparation of carboxylic acids. 4,006,173, Cl. 260-413.000.

Zenith Radio Corporation: See—
Boldt, Melvin H.; Chuboff, David P.; and Becker, Robert W., 4,006,300.

Bubacz, Dennis S.; Hoffmann, Guenter F.; and Schiecke, Konrad L., 4,006,301.
 Podowski, Robert R.; and Collins, Johnny, 4,006,462.
 Zephinie, Gerard, to Societe Soberal S.A. Rescue apparatus. 4,005,762, Cl. 182-48.000.
 Ziegler, James Francis: See—
 Cuomo, Jerome John; Woodall, Jerry MacPherson; and Ziegler, James Francis, 4,005,698.
 Zlupko, John E.: See—
 Korte, Richard M.; and Zlupko, John E., 4,006,330.

Znitmash of Chaussee za Gara Izkar: See—
 Kochemidov, Atanas Dimitrov; Makedonski, Boris Georgiev; Dumanov, Ivan Minkov; and Payakov, Stefan Georgiev, 4,005,550.
 Zoecon Corporation: See—
 Henrick, Clive A.; and Labovitz, Jeffery N., 4,006,188.
 Zollinger, Otto. Yarn tensioning device. 4,005,833, Cl. 242-152.100.
 Zumach, Gerhard: See—
 Siegle, Peter; Kuhle, Engelbert; Zumach, Gerhard; Hammann, Ingeborg; and Homeyer, Bernhard, 4,006,244.
 Zunft, Donald V.: See—
 Burton, Lawrence A.; Heuser, Peter; Robinson, Marquis B.; Trendel, Dennis; and Zunft, Donald V., 4,006,440.

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 415,122	3,997,503	Mar. 16, 1976	Jan. 4, 1977
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 416,257	4,001,335	Mar. 16, 1976	Nov. 9, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 416,589	3,990,363	Jan. 27, 1976	Sep. 21, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976	B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976	B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976	B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976	B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976	B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976	B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976	B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976	B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976	B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977	B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976	B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976	B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976	B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977	B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976	B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976	B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976	B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976	B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976	B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976	B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976	B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976	B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976	B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976	B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976	B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977	B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977	B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977	B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976	B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977	B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976	B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976	B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976	B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977	B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976	B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976	B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976	B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976	B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976	B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976	B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976	B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976	B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977	B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976	B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977	B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976	B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976	B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976	B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976	B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976	B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976	B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976	B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976	B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976	B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976	B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976	B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976	B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976	B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976	B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976	B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977	B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977	B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977	B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976	B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976	B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976	B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976	B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976	B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976	B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976	B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976	B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976	B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976	B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977	B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976	B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976	B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976	B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977	B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976	B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977	B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976	B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976	B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976	B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977	B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976	B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976	B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976	B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976	B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976	B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976	B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976	B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976	B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976	B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976	B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976	B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976	B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976	B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977	B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976	B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976	B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976	B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976	B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976	B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977	B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976	B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976	B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976	B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976	B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976	B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976	B 498,951	3,996,907	Mar. 2, 1976	Oct. 14, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976	B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976	B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976	B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976	B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976	B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976	B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976	B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976	B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976	B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976

PI 37 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976	B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976	B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976	B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976	B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976	B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976	B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976	B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,255	3,996,103	Mar. 2, 1976	Feb. 7, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,303	4,006,029	Mar. 23, 1976	Dec. 1, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976

PI 38 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PI 39
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976				

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY OF
FEBRUARY, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

- Bell Telephone Laboratories, Incorporated: *See—*
Genaro, Donald Michael; McGarvey, John Niel; Seretny, Stanley Edward; Tilley, Alvin Richard; and Webb, Carl Eugene, T955,001.
- Blood, Alden E.: *See—*
Stutler, Athey C.; Statman, Max; and Blood, Alden E., T955,005.
- Cavaliere, Joseph Richard; and Eardley, David Barry, to International Business Machines Corporation. Delay circuits using negative resistance CMOS circuits. T955,006, 2-1-77, Cl. 307-251.000.
- Eardley, David Barry: *See—*
Cavaliere, Joseph Richard; and Eardley, David Barry, T955,006.
- Genaro, Donald Michael; McGarvey, John Niel; Seretny, Stanley Edward; Tilley, Alvin Richard; and Webb, Carl Eugene, to Bell Telephone Laboratories, Incorporated. Telephone set. T955,001, 2-1-77, Cl. D26-14.00A.
- General Electric Company: *See—*
Milkovic, Miran, T955,007.
- Gregor, Lawrence V.; and Shephard, Robert G., to International Business Machines Corporation. Flip chip structure including a silicon semiconductor element bonded to an Si_3N_4 base substrate. T955,008, 2-1-77, Cl. 357-80.000.
- Heggs, Thomas Geoffrey: *See—*
Lansbury, Robert Clive; and Heggs, Thomas Geoffrey, T955,009.
- Imperial Chemical Industries Limited: *See—*
Mann, David Roderick; Irvin, Geoffrey Pickles; and Silverwood, Richard, T955,003.
- International Business Machines Corporation: *See—*
Cavaliere, Joseph Richard; and Eardley, David Barry, T955,006.
- Gregor, Lawrence V.; and Shephard, Robert G., T955,008.
- Ragonese, Ronald R.; and Schulman, Franklin D., T955,010.
- Irvin, Geoffrey Pickles: *See—*
Mann, David Roderick; Irvin, Geoffrey Pickles; and Silverwood, Richard, T955,003.
- Lansbury, Robert Clive; and Heggs, Thomas Geoffrey. Film-forming composition. T955,009, 2-1-77, Cl. 428-515.000.
- Mann, David Roderick; Irvin, Geoffrey Pickles; and Silverwood, Richard, to Imperial Chemical Industries Limited. Photographic films. T955,003, 2-1-77, Cl. 96-87.00A.
- McGarvey, John Niel: *See—*
Genaro, Donald Michael; McGarvey, John Niel; Seretny, Stanley Edward; Tilley, Alvin Richard; and Webb, Carl Eugene, T955,001.
- Milkovic, Miran, to General Electric Company. Method and apparatus for metering apparent energy. T955,007, 2-1-77, Cl. 324-141.000.
- Ragonese, Ronald R.; and Schulman, Franklin D., to International Business Machines Corporation. Hardware/software monitoring system. T955,010, 2-1-77, Cl. 444-1.000.
- Sayre, Robert K., to Westinghouse Electric Corporation. Method for heat exchanger leak detection in a liquid metal cooled nuclear reactor. T955,004, 2-1-77, Cl. 176-19.00R.
- Schulman, Franklin D.: *See—*
Ragonese, Ronald R.; and Schulman, Franklin D., T955,010.
- Schultz, James J.; and Van Pelt, Vincent J., to Tennessee Valley Authority. Fertilizer processes incorporating scrubbed flue gas sludge byproduct. T955,002, 2-1-77, Cl. 71-25.000.
- Seretny, Stanley Edward: *See—*
Genaro, Donald Michael; McGarvey, John Niel; Seretny, Stanley Edward; Tilley, Alvin Richard; and Webb, Carl Eugene, T955,001.
- Shephard, Robert G.: *See—*
Gregor, Lawrence V.; and Shephard, Robert G., T955,008.
- Silverwood, Richard: *See—*
Mann, David Roderick; Irvin, Geoffrey Pickles; and Silverwood, Richard, T955,003.
- Statman, Max: *See—*
Stutler, Athey C.; Statman, Max; and Blood, Alden E., T955,005.
- Stutler, Athey C.; Statman, Max; and Blood, Alden E. Process for purification of alkyl methacrylates. T955,005, 2-1-77, Cl. 260-486.00R.
- Tennessee Valley Authority: *See—*
Schultz, James J.; and Van Pelt, Vincent J., T955,002.
- Tilley, Alvin Richard: *See—*
Genaro, Donald Michael; McGarvey, John Niel; Seretny, Stanley Edward; Tilley, Alvin Richard; and Webb, Carl Eugene, T955,001.
- Van Pelt, Vincent J.: *See—*
Schultz, James J.; and Van Pelt, Vincent J., T955,002.
- Webb, Carl Eugene: *See—*
Genaro, Donald Michael; McGarvey, John Niel; Seretny, Stanley Edward; Tilley, Alvin Richard; and Webb, Carl Eugene, T955,001.
- Westinghouse Electric Corporation: *See—*
Sayre, Robert K., T955,004.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF FEBRUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- Baker, Jack H.: *See—*
List, Harold A.; and Baker, Jack H., Re. 29,132.
- Bethlehem Steel Corporation: *See—*
List, Harold A.; and Baker, Jack H., Re. 29,132.
- Datastrip Corporation: *See—*
Janssen, Alexander Patton, Re. 29,127.
- Dewulf, Paul Joseph: *See—*
Duchateau, Georges Francois; and Dewulf, Paul Joseph, Re. 29,129.
- Duchateau, Georges Francois; and Dewulf, Paul Joseph, to Raffinerie Tirlemontoise. Method of manufacturing elements of crystallized sugar. Re. 29,129, Cl. 127-63.000.
- Janssen, Alexander Patton, to Datastrip Corporation. Visible index systems. Re. 29,127, Cl. 40-64.00R.
- Lee, Chin K.; and Long, Margaret E., to R. J. Reynolds Tobacco Company. Enzymatic process using immobilized microbial cells. Re. 29,130, Cl. 195-31.00F.
- List, Harold A.; and Baker, Jack H., to Bethlehem Steel Corporation. Automatic dry coke weight system. Re. 29,132, Cl. 235-151.100.
- Long, Margaret E.: *See—*
Lee, Chin K.; and Long, Margaret E., Re. 29,130.
- R. J. Reynolds Tobacco Company: *See—*
Lee, Chin K.; and Long, Margaret E., Re. 29,130.
- Raffinerie Tirlemontoise: *See—*
Duchateau, Georges Francois; and Dewulf, Paul Joseph, Re. 29,129.
- Smith, Oliver Wendell; Weigel, James Edward; and Trecker, David John, to Union Carbide Corporation. Radiation-curable acrylate-capped polycaprolactone compositions. Re. 29,131, Cl. 260-77.5AN.
- Sohre, John S. Vaneless supersonic nozzle. Re. 29,128, Cl. 239-289.000.
- Trecker, David John: *See—*
Smith, Oliver Wendell; Weigel, James Edward; and Trecker, David John, Re. 29,131.
- Union Carbide Corporation: *See—*
Smith, Oliver Wendell; Weigel, James Edward; and Trecker, David John, Re. 29,131.
- Weigel, James Edward: *See—*
Smith, Oliver Wendell; Weigel, James Edward; and Trecker, David John, Re. 29,131.

LIST OF PLANT PATENTEES

- Conard-Pyle Company, The: See—
Meilland, Marie-Louise; Meilland, Alain A.; and Richardier, Michele Meilland, 4,013.
Hepler, Mrs. Alexander B., Jr., to L. E. Cooke Co. Inc. Peach tree. 4,014, 2-1-77, Cl. 43.000.
L. E. Cooke Co. Inc.: See—
Hepler, Mrs. Alexander B., Jr., 4,014.
Meilland, Alain A.: See—
Meilland, Marie-Louise; Meilland, Alain A.; and Richardier, Michele Meilland, 4,013.
Meilland, Marie-Louise; Meilland, Alain A.; and Richardier, Michele Meilland, 4,013.
Meilland, to Conard-Pyle Company, The. Rose plant—meilimona variety. 4,013, 2-1-77, Cl. 15.000.
Richardier, Michele Meilland: See—
Meilland, Marie-Louise; Meilland, Alain A.; and Richardier, Michele Meilland, 4,013.

LIST OF DESIGN PATENTEES

- Adams, Anthony J.: See—
Jampolsky, Arthur; Kapash, Richard J.; Flom, Merton C.; Adams, Anthony J.; and Spitzberg, Larry A., 243,288.
Adkinson, Joseph E., to Caldwell, Wilfred G. Two-piece provincial style breakfront or the like. 243,221, 2-1-77, Cl. D6-154.000.
Amerace Corporation: See—
Hutton, William C.; Hugo, Dale P.; and Rivasi, Carl A., 243,239.
Ando, Minoru: See—
Sugihara, Shinichi; Ando, Minoru; Nishiyori, Hiroaki; Arai, Eiichi; Tanaka, Fumio; and Kabetani, Takaharu, 243,277.
Antone, Lawrence J. Wood burning stove. 243,242, 2-1-77, Cl. D23-93.000.
Appleman, Donald T., to Procter & Gamble Company, The. Sheet of paper toweling. 243,278, 2-1-77, Cl. D59-2.00B.
Arai, Eiichi: See—
Sugihara, Shinichi; Ando, Minoru; Nishiyori, Hiroaki; Arai, Eiichi; Tanaka, Fumio; and Kabetani, Takaharu, 243,277.
Asai, Yoshinobu, to Sansui Electric Co., Ltd. Combined amplifier and tuner. 243,255, 2-1-77, Cl. D26-14.00L.
Bacardi, John C.: See—
Vachon, Roy R.; and Bacardi, John C., 243,236.
Baker, Richard M. Bed frame. 243,218, 2-1-77, Cl. D6-84.000.
Ballantyne, John R., to Superscope, Inc. Loudspeaker grille. 243,253, 2-1-77, Cl. D26-14.00G.
Baumgaertner, John Louis. Planter. 243,269, 2-1-77, Cl. D11-156.000.
Bausch & Lomb Incorporated: See—
Hoogesteger, Paul A., 243,287.
Bell & Howell Company: See—
Bookless, George W.; and Samczyk, Casimir S., 243,279.
Beshore, Craig S. Power module for electronic engine ignition systems. 243,245, 2-1-77, Cl. D26-1.00R.
Binion, Velma H. Card holder. 243,220, 2-1-77, Cl. D6-148.000.
Bookless, George W.; and Samczyk, Casimir S., to Bell & Howell Company. Reusable microfilm cartridge. 243,279, 2-1-77, Cl. D26-14.00B.
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	CLASS 63 9 4,005,588	CLASS 86 1 A 4,005,630	CLASS 112 115 4,005,663 158 E 4,005,664	CLASS 139 79 4,005,736	CLASS 177 229 4,005,758
	CLASS 64 112 4,005,584 158 4,005,585 372 4,005,586 401 4,005,587	CLASS 87 6.5 4,005,631 7 4,005,632 33 D 4,005,633 36 H 4,005,634	CLASS 113 115 4,005,663 158 E 4,005,664	CLASS 140 109 4,005,737	CLASS 178 50 4,006,302 69 A 4,006,303 69.1 4,006,304 115 4,006,305
	CLASS 65 114 4,006,002	CLASS 88 11 C 4,005,635	CLASS 114 42 4,005,666 91 4,005,669 125 4,005,670 219 4,005,672 283 4,005,667 298 4,005,671	CLASS 141 67 4,005,668	CLASS 179 1 E 4,006,308 1 GA 4,006,311 1 GQ 4,006,306 1 H 4,006,310 1 P 4,006,307 1 VC 4,006,309 6 R 4,006,312 15 BS 4,006,314 15 BT 4,006,313 82 4,006,315 84 R 4,006,316 111 R 4,006,317 121 C 4,006,318 175.3 R 4,006,319 175.31 R 4,006,320 180 4,006,321
		CLASS 89 6.5 4,005,631 7 4,005,632 33 D 4,005,633 36 H 4,005,634	CLASS 115 1 C 4,005,673 41 R 4,005,674	CLASS 142 14.08 4,005,680 35 4,005,679	CLASS 180 65 R 4,005,759 74 4,005,760
		CLASS 90 11 C 4,005,635	CLASS 116 115 4,005,663 158 E 4,005,664	CLASS 143 32 4,005,681	CLASS 181 141 4,005,761
		CLASS 91 31 4,005,636 276 4,005,637	CLASS 117 115 4,005,663 158 E 4,005,664	CLASS 144 136 R 4,005,738	CLASS 182 48 4,005,762
			CLASS 118 38 4,005,675 63 4,005,676 307 4,005,677 505 4,005,678	CLASS 145 1.5 4,006,040 6.16 4,006,041 16.5 4,006,042 27 4,006,043	

CLASSIFICATION OF PATENTS

CLASS 184	620	4,005,793	220.2	4,005,843	4,006,166	CLASS 293	92	4,006,401		
24	4,005,763	CLASS 219	311.3	4,005,844	4,006,167	84	4,005,891	94 H	4,006,402	
CLASS 185	8.5	4,006,337	419	4,005,845	348 R	4,006,169	CLASS 294	15	4,006,403	
37	4,005,764	10.55 F	CLASS 249	204	4,005,846	378	1 R	33	4,006,404	
CLASS 188	121 P	4,006,340	CLASS 250	203 R	4,006,356	384	28	34 R	4,006,406	
1 A	4,005,766	CLASS 220	310	4,006,357	413	397.2	65.5	34 TK	4,006,405	
1 C	4,005,765	7	310	4,006,357	429.1	413	67 BA	40	4,006,407	
203	4,005,767	22.5	339	4,006,358	438.5 R	413	88	41	4,006,408	
218 A	4,005,768	85 CH	358 P	4,006,359	448.2 N	429.1	115	51	4,006,409	
315	4,005,769	85 R	461 B	4,006,360	449 M	438.5 R	118	41	4,006,408	
CLASS 195	288	4,005,799	510	4,006,361	465 D	448.2 N	23 R	52	4,006,410	
2	4,006,056	337	518	4,006,362	468 J	449 M	97 E	61 R	4,006,411	
29	4,006,057	CLASS 221	CLASS 251	148	4,005,847	473 F	137 B	96	4,006,412	
31 F	Re.29.130	56	173	4,005,848	474	4,006,180	103 P	106	4,006,413	
49	4,006,058	CLASS 222	305	4,005,849	486 H	4,006,181	166	166	4,006,414	
68	4,006,059	14	570.7	4,006,185	502.5	4,006,182	182	182	4,006,415	
80 R	4,006,060	57	577	4,006,186	558 S	4,006,183	CLASS 297	30	4,006,416	
103.5 R	4,006,061	144.5	577	4,006,187	570.7	4,006,184	129	38 R	4,005,818	
CLASS 197	1 R	4,005,770	51.5 R	4,006,089	575	4,006,185	328	163	4,006,418	
64	4,005,771	178	577	4,006,090	577	4,006,186	389	348	4,006,419	
84 R	4,005,772	193	577	4,006,091	586 R	4,006,188	CLASS 299	363	4,006,420	
CLASS 198	335	4,005,773	577	4,006,092	601 R	4,006,189	31	474	4,006,421	
384	4,005,774	49	577	4,006,093	602	4,006,190	91	CLASS 301	233	4,006,422
CLASS 200	16 A	4,006,322	577	4,006,094	610 B	4,006,191	36 R	CLASS 302	103	4,006,423
42 T	4,006,324	64	577	4,006,095	615 R	4,006,192	3	CLASS 303	160	4,006,424
48 A	4,006,325	169	577	4,006,096	617 R	4,006,193	91	CLASS 304	117	4,006,425
61.24	4,006,326	42 T	577	4,006,097	621 C	4,006,194	96	CLASS 305	4.3	4,006,426
61.25	4,006,327	48 A	577	4,006,098	650 R	4,006,195	111	CLASS 306	29	4,006,427
61.54	4,006,328	61.24	577	4,006,099	676 MS	4,006,196	13	CLASS 307	51	4,006,428
61.64	4,006,329	61.25	577	4,006,100	682	4,006,197	88.3	CLASS 308	14	4,006,429
83 D	4,006,330	61.54	577	4,006,101	683.15 B	4,006,198	119	CLASS 309	65	4,006,430
144 B	4,006,331	61.64	577	4,006,102	836	4,006,200	205	CLASS 310	94.5 C	4,006,432
144 C	4,006,332	83 D	577	4,006,103	878 R	4,006,201	238	CLASS 311	94.5 P	4,006,433
148 E	4,006,333	144 B	577	4,006,104	880 R	4,006,202	252 B	CLASS 312	117 R	4,006,434
157	4,006,334	144 C	577	4,006,105	940	4,006,203	261	CLASS 313	1.1	4,006,434
159 B	4,006,335	148 E	577	4,006,106	958	4,006,204	6 C	CLASS 314	30 R	4,006,435
246	4,006,336	157	577	4,006,107	CLASS 261	4,006,205	36 R	CLASS 315	72	4,006,436
284	4,006,337	159 B	577	4,006,108	39 R	4,006,205	36.1	CLASS 316	15	4,006,439
CLASS 202	169	246	577	4,006,109	CLASS 264	4,006,206	72	CLASS 317	132	4,006,440
CLASS 204	51	284	577	4,006,110	3 E	4,006,206	40 MM	CLASS 318	153	4,006,441
1 T	4,006,063	CLASS 206	577	4,006,111	108	4,006,207	49 R	CLASS 319	180	4,006,442
51	4,006,064	45.18	577	4,006,112	176 F	4,006,208	215	CLASS 320	215	4,006,443
59 R	4,006,065	84	577	4,006,113	211	4,006,209	CLASS 321	CLASS 321	14 R	4,005,921
67	4,006,066	497	577	4,006,114	250	4,006,210	27	CLASS 322	17 D	4,005,924
151	4,006,067	CLASS 208	577	4,006,115	291	4,006,211	214	CLASS 323	59 M	4,005,922
159.11	4,006,068	138	577	4,006,116	CLASS 266	4,005,856	95	CLASS 324	157 C	4,005,923
180 G	4,006,069	164	577	4,006,117	161	4,005,857	6 C	CLASS 325	198 H	4,005,925
192	4,006,070	211	577	4,006,118	191	4,005,857	36 R	CLASS 326	15	4,006,444
228	4,006,071	251 H	577	4,006,119	CLASS 267	4,005,858	36.1	CLASS 327	15.5 TC	4,006,445
238	4,006,072	CLASS 210	577	4,006,120	CLASS 271	4,005,859	72	CLASS 328	23	4,006,446
298	4,006,073	23 F	577	4,006,121	CLASS 272	4,005,860	40 MM	CLASS 329	33	4,006,447
CLASS 206	45.18	36	577	4,006,122	CLASS 273	4,005,861	49 R	CLASS 330	52 F	4,006,448
84	4,005,778	45	577	4,006,123	CLASS 274	4,005,862	8.2	CLASS 331	58	4,006,449
306	4,005,776	58	577	4,006,124	CLASS 275	4,005,863	13	CLASS 332	63	4,006,450
497	4,005,777	83	577	4,006,125	CLASS 276	4,005,864	40 MM	CLASS 333	65	4,006,451
CLASS 208	138	90	577	4,006,126	CLASS 267	4,005,858	49 R	CLASS 334	67	4,006,453
164	4,006,075	180	577	4,006,127	CLASS 271	4,005,859	82	CLASS 335	146.1 F	4,006,455
211	4,006,076	192	577	4,006,128	CLASS 272	4,005,860	13	CLASS 336	146.1 R	4,006,456
251 H	4,006,077	238	577	4,006,129	CLASS 273	4,005,861	40 MM	CLASS 337	147 R	4,006,457
CLASS 210	23 F	298	577	4,006,130	CLASS 274	4,005,862	49 R	CLASS 338	149 A	4,006,458
23 F	4,006,078	45.18	577	4,006,131	CLASS 275	4,005,863	49 R	CLASS 339	149 R	4,006,459
36	4,006,079	84	577	4,006,132	CLASS 276	4,005,864	262 S	CLASS 340	163	4,006,461
45	4,006,080	497	577	4,006,133	CLASS 267	4,005,858	300	CLASS 341	168 B	4,006,462
58	4,006,081	CLASS 212	577	4,006,134	CLASS 271	4,005,859	400	CLASS 342	172.5	4,006,463
83	4,006,082	7	577	4,006,135	CLASS 272	4,005,860	19	CLASS 343	4,006,464	
90	4,006,083	8 R	577	4,006,136	CLASS 273	4,005,861	5	CLASS 344	4,006,465	
180	4,006,084	CLASS 214	577	4,006,137	CLASS 274	4,005,862	27 R	CLASS 345	4,006,466	
195 S	4,006,085	1 BB	577	4,006,138	CLASS 275	4,005,863	100	CLASS 346	4,006,467	
242 R	4,006,086	1 OG	577	4,006,139	CLASS 276	4,005,864	249 D	CLASS 347	4,006,468	
289	4,006,087	6 B	577	4,006,140	CLASS 277	4,005,865	262 S	CLASS 348	4,006,469	
321 B	4,006,088	16.1 EB	577	4,006,141	CLASS 278	4,005,866	CLASS 318	CLASS 349	4,006,470	
CLASS 212	7	16.4 A	577	4,006,142	CLASS 279	4,005,867	227	CLASS 350	4,006,471	
7	4,005,779	58	577	4,006,143	CLASS 280	4,005,868	266	CLASS 351	4,006,472	
8 R	4,005,780	77 P	577	4,006,144	CLASS 281	4,005,869	473	CLASS 352	4,006,473	
CLASS 214	1 BB	82	577	4,006,145	CLASS 282	4,005,870	594	CLASS 353	4,006,474	
1 BB	4,005,782	83.36	577	4,006,146	CLASS 283	4,005,871	685	CLASS 354	4,006,475	
1 OG	4,005,783	302	577	4,006,147	CLASS 284	4,005,872	CLASS 318	CLASS 355	4,006,476	
6 B	4,005,784	309	577	4,006,148	CLASS 285	4,005,873	19	CLASS 356	4,006,477	
16.1 EB	4,005,785	309.6	577	4,006,149	CLASS 286	4,005,874	2	CLASS 357	4,006,478	
16.4 A	4,005,786	325 PH	577	4,006,150	CLASS 287	4,005,875	31	CLASS 358	4,006,479	
58	4,005,787	325 R	577	4,006,151	CLASS 288	4,005,876	47	CLASS 359	4,006,480	
77 P	4,005,788	326 C	577	4,006,152	CLASS 289	4,005,877	CLASS 322	CLASS 360	4,006,481	
82	4,005,789	326.5 B	577	4,006,153	CLASS 290	4,005,878	47	CLASS 361	4,006,482	
83.36	4,005,790	343.6	577	4,006,154	CLASS 291	4,005,879	CLASS 323	CLASS 362	4,006,483	
302	4,005,791	CLASS 248	577	4,006,155	CLASS 292	4,005,880	19	CLASS 363	4,006,484	
309	4,005,792	118	577	4,006,156	CLASS 293	4,005,881	CLASS 324	CLASS 364	4,006,485	

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18 A	4,006,479		133	4,005,944	177	4,006,223	197	4,005,962	123	4,006,036
18 E	4,006,478				180	4,006,224	218	4,005,963	164	4,006,271
705	4,006,480	5		CLASS 408		4,006,225	242 R	4,005,964	278	4,006,273
770	4,006,481		115 B	4,005,945	184	4,006,226	315	4,005,965	381	4,006,274
					195	4,006,227	326 B	4,005,966		
CLASS 346		106 S		CLASS 415		4,006,228	326 R	4,005,967	CLASS 428	
		149			212	4,006,229		4,005,968	36	4,006,275
75	4,006,482	165	136	4,005,946	225	4,006,230	384	4,005,969	195	4,006,276
77 R	4,006,483	172		CLASS 416	246	4,006,231	389	4,005,969	224	4,006,277
					248.5	4,006,232	392	4,005,970	268	4,006,278
CLASS 350		3	197 A	4,005,947	250	4,006,233	410	4,005,971	427	4,006,279
					251	4,006,234	439	4,005,972	432	4,006,279
7	4,005,926	23		CLASS 417		4,006,235	443	4,005,973	537	4,005,954
96 WG	4,005,927	45	269	4,005,948		4,006,236	450.1	4,005,974		
160 LC	4,005,928				258	4,006,237	500	4,005,975	CLASS 429	
	4,005,929			CLASS 418		4,006,238			72	4,006,035
		92	15	4,005,949		4,006,239	CLASS 426		98	4,006,280
CLASS 351		106	53	4,005,950	263	4,006,240	69	4,006,253	103	4,006,281
		127	61 R	4,005,951		4,006,241	72	4,006,254	176	4,006,037
113	4,005,930		94	4,005,955	270	4,006,242		4,006,255	181	4,006,282
CLASS 352		128	131	4,005,952		4,006,243	102	4,006,256		
			142	4,005,953	273	4,006,244	269	4,006,257	CLASS 431	
78 R	4,005,931				282	4,006,245	272	4,006,258	13	4,005,976
		136		CLASS 423	283	4,006,246	308	4,006,259	116	4,005,977
CLASS 353		196	49	4,006,212	309	4,006,247	438	4,006,260	288	4,005,978
		240	92	4,006,213	316	4,006,248	537	4,006,261		
6	4,005,932	248	112	4,006,214	326	4,006,249	573	4,006,262	8	4,005,979
CLASS 354		254	142	4,006,215	328	4,006,250	594	4,006,263	80	4,005,980
		293	592	4,006,216	331	4,006,251	607	4,006,264	144	4,005,981
23 D	4,006,484		605	4,006,217		4,006,252	623	4,006,265	248	4,005,982
53	4,006,485							4,006,266		
76	4,006,486								CLASS 432	
79	4,006,487								8	4,005,979
		132		CLASS 360					80	4,005,980
187	4,006,488								140	4,005,981
214	4,006,489								248	4,005,982
									CLASS 433	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 434	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 435	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 436	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 437	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 438	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 439	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 440	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 441	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 442	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 443	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 444	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 445	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 446	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 447	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 448	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 449	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 450	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 451	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 452	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 453	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 454	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 455	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 456	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 457	
									8	4,005,979
									80	4,005,980
									144	4,005,981
									248	4,005,982
									CLASS 458	
									8	4,005,979

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272 243,210	143 243,224	7 243,281	243,246	243,259	243,274
309 243,211	151 243,225	9 243,282	243,247	4 R 243,260	4 D 243,277
12 243,212	207 243,226	15 243,270	243,248	5 BC 243,261	5 B 243,278
14 243,213	129 243,227	29 243,275	243,249	5 PP 243,262	D64— 11 R 243,280
28 243,214	243,228	30 243,238	243,250	14 D 243,263	D83— 1 D 243,285
36 243,215	243,229	65 243,237	243,251	243,264	1 E 243,286
49 243,216	182 243,230	D19— 35 243,276	243,254	243,265	1 F 243,284
63 243,217	267 243,231	D23— 7 243,239	243,255	15 AE 243,268	1 W 243,287
84 243,218	73 243,232	25 243,240	243,252	15 AJ 243,266	12 A 243,283
136 243,219	111 243,233	58 243,241	243,253	243,267	12 R 243,288
148 243,220	D11— 156 243,269	93 243,242	243,255	D48— 20 D 243,271	5 C 243,289
154 243,221	D12— 91 243,234	162 243,243	243,256	24 R 243,272	9 243,290
177 243,222	96 243,235	D26— 1 B 243,244	243,257		

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P.— 15 4,013	43 4,014				
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(Notice of Dec. 16, 1969, 869 O.G. 6877)

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,006,085	4,005,828	4,006,414	4,005,805	4,006,197	4,006,220
4 : 4,006,160	4,005,836	4,006,424	4,005,823	4,006,240	4,006,270
4,005,662	4,005,842	4,006,425	4,005,888	4,006,254	4,006,390
4,005,682	4,005,863	4,006,432	4,005,972	4,006,255	4,006,404
4,005,791	4,005,877	4,006,444	4,006,115	4,006,256	4,006,413
4,006,400	4,005,890	4,006,453	4,006,205	4,006,266	4,006,460
4,006,417	4,005,892	4,006,458	4,006,219	4,006,300	25 : Re.29,128
4,006,457	4,005,893	4,006,459	4,006,257	4,006,301	4,005,519
4,006,466	4,005,899	4,006,465	4,006,291	4,006,307	4,005,549
4,006,467	4,005,927	4,006,480	4,006,309	4,006,319	4,005,553
4,006,468	4,005,934	4,006,493	4,006,386	4,006,321	4,005,603
4,006,473	4,005,935	4,005,562	4,006,396	4,006,334	4,005,689
4,006,477	4,005,942	4,005,599	4,006,397	4,006,398	4,005,701
4,006,491	4,005,958	4,005,707	4,006,409	4,006,399	4,005,782
6 : 4,005,506	4,006,004	4,006,071	4,006,478	4,006,407	4,005,827
4,005,508	4,006,005	4,006,098	4,005,744	4,006,454	4,005,919
4,005,521	4,006,073	4,006,303	4,005,816	4,006,462	4,005,957
4,005,533	4,006,076	4,005,503	4,005,897	4,005,573	4,006,025
4,005,535	4,006,078	4,005,514	4,005,606	4,005,585	4,006,036
4,005,544	4,006,082	4,005,515	4,005,810	4,005,636	4,006,046
4,005,546	4,006,090	4,005,609	4,005,501	4,005,639	4,006,107
4,005,564	4,006,094	4,005,612	4,005,524	4,005,728	4,006,150
4,005,578	4,006,100	4,005,688	4,005,540	4,005,820	4,006,151
4,005,579	4,006,154	4,005,800	4,005,543	4,005,846	4,006,271
4,005,580	4,006,156	4,005,808	4,005,592	4,006,059	4,006,298
4,005,586	4,006,188	4,005,817	4,005,593	4,006,138	4,006,353
4,005,597	4,006,196	4,005,946	4,005,615	4,006,148	4,006,354
4,005,607	4,006,204	4,005,965	4,005,676	4,006,161	4,006,360
4,005,632	4,006,253	4,005,988	4,005,712	4,006,474	4,006,363
4,005,644	4,006,259	4,005,989	4,005,713	4,005,565	4,006,375
4,005,655	4,006,268	4,006,007	4,005,760	4,005,616	4,006,382
4,005,666	4,006,275	4,006,012	4,005,764	4,005,628	4,006,416
4,005,670	4,006,276	4,006,119	4,005,776	4,005,802	4,006,418
4,005,681	4,006,289	4,006,122	4,005,812	4,005,803	4,006,437
4,005,683	4,006,292	4,006,142	4,005,819	4,005,848	26 : 4,005,511
4,005,696	4,006,294	4,006,164	4,005,840	4,005,944	4,005,602
4,005,711	4,006,299	4,006,185	4,005,891	4,005,973	4,005,630
4,005,715	4,006,305	4,006,247	4,005,896	4,005,999	4,005,650
4,005,722	4,006,315	4,006,283	4,005,912	4,006,483	4,005,733
4,005,735	4,006,317	4,006,329	4,005,950	4,005,583	4,005,734
4,005,737	4,006,336	4,006,355	4,005,960	4,005,726	4,005,748
4,005,738	4,006,344	4,006,405	4,005,966	4,005,968	4,005,763
4,005,747	4,006,349	4,005,835	4,006,000	4,005,996	4,005,768
4,005,751	4,006,351	4,006,123	4,006,009	4,005,504	4,005,789
4,005,752	4,006,356	4,006,262	4,006,016	4,005,568	4,005,793
4,005,753	4,006,358	4,006,446	4,006,033	4,005,672	4,005,806
4,005,779	4,006,372	4,006,023	4,006,034	4,005,941	4,005,809
4,005,785	4,006,373	4,005,520	4,006,037	4,006,203	4,005,825
4,005,813	4,006,388	4,005,532	4,006,074	4,006,274	4,005,841
4,005,814	4,006,394	4,005,669	4,006,083	4,005,625	4,005,844
4,005,822	4,006,401	4,005,673	4,006,088	4,005,818	4,005,861
4,005,824	4,006,403	4,005,685	4,006,103	4,005,870	4,005,865
	4,006,412	4,005,723	4,006,112	4,005,923	4,005,882

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,005,886	4,006,166	4,005,978	4,005,915	4,005,797	4,005,997
4,005,918	4,006,169	4,005,983	4,005,924	4,005,837	4,005,998
4,005,967	4,006,183	4,005,984	4,005,962	4,005,838	4,006,058
4,005,992	4,006,194	4,006,017	4,005,964	4,005,864	4,006,116
4,005,993	4,006,209	4,006,019	4,005,994	4,005,880	4,006,168
4,006,068	4,006,218	4,006,020	4,006,002	4,005,895	4,006,177
4,006,091	4,006,221	4,006,029	4,006,003	4,005,906	4,006,202
4,006,102	4,006,222	4,006,040	4,006,028	4,005,917	4,006,391
4,006,132	4,006,225	4,006,045	4,006,079	4,005,921	4,006,410
4,006,172	4,006,236	4,006,067	4,006,092	4,005,932	4,006,433
4,006,200	4,006,238	4,006,099	4,006,105	4,005,945	4,006,451
4,006,226	4,006,242	4,006,117	4,006,125	4,005,959	4,006,455
4,006,280	4,006,248	4,006,159	4,006,140	4,005,981	4,006,463
4,006,324	4,006,264	4,006,179	4,006,155	4,006,011	4,005,541
4,006,328	4,006,288	4,006,195	4,006,176	4,006,032	4,005,757
4,006,362	4,006,304	4,006,224	4,006,211	4,006,038	4,005,794
4,006,441	4,006,306	4,006,234	4,006,251	4,006,039	4,005,876
27 : 4,005,538	4,006,310	4,006,263	4,006,252	4,006,047	4,006,476
4,005,542	4,006,314	4,006,273	4,006,267	4,006,049	4,005,633
4,005,652	4,006,345	4,006,290	4,006,337	4,006,063	Re.29,127
4,005,745	4,006,389	4,006,318	4,006,377	4,006,152	4,005,529
4,006,018	4,006,471	4,006,339	4,006,481	4,006,180	4,005,601
4,006,035	4,006,475	4,006,365	4,006,486	4,006,190	4,005,645
4,006,393	4,005,496	4,006,378	4,006,487	4,006,212	4,005,668
28 : 4,005,526	4,005,527	4,005,572	4,006,487	4,006,213	4,005,710
4,005,536	4,005,629	4,005,661	4,006,572	4,006,233	4,005,821
4,005,756	4,005,990	4,005,677	4,005,677	4,006,250	4,005,920
29 : 4,005,622	4,006,227	4,005,694	4,005,694	4,006,285	4,006,097
4,006,061	4,005,512	4,005,790	4,005,790	4,006,316	4,006,206
31 : 4,005,729	4,005,525	4,005,850	4,005,850	4,006,330	4,006,370
4,005,730	4,005,531	4,005,947	4,005,947	4,006,331	4,006,469
4,005,731	4,005,537	4,005,985	4,005,985	4,006,332	4,006,367
4,005,889	4,005,563	4,006,084	4,006,084	4,006,341	4,006,428
32 : 4,006,260	4,005,577	4,006,087	4,006,087	4,006,376	4,006,131
33 : 4,006,051	4,005,584	4,006,346	4,006,346	4,006,381	4,005,534
34 : 4,005,509	4,005,618	4,006,479	4,006,479	4,006,383	4,005,750
4,005,552	4,005,637	4,006,492	4,006,492	4,005,561	4,005,498
4,005,582	37 : Re.29,130	4,005,561	4,005,561	4,006,384	4,005,554
4,005,605	4,005,654	4,005,898	4,005,898	4,006,429	4,005,556
4,005,608	4,005,659	4,005,885	4,005,885	4,006,438	4,005,591
4,005,623	4,005,663	4,005,976	4,005,976	4,006,439	4,005,626
4,005,664	4,005,678	4,006,325	4,006,325	4,005,545	4,005,674
4,005,706	4,005,695	4,006,369	4,006,369	4,005,588	4,005,739
4,005,772	4,005,698	4,005,551	4,005,551	4,006,335	4,005,746
4,005,804	4,005,699	4,005,502	4,005,502	4,005,833	4,005,775
4,005,873	4,005,708	4,005,505	4,005,505	4,005,833	4,005,780
4,005,931	4,005,720	4,005,555	4,005,555	4,005,494	4,005,798
4,005,937	4,005,766	4,005,566	4,005,566	4,005,547	4,005,843
4,005,969	4,005,771	4,005,574	4,005,574	4,005,908	4,005,894
4,006,006	4,005,777	4,005,611	4,005,611	4,005,979	4,005,949
4,006,010	4,005,829	4,005,614	4,005,614	4,005,587	4,006,056
4,006,052	4,005,839	4,005,642	4,005,642	4,005,621	4,006,278
4,006,060	4,005,854	4,005,675	4,005,675	4,005,671	4,006,322
4,006,075	4,005,860	4,005,697	4,005,697	4,005,732	4,006,323
4,006,089	4,005,869	4,005,724	4,005,724	4,005,749	4,006,333
4,006,110	4,005,879	4,005,801	4,005,801	4,005,788	4,006,371
4,006,114	4,005,913	4,005,815	4,005,815	4,005,881	4,006,392
4,006,137	4,005,929	4,005,852	4,005,852	4,005,909	4,006,440
4,006,143	4,005,939	4,005,862	4,005,862	4,005,922	4,006,443
4,006,153	4,005,940	4,005,907	4,005,907	4,005,928	

DESIGN PATENTS

1 : 243,283	243,260	17 : 243,233	243,242	243,262	243,230
4 : 243,271	243,280	243,257	243,254	243,266	243,273
6 : 243,214	243,285	243,258	243,263	243,267	44 : 243,244
243,217	243,288	243,279	243,264	243,287	48 : 243,246
243,218	8 : 243,276	243,290	243,265	243,231	243,247
243,235	9 : 243,289	243,216	243,281	243,239	243,248
243,236	12 : 243,215	243,221	243,211	243,274	51 : 243,209
243,245	243,222	243,227	243,220	243,278	243,286
243,252	13 : 243,259	243,224	243,229	243,212	55 : 243,241
243,253	243,268	243,225	243,240	243,219	243,261
243,256		243,225	243,238	243,226	243,282

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6 : 4,014					
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DEFENSIVE PUBLICATIONS APPLICATIONS
[Notice of Dec. 16, 1969, 869 O.G. 6877]

1 : T955,002	34 : T955,001	T955,007	T955,010	42 : T955,004	48 : T955,005
	36 : T955,006	T955,008			

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UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

National Inventors Day

The Patent and Trademark Office will be observing National Inventors Day in the Public Search Room on Saturday, February 5 from 1:00 p.m. to 5:00 p.m. and Sunday, February 6, 1977 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend a formal program at 2:00 p.m. on Sunday.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 4, 1977.

We would appreciate the cooperation of all users of the Search Room facilities in removing all personal items and belongings in order to permit the early closing time.

C. MARSHALL DANN,
Commissioner of Patents
and Trademarks.

Jan. 17, 1977.

Recombinant DNA

Accelerated Processing of Patent Applications for Inventions

In recent years revolutionary genetic research has been conducted involving recombinant deoxyribonucleic acid ("recombinant DNA"). Recombinant DNA research appears to have extraordinary potential benefit for mankind. It has been suggested, for example, that research in this field might lead to ways of controlling or treating cancer and hereditary defects. The technology also has possible applications in agriculture and industry. It has been likened in importance to the discovery of nuclear fission and fusion. At the same time concern has been expressed over the safety of this type of research. The National Institutes of Health (NIH) has released guidelines for the conduct of research concerning recombinant DNA. "Guidelines for Research Involving Recombinant DNA Molecules," published in the Federal Register of July 7, 1976, 41 F.R. 27902-27943. NIH is sponsoring experimental work to identify possible hazards and safety practices and procedures.

In view of the exceptional importance of recombinant DNA and the desirability of prompt disclosure of developments in the field, the Assistant Secretary of Commerce for Science and Technology has requested that the Patent and Trademark Office accord "special" status to patent applications involving recombinant DNA. Upon appropriate request, the Office will make special patent applications for inventions relating to recombinant DNA, including those that contribute to safety of research in the field. Requests for special status should be written, should identify the application by serial number and filing date, and should be accompanied by affidavits or declarations under 37 CFR 1.102 by the applicant, attorney or agent explaining the relationship of the invention to recombinant DNA research. Requests also must include a statement that the NIH guidelines cited above or as amended in the future are being followed in any experimentation in this field, except that the statement may include an explanation of any deviations considered essential to avoid disclosure of proprietary information or loss of patent rights. The requests will be handled in the same manner as requests to make applications special that relate to energy or environmental quality. See Manual of Patent Examining Procedure 708.02.

Dated: Jan. 7, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: January 10, 1977.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc.77-1155; Filed 1-12-77; 8:45 am]

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TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

[37 CFR Parts 1, 3 and 5]

IMPLEMENTATION OF PATENT COOPERATION TREATY

Notice of Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in Section 6, Title 35 of the United States Code, and Pub. L. 94-131, 89 Stat. 685, of November 14, 1975 which will come into force on the same day as the entry into force of the Patent Cooperation Treaty, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by either amending or revising sections 1.1, 1.4, 1.5, 1.8, 1.12, 1.14, 1.21, 1.23, 1.25, 1.26, 1.52, 1.55, 1.57, 1.58, 1.72, 1.75, 1.77, 1.78, 1.81, 1.83, 1.84, 1.104, 1.141, 1.146, 1.331, 5.1, 5.3, 5.11, 5.14, 5.15 and 5.17; and by adding new sections 1.9, 1.61, 1.70, 1.318, 1.401, 1.412, 1.413, 1.414, 1.415, 1.421, 1.422, 1.423, 1.424, 1.425, 1.431, 1.432, 1.433, 1.434, 1.435, 1.436, 1.437, 1.438, 1.445, 1.446, 1.451, 1.455, 1.461, 1.465, 1.468, 1.471, 1.475, 1.481, 1.482, 3.56 and 3.57.

In view of the approaching entry into force of the Patent Cooperation Treaty, the Patent and Trademark Office is proposing certain amendments to the rules of practice in patent cases, forms for patent cases and the rules relating to secrecy of certain inventions and licenses to file applications in foreign countries. These proposed rules provide for the formal acceptance of international applications filed under the Patent Cooperation Treaty in the Patent and Trademark Office as a Designated Office, establish processing fees for international applications, clarify procedures before the Receiving Office and International Search Authority, and provide for other matters relating to the filing and processing of international applications.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before May 26, 1977 on which date a hearing will be held at 9:30 a.m. in Room 11C24, Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. All persons wishing to be heard orally at the hearing are requested to notify the Commissioner of Patents and Trademarks of their intended appearance. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. If the Patent Cooperation Treaty implementation schedule permits the period for comments may be extended. It is also possible that a further draft will be published for comment.

The proposed rules will not be promulgated until the Patent Cooperation Treaty and Public Law 94-131, 89 Stat. 685 come into force. This will occur three months after the necessary eight ratifications or accessions to the Treaty have occurred, four of which must be countries with major patent activity, PCT Article 63. The United States of America and the Federal Republic of Germany are two of the four major countries which have ratified the Treaty. Two additional major countries must yet ratify or accede to the Treaty before it can enter into force.

This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A-107 and determined to have no major inflationary impact.

The Patent Cooperation Treaty was published in the OFFICIAL GAZETTE on July 14, 1970 at 876 O.G. 341-388. The implementing legislation, Public Law 94-131, was published in the OFFICIAL GAZETTE on January 6, 1976 at 942 O.G. 177-185. The latest draft of the Administrative Instructions to be promulgated under Rule 89 of the Treaty by the World Intellectual Property Organization is being published in an OFFICIAL GAZETTE in January of 1977.

The following comments are directed to the proposed changes and additions in the Patent Rules of Practice.

FEBRUARY 8, 1977

U. S. PATENT AND TRADEMARK OFFICE

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In order to distinguish which rules apply to national applications, which to international applications, and which to both. It is being proposed that Part I of 37 CFR be divided into 3 subparts. Subpart A would relate to "General Provisions" directed to both national applications and international applications and would include §§ 1.1 through 1.26. Subpart B would relate to "National Processing Provisions" directed to national applications only, and would include §§ 1.31 through 1.352. Subpart C would relate to "International Processing Provisions" under the Patent Cooperation Treaty and would include proposed new §§ 1.401 through 1.482. Within each subpart, where an exception as to the applicability of a rule to national and/or international applications occurs, a specific clarifying reference has been added. In all cases, the present numbering of rules has been maintained.

Section 1.1 provides a special "Box PCT" address to permit an early separation and routing of PCT related mail from other types of mail.

Section 1.4(a) is amended to refer to the added rules relating to international processing.

Section 1.5(a) is amended to indicate that international applications are to be identified by their international application numbers.

Section 1.8(a) is amended to exclude international applications and papers relating thereto from the certificate of mailing procedure.

New section 1.9 is added to distinguish between the terms "national application" and "international application" as used in these rules.

Section 1.12 is amended to refer specifically to the international application number.

Section 1.14(a) indicates the current practice as to application secrecy and also refers specifically to applications identified in international applications. Section 1.14(c) changes the reference from Atomic Energy Commission to the Energy Research and Development Administration.

An international-type search will be made in all national applications as indicated in § 1.104(c). New paragraph (w) to § 1.21 adds a fee to cover the cost of preparing an international-type search report where desired (PCT Art. 15(5)), although it is not required by the United States Patent and Trademark Office.

Section 1.23 includes a reference to international application processing fees to clearly indicate that such fees must be paid in United States currency.

Section 1.25(b) is amended to indicate that international application fees may be charged against deposit accounts.

Section 1.26 is amended to provide for refunding some portion of the international search fee during subsequent national examination where the prior art search is wholly or partly based on the earlier international search. The amount of the refund will be determined by the examiner in a manner similar to that indicated in the remarks directed to § 1.446 below. Such a refund will tend to make applicants' cost of using the PCT about the same regardless of whether the national or international application is filed initially.

In section 1.52, paragraphs (a) and (b) are amended to permit an application complying with the formal requirements of PCT Rule 11 to be formally acceptable as a national application. International applications arriving in the Patent and Trademark Office as a Designated Office under 35 U.S.C. 371 will be in PCT format and with the changed wording of this rule, will also be formally acceptable for national patentability examination.

Section 1.55 is amended to contain an additional paragraph (d) which states the position set forth in PCT Art. 11(3) and 35 U.S.C. 363 that the international filing date is in effect the national filing date except for the reservation under PCT Art. 64(4). This reservation was taken by the United States of America at the time it deposited its instrument of ratification.

Section 1.57 is amended to indicate that the signature on the Request of an international application will be accepted as the signature on the application.

Section 1.58 is amended slightly to remove any conflict with the formal requirements of the Patent Cooperation Treaty.

Section 1.61 is a new section which relates to the filing of an international application with the Patent and Trademark Office as a Designated Office for national patentability examination (35 U.S.C. 371). These requirements differ some-

what from those applying to the regular filing of national applications.

Section 1.70 is a new section which sets forth the requirements of an oath or declaration under 35 U.S.C. 371(c)(4).

Section 1.72 is amended to indicate that the abstract must be located on a separate sheet of paper. This change has been introduced in order to assure uniformity in information placement in international and regular applications that will aid in patent printing. Except for this change, national applications may continue to be filed in the present format.

Section 1.75, paragraph (c), is amended to provide for multiple dependent claims (PCT Rule 6.4). Paragraphs (f) and (g) have been added to incorporate current practice not previously stated in the rules.

Sections 1.77 and 1.78 have been amended to indicate the preferred order of arrangement of application elements including placement of the abstract after the claims as in PCT Art. 3(2) and Section 208 of the Administrative Instructions.

Section 1.81 is amended to reflect the changes made in 35 U.S.C. 113 by Public Law 94-131 and to comply with PCT Rule 7.2.

Section 1.83 has been amended to remove the mandatory requirement that the drawing show every feature claimed. Such illustrations, however, continue to be strongly preferred and are absolutely essential where necessary for the understanding of the invention.

Section 1.84, which relates to the formal requirements for drawings, has been amended to provide for two alternative drawing sizes. One size is that currently in use and the other is the A4 size required by PCT Rule 11. However, all drawings in a particular application must be of the same size. Other changes have been incorporated to take into consideration the requirements of PCT Rule 11.

Section 1.104 is amended to include a new paragraph (c) relating to the international-type search. Note PCT Art. 15(5) and PCT Rule 41.

Section 1.141 has been amended to provide for including in a single application, inventions so linked as to form a single general inventive concept as in PCT Rule 13.1-13.3.

The rules for determining which inventions can be grouped together in a single application are more liberal in certain respects under the Patent Cooperation Treaty than they are currently in 37 CFR 1.141-1.146. The proposed amendment to Section 1.141 extends the more liberal practice, which a Designated Office is required to apply to national applications that have been initially filed as international applications, to all national applications. Paragraph (a) removes the limit of five species of an invention. Paragraphs 1.141(c)(1) and (11) generally include the wording of PCT Rule 13.2. Paragraphs 1.141(c)(1) and (d), taken together, state that an application may include, in addition to an allowable independent claim to a product, one independent claim to one process specially adapted for the manufacture of the product as well as one independent claim for one use of the product. Paragraphs 1.141(c)(11) and (d), taken together state that an application may include, in addition to an allowable independent claim for a given process, one independent claim for one apparatus or means for carrying out the process. Such claims drawn to product, process of manufacture, process of use, or apparatus, are considered to be claims to different categories. Paragraph 1.141(e) includes generally the wording of PCT Rule 13.3 and is limited to applications where all of the claims are drawn to only one category.

Section 1.146 follows the revised wording of section 1.141 by removing the limit of five species and also removes the reference to a search of the generic claims.

Section 1.318 is a new section relating to the Office's notifying the International Bureau of the publication of a United States patent based on an unpublished international application in accordance with PCT Rule 48.5.

Paragraphs (a) and (c) of section 1.331 are amended to provide for recording of assignments of international applications which designate the United States of America.

Sections 1.401-1.482 relate to processing of international applications during the international processing stage when the United States Patent and Trademark Office acts as a Receiving Office, International Searching Authority or a Designated Office prior to the acceptance of the international application as a national application for regular patentability examination.

Section 1.401 defines various expressions used in later rules.

Section 1.412 defines those applicants for which the United States Patent and Trademark Office will act as a Receiving Office and also sets forth the major functions of a Receiving Office.

Section 1.413 states that the United States Patent and Trademark Office will act as an International Searching Authority, subject to special agreement and appointment by the Assembly, and indicates some of the major functions thereof.

Section 1.414 states the conditions under which the United States Patent and Trademark Office will act as a Designated Office and defines the functions of the Office as a Designated Office.

Section 1.415 is included to clearly define the authority acting as the International Bureau.

Section 1.421 indicates who may file an international application with the United States Receiving Office.

Sections 1.422, 1.423 and 1.425 are similar to present §§ 1.42, 1.43 and 1.47 and have been added to indicate situations where a person other than the inventor may file an international application designating the United States. These situations include those where the inventor is dead, insane or legally incapacitated, cannot be found or reached, or refuses to sign.

Section 1.431 defines the requirements of an international application filed in the United States Receiving Office.

Section 1.432 relates to the designation of States and the payment of designation fees.

Section 1.433 indicates that only one copy of an international application need be filed and refers to those provisions of the Treaty and Administrative Instructions relating to the physical requirements for international applications.

Section 1.434 relates to the Request portion of an international application.

Section 1.435 calls attention to the PCT Rules relating to the description and also provides that international applications designating the United States must contain an indication of the "best mode" (PCT Rule 5.1(a)(v)).

Section 1.436 refers to the portions of the Treaty and its Regulations which relate to claims.

Section 1.437 relates to the drawings and includes reference to the procedure for receipt of late drawings.

Section 1.438 refers to the abstract requirements of an international application.

Section 1.445 sets forth the fees charged by the Patent and Trademark Office for processing international applications. The amounts of the fees are tentative. More complete and updated studies will be made before these rule changes are finally promulgated and the amounts of the fees will be adjusted accordingly. The fees will be set to reflect 100% recovery of actual cost.

Section 1.446 relates to refund of international application processing fees. It should be noted that since an international-type search will be made in prior filed U.S. national applications or, if an international search made in an international application by the International Searching Authority of Washington is followed by a national examination on such an application, a substantial portion of the international search fee (37 CFR 1.445(a)(2)) could be refunded in many instances. This refund will reduce PCT filing costs.

The examples use the maximum refund and should therefore not be considered to be typical for all applications.

	(A)	(B)
National application filed first	National application filed first	International application filed first
National filing fee for national application 35 U.S.C. 41	\$65	
Transmittal fee (§ 1.445(a)(1))	35	\$35
International fees:		
Basic fee (PCT Rule 15.2(a))	45	45
Designation fees, 3 countries (PCT Rule 15.2(b)(1))	26	36
Search fee (§ 1.445(a)(2))	300	300
Search fee refund based on international type search (§ 1.446)	(-270)	
National filing fee (§ 1.445(a)(4))		65
(Refund of search fee based on savings at national stage (§ 1.26))		(-\$270)
Net international processing fees	146	146

The first fee column, labeled (A), relates to a situation where an applicant first files his national application in the Patent and Trademark Office and later, within the priority year, decides to file an international application with the same claims and designates 3 foreign countries. The total fees for the international application in the example would be \$416. However, since the claims are the same as those in the national application in which the Office previously made an international-type search, a refund of \$270 would be made as indicated in the table below. This would result in the PCT route fees actually costing the applicant \$146.

The second fee column, labeled (B), relates to a situation in which the applicant files his international application initially and designates the United States of America as one of the Designated States. Here again the international application fees would be \$416. Subsequently, not later than at the expiration of 20 months from the priority date (in this example the international filing date, PCT Art. 2(x1)(c)), the applicant must pay his national fees in the Designated Offices (PCT Art. 22.1). The Patent and Trademark Office, as a Designated Office, may refund during patentability examination a portion of the international search fee under § 1.26. This practice will result in the total cost to the applicant being about the same regardless of whether the national or international application is filed first.

The following table is a draft of the criteria which the examiners may use to determine the amount of the international search fee which may be refunded as a result of an earlier international-type search. Similar criteria will be used for refunds under § 1.26. Current plans are to have the examiner making the international search merely indicate which category most nearly describes the situation in the application under consideration.

CRITERIA FOR REFUND

	Refund percent- age of search fee	Refund based on \$300 search fee
A. The prior international-type search was so complete that only an updating search was required.	90	\$270
B. The prior international-type search was directed to substantially the same invention. However, the claims in the international vary from the national application so that a search in at least one additional subclass is required.	70	210
C. The prior international-type search was such that about a half of the search time of the international search was saved.	40	120
D. The prior international-type search was of only small value. The claims of the international application were so different from the claims in the prior national application that the search of only a few subclasses was saved.	25	75
E. The prior international-type search was of no value.	0	(1)

1 No refund.

Section 1.451 indicates the procedures to be used to file certified copies of priority documents. Paragraph (b) includes a procedure by which the Office will automatically forward a copy of the priority document to the International Bureau if a fee for copy preparation and a request for such service is filed with the international application.

Section 1.455 relates to who may act as applicant's representative in an international application, and indicates the International Authority to which powers of attorney and revocations thereof should be sent.

Section 1.461 covers the procedures for transmittal of the record copy to the International Bureau. It should be noted that the alternative procedure in paragraph (b) requires that applicants electing transmittal of the international application by themselves rather than by the Receiving Office must file such applications before the expiration of 11 months from the priority date to permit sufficient time for the Receiving Office to process the applications before transmittal by the applicant takes place.

Section 1.465 relates to the time limits for processing based on the priority date that are set by the Treaty and its Regulations. This rule indicates which date is to be used if the original claimed priority date is either canceled or changed.

Section 1.468 refers to excusing failures to meet time limits during international processing.

Section 1.471 covers procedures for correcting or amending international applications.

Section 1.475 indicates to which International Authority changes in person, name or address of the applicant or inventor should be sent during various processing stages.

Section 1.481 relates to the International Searching Authority's finding a lack of unity of invention (multiple inventions) under PCT Rule 13 and the resulting invitation to pay additional fees. This section also relates to the filing of a protest on a holding of lack of unity of invention and the payment of additional fees.

Section 1.482 indicates that the International Searching Authority may determine the novelty and obviousness of generic or linking claims to decide if such claims properly link claims to different inventions.

PART 3

Sections 3.56 and 3.57 are proposed as oath and declaration forms which may be used when filing an international application with the United States Designated Office under 35 U.S.C. 371(c)(4).

PART 5

Section 5.1 relates to inspection of applications by defense agencies. Paragraph (a) indicates that the provisions of Part 5 apply to both national and international applications except as otherwise specifically indicated and that the filing of an international application designating a foreign country is considered to be a "foreign filing." In paragraph (b) Atomic Energy Commission is changed to the Energy Research and Development Administration.

Paragraph (d) of § 5.3 is added to indicate that the record and search copies will not be forwarded to the Authorities or delivered to the applicant if the international application is under secrecy order.

Sections 5.11, 5.14, 5.15 and 5.17 indicate that a license for filing an international application which designates a foreign country is required in the same manner as a license to file a foreign application directly in a foreign country.

The following table of contents indicates the contents of the proposed Subparts and the location of added sections and section headings.

PART I—RULES OF PRACTICE IN PATENT CASES

SUBPART A—GENERAL PROVISIONS

(§§ 1.1-1.26)

General Information and Correspondence

§ 1.9 Definitions.

SUBPART B—NATIONAL PROCESSING PROVISIONS

(§§ 1.31-1.352)

The Application

§ 1.61 Filing of applications in the United States of America as a Designated Office.

Statement; Oath or Declaration

§ 1.70 Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).

Allowance and Issue of Patent

§ 1.318 Notification of national publication of a patent based on an international application.

SUBPART C—INTERNATIONAL PROCESSING PROVISIONS

General Information

§ 1.401 Definitions of Terms under the Patent Cooperation Treaty.

- § 1.412 The United States Receiving Office.
- § 1.413 The International Searching Authority of Washington.
- § 1.414 The United States Designated Office.
- § 1.415 The International Bureau.

Who May File an International Application

- § 1.421 Applicant for international application.
- § 1.422 When the inventor is dead.
- § 1.423 When the inventor is insane or legally incapacitated.
- § 1.424 Joint Inventors.
- § 1.425 Filing by other than inventor.

The International Application

- § 1.431 International application requirements.
- § 1.432 Designation of States and payment of designation fees.
- § 1.433 Physical requirements of international application.
- § 1.434 The Request.
- § 1.435 The Description.
- § 1.436 The Claims.
- § 1.437 The Drawings.
- § 1.438 The Abstract.

Fees

- § 1.445 International application filing and processing fees.
- § 1.446 Refund of international application filing and processing fees.

Priority

- § 1.451 The priority claim and priority document in an international application.

Representation

- § 1.455 Representation in international applications.

Transmittal of Record Copy

- § 1.461 Procedures for transmittal of Record Copy to the International Bureau.

Timing

- § 1.465 Timing of application processing based on the priority date.
- § 1.468 Delays in meeting time limits.

Amendments

- § 1.471 Corrections and amendments during international processing.
- § 1.475 Changes in person, name, or address of applicants and inventors.

Unity of Invention

- § 1.481 Unity of invention.
- § 1.482 Holding of lack of unity of invention.

PART 3—FORMS FOR PATENT CASES

- § 3.56 Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).
- § 3.57 Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).

The texts of the proposed amendments are as follows (additions are indicated by arrows; deletions are bracketed):

PART I—RULES OF PRACTICE IN PATENT CASES

1. By revising § 1.1 to read as follows:

- § 1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

All letters and other communications intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks," Washington, D.C. 20231. When appropriate, a letter [may] should also be marked for the attention of a particular officer or individual.

Letters and other communications relating to international applications during the international stage and prior to the assignment of a national serial number should be additionally marked "Box PCT."

NOTE: §§ 1.1 to 1.26 are applicable to trademark cases as well as to national and international patent cases except for provisions specifically directed to patent cases. See § 1.9 for definitions of "national application" and "international application."

2. By revising paragraph (a) of § 1.4 to read as follows:

§ 1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, and prosecution of applications or other proceedings [(1) of national applications in Subpart B, §§ 1.31 to 1.352; of international applications in Subpart C, §§ 1.401-1.482; and of trademark applications, §§ 2.11 to 2.189].

3. By revising paragraph (a) of § 1.5 to read as follows:

§ 1.5 Identification of application, patent or registration.

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number of or international application number of the application, the date of filing the same, and, if known, the group art unit and name of the examiner to which it has been assigned (see § 1.55).

4. By revising paragraphs (a) (i) and (xi) of § 1.8 to read as follows:

§ 1.8 Certificate of mailing.

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of national applications for patent;

(xi) The filing of international applications for patent and papers relating thereto.

5. A new section 1.9 is added to read as follows:

§ 1.9 Definitions.

(a) A national application as used in this Chapter means a United States national application for patent which was either filed in the Office under 35 U.S.C. 111 or which resulted from an international application after compliance with 35 U.S.C. 371.

(b) An international application as used in this Chapter means an international application for patent filed under the Patent Cooperation Treaty prior to entering national processing at the Designated Office stage.

6. By revising § 1.12 to read as follows:

§ 1.12 Assignment records open to public inspection.

The assignment records, relating to original or reissue patents, including digests and indexes, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned application are not available to the public. Copies of any

such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number of or international application number of the application, an extra charge will be made for the time consumed in making a search for such assignment.

7. By revising paragraphs (a) and (c) of § 1.14 to read as follows:

§ 1.14 Patent applications preserved in secrecy.

(a) Except as provided in § 1.11(b) pending patent applications are preserved in secrecy. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, unless the application has been identified by serial number in a published patent document or the United States of America has been indicated as a designated state in a published international application, in which case status information such as whether it is pending, abandoned or patented may be supplied, or unless it shall be necessary to the proper conduct of business before the Office or as provided by this part. Where an application has been patented, the patent number and issue date may also be supplied.

(c) Applications for patents which disclose, or which appear to disclose, or which purport to disclose, inventions or discoveries relating to atomic energy are reported to the Energy Research and Development Administration [Atomic Energy Commission] and the [Commission] Administration will be given access to such applications, but such reporting does not constitute a determination that the subject matter of each application so reported is in fact useful or an invention or discovery or that such application in fact discloses subject matter in categories specified by secs. 151(c) and 151(d) of the Atomic Energy Act of 1954, 68 Stat. 919; 42 U.S.C. 2181.

8. By adding a new paragraph (w) to § 1.21 to read as follows:

§ 1.21 Patent and miscellaneous fees and charges.

(w) For preparing an international-type search report in a national patent application ----- \$25.00.
NOTE: For fees relating to processing of international applications, see § 1.445.

9. By revising § 1.23 to read as follows:

§ 1.23 Method of payment.

All payments of money required for Patent and Trademark Office fees, including fees for the processing of international applications (§ 1.445), should be made in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. If sent in any other form, the Office may delay or cancel the credit until collection is made. Money orders and checks must be made payable to the Commissioner of Patents and Trademarks. Remittances from foreign countries must be payable and immediately negotiable in the United States for the full amount of the fee required. Money sent by mail to the Patent and Trademark Office will be at the risk of the sender; letters containing money should be registered.

10. By revising paragraph (b) of § 1.25 to read as follows:

§ 1.25 Deposit accounts.

(b) Filing, issue, appeal, international-type search report, international application processing, and petition fees may be charged against these accounts.

11. By revising § 1.26 to read as follows:

§ 1.26 Refund.

Money paid by actual mistake or in excess, such as a payment not required by law, will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw his application or to withdraw an appeal, will not entitle a party to demand such a return. Refund of a portion of any international search fee paid to the Patent and Trademark Office may be made where the prior art search made during the subsequent national examination of that application is wholly or partly based on the earlier international search made in the international application for which the search fee was paid. The amount of the refund will be as determined by the examiner according to the value of the prior international search made by the Patent and Trademark Office as an International Searching Authority, as 90%, 70%, 40%, 25% or 0% of the international search fee. If the amount of the refund is not a multiple of \$10, it will be rounded off to the next higher multiple of \$10. (Note § 1.446 for refund of the search fee in an international application.) Amounts of ten cents or less will not be returned unless specifically demanded, within a reasonable time, nor will the payer be notified of such amount; amounts over ten cents but less than one dollar may be returned in postage stamps, and other amounts by check.

12. By revising paragraphs (a) and (b) of § 1.52 to read as follows:

§ 1.52 Language, paper, writing, margins.

(a) The application, any papers pertaining thereto, any amendments and the [specification and] oath or declaration must be in the English language or be accompanied by a verified translation of the application and a translation of any other papers into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written, typed, or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing, typing, or printing thereon to permit the direct production of readily legible copies in any number by use of photographic, electrostatic, photoffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

(b) The application papers (specification, including claims, abstract, oath, or declaration, and papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly written on but one side of the paper. The size of all sheets of paper should be 8 to 8½ by 10½ to 13 inches (20.3 to 21.6 cm. by 26.6 to 33.0 cm.). A margin of at least approximately one inch (2.5 cm.) [1½ inches (3.8 cm.)] must be reserved on the left-hand side of each page. The [and on the] top of each page of the application [specification], including claims must have a margin of at least approximately ¾ inch (2 cm.). The lines of text must not be crowded too closely together; typewritten lines should be 1½ or double spaced. The pages of the application [specification], including claims and abstract, should be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text [placed in the center of the bottom margins].

13. By adding paragraph (d) to § 1.55 to read as follows:

§ 1.55 Serial number and filing date of application.

(d) The filing date of an international application designating the United States of America shall be treated as the

filing date in the United States of America under PCT Article 11(3), except provided in 35 U.S.C. 102(e).

14. By revising § 1.57 to read as follows:

§ 1.57 Signature.

(a) The application must be signed by the applicant in person. The signature to the oath or declaration under § 1.65 will be accepted as the signature to the application provided the oath or declaration under § 1.65 is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims.

(b) The signature to the oath or declaration under § 1.70 will be accepted as the signature to the application provided the oath or declaration under § 1.70 specifically refers to the specification and claims to which it applies.

(c) Full names must be given, including at least one given name without abbreviation together with any other given name or initial.

15. By revising § 1.58 to read as follows:

§ 1.58 Chemical and mathematical formulas and tables.

(a) The specification, including the claims, may contain chemical and mathematical formulas, but shall not contain drawings or flow diagrams. The description portion of the specification may contain tables; claims may contain tables [either only] if necessary to conform to 35 U.S.C. 112 or if otherwise found to be desirable.

(b) All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on paper which is flexible, strong, white, smooth, non-shiny and durable [pure white durable paper, the surface of which is calendered and smooth], in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter ribbon should [must] be used to secure perfectly dark [black] solid lines.

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 5 inches (12.7 cm.) so that it may appear as a single column in the printed patent. If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10¼ inches (27.3 cm.) and to place it sideways on the sheet, in which case the formula or table will appear printed across both columns of the page in the printed patent. Typewritten characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least 0.08 [0.085] inch (2.1 mm.) [2.2 mm.] high (e.g. elite type). Hand lettering must be neat, clean, and have a minimum character height of 0.08 [0.085] inch (2.1 mm.) [2.2 mm.]. A space at least ¼ inch (6.4 mm.) high should be provided between the formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

16. By adding a new § 1.61 to read as follows:

§ 1.61 Filing of application in the United States of America as a Designated Office.

(a) To maintain the benefit of the international filing date, the applicant shall furnish to the United States Patent and Trademark Office a copy of the international application with any amendments, unless it has been previously furnished by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office, a verified translation of the international application and a translation of any amendments into the English language if originally filed elsewhere in another language, the national fee (see § 1.445(a)(4)) and an oath or declaration of the inventor (see § 1.70) not later than the expiration of 20 months from the priority date.

(b) Where an International Searching Authority has made a declaration that no international search report will be established because the international application relates to subject matter which it is not required to search, or because the application fails to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out, the time for performing the acts referred to in

paragraph (a) of this section is two months from the mailing date of the declaration to the applicant.

17. By adding a new § 1.70 to read as follows:

§ 1.70 *Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).*

▶(a)(1) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he must specifically identify the international application and any amendments thereto and state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States of America before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his international application as filed or as amended. In every application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States of America more than one year prior to his international application, or patented or described in any printed publication in any country before his invention or more than one year prior to his international application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his international application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his international application. He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or by his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the international application.

▶(2) This statement (1) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66, or (b) include the personal declaration of the applicant as prescribed in § 1.68.

▶(b) If the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his relationship to the inventor and, upon information and belief, the facts which the inventor is required by this section to state.

18. By revising paragraph (b) of § 1.72 to read as follows:
§ 1.72 *Title and abstract.*

(b) A brief abstract of the technical disclosure in the specification must be set forth on a separate sheet, preferably following the claims. [Immediately following the title and preceding the disclosure in a separate paragraph] under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure, and the abstract shall not be used for interpreting the scope of the claims.

19. By revising paragraph (c) of § 1.75 and adding paragraphs (f) and (g) as follows:

§ 1.75 *Claim(s).*

(c) ▶One or more claims may be presented in dependent form, referring back to another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. ▶[When more than one claim is presented, they may be placed in dependent form in which a claim may refer back to and further restrict a single preceding claim]. Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. ▶A multiple dependent claim shall be construed to incorporate by reference all the limitations of

the particular claim in relation to which it is being considered.

▶(f) If there are several claims, they shall be numbered consecutively in Arabic numerals.

▶(g) All dependent claims referring back to a single previous claim, and all dependent claims referring back to several previous claims, should be grouped together to the extent possible.

20. By revising § 1.77 to read as follows:

§ 1.77 *Arrangement of application elements.*

The elements of the application should appear in the following order: [following order of arrangement should be observed in framing the application]:

(a) Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used.

(b) [Abstract of the disclosure.] ▶(reserved)

(c) Cross-references to related application, if any.

(d) Brief summary of the invention.

(e) Brief description of the several views of the drawing, if there are drawings.

(f) Detailed description.

(g) Claim or claims.

(h) Signature. (See § 1.57.)

▶(i) Abstract of the disclosure.

▶(j) Drawings.

21. By revising paragraph (a) of § 1.78 to read as follows:

§ 1.78 *Cross-references to other applications.*

(a) When an applicant files an application claiming an invention disclosed in a prior filed copending ▶national application ▶or international application designating the United States of America of the same applicant, the second application must contain or be amended to contain in the first sentence of the specification following the title [and abstract] a reference to [the] ▶such prior application, identifying it by serial number and filing date ▶or international application number and international filing date and indicating the relationship of the applications, if the benefit of the filing date of [the] ▶such prior application is to be claimed. Cross-references to other related applications may be made when appropriate. (See § 1.14(b).)

22. By revising § 1.81 to read as follows:

§ 1.81 *Drawings required.*

▶(a) ▶The applicant for patent is required by statute to furnish a drawing of his invention ▶where necessary for the understanding of the subject matter sought to be patented; ▶[whenever the nature of the case admits of it:] this drawing must be filed with the application.

▶(b) ▶Illustrations facilitating an understanding of the invention (for example, flow sheets in cases of processes, and diagrammatic views) may also be furnished in the same manner as drawings [and may be required by the Office when considered necessary or desirable].

▶(c) When a drawing or illustration is not necessary for, but would facilitate, the understanding of the subject matter sought to be patented and the applicant has not furnished such a drawing or illustration, the Office may require its submission within a time period of not less than two months from the sending of a notice thereof.

23. By revising § 1.83 to read as follows:

§ 1.83 *Content of drawing.*

(a) The drawing ▶should preferably ▶[must] show every feature of the invention specified in the claims. [However,] Conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box).

(b) When the invention consists of an improvement on an old machine the drawing ▶should ▶[must] when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

24. By revising paragraphs (a), (b), (c), (d), (e), (f), (i), (j) and (l) of § 1.84 to read as follows:

§ 1.84 *Standards for drawings.*

(a) *Paper and ink.* Drawings must be made upon ▶paper which is flexible, strong, white, smooth, non-shiny and durable. ▶[pure white paper of a thickness corresponding to] Two-ply or three-ply bristol-board ▶is preferred. The surface of the paper ▶should ▶[must] be calendered [and smooth] and of a quality which will permit erasure and correction with India ink, India ink, or its equivalent in quality, ▶is preferred. ▶[must be used] for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not ▶normally acceptable.

(b) *Size of sheet and margins.* The size of ▶the sheets on which drawings are made may either be ▶[a sheet on which a drawing is made must be] exactly 8½ by 14 inches (21.6 by 35.6 cm.) ▶or exactly 21.0 by 29.7 cm. (DIN size A4). All drawing sheets in a particular application must be the same size. ▶One of the shorter sides of the sheet is regarded as its top.

▶(1) On 8½ by 14 inch drawing sheets, ▶the drawing must include a top margin of 2 inches (5.1 cm.) and bottom and side margins of one-quarter inch (6.4 mm.) from the edges, thereby leaving a "sight" precisely 8 by 11¼ inches (20.3 by 29.8 cm.). Margin border lines are not permitted. All work must be included within the "sight." The sheets may be provided with two one-quarter inch (6.4 mm.) diameter holes having their centerlines spaced eleven-sixteenths inch (17.5 mm.) below the top edge and 2¾ inches (7.0 cm.) apart, said holes being equally spaced from the respective side edges.

▶(2) On 21.0 by 29.7 cm. drawing sheets, the drawing must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm. Margin border lines are not permitted. All work must be contained within a sight size not to exceed 17 by 26.2 cm.

(c) *Character of lines.* All drawings must be made with drafting instruments or by a process which will give them satisfactory reproduction characteristics. Every line and letter must be ▶durable, black or blue, sufficiently dense and dark, uniformly thick and well defined; ▶[absolutely black and permanent]; the weight of all lines and letters must be heavy enough to permit adequate reproduction. This direction applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. All lines must be clean, sharp, and solid [and fine]. ▶Fine or crowded lines should be avoided. Solid black ▶or blue should not be used for sectional or surface shading. Freehand work should be avoided wherever it is possible to do so.

(d) *Hatching and shading.* (1) Hatching should be made by oblique parallel lines ▶spaced sufficiently apart to enable the lines to be distinguished without difficulty. ▶[which may be not less than about one-twentieth inch (1.3 mm.) apart].

(2) Heavy lines on the shade side of objects should ▶preferably ▶be used except where they tend to thicken the work and obscure reference characters. The light should come from the upper left hand corner at an angle of 45°. Surface delineations should ▶preferably ▶be shown by proper shading, which should be open.

(e) *Scale.* The scale to which a drawing is made ought to be large enough to show the mechanism without crowding when the drawing is reduced ▶in size to two-thirds in reproduction, and views of portions of the mechanism on a larger scale should be used when necessary to show details clearly; two or more sheets should be used if one does not give sufficient room to accomplish this end, but the number of sheets should not be more than is necessary.

(f) *Reference characters.* The different views should be consecutively numbered figures. Reference numerals (and letters, but numerals are preferred) must be plain, legible and carefully formed, and not be encircled. They should, if possible, measure at least one-eighth of an inch (3.2 mm.) in height so that they may bear reduction to one twenty-fourth of an inch (1.1 mm.); and they may be slightly larger when there is sufficient room. They ▶should ▶[must] not be so placed in the close and complex parts of the drawing as to interfere with a thorough comprehension of the same, and therefore should rarely cross or mingle with the lines. When

necessarily grouped around a certain part, they should be placed at a little distance, at the closest point where there is available space, and connected by lines which the parts to which they refer. They should not be placed upon hatched or shaded surfaces but when necessary, a blank space may be left in the hatching or shading where the character occurs so that it shall appear perfectly distinct and separate from the work. The same part of an invention appearing in more than one view of the drawing must always be designated by the same character, and the same character must never be used to designate different parts. ▶Reference signs not mentioned in the description shall not appear in the drawing, and vice versa.

(i) *Views.* The drawing must contain as many figures as may be necessary to show the invention; the figures should be consecutively numbered if possible in the order in which they appear. The figures may be plain, elevation, section, or perspective views, and detail views of portions or elements, on a larger scale if necessary, may also be used. Exploded views, with the separated parts of the same figure embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When necessary, a view of a large machine or device in its entirety may be broken and extended over several sheets if there is no loss in facility of understanding the view. ▶Where figures on two or more sheets form in effect a single complete figure, the figures on the several sheets should be so arranged that the complete figure can be assembled without concealing any part of any of the figures appearing in the various sheets. ▶[the different parts should be identified by the same figure number but followed by the letters, a, b, c, etc., for each part]. The plane upon which a sectional view is taken should be indicated on the general view by a broken line, the ends of which should be designated by numerals corresponding to the figure number of the sectional view and have arrows applied to indicate the direction in which the view is taken. A moved position may be shown by a broken line superimposed upon a suitable figure if this can be done without crowding, otherwise a separate figure must be used for this purpose. Modified forms of construction can only be shown in separate figures. Views should not be connected by projection lines nor should center lines be used.

(j) *Arrangement of views.* All views on the same sheet ▶should ▶[must] stand in the same direction and ▶[should], if possible, stand so that they can be read with the sheet held in an upright position. If views longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the ▶top of the sheet with the appropriate top margin ▶[two-inch (5.1 cm.) margin] is on the right hand side. One figure must not be placed upon another or within the outline of another.

(1) *Extraneous matter.* [An inventor's, agent's, or attorney's name, signature, stamp, or address, or other extraneous matter, will not be permitted upon the face of a drawing, within or without the margin, except that] Identifying indicia (▶such as the ▶attorney's docket number, inventor's name, number of sheets, etc.) ▶[should] ▶not to exceed 2¼ inches (7.0 cm.) in width may ▶be placed ▶in a centered location between the side edges ▶within three-fourths inch (19.1 mm.) of the top edge [and between the hole locations defined in paragraph (b) of this section]. Authorized security markings may be placed on the drawings provided they ▶be ▶are ▶outside the illustrations and are removed when the material is declassified. ▶Other extraneous matter will not be permitted upon the face of a drawing.

25. By adding new paragraphs (c) and (d) to § 1.104 to read as follows:

§ 1.104 *Nature of examination; examiner's action.*

▶(c) An international-type search will be made in all national applications filed on and after the date the United States Patent and Trademark Office is appointed as an International Searching Authority.

▶(d) Any national application may also have an international-type search report prepared thereon at the time of

the national examination upon specific written request therefor and payment of the international-type search report fee. See § 1.21(w) for amount of fee for preparation of international-type search report.

26. By revising § 1.141 to read as follows:

§ 1.141 *Different inventions in one application.*

►(a) Two or more independent and distinct inventions may not be claimed in one application. However, a group of inventions which are so linked as to form a single general inventive concept such as those set forth in paragraphs (b), (c) or (d) of this section, are considered to be one invention under §§ 1.141-1.146 [except that more than one species of an invention, not to exceed five].

►(b) Different species of an invention may be specifically claimed in different claims in one application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to [each] species in excess of one are written in dependent form (§ 1.75) or otherwise include all the limitations of the generic claim.

►(c) Paragraph (a) of this section shall be construed as permitting the examination of claims of different categories in an application, in particular either of the following two groupings of claims of different categories:

►(i) In addition to an independent claim for a given product, the inclusion in the same application of one independent claim for one process specially adapted for the manufacture of the said product, or the inclusion in the same application of one independent claim for one use of the said product, or both; or

►(ii) In addition to an independent claim for a given process, the inclusion in the same application of one independent claim for one apparatus or means specifically designed for carrying out the said process.

►(d) If the product claim of subparagraph (i) of paragraph (c) of this section or the process claim of subparagraph (ii) of paragraph (c) of this section is not allowable, the examiner may withdraw from consideration the claims to the other categories. If subsequently such a product or process claim is found allowable, the examiner must also consider the merits of the claims to the other categories as indicated in subparagraphs (i) and (ii) of paragraph (c) of this section.

►(e) Subject to paragraph (a) of this section, and except where paragraph (c) of this section applies, there may be included in the same application two or more independent claims of one and the same category (i.e., product, process, apparatus, or use) which cannot readily be covered by a single generic claim.

27. By revising § 1.146 to read as follows:

§ 1.146 *Election of species.*

In the first action on an application containing a generic claim and claims restricted separately to each of more than one species embraced thereby, the examiner, if of the opinion after a complete search on the generic claims that no generic claim presented is allowable, shall require the applicant in his response to that action to elect that species of his invention to which his claims shall be restricted if no generic claim is finally held allowable. [However, if such application contains claims directed to more than five species, the examiner may require restriction of the claims to not more than five species before taking any further action in the case.]

28. By adding a new § 1.318 to read as follows:

§ 1.318 *Notification of national publication of a patent based on an international application.*

►The Office will notify the International Bureau when a patent is issued on an application filed under 35 U.S.C. 371, and there has been no previous international publication.

29. By revising paragraphs (a) and (c) of § 1.331 to read as follows:

§ 1.331 *Recording of assignments.*

(a) Assignments, including grants and conveyances, of patents, national applications, or international applications which designate the United States of America [or applications for patents] under 35 U.S.C. 261, will be recorded in the Patent and Trademark Office. Other instru-

ments affecting title to a patent [or application for patent], a national application, or an international application which designates the United States of America, and licenses, even though the recording thereof may not serve as constructive notice under 35 U.S.C. 261, will be recorded as provided in this section or in the discretion of the Commissioner.

(c) An instrument relating to a patent should identify the patent by number and date (the name of the inventor and title of the invention as stated in the patent should also be given); an instrument relating to [an] a national application, or an international application which designates the United States of America should identify the application by serial number or international application number and date of filing (the name of the inventor and title of the invention as stated in the application should also be given) but if an assignment is executed concurrently with or subsequent to the execution of the application but before the application is filed or before its serial number or international application number and filing date are ascertained, it should adequately identify the application, as by its date of execution and name of the inventor and title of the invention; so that there can be no mistake as to the patent or application intended.

Proposed Subpart C

30. By adding a new § 1.401 to read as follows:

§ 1.401 *Definitions of Terms under the Patent Cooperation Treaty.*

►(a) The abbreviation "PCT" or the term "Treaty" means the Patent Cooperation Treaty.

►(b) "International Bureau" means the World Intellectual Property Organization located at 32 chemin des Colombettes, Geneva, Switzerland.

►(c) "Administrative Instructions" means that body of instructions for operating under the Patent Cooperation Treaty referred to in PCT Rule 89.

►(d) "Request," when capitalized, means that element of the international application described in PCT Rules 3 and 4.

►(e) "International application," as used in this Subchapter is defined in § 1.9.

►(f) "Priority date" for the purposes of computing time limits under the Patent Cooperation Treaty is defined in PCT Art. 2 (xi). Note also § 1.465.

►(g) Other terms and expressions in this subpart C not defined in this section are to be taken in the sense indicated in PCT Art. 2 and 35 U.S.C. 351.

31. By adding a new § 1.412 to read as follows:

§ 1.412 *The United States Receiving Office.*

►(a) The United States Patent and Trademark Office is a Receiving Office only for applicants who are residents or nationals of the United States of America.

►(b) The Patent and Trademark Office, when acting as a Receiving Office, will be identified by the full title "United States Receiving Office" or by the abbreviation "RO/US."

►(c) The major functions of the Receiving Office include: (1) according of international filing dates to international applications meeting the requirements of PCT Art. 11(1), and PCT Rule 20;

(2) assuring that international applications meet the standards for format and content of PCT Art. 14(1), PCT Rules 9, 26, 29.1, 37, 38, 91, and portions of PCT Rules 3 through 11;

(3) collecting and, when required, transmitting fees due for processing international applications (PCT Rules 14, 15, 16); and

(4) transmitting the record and search copies to the International Bureau and International Searching Authority, respectively (PCT Rules 22 and 23).

32. By adding a new § 1.413 to read as follows:

§ 1.413 *The International Searching Authority of Washington.*

►(a) Pursuant to appointment by the Assembly, the United States Patent and Trademark Office will act as an International Searching Authority for international applica-

tions filed with the United States Receiving Office, in accordance with agreement between the Patent and Trademark Office and the International Bureau (PCT Art. 16(3)(b)).

►(b) The Patent and Trademark Office, when acting as an International Searching Authority, will be identified by the full title "International Searching Authority of Washington," or by the abbreviation "ISA/US."

►(c) The major functions of the International Searching Authority include:

(1) approving or establishing the title and abstract;

(2) considering the matter of unity of invention;

(3) conducting international and international-type searches and preparing international and international-type search reports (PCT Art. 15, 17 and 18, and PCT Rules 25, 33-45 and 47); and

(4) transmitting the international search report to the applicant and the International Bureau.

33. By adding a new § 1.414 to read as follows:

§ 1.414 *The United States Designated Office.*

►(a) The United States Patent and Trademark Office will act as a Designated Office for international applications in which the United States of America has been designated as a State in which patent protection is desired.

►(b) The Patent and Trademark Office, when acting as a Designated Office during international processing will be identified by the full title "United States Designated Office" or by the abbreviation "DO/US."

►(c) The major functions of the United States Designated Office in respect to international applications in which the United States of America has been designated, include:

(1) receiving various notifications throughout the international stage,

(2) accepting for regular national patentability examination international applications which satisfy the requirements of 35 U.S.C. 371, and

(3) conducting reviews under PCT Article 25 for those international applications declared withdrawn.

34. By adding a new § 1.415 to read as follows:

§ 1.415 *The International Bureau.*

►(a) The International Bureau is the World Intellectual Property Organization located at Geneva, Switzerland. It is the international intergovernmental organization which acts as the coordinating body under the Treaty and the Regulations. (PCT Art. 2 (xix) and 35 U.S.C. 351(h).)

►(b) The major functions of the International Bureau include:

(1) publishing of international applications and the International Gazette;

(2) transmitting copies of international applications to Designated Offices;

(3) storing and maintaining record copies; and transmitting information to authorities pertinent to the processing of specific international applications.

35. By adding a new § 1.421 to read as follows:

§ 1.421 *Applicant for international application.*

►(a) Only residents or nationals of the United States of America may file international applications in the United States Receiving Office.

►(b) Although the United States Receiving Office will accept international applications filed by any resident or national of the United States of America for international processing, an international application designating the United States of America will be accepted by the Patent and Trademark Office for the national stage only if filed by the inventor or as provided in §§ 1.422, 1.423 or 1.425.

►(c) International applications which do not designate the United States of America may be filed by the assignee or owner.

►(d) Any indication of different applicants for the purpose of different designated offices must be shown on the Request portion of the international application.

►(e) Changes in the person, name, or address of the applicant shall be made in accordance with PCT Rule 18.5.

36. By adding a new § 1.422 to read as follows:

§ 1.422 *When the inventor is dead.*

►In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor

may sign the Request and other papers in an international application which designates the United States of America.

37. By adding a new § 1.423 to read as follows:

§ 1.423 *When the inventor is insane or legally incapacitated.*

►In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may sign the Request and other papers in an international application which designates the United States of America.

38. By adding a new § 1.424 to read as follows:

§ 1.424 *Joint inventors.*

►Joint inventors must each sign the Request in an international application which designates the United States of America; the signature of either of them alone, or less than the entire number will be insufficient for an invention invented by them jointly, except as provided in § 1.425.

39. By adding a new § 1.425 to read as follows:

§ 1.425 *Filing by other than inventor.*

►(a) If a joint inventor refuses to join in an international application which designates the United States of America or cannot be found or reached after diligent effort, the international application which designates the United States of America may be filed by the other inventor on behalf of himself and the omitted inventor. Such an international application which designates the United States of America must be accompanied by proof of the pertinent facts and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the international application to the omitted inventor at said address.

►(b) Whenever an inventor refuses to execute an international application which designates the United States of America, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may file the international application on behalf of and as agent for the inventor. Such an international application which designates the United States of America, must be accompanied by proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application.

40. By adding a new § 1.431 to read as follows:

§ 1.431 *International application requirements.*

►(a) An international application shall contain, as specified in the Treaty and the Regulations, a Request, a description, one or more claims, one or more drawings (where required), and an abstract (PCT Art. 3(2)).

►(b) An international filing date will be accorded by the United States Receiving Office, at the time of receipt of the international application, provided that:

(1) The applicant is a United States resident or national (35 U.S.C. 361(a), PCT Art. 11(1)(i)).

(2) The international application is in the English language (35 U.S.C. 361(c), PCT Art. 11(1)(ii)).

(3) The international application contains at least the following elements (PCT Art. 11(1)(iii)):

(i) an indication that it is intended as an international application (PCT Rule 4.2),

(ii) the designation of at least one contracting State of the International Patent Cooperation Union,

(iii) the name of the applicant, as prescribed (note § 1.422),

(iv) a part which on the face of it appears to be a description, and

(v) a part which on the face of it appears to be a claim (PCT Art. 11(1)).

►(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fee (§ 1.441)

shall be made in full at the time the international application papers required by paragraph (b) of this section are deposited. Failure to make full payment on the same date as the deposit of the international application papers required by subparagraph (b) of this section will result in the international application being considered withdrawn (PCT Art. 14(3)(a)).

41. By adding a new § 1.432 to read as follows:

►§ 1.432 *Designation of States and payment of designation fees.*

►(a) The names of Designated States shall appear in the Request upon filing and must be indicated as set forth in Section 202 of the Administrative Instructions.

►(b) The designation fees may be paid upon filing of the international application, but must be paid at the latest before the expiration of one year from the priority date (PCT Rule 15.4(b)). Failure to timely pay the designation fee for a particular Designated State will result in the withdrawal of that designation (PCT Art. 14(3)(b)). Failure to timely pay at least one designation fee will result in the withdrawal of the international application (PCT Art. 14(3)(a)).

42. By adding a new § 1.433 to read as follows:

►§ 1.433 *Physical requirements of international application.*

►(a) The international application and each of the documents that may be referred to in the check list of the Request (PCT Rule 3.3(a)(II)) shall be filed in one copy only.

►(b) The physical requirements for international applications are set forth in PCT Rule 11 and Sections 201-208 of the Administrative Instructions.

43. By adding a new § 1.434 to read as follows:

►§ 1.434 *The Request.*

►(a) The Request shall be made on a standardized printed form (PCT Rules 3 and 4). Copies of such printed Request forms are available from the Patent and Trademark Office. Letters requesting such forms should be marked "Box PCT."

►(b) The Check List portion of the Request form should indicate each document accompanying the international application on filing.

►(c) All information, for example, addresses, names of States and dates, shall be indicated in the Request as required by PCT Rule 4 and Administrative Instructions 201 and 202.

►(d) International applications which designate the United States of America shall include:

(1) the name, address, and signature of the inventor, except as provided by §§ 1.422, 1.423 and 1.425;

(2) a reference to any copending national application or international application designating the United States of America, if the benefit of the filing date of the prior copending application is to be claimed.

44. By adding a new § 1.435 to read as follows:

►§ 1.435 *The Description.*

►(a) Requirements as to the content and form of the description are set forth in PCT Rules 5, 9, 10, and 11 and Administrative Instruction 205, and shall be adhered to.

►(b) In international applications designating the United States of America the description must contain upon filing an indication of the best mode contemplated by the inventor for carrying out the claimed invention.

45. By adding a new § 1.436 to read as follows:

►§ 1.436 *The Claims.*

►The requirements as to the content and format of claims are set forth in PCT Art. 6 and PCT Rules 6, 9, 10, and 11 and shall be adhered to.

46. By adding a new § 1.437 to read as follows:

►§ 1.437 *The Drawings.*

►(a) Subject to paragraph (b) of this section, when drawings are necessary for the understanding of the invention, or are mentioned in the description, they must be part of an international application as originally filed in the United States Receiving Office in order to maintain the international filing date during the national stage (PCT Art. 7).

►(b) Drawings missing from the application upon filing will be accepted if such drawings are received within 30 days of the date of first receipt of the incomplete papers. If the missing drawings are received within the 30 day period, the international filing date shall be the date on which such drawings are received. If such drawings are not timely received all references to drawings in the international application shall be considered non-existent (PCT Art. 14(2), Administrative Instruction 310).

►(c) The physical requirements for drawings are set forth in PCT Rule 11 and shall be adhered to.

47. By adding a new § 1.438 to read as follows:

►§ 1.438 *The Abstract.*

►(a) Requirements as to the content and form of the abstract are set forth in PCT Rule 8, and shall be adhered to.

►(b) Lack of an abstract upon filing of an international application will not affect the granting of a filing date. However, failure to furnish an abstract within one month from the date of the notification by the Receiving Office will result in the international application being declared withdrawn.

48. By adding a new § 1.445 to read as follows:

►§ 1.445 *International application filing and processing fees.*

►(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14)—\$35.00.

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16)—\$300.00.

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2)—\$200.00 per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under 35 U.S.C. 41(a)1.

(5) A special fee when required, see 35 U.S.C. 372(c)—\$10.00 per claim.

►(b) The basic fee and designation fee portions of the international fee shall be as prescribed in PCT Rule 15.

49. By adding a new § 1.446 to read as follows:

►§ 1.446 *Refund of international application filing and processing fees.*

►(a) Money paid for international application fees, where paid by actual mistake or in excess, such as a payment not required by law or Treaty and its Regulations, will be refunded.

►(b) Refunds of a portion of the search fee may be made if the international search report is wholly or partly based on an earlier international or international-type search. (PCT Rules 16 and 41.) The amount of the refund will be as determined by the examiner according to the value of the prior international-type search or international search as 90%, 70%, 40%, 25% or 0% of the international search fee. See § 1.26 for refund of a portion of the international search fee during subsequent national examination of the application.

►(c) Refund of the supplemental search fees will be made if such refund is determined to be warranted by the Commissioner or his designee acting under PCT Rule 40.2(c).

►(d) The international and search fees will be refunded if no international filing date is granted (PCT Rules 15.6 and 16.2).

50. By adding a new § 1.451 to read as follows:

►§ 1.451 *The priority claim and priority document in an international application.*

►(a) The claim for priority must be made on the Request (PCT Rule 4.10) in a manner complying with Section 201 and 202 of the Administrative Instructions.

►(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office, that the Patent and Trademark Office prepare a certified copy of the national applica-

tion for transmittal with the record copy to the International Bureau (PCT Art. 8 and PCT Rule 17). The fee for preparing a certified copy is stated in § 1.21(b) and (d).

►(c) If a certified copy of the priority document is not submitted together with the international application on filing or a request and appropriate payment as in paragraph (b) of this section do not accompany the international application on filing, the certified copy of the priority document must be transmitted directly by the applicant to the International Bureau within the time limit specified in PCT Rule 17.1(a).

51. By adding a new § 1.455 to read as follows:

►§ 1.455 *Representation in international applications.*

►(a) Applicants of international applications may be represented by attorneys or agents licensed to practice before the Patent and Trademark Office or by a common representative (PCT Art. 49, Rules 4.8 and 90 and § 1.341).

►(b) Appointment of an agent, attorney or common representative must be effected either in the Request form, signed by all applicants, or in a separate power of attorney submitted either to the United States Receiving Office or to the International Bureau.

►(c) Powers of attorney and revocations thereof should be submitted to the United States Receiving Office until the issuance of the international search report in order to facilitate communications.

►(d) The addressee for correspondence will be as indicated in Section 108 of the Administrative Instructions.

52. By adding a new § 1.461 to read as follows:

►§ 1.461 *Procedures for transmittal of Record Copy to the national Bureau.*

►(a) Transmittal of the record copy of the international application to the International Bureau shall be made, at the option of the applicant, either by the United States Receiving Office or by the applicant. Subject to paragraph (b) of this section, any applicant who chooses to make such transmittal himself shall notify the United States Receiving Office to that effect in writing, by way of a notice filed together with the international application. Such notice shall also state whether the applicant wishes to collect the record copy at the United States Receiving Office or to have the record copy mailed directly to him. The record copy of an international application which was filed without being accompanied by such notice will be transmitted to the International Bureau by the United States Receiving Office. (PCT Rule 22.)

►(b) An applicant may transmit the record copy to the International Bureau as provided in PCT Rule 22.2 only if the international application is filed with the United States Receiving Office before the expiration of 11 months from the priority date.

53. By adding a new § 1.465 to read as follows:

►§ 1.465 *Timing of application processing based on the priority date.*

►(a) For the purpose of computing time limits under the Treaty, the priority date shall be defined as in PCT Art. 2(xi).

►(b) When a claimed priority date is cancelled under PCT Rule 4.10(d) or considered not to have been made under PCT Rule 4.10(a), the priority date for the purposes of computing time limits will be the date of the earliest valid remaining priority claim of the international application, or if none, the international filing date.

►(c) When corrections under PCT Art. 11(2), Art. 14(2) or Rule 20.2(a)(I) or (III) are timely submitted, and the date of receipt of such corrections falls later than one year from the claimed priority date or dates, the Receiving Office shall proceed under Rule 4.10(d).

54. By adding a new § 1.468 to read as follows:

►§ 1.468 *Delays in meeting time limits.*

►(a) Delays in meeting time limits during international processing of international applications may only be excused as provided in PCT Rule 82. For delays in meeting time limits in a national application see § 1.137.

►(b) In cases of unavoidable delay or loss in the mail during international processing of international applications,

evidence may be offered only if the mail that was delayed or lost was registered by the postal authorities.

55. By adding a new § 1.471 to read as follows:

►§ 1.471 *Corrections and amendments during international processing.*

►(a) All corrections submitted to the United States Receiving Office must be in the form of replacement sheets and be accompanied by a letter that draws attention to the differences between the replaced sheets and the replacement sheets, except that the deletion of lines of text, the correction of simple typographical errors, and one addition or change of not more than five words per sheet may be stated in a letter and the United States Receiving Office will make the deletion or transfer the correction to the international application, provided that such corrections do not adversely affect the clarity and direct reproducibility of the application (PCT Rule 26.4).

►(b) Amendments of claims submitted to the International Bureau shall be as prescribed by PCT Rule 46.

56. By adding a new § 1.475 to read as follows:

►§ 1.475 *Changes in person, name, or address of applicants and inventors.*

►All requests for a change in person, name or address of applicants and inventors should be sent to the United States Receiving Office until the time of issuance of the international search report. Thereafter requests for such changes should be submitted to the International Bureau.

57. By adding § 1.481 to read as follows:

►§ 1.481 *Determination of Unity of Invention before the International Searching Authority.*

►(a) Before establishing the international search report, the International Searching Authority shall determine whether the international application complies with the requirement of unity of invention as set forth in PCT Rule 13. If the International Searching Authority considers that the international application does not so comply, it shall inform the applicant accordingly and request the payment of additional fees. (Note § 1.441 and PCT Art. 17(3)(a) and PCT Rule 40.)

►(b) The applicant will be given a time period in accordance with PCT Rule 40.3 to pay the additional fees due.

►(c) If the applicant disagrees with the holding of lack of unity of invention by the International Searching Authority, he may pay the additional fee under protest, that is accompanied by a request for refund and a statement setting forth his reasons for disagreement or why he considers the required additional fees excessive, or both (PCT Rule 40.2(c)).

►(d) Protests under paragraph (c) of this section will be examined by the Commissioner or his designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.

►(e) An applicant who desires that a copy of the protest and the decision thereon accompany the international search report when forwarded to the designated offices, may notify the International Searching Authority to that effect any time prior to the issuance of the international search report. Thereafter, such notifications should be directed to the International Bureau. (PCT Rule 40.2(c).)

►(f) The international search report will be established only on those parts of the international application which relate to the invention first mentioned in the claims ("main invention") and those other parts of the international applications which relate to inventions for which additional fees have been timely paid (PCT Art. 17(3)(a) and PCT Rule 40.3).

58. By adding § 1.482 to read as follows:

►§ 1.482 *Holding of lack of unity of invention.*

►(a) The International Search Authority may not raise the objection of lack of unity of invention merely because an application contains several claims of the same category or several claims of different categories related as under PCT Rules 13.2 and 13.3.

►(b) Lack of unity of invention may exist in a single claim where the claim contains alternatives which are not linked by a single general inventive concept (PCT Rule 13.1).

►(c) Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Searching Authority may raise the objection of lack of unity of invention (and limit the search to the invention first mentioned if no additional fees are paid).◄

►(d) Occasionally in cases which lack unity of invention, the examiner will be able to make a complete search for all inventions with negligible additional work, in particular when the inventions are conceptually very close and none of them requires a search in separate classification units. In those cases, the search for the additional inventions should be completed together with that for the invention first mentioned. All results should then be included in a single search report, and no objection of lack of unity should ordinarily be raised.◄

►(e) For unity of invention practice at the national stage see §§ 1.141-1.146.◄

59. By adding a new § 3.56 to read as follows:

►§ 3.56 *Oath to be filed with United States Designated Office under 35 U.S.C. 371(c) (4).*◄

►As a below-named inventor, being duly sworn (or affirmed), I depose and say that:

My residence, post office address and citizenship are as stated below next to my name:

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled:

described and claimed in international application number _____ filed _____, and as amended on _____

(If any), for which I solicit a patent;

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns except as follows: _____

(Full name of sole or first inventor)

Date

(Inventor's signature)

(Residence)

(Citizenship)

(Post Office Address)

(Full name of second joint inventor, if any)

Date

(Inventor's signature)

(Residence)

(Citizenship)

(Post Office Address)

(Supply similar information and signature for third and subsequent joint inventors)

ss:

Sworn to and subscribed before me this _____ day of _____, 19____

[SEAL]

(Signature of notary or officer)

(Official character) ◄

60. By adding a new § 3.57 to read as follows:

►§ 3.57 *Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c) (4).*◄

►As a below named inventor, I hereby declare that: My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled:

described and claimed in international application number _____ filed _____ and as amended

on _____ (If any), for which I solicit a patent;

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows:

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(Full name of sole or first inventor)

Date

(Inventor's signature)

(Residence)

(Citizenship)

(Post Office Address)

(Full name of second joint inventor, if any)

Date

(Inventor's signature)

(Residence)

(Citizenship)

(Post Office Address)

61. By revising § 5.1 to read as follows:

§ 5.1 *Defense inspection of certain applications.*

►(a) The provisions of this part shall apply to both national and international applications filed in the Patent and Trademark Office except as otherwise specifically indicated. The filing of an international application designating a foreign country is considered to be a filing in a foreign country within the meaning of Chapter 17 of Title 35, United States Code.◄

►(b)◄ In accordance with the provisions of 35 U.S.C. 181, patent applications containing subject matter the disclosure of which might be detrimental to the national security are made available for inspection by defense agencies as specified in said section. Only applications obviously relating to national security, and applications within fields indicated to the Patent and Trademark Office by the defense agencies as so related, are made available. The inspection will be made only by responsible representatives authorized by the agency to review applications. Such representatives are required to sign a dated acknowledgement of access accepting the condition that information obtained from the inspection will be used for no purpose other than the administration of 35 U.S.C. 181-188. Copies of applications may be made available to such representatives for inspection outside the Patent and Trademark Office under conditions assuring that the confidentiality of the applications will be maintained, including the conditions that: (a) All copies will be returned to the Patent and Trademark Office promptly if no secrecy order is imposed, or upon rescission of such order if one is imposed, and (b) no additional copies will be made by the defense agencies. A record of the removal and return of copies made available for defense inspection will be maintained by the Patent and Trademark Office. Applications relating to atomic energy are made available to the [Atomic Energy Commission] Energy Research and Development Administration as specified in § 1.14 of this chapter.

62. By revising § 5.3 to read as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

Unless specifically ordered otherwise, action on the application by the Office and prosecution by the applicant will proceed during the time an application is under secrecy order to the point indicated in this section:

(a) ►National◄ applications under secrecy order which come to a final rejection must be appealed or otherwise prosecuted to avoid abandonment. Appeals in such cases must be completed by the applicant but unless otherwise specifically ordered by the Commissioner will not be set for hearing until the secrecy order is removed.

(b) An interference will not be declared involving ►national◄ applications under secrecy order. However, if an application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent.

(c) When the ►national◄ application is found to be in condition for allowance except for the secrecy order the applicant and the agency which caused the secrecy order to be issued will be notified. This notice (which is not a notice of allowance under § 1.311 of this chapter) does not require response by the applicant and places the ►national◄ application in a condition of suspension until the secrecy order is removed. When the secrecy order is removed the Patent and Trademark Office will issue a notice of allowance under § 1.311 of this chapter, or take such other action as may then be warranted.

►(d) International applications under secrecy order will be processed up to the point where the record and search copies are ready to be forwarded. However, the copies will not be forwarded to the Authorities or delivered to the applicant.◄

63. Section 5.11 is revised to read as follows:

§ 5.11 *License for filing application in foreign country ►or for filing international application.◄*

(a) When no secrecy order has been issued under § 5.2, a license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign country, ►or filing an inter-

national application,◄ or causing or authorizing such filing, with respect to an invention made in the United States, if:

(1) The foreign application ►or international application◄ is to be filed ►,◄ or its filing caused or authorized ►,◄ before [an] ►a national◄ application for patent is filed in the United States, or

(2) The foreign application ►or international application◄ is to be filed, or its filing caused or authorized, prior to the expiration of six months from the filing of the ►national◄ application in the United States.

(b) When there is no secrecy order in effect, a license under 35 U.S.C. 184 is not required if:

(1) The invention was not made in the United States, or

(2) The foreign application ►or international application◄ is to be filed, or its filing caused or authorized, after the expiration of six months from the filing of the ►national◄ application in the United States.

(c) When a secrecy order has been issued under § 5.2, an application cannot be filed in a foreign country ►, nor can an international application be filed,◄ in any case except in accordance with § 5.5.

64. By revising paragraphs (b) and (c) of § 5.14 to read as follows:

§ 5.14 *Petition for license; corresponding U.S. application.*

• • • • •
(b) Two or more United States applications should not be referred to in the same petition for license unless they are to be combined in the foreign ►or international◄ application, in which event the petition should so state and the identification of each United States application should be in separate paragraphs.

(c) Where the application to be filed abroad ►or the international application◄ contains matter not discussed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country ►or international application◄ as it is to be filed in the Receiving Office◄ must be furnished with the petition. If, however, all new matter in the ►foreign or international◄ application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

65. By revising § 5.15 to read as follows:

§ 5.15 *Scope of license.*

(a) A license to file an application in a foreign country ►or to file an international application◄, when granted, includes authority to forward all duplicate and formal papers to the foreign country ►or international authorities◄ and to make amendments and take any action in the prosecution of the ►foreign or international◄ application, provided subject matter additional to that covered by the license is not involved. In those cases in which no license is required to file the foreign ►or international◄ application, no license is required to file papers in connection with the prosecution of the foreign ►or international◄ application not involving disclosure of additional subject matter. Any paper filed abroad ►or before an international authority◄ following the filing of a foreign ►or international◄ application which involves the disclosure of additional subject matter must be separately licensed in the same manner as ►a foreign or international◄ [an] application.

66. By revising § 5.17 to read as follows:

§ 5.17 *Who may use license.*

Licenses may be used by anyone interested in the foreign ►or international◄ filing for or on behalf of the inventor or his assigns.

Date: December 23, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, PH.D.
Assistant Secretary for
Science and Technology.

Date: Jan. 6, 1977.

[FR Doc. 77-1024; Filed 1-11-77; 8.45 am]
Published 42 FR No. 8, 2632-2644, Jan. 12, 1977.

Removal From Register

Pursuant to the provisions of 37 CFR 1.347 a letter was directed on February 12, 1976, to the last post office address furnished to the Committee on Enrollment by all of the persons registered to practice before the Patent and Trademark Office in patent cases. A list of the names and addresses of persons being removed for failure to respond to the letter within the period of forty-five days therein set was published in the August 10, 1976 OFFICIAL GAZETTE, vol. 949, page 414.

The following persons, whose names appeared in that list have been removed from the active Register of Attorneys and Agents, effective December 31, 1976.

LUTRELLE F. PARKER,

Jan. 10, 1977. *Chairman, Committee on Enrollment.*

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Zewadski, Clarence B., Whittemore, Hulbert and Belknap, 3053 Penobscot Bldg., Detroit, Mich. 48226

Ziegler, Jacob, Department of Army, Edgewood Arsenal, Edgewood, Md. 21010
Zierold, Wenzel, 2040 Pleasant St., Wauwatosa, Wis. 53213

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,740,265, J. R. Bayston, MACHINE FOR MANUFACTURING ICE CUBES; 2,763,993, same, ICECUBE MANUFACTURING APPARATUS; 3,009,336, Bayston and Kuebler, ICE MAKING MACHINE, filed July 2, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c2182, Uniflow Manufacturing Co. and Ice-crafter Trust v. Liquid Carbonic. By stipulation order the complaint be dismissed with prejudice as to U.S. Patents 2,740,265 and 2,763,993 and be dismissed without prejudice as to U.S. Patent 3,009,336, Sept. 21, 1976.

2,763,993. (See 2,740,265.)

3,009,336. (See 2,740,265.)

3,151,503, Keller and Keller, TRANSMISSION SYSTEM; 3,231,117, Melroe and Keller, TRACTOR VEHICLE AND DRIVE THEREFOR; D. 195,254, Keller, Keller and Melroe, SELF-PROPELLED LOADER, filed Sept. 23, 1976, D.C. N. Dak. (Fargo) Doc. 4839, Louis J. Keller and Cyril N. Keller v. Clark Equipment Company and Clark Equipment, A.G. Judgment, court found Patent 3,231,117 to be invalid and that Patents 3,151,503 and D. 195,254 have not been proved to be invalid, Sept. 23, 1976. Same, filed Sept. 23, 1976, D.C. N. Dak. (Fargo) Doc. 4875, Clark Equipment Company v. Louis J. Keller and Cyril N. Keller. Judgment, court found Patent 3,231,117 to be invalid; and that Patents 3,151,503 and D. 195,254 have not been proved to be invalid, Sept. 23, 1976.

3,159,916, L. Hunter, VEHICLE WHEEL ALIGNMENT APPARATUS; 3,206,862, same, filed Oct. 22, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c3030, Lee Hunter and Hunter Engineering v. FMC Corporation. It is hereby ordered that this action be dismissed without prejudice subject to reinstatement as a Motion of Course, June 28, 1975.

3,188,468, L. E. Packard, METHOD AND APPARATUS FOR AUTOMATIC STANDARDIZATION IN LIQUID SCINTILLATION SPECTROMETRY, filed Dec. 16, 1970, D.C., N.D. Ill. (Chicago) Doc. 70c3150, Packard Instrument Co. v. Beckman Instruments Inc. Pursuant to stipulation, cause dismissed between plaintiff and defendant. Third party action pending, Apr. 3, 1973; motion for voluntary dismissal of third party complaint granted, Apr. 6, 1973.

3,206,862. (See 3,159,916.)

3,231,117. (See 3,151,503.)

3,486,201, W. Bourne, CABLE AND LIKE BINDING CLIPS, filed Sept. 24, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c3574, Bowthorpe-Hellermann Limited v. All States Plastic Manufacturing Company, Inc.

3,547,108, S. V. Seifert, COMBINATION DEFIBRILLATOR AND HEARTBEAT MONITORING SYSTEM, filed June 12, 1972, D.C., N.D. Ill. (Chicago) Doc. 72c1456, Physio-Control Corp. v. Gould, Inc. Order, Physio-Control Corp. is severed and hereby cause is dismissed with prejudice, Dec. 5, 1974.

3,577,825, H. E. Reusser, BOLT ANCHOR AND METHOD FOR MAKING SAME, filed Sept. 7, 1976, D.C., N.D. Ohio (Akron) Doc. C76-278A, The Eastern Co., by and through its division, Frazer & Jones Co. v. Gottschall Tool & Die, Inc. and George W. Allen.

3,599,030, D. A. Armstrong, ANNULAR SURFACE GAP SPARK PLUG, filed June 14, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c2193, Brunswick Corporation v. Champion Spark Plug Company.

3,601,609, W. L. Yauger, Jr., IONIZATION DETECTION DEVICE USING A NICKEL-63 RADIOACTIVE SOURCE, filed Mar. 6, 1972, D.C., N.D. Ill. (Chicago) Doc. 72c580, Tracor, Inc. v. Hewlett-Packard Co. et al. Final judgment and writ of permanent injunction, defendant is hereby permanently enjoined from infringing upon said Letters Patent, Nov. 11, 1975.

3,620,367, O. G. Stembel, CASSETTE STORAGE CONTAINER, filed Mar. 5, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c0715, Dudley A. Olsen and Oren G. Stembel v. Industrial Audio/Film Service, Inc. By agreement it is ordered that this cause of action be and hereby is dismissed without prejudice, Feb. 25, 1976.

3,646,696, R. Sarkisian, POSTER DISPLAY DEVICE; 3,662,482, same, filed Dec. 10, 1975, D.C. Oreg. (Portland) Doc. C-75-1131, Robert Sarkisian v. Winn-Proof Corporation et al. Judgment of permanent injunction entered against defendants, Sept. 23, 1976.

3,671,006, Berkowitz and Ahrendt, REFRIGERATOR WALL PANELS WITH PANEL FASTENERS AND APPARATUS FOR MAKING SAID PANELS, filed Oct. 28, 1975, D.C., N.D. Ill. (Freeport) Doc. 75,0053, Kason Hardware Corp. v. National Lock Hardware Co. and Keystone Consolidated Industries, Inc. Case dismissed by stipulation, parties reached satisfactory accord. Case dismissed with prejudice, Oct. 5, 1976.

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, filed Sept. 3, 1976, D.C., M.D.N.C. (Greensboro), Doc. C-76-464-G, Tights, Inc. v. Best Wear Hosiery Mills, Inc. Same, filed Sept. 3, 1976, D.C., M.D.N.C. (Greensboro) Doc. C-76-465-G, Tights, Inc. v. Dependable Hosiery Mills, Incorporated.

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE; Re. 25,360, E. G. Rice, COMBINATION STOCKINGS AND PANTY, filed Oct. 5, 1976, D.C., M.D.N.C. (Greensboro) Doc. C-76-525-G, Tights, Inc. v. Liberty Hosiery Mills, Inc.

3,771,430, R. W. Lane, LOUVER ASSEMBLY, filed Sept. 14, 1976, D.C., S.D.N.Y., Doc. 76-C-4079, Airlite Co. v. Arrow, Louver and Damper.

3,814,937, A. R. Lowes, PULSE PILE-UP REJECTOR WITH LIVE-TIME CORRECTOR CIRCUIT, filed Sept. 2, 1976, D.C., N.D. Calif. (San Francisco) Doc. C-76-1877-AJZ, Kevex Corporation v. Canberra Industries, Inc.

3,837,981, T. R. Flint, EPOXY TAPE, filed Oct. 6, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76-1657A, Theodore R. Flint and Polymeric Systems, Inc. v. Dynatron Bondo Corporation.

3,852,790, J. A. Robinson, UNIVERSAL MOUNT FOR ELECTRONIC FLASH UNIT, filed Mar. 20, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c923, Acme-Lite Manufacturing Co. v. International Telephone & Telegraph Corp. On the stipulation of the parties, order above law dismissed with prejudice, Dec. 23, 1975.

3,867,806, Lancaster III and Lancaster, PROCESS OF MAKING A STRETCHED-WRAPPED PACKAGE, filed Sept. 1, 1976, D.C.N.J. (Newark) Doc. C-76-1713, Lantech Inc. v. Packaging Sales and Development Corporation.

3,883,845, P. M. Devita, SIGNAL LIGHT ADAPTER FOR TRAILERS, filed May 10, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76-824A, Peter Michael Devita v. Leisure Components Corporation; Arnold Leane & Associates and John Berford.

3,908,407, Brand and Hubbard, LADIES' KNEE-HIGH STOCKING WITH SUPPORTING CUFF, filed Nov. 19, 1975, D.C., W.D.N.C. (Statesville) Doc. ST-C-75-58, Americal Corporation v. Ridgeview Hosiery Mill Co., Inc. It is hereby stipulated and agreed by and between the parties hereto, that this action including the counterclaims asserted therein, is hereby dismissed with prejudice, Aug. 19, 1976.

3,913,250, A. T. Spees, FILLING SYSTEM AND ELEMENTS THEREFOR, filed Apr. 16, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76-1256-RF, Visu-Flex Company, Incorporated v. Bell & Howell Company.

3,924,750, R. S. Dunchock, EYEGLASS DISPLAY UNIT, filed May 13, 1976, D.C., N.D. Calif. (San Francisco) Doc. C-76-0981-CBR, Optarac Corporation v. Optivest Corporation.

3,928,933, T. Iwamoto, HOLDING TOY, filed Sept. 29, 1976, D.C., N.D. Calif. (San Francisco) Doc. C-76-2132-ACW, ITI Hawaii, Inc. and Takeji Iwamoto v. Gems of the Golden West and Jack B. Neuman and Florence C. Neuman.

3,949,707, Armstrong and Kunkel, LIVESTOCK WATERING SYSTEM, filed Aug. 16, 1976, D.C., S.D. Iowa (Des Moines) Doc. 76-260-2, Confinement Livestock Systems, Inc. v. Total Livestock Confinement, Inc. et al.

3,965,399, Walker, Jr. and Shevlin, PUSHBUTTON CAPACITIVE TRANSDUCER, filed Sept. 8, 1976, D.C., W.D. Wash. (Seattle) Doc. C76-617, Key Tronic Corporation v. Controls Technology Corp. and Automix Keyboards, Inc.

3,978,596, Brown and Brown, SANDALS AND METHOD OF MAKING SAME, filed Sept. 28, 1976, D.C., N.D. Tex. (Dallas) Doc. CA3-76-1302, Dwight C. Brown and Kevin B. Brown, doing business as Tiddies Company v. E.S. Originals, Inc.

Re. 25,360. (See 3,675,247.)

Re. 28,480, V. Petrusek, INFLATABLE BOXING GLOVE OR PILLOW, filed Nov. 3, 1975, D.C., N.D. Ill. (Chicago) Doc. C3715, Centsable Products, Inc. et al. v. Spiegel of Illinois, Inc. et al. Consent decree, defendants are hereby permanently enjoined and restricted from doing any act which infringes said reissue, Mar. 29, 1976.

D. 195,254. (See 3,151,503.)

PATENT NOTICES

Certificates of Correction for the Week of Feb. 8, 1977

Re. 28,617	3,956,283	3,979,788	3,990,902
3,667,250	3,957,814	3,980,394	3,990,950
3,675,881	3,957,834	3,980,530	3,991,065
3,753,678	3,958,960	3,980,583	3,991,572
3,673,021	3,960,278	3,980,712	3,991,607
3,763,069	3,960,476	3,980,778	3,991,936
3,819,745	3,960,845	3,981,426	3,991,944
3,829,504	3,962,178	3,981,752	3,991,955
3,833,049	3,964,550	3,981,760	3,992,051
3,856,808	3,965,183	3,981,924	3,992,063
3,870,046	3,965,760	3,981,953	3,992,106
3,900,823	3,966,873	3,983,099	3,992,182
3,904,761	3,967,004	3,983,443	3,992,238
3,905,022	3,968,861	3,984,095	3,992,422
3,905,863	3,968,888	3,984,610	3,992,470
3,909,721	3,969,542	3,985,128	3,992,724
3,914,712	3,970,186	3,985,278	3,992,966
3,915,577	3,970,286	3,985,593	3,993,109
3,919,508	3,971,223	3,985,766	3,993,129
3,922,276	3,972,014	3,985,808	3,993,361
3,923,862	3,972,551	3,985,885	3,993,377
3,923,863	3,972,894	3,987,690	3,993,417
3,923,864	3,973,825	3,988,678	3,994,152
3,927,185	3,973,839	3,988,699	3,994,554
3,936,487	3,975,083	3,989,203	3,994,758
3,948,029	3,976,623	3,989,236	3,994,804
3,949,549	3,977,337	3,989,524	3,994,954
3,950,733	3,977,819	3,990,431	3,995,092
3,951,177	3,978,028	3,990,490	3,995,239
3,951,292	3,978,147	3,990,562	3,995,258
3,951,849	3,978,474	3,990,662	3,995,768
3,954,995	3,978,679	3,990,826	3,996,228
3,955,927			

Availability of Consolidated Listings

The "Consolidated Listing of Recent Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures," Patent Section and Trademark Section which appeared in the OFFICIAL GAZETTE of January 4, 1977, are available from the Superintendent of Documents, Washington, D.C. 20402. Please include the following information when ordering:

Patent Section—Stock No. 003-004-00539-4, cost \$7.70
Trademark Section—Stock No. 003-004-00540-8, cost \$1.10.

There is a minimum charge of \$1.00 for each mail order.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

Jan. 18, 1977.

Disclaimers and Dedications

3,205,390.—Edward Emanuel Sheldon, New York, N.Y. EN-
DOSCOPIC INSTRUMENTS. Patent dated Sept. 7, 1965.
Disclaimer and dedication filed Nov. 1, 1976, by the as-
signee, American Optical Corporation.

Hereby disclaims and dedicates to the Public the remaining
term of said patent.

3,305,690.—Edward Emanuel Sheldon, New York, N.Y.
ELECTRON DISCHARGE DEVICE WITH FIBER OP-
TIC END WALL. Patent dated Feb. 21, 1967. Disclaimer
and dedication filed Nov. 1, 1976, by the assignee, Ameri-
can Optical Corporation.

Hereby disclaims and dedicates to the Public the remaining
term of said patent.

3,440,313.—Walter E. Schmocker, Chagrin Falls, Ohio. PROC-
ESS OF MAKING RUBBER-TIPPED VALVE ELE-
MENT. Patent dated Apr. 22, 1969. Disclaimer and dedi-
cation filed Dec. 15, 1976, by the assignee, Industrial
Electronic Rubber Company.

Hereby disclaims and dedicates to the Public all claims
of said patent.

Disclaimers

3,578,452.—Konrad Parker, Park Ridge, Ill. DEVELOPING
COMPOSITIONS FOR DIAZOTYPE MATERIALS. Pat-
ent dated May 11, 1971. Disclaimer filed Oct. 27, 1976,
by the assignee, Addressograph-Multigraph Corporation.

Hereby enters this disclaimer to claims 1, 2 and 5 of said
patent.

3,587,177.—William F. Overly, Winneconne, and Kenneth J.
Pagel, Neenah, Wis. AIRFOIL NOZZLE. Patent dated
June 28, 1971. Disclaimer filed Dec. 10, 1976, by the as-
signee, Overly, Inc.

Hereby enters this disclaimer to claims 1, 2, 5 and 6 of
said patent.

3,918,796.—James L. Ferguson, Kent, Ohio. LIQUID-CRYSTAL
NON-LINEAR LIGHT MODULATORS USING
ELECTRIC AND MAGNETIC FIELDS. Patent dated
Nov. 11, 1975. Disclaimer filed July 2, 1976, by the as-
signee, Hoffmann-La Roche Inc.

The term of this patent subsequent to May 8, 1980 has
been disclaimed.

3,934,999.—Harold R. Meter, Minneapolis, Minn. COMPOST-
ING METHOD AND APPARATUS. Patent dated Jan.
27, 1976. Disclaimer filed Dec. 13, 1976, by the assignee,
Judd Ringer Corporation.

Hereby enters this disclaimer to claim 7 of said patent.

3,966,811.—John Krenzer, Oak Park, Ill. DIALKYL ACETALS
OF ANILINOACETALDEHYDES. Patent dated June 29,
1976. Disclaimer filed Dec. 17, 1976, by the assignee,
Velsicol Chemical Corporation.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 7
and 8 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 18, 1976

PATENT EXAMINING GROUPS

	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director.....	2-2-76
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director.....	4-22-76
Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director.....	11-11-75
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.....	2-11-76
Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director.....	1-8-76
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director.....	8-12-75
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director.....	2-19-76
Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio- Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....	12-17-75
Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director.....	6-21-76
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director.....	1-22-76
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Net- works; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 290—C. D. QUARFORTH, Director.....	6-10-75
Industrial Arts; Household, Personal and Fine Arts.	
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director.....	2-26-76
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director.....	5-5-76
Manufacturing Processes; Assembling; Combined Machines; Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director.....	3-1-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director.....	1-12-76
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director.....	5-20-76
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	

Expiration of patents: The patents within the range of numbers indicated below expire during January 1977, except those which may have
expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public
Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of
35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for
the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,919,443 to 2,923,007 inclusive
Plant Patents..... Numbers 1,893 to 1,900, inclusive

PATENTS

GRANTED FEBRUARY 8, 1977

ERRATA

For CLASS	See PATENT NO.
290-055.....	4,006,925
305-012.....	4,006,940
429-206.....	4,007,054
423-565.....	4,007,055
429-222.....	4,007,056
429-057.....	4,007,057
429-034.....	4,007,058
429-009.....	4,007,059
429-053.....	4,007,060
148-105.....	4,007,072
148-120.....	4,007,073
148-175.....	4,007,074
536-017.....	4,007,166
536-017.....	4,007,167
358-280.....	4,007,326
358-160.....	4,007,327
358-085.....	4,007,328
235-101.....	4,007,359
219-385.....	4,007,367
219-388.....	4,007,368
219-390.....	4,007,369
219-521.....	4,007,370
219-523.....	4,007,371
343-225.....	4,007,455

PATENTS

GRANTED FEBRUARY 8, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,006,494

PANTS WITH FRONT POCKET

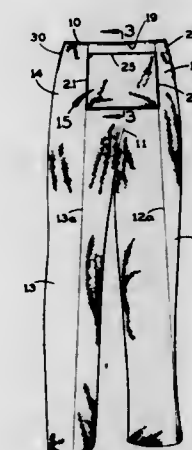
E. Roy Knoppel, 800 SW. 17th St., Boca Raton, Fla. 33432

Filed Jan. 26, 1976, Ser. No. 652,619

Int. Cl.² A41D 1/06, 27/20

U.S. Cl. 2—227

5 Claims



1. In a pair of pants or slacks having a waistband at the top, a crotch spaced below the waistband, a front panel between the waistband and the crotch, and a pair of legs, the improvement which comprises:

a front pocket joined directly to said front panel and extending from side to side across the front thereof for at least substantially the width of the pants between the respective centerlines of its legs;

said pocket having a back panel and a front panel which are joined to each other and disconnected from said front panel of the pants at the lower edge and along the opposite side edges up from said lower edge of the pocket, whereby to provide a flap at the lower end of the pocket that is foldable up in front of the upper portion of the pocket;

said pocket having a substantially horizontal top opening extending from side to side across substantially the full width of the pocket, and a slide fastener extending across said top opening;

said front and back panels of the pocket being stitched at their upper ends to said front panel of the pants;

said top opening in the pocket being spaced below the stitched upper end of said front and back panels of the pocket;

and said front and back panels of the pocket being stitched to said front panel of the pants down along the opposite side edges of the pocket from the upper end of said front and back panels of the pocket to a location more than half-way down the pocket.

4,006,495

COAT CONSTRUCTION

John Roger Jones, 206 8th Ave., Salt Lake City, Utah 84102

Filed Sept. 15, 1975, Ser. No. 613,456

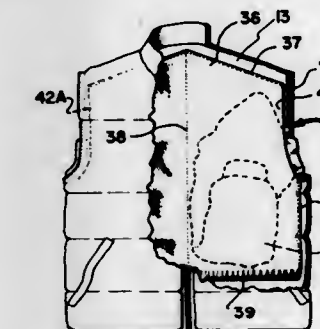
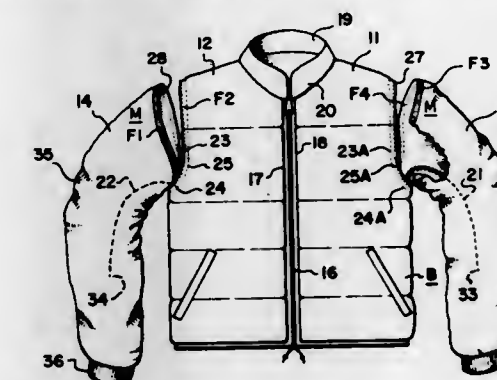
Int. Cl.² A41D 1/02

U.S. Cl. 2—93

3 Claims

2. A coat garment including, in combination, a coat body having opposite arm apertures; a pair of semi-detachable sleeves having upper arm-hole margins provided with lower-rear portions solely permanently attached to said coat body proximate said arm apertures, said sleeves also having respective, elongate, arm removal and replacement, mutually and releasably closable longitudinal margins extending longitudinally along said sleeves, said longitudinal margins being so provided with means for so releasably closing said longitudinal margins; and means for releasably securing said sleeves along

remaining portions of said upper margins to said coat body, about and over said arm apertures for closed registry therewith, said longitudinal margins respectively extending to said



remaining portions to form extensions thereof, and wherein said coat body is provided with interior pockets releasably receiving said sleeves, respectively, when in stored condition therein.

4,006,496

SAFETY HELMET

Peter O. Marker, La Habra, Calif., assignor to Land Tool

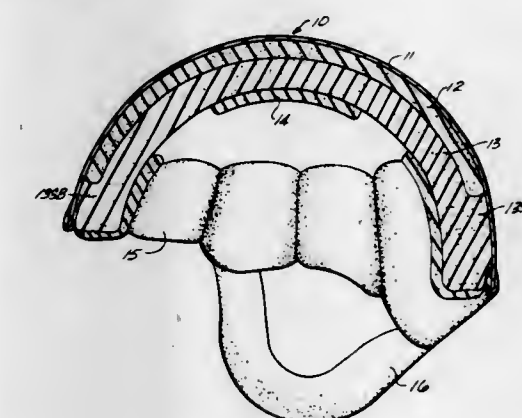
Company, Wichita, Kans.

Filed Aug. 13, 1975, Ser. No. 604,190

Int. Cl.² A42B 3/00

U.S. Cl. 2—414

6 Claims



1. A safety helmet comprising an outer shell shaped to be worn on the head of a user and constructed of a preselected lightweight material having a high flexural modulus for distributing an impact load,

a shock absorbing liner including integral stiffening pads adapted to be carried by the shell,

the stiffening pads being constructed and defined to cover the brow areas and rear areas of the shell when the helmet is worn on the head of the user and extending in contact with the inner wall of the shell at said edges, and

a resilient shock dampening layer arranged between the inner wall of the shell and the outer surface of the shock absorbing liner and extending coextensively with the

inner wall of the shell to said stiffening pads for the shock absorbing liner, the resilient layer and shock absorbing liner being arranged in a close friction fit with the inside wall of the shell,

the resilient layer and shock absorbing layer being constructed and defined for coacting to absorb the impact energy transmitted through the outer shell and to release the stored energy after impact without any permanent deformation.

4,006,497

APPARATUS FOR DISTRIBUTING FLUSHING LIQUID IN CLOSET PANS

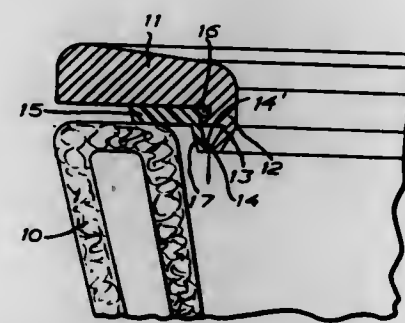
Karl Allan Bonde Møllerstedt, Fjalkinge, Sweden, assignor to IFO AB, Bromölla, Sweden

Filed July 3, 1975, Ser. No. 592,794

Claims priority, application Sweden, July 4, 1974, 7408810 Int. Cl.³ A47K 17/00

U.S. Cl. 4-1

4 Claims



1. An apparatus for distributing flushing liquid in a closet pan, comprising a separate member extending along at least the greater part of the upper edge of said closet pan and having a longitudinal channel with a row of openings which are directed towards the inner wall of said closet pan, said channel being connected to a supply of flushing liquid, a valve means between said supply of flushing liquid and said channel, said channel being defined by a wall of elastic material, said wall having a slot along said row of openings for the discharge of flushing liquid, said slot being closed in the normal position because of the inherent elasticity of the material but permitting the insertion of a tool which may be pulled along the entire length of said slot for cleaning said channel and said openings.

4,006,498

ADAPTER FOR BATHTUB DRAIN

Casper Cuschera, 31650 Medinah St., Hayward, Calif. 94543

Filed Sept. 2, 1975, Ser. No. 609,747

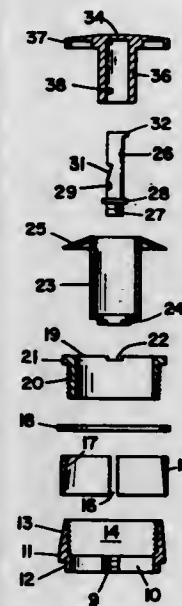
Int. Cl.³ A47K 1/14; F16B 2/14

U.S. Cl. 4-191

4 Claims

1. An adapter for securing a valve device in a drain, comprising a cylindrical member adapted to be disposed in said drain, said cylindrical member including an exterior surface portion tapering inwardly and upwardly; an annular wedge disposed about said cylindrical member; drive means secured to said adapter and variably spaced with respect to said cylindrical member to drive said wedge to engage said tapered surface portion and the interior surface of said drain; and securing means for securing a valve device to said adapter, said cylindrical member including a central bore having an internally threaded portion, and said drive means including a tubular member provided with external threads adapted to be received in said central bore, said tubular member including a

flange extending radially from the upper end thereof and beyond said cylindrical member for engaging and driving said



4,006,499

HOSPITAL BED

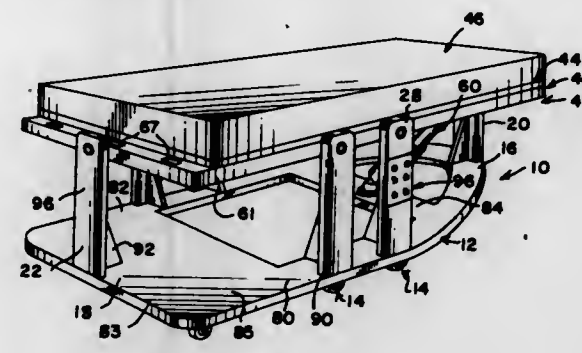
Claude A. Young, 126 Kensington, LaGrange, Ill. 60525

Filed July 21, 1975, Ser. No. 597,422

Int. Cl.³ A61G 7/10

U.S. Cl. 5-62

3 Claims



1. A hospital bed comprising:

a bed underframe defining head and foot ends at the respective ends of same,

a mattress support frame disposed above the bed underframe and defining head and foot ends at the respective ends of same overlying the respective head and foot ends of said underframe,

said bed underframe including a head end pedestal adjacent the head end of said support frame, a foot end pedestal adjacent the foot end of said support frame, a first pair of side pedestals disposed one on either side of said support frame adjacent the midportion of the length of same, and a second pair of side pedestals disposed one on either side of said support frame intermediate said foot end of said support frame and the respective side pedestals of said first pair of pedestals,

first means for releasably connecting said support frame to said first pair of side pedestals for pivotal movement with respect thereto about aligned horizontal axes,

second means for releasably connecting said support frame to said first pair of side pedestals for pivotal movement with respect thereto about aligned horizontal axes,

third means for releasably connecting said support frame to said second pair of side pedestals for pivotal movement with respect thereto about aligned horizontal axes,

means for selectively operating the respective connecting means to the exclusion of the remaining connecting

means for conditioning said support frame for said pivotal movement about said axes of pedestals of the selected connecting means,

and power means operatively interposed between said underframe and said support frame for pivoting said support frame about the pivotal axes for which said support frame has been conditioned

and power means comprising:

actuating means operably connected to said support frame between said head end of same and said axes of said first pair of side pedestals, and to one side of said axes of said head and foot pedestals for pivoting said support frame about the pivotal axes for which said support frame has been conditioned,

and means for actuating said actuating means,

said first, second and third releasable connecting means each comprising:

a pair of opposed pin elements,

and means for moving said pin elements between operative positions connecting said support frame to the respective pedestals and inoperative positions freeing said support frame for up and down movement relative thereto.

4,006,500

STRETCHER HOLDER DEVICE FOR AMBULANCES

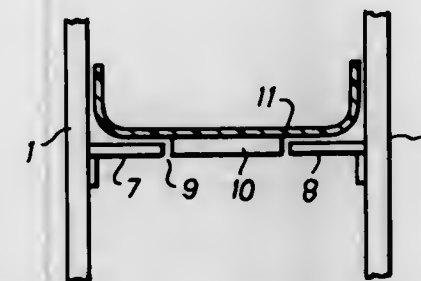
Andre Bonifay, 14 Bvd d'Athènes, Marseille 13001, France

Filed Mar. 13, 1975, Ser. No. 557,951

Int. Cl.³ A61G 1/00

U.S. Cl. 5-82 R

1 Claim



1. A stretcher and holder assembly comprising:

i. a frame including four parallel uprights,

ii. a respective plurality of parallel longitudinal crosspieces connecting each pair of said uprights at each of the sides of the frame,

iii. a respective plurality of parallel transverse crosspieces connecting each pair of said uprights at each of the two ends of the frame,

iv. a plurality of pairs of brackets disposed in vertical spaced relationship with one bracket of each pair secured on the pair of uprights at a respective side of the frame, the brackets of each pair being in the same plane and defining between them a longitudinal gap, said brackets being releasably secured on the respective uprights and adjustable along said uprights,

v. means for securing the ends of the uprights to the roof and floor of an ambulance, and

vi. at least one stretcher in the form of an elongated trough of rigid material, said stretcher including a longitudinal partition upstanding centrally for a part of its length to define in the stretcher trough a pair of zones to receive the legs, said stretcher including a longitudinal base member narrower than the trough width projecting downwardly from the trough along the entire length of the trough centrally thereof and serving to stiffen the trough, said stretcher being supported on a respective pair of said brackets with its longitudinal base member disposed in said longitudinal gap.

955 O.G.-16

4,006,501

WATER BED MATTRESS

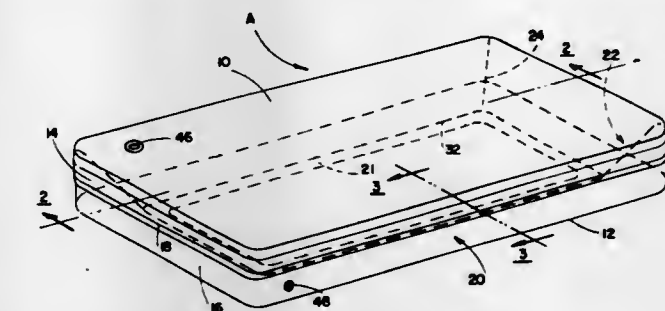
Raymond M. Phillips, 305 Poquito Lane, Topanga, Calif. 90290

Filed May 27, 1975, Ser. No. 581,262

Int. Cl.³ A47C 27/08

U.S. Cl. 5-371

20 Claims



1. A water bed mattress comprising

a. an upper sheet having a peripheral end margin,

b. a lower sheet having a peripheral end margin and being in spaced apart relationship to said upper sheet,

c. a peripheral inner wall extending between and secured in operative relationship to said upper and lower sheets and forming a water chamber between said inner wall and upper and lower sheets,

d. said inner wall being inclined so that it extends in proximate relationship to the peripheral end margin of said upper sheet to form said water chamber substantially continuous with the surface of said upper sheet so that substantially the entire upper sheet is supported by water in said water chamber, and said inner wall extending inwardly from the peripheral end margin of said lower sheet and being secured to said lower sheet inwardly of its peripheral end margin,

e. and a peripheral outer wall extending between said upper and lower sheets forming an air chamber bounded by said outer and said inner wall and said lower sheet so that said air chamber when filled with air provides continuous peripheral support by the air which is relatively less yieldable than the water in said water chamber, said water chamber having a periphery substantially contiguous with the periphery of said air chamber such that the air chamber can provide continuous peripheral support.

4,006,502

PACKAGING AND APPLICATOR TOOL FOR ELECTRICAL TERMINALS

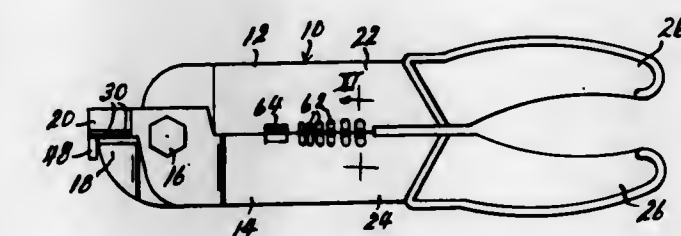
Robert V. Strickland, 9021 Wedd, Overland Park, Kans. 66212

Filed Jan. 12, 1976, Ser. No. 648,300

Int. Cl.³ B25F 1/00

U.S. Cl. 7-5.4

7 Claims



1. In combination with a terminal for electric wires having at one end a tubular ferrule adapted to be crimped tightly about an electric wire inserted therein, and an opposite end portion, and a package for such terminals consisting of a flexible tape to which said terminals are adhered in longitudinally spaced apart relation, a tool for apply said terminals comprising:

a. first, second and third pairs of relatively pivoted jaws

disposed in side-by-side relation with their operative edges extending transversely to their pivotal axes, and b. operating means operable to close said jaw pairs in the same sequence, said first jaw pair being operable to grip said tape and said opposite end portion of one of said terminals therebetween, said second jaw pair including blade means operable to sever said tape intermediate the terminal so gripped and the next successive terminal on said tape, and said third jaw pair being operable to grip and crimp the ferrule of the terminal so gripped by said first jaw pair.

4,006,503

AQUATIC MAT

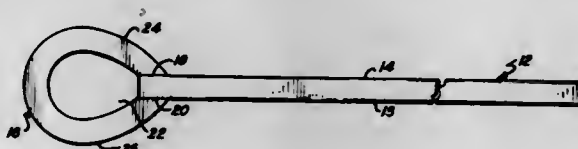
Robert L. Wood, Wichita Falls, Tex., assignor to Advanced Sports Corporation, Wichita Falls, Tex.

Continuation-in-part of Ser. No. 594,018, July 8, 1975, abandoned. This application Aug. 29, 1975, Ser. No. 609,049

Int. Cl.² A47C 27/08

U.S. Cl. 9-13

6 Claims



1. An aquatic floatation mat capable of floating on either side in water and supporting one or more persons, comprising an elongated planar member and a headrest secured to and extending from an end portion of said planar member; said planar member and said headrest formed from closed cell, unicellular, plastic foam slab members, which are flexible, resilient, and non-water absorbent, and which have a surface coating of a tough, pliable, plastic material; said headrest slab member having ends thereof secured to the top and bottom of said end portion of said planar member, said headrest has a generally rounded shape with surfaces thereof extending above and below said planar member, and said headrest has an open transverse void.

4,006,504

AUTOMATIC HEEL AND SIDE LASTING SHOE MACHINES

Ronald O. C. Gadd, Leicester, England, assignor to USM Corporation, Boston, Mass.

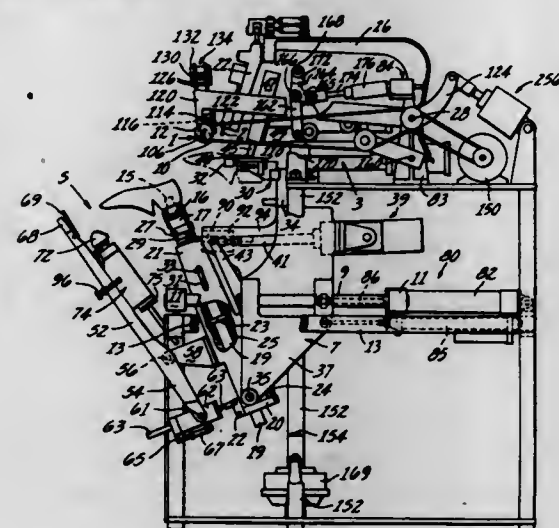
Filed Aug. 27, 1975, Ser. No. 608,327

Claims priority, application United Kingdom, Aug. 27, 1974, 37307/74

Int. Cl.² A43D 21/00

U.S. Cl. 12-8.3

4 Claims



1. A shoe machine for automatically lasting side and heel portions of a shoe assembly, and machine comprising:

shoe assembly supporting means for supporting a shoe assembly, said shoe assembly comprising an upper and an insole assembled on a last;

a side lasting arrangement comprising a pair of side lasting rolls, each of said lasting rolls having a wiping element disposed helically about a circumferential portion of lasting roll;

said lasting rolls being supported by roll carrying means so that the axes about which said lasting rolls rotate extend at least substantially widthwise of any shoe assembly being operated upon;

means for rotating said lasting rolls in such directions that they operate to wipe marginal portions of said upper at opposite sides of a shoe assembly inwardly with respect to said insole of said shoe assembly so that the marginal portions of said upper and said insole may become secured together after an application of adhesive has been applied therebetween, the side lasting operation caused to progress along the opposite sides of said shoe assembly during relative movement in a direction extending lengthwise of said shoe assembly between said shoe supporting means and said lasting rolls;

means for providing relative movement between said shoe supporting means and said lasting rolls;

a heel seat lasting arrangement comprising a pair of wipers including means for effecting advancing and closing movements of said wipers to cause them to wipe marginal portions of said upper around said heel seat portion of said shoe assembly;

a shoe length measuring arrangement which permits positioning of said shoe assembly support means prior to the side lasting operation;

said shoe assembly supporting means being comprised of a slidably mounted carriage which permits movement in a direction extending lengthwise of said shoe assembly; and said supporting means also comprising a pneumatically operated cylinder disposed to raise and lower said shoe assembly therewith, including a pivotal base on said support, and a pneumatically operated cylinder attached to impart motion thereto.

4,006,505

SLIDING SWING SUPPORT FOR BRIDGES OR SIMILAR SUPPORTING STRUCTURES

Waldemar Küster, Forsbach, Germany, and Reinhold Huber, Rorbach, Switzerland, assignors to Kober AG, Glarus Schweiz-Spielhof, Germany

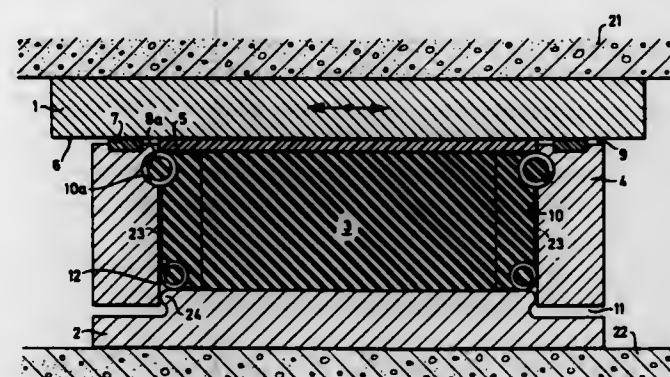
Filed July 8, 1975, Ser. No. 594,060

Claims priority, application Germany, July 9, 1974, 2432898

Int. Cl.² E01D 19/06

U.S. Cl. 14-16.1

13 Claims



1. A sliding swing bearing comprising upper and lower supporting members and an elastic cushion disposed therebetween, one of said supporting members being movable with respect to said cushion and the other one of said supporting members, said elastic cushion being at least in part enclosed by a peripheral wall casing and being provided with at least one insert of a material less resilient than said cushion spaced

about the periphery thereof adjacent the movable support, said insert being partially embedded in said cushion and partially extending radially outward within said wall casing, said casing being formed with means for receiving said insert.

4,006,506

SURFACE CLEANING MACHINE WITH SQUEEGEE ASSEMBLY

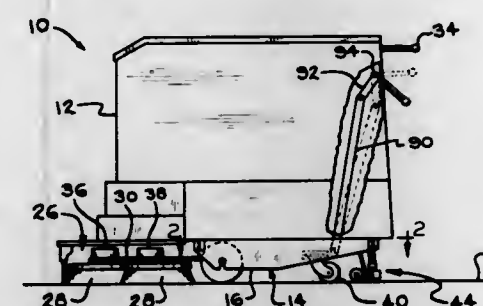
Jack L. Burgoon, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Feb. 10, 1975, Ser. No. 548,566

Int. Cl.² A47L 11/30

U.S. Cl. 15-50 R

3 Claims



1. A machine for cleaning a surface comprising a frame, a pair of forward wheels carried by said frame for movably supporting the machine on the surface, scrubbing means carried by said machine forwardly of said wheels for scrubbing a strip of the surface when moved thereover, a squeegee assembly comprising a squeegee, a single arm connected to a center portion of said squeegee, means pivotally connecting said arm to said machine with the pivot point being centrally located between the sides of the machine and behind said scrubbing means, spring means having an end connected below said arm near said arm pivot means and another end connected to said arm between said pivot means and said squeegee for urging said squeegee only toward the surface and not in a direction transverse to the direction of movement of the machine, two spaced wheels connected to said squeegee and engagable with the surface to be cleaned, means for vertically adjusting said wheels relative to said squeegee, and means carried by said machine for lifting said arm to raise the squeegee above the surface only when said arm extends substantially straight back from said pivot means.

4,006,507

DEVICE FOR CONVEYING A CARD USED FOR A CARD READER

Shigeru Yoshida, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, both of Japan

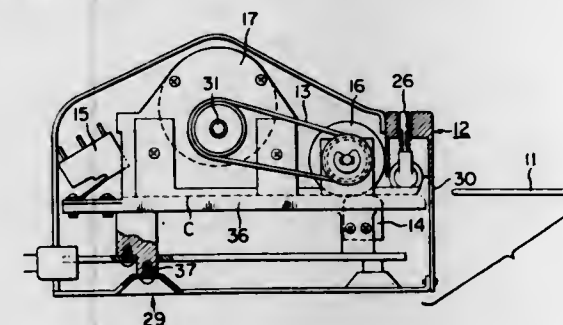
Filed June 11, 1975, Ser. No. 585,888

Claims priority, application Japan, June 14, 1974, 49-69247

Int. Cl.² F26B 13/28

U.S. Cl. 15-102

8 Claims



1. A device for conveying a card comprising a card guiding path having a port for inserting the card and guiding the inserted card along said path; means for reciprocatingly transferring the card along the card guiding path in said direction; and

means for cleaning the card provided on the card guiding path at the side of the card inserting port thereof relative to the transfer means, the cleaning means comprising a roller having a cleaning member on at least a part of the surface of the roller, at least a part of the roller being contactable with the card, and controlling means for permitting the roller to be rotated in one direction by the card and preventing the roller from rotating in the other direction to effect cleaning of the card as its advances along the stationary roller surface.

4,006,508

MANUAL RADIATOR RODDER

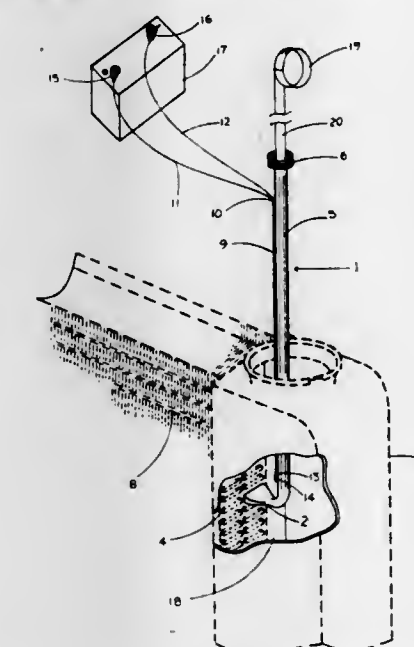
Leonard Rudolph Brown, 8509 Whiteus Drive, El Paso, Tex. 79925

Filed Apr. 18, 1975, Ser. No. 569,403

Int. Cl.² B08B 9/00

U.S. Cl. 15-104.05

5 Claims



1. A device for cleaning the tubes of an automotive radiator comprising in combination: an elongated, hollow conduit, said conduit being provided at one end with coupling means for attaching a source of flushing fluid to said conduit and at the other end with means for coupling said conduit to the open end of an automotive radiator tube; flexible flat elongated means for reaming foreign material from said automotive radiator tubes by manual reciprocating motion, said flexible elongated means being disposed within said conduit and adapted for said reciprocating movement through said conduit and into a heat exchanger tube when said conduit is coupled therewith.

4,006,509

MOP HOLDER

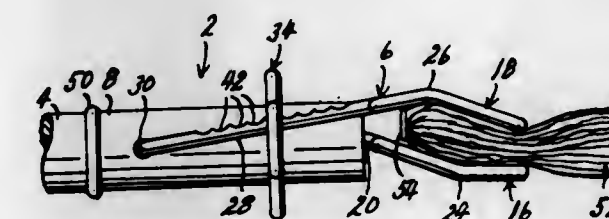
Erin O. Chase, Box 266, Seneca, Mo. 64865

Filed Oct. 28, 1975, Ser. No. 626,247

Int. Cl.² A47L 13/253

U.S. Cl. 15-150

5 Claims



1. A mop holder comprising:
a. an elongated handle staff,

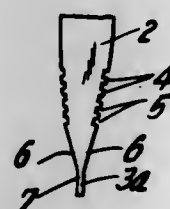
b. a fixed jaw fixed to the lower end of said staff with its operative surface facing transversely of said staff,
c. a movable jaw pivoted to said staff on an axis transverse to said staff and spaced upwardly from said fixed jaw, the operative surface of said pivoted jaw facing said fixed jaw and being movable toward and away from said fixed jaw, said pivoted jaw including a pair of parallel arms extending upwardly from the operative portion thereof respectively along transversely opposite sides of said staff, the upper ends of said arms being coaxially pivoted to said staff on an axis transverse to said staff, whereby pivotal movement of said arms toward parallelism with the staff moves said jaws relatively closer together to clamp a mophead therebetween, and
operating means carried by said staff and operable to move said jaws closer together and to lock said jaws releasably at variable spacings therebetween, whereby mopheads of variable bulk and thickness may be clamped therebetween, said operating means comprising a closed locking ring encircling said staff and the arms of said pivoted jaw, whereby downward movement of said locking ring along said staff pivots said arms toward parallelism with said staff, said locking ring having sliding engagement with said staff at at least three generally regularly spaced points about its periphery, whereby said ring is guided relatively to said staff, and is provided at diametrically opposite regions thereof with outwardly offset portions each enclosing one of the arms of said pivoted jaw, each of said offsets having a reach engaging the associated arm and coaxial with the corresponding reach of the other offset, the common axis of said reaches being parallel to a plane established by the axes of said arms, said locking ring being rotatable on said staff.

4,006,510 SQUEEGEE

Bernabé Teixeira Soares, Sao Paulo, Brazil, assignor to Industrias Soares S/A. Borrachas e Metais, Sao Paulo, Brazil
Filed Aug. 25, 1975, Ser. No. 607,899
Claims priority, application Brazil, Aug. 26, 1974, 7064
Int. Cl.² B60S 1/04

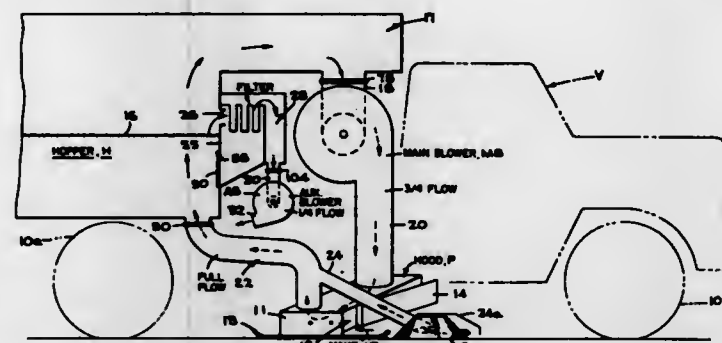
U.S. Cl. 15-245

2 Claims



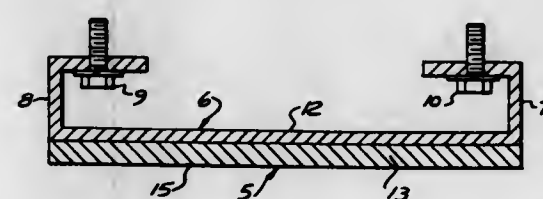
1. A squeegee comprising a thin, elongated rigid plate, a rubber-like coating completely enclosing said rigid plate having the same general shape as said rigid plate, said rubber-like coating forming a projection from one edge of said rigid plate and said projection forming a flexible working edge, said working edge comprising a tapered portion having a first face and a second face with said faces disposed in converging relationship as they project outwardly from said plate and a plurality of alternating parallel ribs and grooves generally rectangularly shaped in transverse section and formed in each of said first and second faces with said ribs and grooves extending parallel of said working edge, a thin flexible blade projecting outwardly from the narrower end of said tapered portion, the opposite surfaces of said blade extending outwardly from said tapered portion being disposed in parallel relation, and handle means connected to said rubber coating and said rigid plate.

4,006,511
SWEEPER WITH RECIRCULATION HOOD AND
INDEPENDENT FILTER SYSTEM
Gregory J. Larsen, Claremont, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Feb. 9, 1976, Ser. No. 647,485
Int. Cl.² E01H 1/08
U.S. Cl. 15-300 A 16 Claims



1. In a mobile street sweeper or the like of the type comprising a vehicle carrying a hopper, a filter associated with said hopper for separating out fine debris, sweeper means comprising a debris pickup hood having surface engaging flaps, blower means for withdrawing air from the hopper and delivering air to the hood, and an air return line for directing air from the hood back to the hopper, the improvement wherein said blower means comprises a main blower and a separate, auxiliary blower; a main blower inlet line connected to said hopper, a main blower delivery line connected to said hood; said fine debris filter having an inlet for receiving dusty air from said hopper and an outlet for filtered air connected to the inlet of said auxiliary blower, said auxiliary blower discharging filtered air to the atmosphere; the majority of the air flowing through said air return line from said hood coming from said main blower, said auxiliary blower inducing the remainder of the air flowing in said air return line which remainder corresponds to a flow of atmospheric air entering said sweeper means at the swept surface.

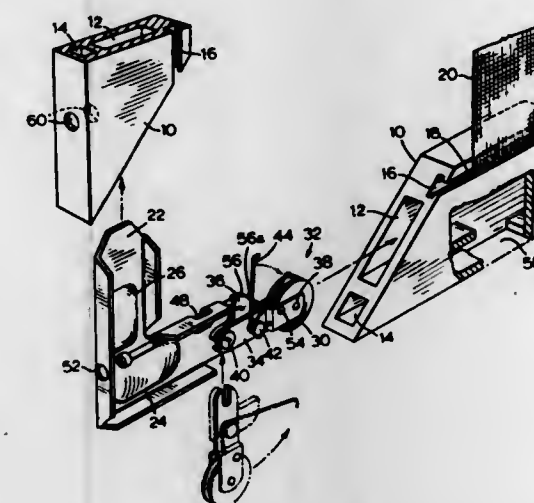
4,006,512
MAGNETIC BUMPER AND PICKUP DEVICE
Saul S. Saulson, 31477 Lost Hollow Lane, Birmingham, Mich. 48010
Continuation of Ser. No. 487,856, July 12, 1974, abandoned.
This application Jan. 7, 1976, Ser. No. 647,075
Int. Cl.² A47L 9/00
U.S. Cl. 15-339 2 Claims



1. The combination of a vacuum sweeper and a magnetic pickup and bumper device comprising a strip of magnetized rubber of length equivalent to the width of the front end of the vacuum sweeper, said strip being permanently magnetized in a bipolar fashion so as to create opposing magnetic poles along the opposite longitudinal edges of said rubber strip; said rubber strip being bonded to and supported on one side of a strip of steel of equal width to induce a magnetic field in the steel strip; said steel strip having a U-shaped mounting bracket formed at each end so that the length of the bonded surface of the steel strip is equivalent to the length of said rubber strip; said steel strip being fastened to the lower forward end of the vacuum sweeper by said mounting brackets so as to create a space between the backside of said steel strip and the forward

end of said sweeper; said rubber strip facing outwardly from said sweeper with its length being parallel, and its width perpendicular to the surface of the floor supporting said vacuum sweeper whereby the rubberized strip precedes the sweeper upon forward motion of the sweeper to act as a resilient bumper and ferrous objects attracted to the device will become lodged on the backside of the steel strip with their elongate axes vertically aligned, out of the pickup range of the sweeper.

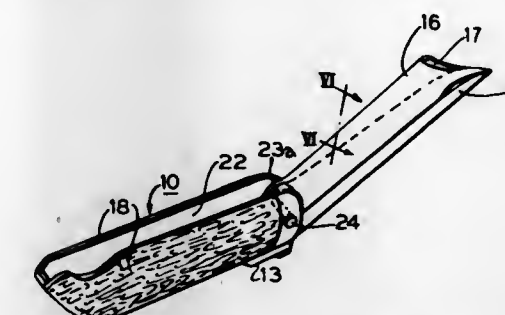
4,006,513
RUNNER WHEEL SUPPORT
Hermann Friedrich Offerdinger, 602 Galway Drive, Burlington, Ontario, Canada
Filed June 25, 1975, Ser. No. 590,199
Int. Cl.² E05D 13/02
U.S. Cl. 16-99 9 Claims



1. A runner wheel support for sliding doors, windows and the like of the type having a frame formed by connected hollow sections, the support comprising:
a support body adapted to be inserted in a frame hollow section for retention therein;
a removable wheel support member carrying a runner wheel and pivoted to the support body by a disengageable pivot for movement between stored, operative and removal positions; in which stored position the support body and wheel support member pivoted thereon can be mounted in a hollow frame section; in which operative position the wheel can engage a track on which it runs; and in which removal position the wheel support member can be disengaged from the said pivot and thereby from the support body;
a cam member movable with the wheel support member about the said pivot;
a first cam-engaging means on the support body engaging the cam member to releasably retain the wheel support member in the said stored position; and
a second cam-engaging means on the support body engaging the cam member to releasably retain the wheel support member in a lowermost operative position;
engagement of the cam member and a cam-engaging means retaining the wheel support member on the disengageable pivot and movement of the wheel support member to the said removal position disengaging the cam member and the cam engaging means to permit disengagement of the wheel support member from the pivot.

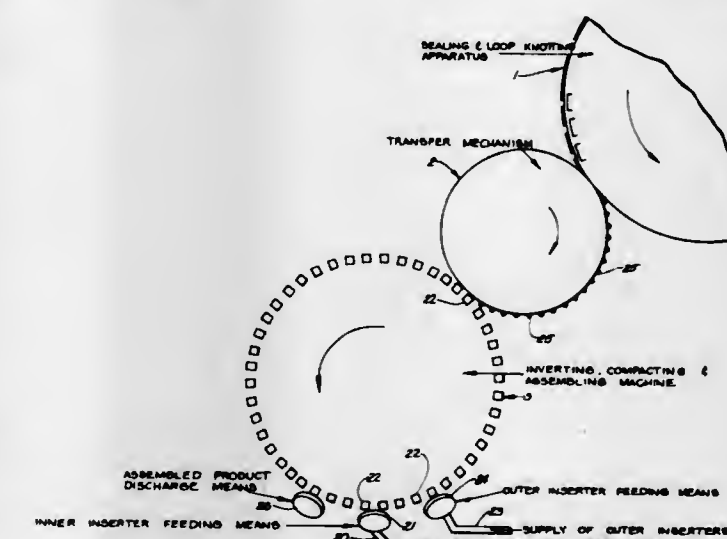
4,006,514
FOLDING FILLETING TOOL
Melvin C. Peerman, 560 Heim Road, Getzville, N.Y. 14068
Filed July 10, 1975, Ser. No. 594,587
Int. Cl.² A22C 25/00
U.S. Cl. 17-68 5 Claims

1. A portable, foldable tool for filleting fish comprising a handle, a dual purpose blade, sharpened to a cutting edge



shield completely covering said cutting edge in nested position with said blade and being of generally U-shaped in transverse cross section, the web of the U being closed over its entire length having a concave curvature at its free end having sharp edges at the junction with their lateral surfaces to serve as shears to remove the fillet from the rib cage merging with the free end of said blade when said blade is nested in said shield to form a combined end curvature substantially conforming to the curvature of the rib cage of a fish.

4,006,515
APPARATUS FOR FORMING TAMPONS AND
ASSEMBLING SAME IN INSERTERS
John George Mast, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 10, 1974, Ser. No. 531,222
Int. Cl.² A61L 15/00
U.S. Cl. 19-144.5 56 Claims



1. In apparatus for inverting aggregate containing tampon sacks having withdrawal strings at one end to form them into rosette shape, compacting the inverted sacks into cylindrical configuration, and assembling the compacted sacks in inserters having inner and outer parts, a rotatable assembly turret, drive means for rotating said turret, a plurality of operating heads located at equally spaced apart intervals about the periphery of said turret, a first feeding means for delivering inner inserter parts to each said head and a second feeding means for delivering outer inserter parts to each said head as said turret rotates, transfer means for delivering tubular tampon sacks to each said head as said turret rotates, said transfer means including string gripping means for presenting the tampon sacks to said heads with their withdrawal strings extended, grabbing means associated with each said head for engaging the extended withdrawal strings of the tampon sacks

and drawing the tampon sacks into the heads by means of their strings, each said head including inverting means for forming the tampon sacks into rosette shape, compression means for compacting the inverted sacks into essentially cylindrical tampons, and means for assembling the compacted tampons with said inner and outer inserter parts to form an assembled tampon structure, and means for discharging the assembled tampon structures from said heads during rotation of said turret.

4,006,516

PROCESS FOR IMPARTING A CRUSHED APPEARANCE TO PILE FABRIC

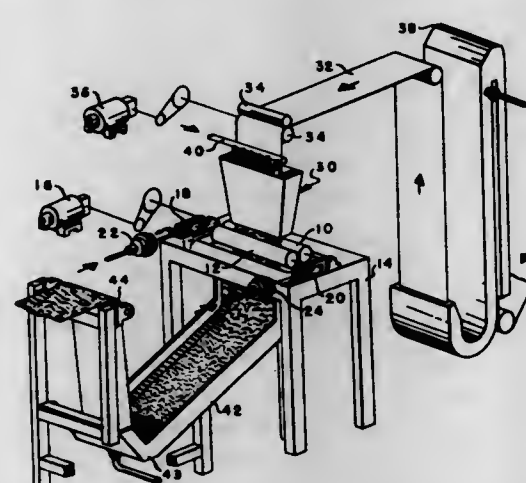
Charles R. Ruppe, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 346,679, March 30, 1973, abandoned, which is a continuation of Ser. No. 157,965, June 29, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,626

Int. Cl.³ D06C 23/04

U.S. Cl. 26—2 R

1 Claim



1. A process for imparting a crushed appearance to pile fabric comprising the steps of: providing a supply of wet pile fabric capable of retaining a substantially permanent crush upon the application of pressure, continuously overfeeding the supply of wet pile fabric into a confined tapering zone to compress the width of the pile fabric and generally fold the pile fabric in the transverse direction, continuously accumulating the mass of pile fabric into lengthwise and widthwise folds in the confined tapering zone and gravitationally feeding the folded pile fabric from the confined tapering zone into a compressing zone and continuously compressing the pile fabric from the confined zone to impart a crushed appearance thereto.

4,006,517

STUFFER BOX CRIMPING APPARATUS

Nobuharu Izawa; Yasumasa Nomizo, and Kenji Kanda, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 3, 1976, Ser. No. 654,980

Claims priority, application Japan, Feb. 10, 1975, 50-16222

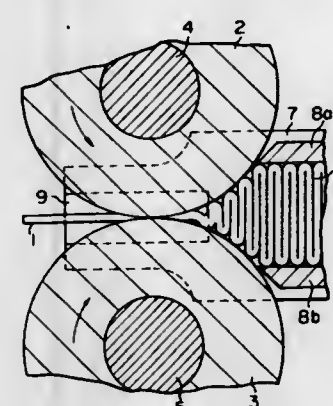
Int. Cl.³ D02G 1/12

U.S. Cl. 28—1.6

17 Claims

1. A stuffer box crimping apparatus for a thermoplastic filamentary tow comprising a pair of a cylindrical parallel nipping rollers forming a nip therebetween, a stuffer box adjacent said nipping rollers and receiving said tow from said nip, and a pair of cheek members arranged in contact with outer lateral side surfaces of said nipping rollers at the nip portion of said nipping rollers, said cheek member comprising a base layer consisting of a hard material and a soft surface layer which consists of soft material and has a thickness of 0.2mm or less, said soft surface layer being supported on at

least a surface portion of said base layer in contact with the outer lateral side surfaces of said nipping rollers, said surface



portion of said base layer being substantially parallel to said outer lateral side surfaces of said nipping rollers.

4,006,518

TURRET LATHE

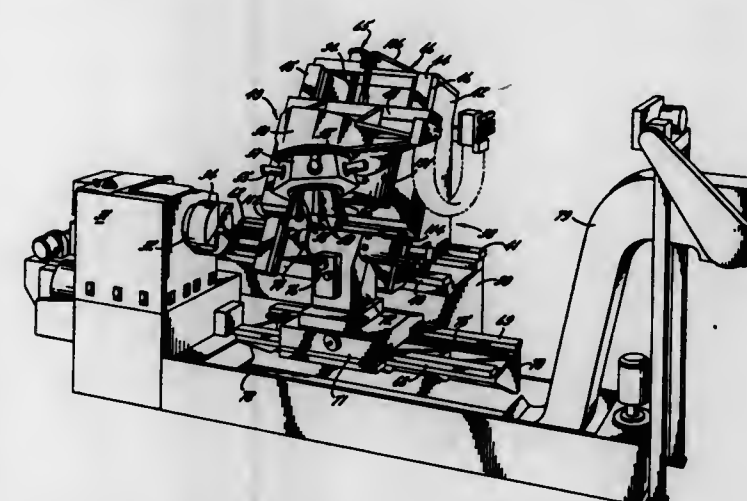
Richard C. Rudolph; Ernest J. Henkel; Michael A. Glandt, all of Fond du Lac, and Daniel J. Seichter, New Holstein, all of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Aug. 30, 1974, Ser. No. 501,869

Int. Cl.³ B23B 3/18

U.S. Cl. 29—39

18 Claims



1. In a turret lathe for machining a workpiece by engaging the workpiece with tools while rotating said workpiece about a horizontal spindle axis, the combination comprising, a bed, a pair of bed ways supported on the bed in a horizontal plane, said bed ways being parallel to the spindle axis but offset therefrom, a carriage mounted for rectilinear translation on the bed ways, the carriage having a pair of parallel slide ways defining a slant plane parallel to the spindle axis but inclined with respect to the plane of the bed ways, a slide mounted for rectilinear translation on the slide ways, a tool holding turret on the slide having an axis intersecting the spindle axis but skewed with respect thereto, the tool holding turret including means for compensating for the skew angle of the turret axis to present a selected tool to the workpiece in a non-skewed attitude.

4,006,519

APPARATUS FOR MAKING TAP CONNECTIONS TO MULTI-CONDUCTOR CABLE

Robert Alvin Long, and William Boderick Over, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 19, 1975, Ser. No. 633,192

Int. Cl.³ HOIR 43/04

U.S. Cl. 29—749

11 Claims

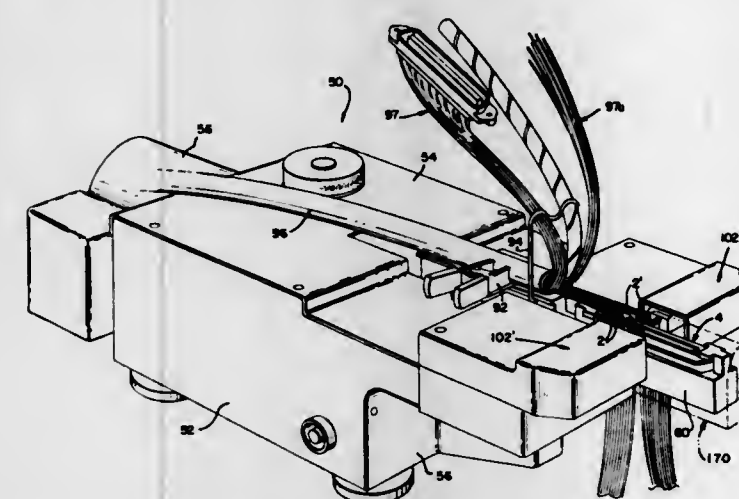
1. Apparatus for inserting intermediate portions of a plurality of pairs of wires into the wire-receiving portions of electrical contact terminals, said terminals being contained in an

electrical connector and being arranged in two aligned parallel rows with said wire-receiving portions being oppositely directed whereby a pair of wires can be electrically connected to corresponding aligned terminals in said rows by locating said wires on opposite sides of said connector and moving said wires laterally of their axes, towards said connector and into the wire receiving portions of said aligned terminals, said apparatus comprising:

frame means,

connector supporting means, said connector supporting means projecting cantilever fashion from said frame means for a distance which is substantially equal to twice the length of one of said rows, said connector supporting means having connector supporting surface portions for supporting said connector in an orientation with said rows extending in the projecting direction of said supporting means,

first and second wire inserting rams on two opposite sides of said supporting means, said inserting rams being spaced from said frame means by a distance which is substantially equal to, or greater than, the length of one of said



rows, said inserting rams being reciprocable towards and away from a connector supported on said supporting means,

positioning means for providing relative movement of said supporting means and said rams with respect to each other in directions extending parallel to the projecting direction of said supporting means so that said rams can be located selectively in alignment with the wire-receiving portions of all of the aligned terminals in said rows, and

wire stop means disposed proximate to said inserting rams for locating a pair of said wires on opposite sides of said supporting means and in alignment with said inserting rams whereby,

upon positioning said connector on said supporting surface portions of said supporting means, repetitively actuating said positioning means to locate said rams in alignment with two predetermined aligned terminals in said rows, repetitively locating a pair of wires on opposite sides of said supporting means and against said wire stops, and repetitively reciprocating said inserting rams, said pairs of wires are inserted into the wire receiving portions of the aligned terminals in said rows.

4,006,520

MACHINE FOR CONNECTING WORKPIECES, ESPECIALLY PIPE BEND SEGMENTS OR THE LIKE

Erich Wachter, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 12, 1976, Ser. No. 648,562

Claims priority, application Switzerland, Jan. 20, 1975, 647/75

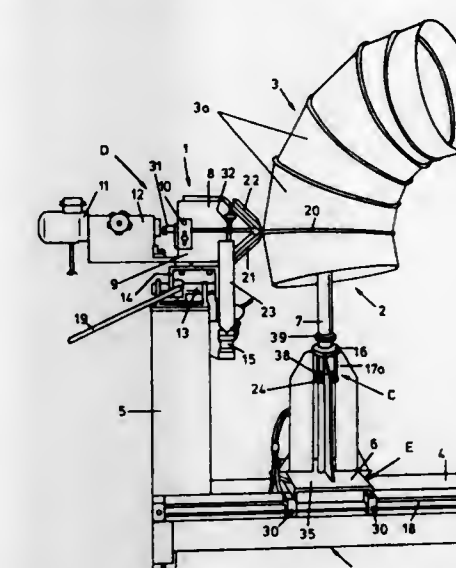
Int. Cl.³ B21D 39/04

U.S. Cl. 29—243.52

19 Claims

1. A machine for connecting pipe bend segments, comprising a table for supporting pipe bend segments to be interconnected, means for rotatably mounting the table, a support, a working head mounted at said support for cooperation with

said rotatable table, said working head being provided with two rolls for connecting the pipe bend segments, adjustment



means for changing the relative spacing between the working head and the rotatable table, and means for elastically supporting the rotatable table in elevational position.

4,006,521

PIPE REMOVER

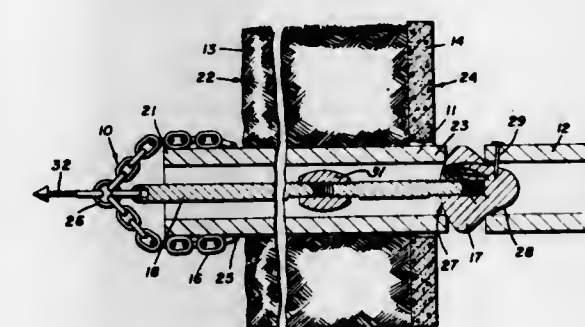
John A. Pedone, 19 Commonwealth Ave., Shrewsbury, Mass. 01545

Filed June 2, 1975, Ser. No. 583,049

Int. Cl.³ B21D 39/00; B23P 19/04

U.S. Cl. 29—282

6 Claims



1. A pipe remover for extracting an old buried pipe having a first end and a second end, comprising

- a pushing dog adapted for contact engagement with the second end of the pipe, the pushing dog having a first side which contacts the second end of the pipe and a second side which has a fastening means to secure a replacement pipe to the second side,
- a drawing element connected to the pushing dog and passing through the pipe to the first end to allow drawing of the element outwardly of the first end, and
- a grasping dog which is adapted to securely engage the first end of the pipe for axial pulling of the pipe outwardly of the first end, so that the pipe is pulled at its first end and pushed at its second end.

4,006,522

TWO PIECE SHEET METAL CAPSTAN HOUSING ASSEMBLY METHOD

Donald J. Dattilo, Mount Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 469,203, May 13, 1974, Pat. No. 3,921,881. This application Nov. 20, 1975, Ser. No. 633,739

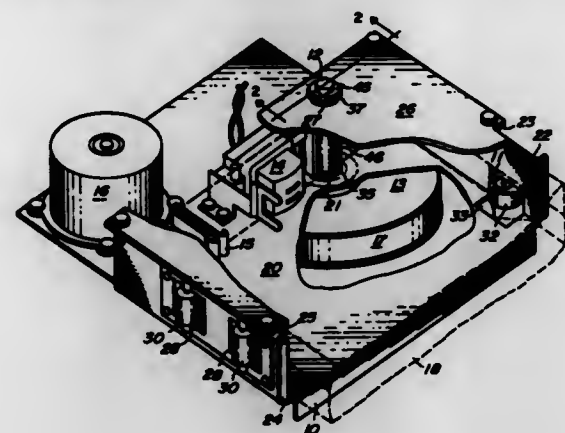
Int. Cl.³ B23Q 17/18

U.S. Cl. 29—407

4 Claims

1. A method of constructing a cartridge receiving chamber and a capstan housing assembly for a tape player device of the type using an exchangeable cartridge, comprising the steps of:

forming a cartridge support member and a cover plate of sheet material with openings in the member and the plate adapted to receive capstan bearings, seating one capstan bearing in the opening of the support member and another capstan bearing in the opening of the cover plate,



aligning the support member and the cover plate with respect to each other by inserting a shaft through each of the seated bearings perpendicular to the support member, and fastening the cover plate to the support member to hold the capstan bearings in alignment with the cartridge receiving chamber formed by the support member and the cover plate.

4,006,523

METHOD OF PRODUCING A PRE-STRESSED BEAM OF STEEL AND CONCRETE

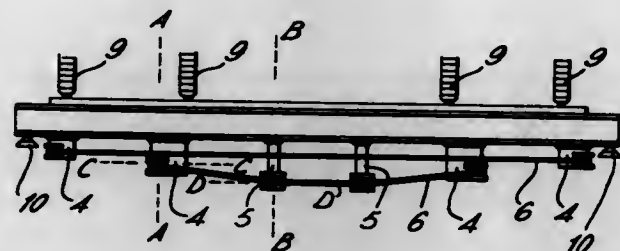
Jean-Baptiste Mauquoy, 264 route Provinciale, Bierges lez Wavre, Belgium

Filed Jan. 21, 1975, Ser. No. 542,702

Claims priority, application Belgium, Jan. 22, 1974, 140078 Int. Cl.² B28B 23/04

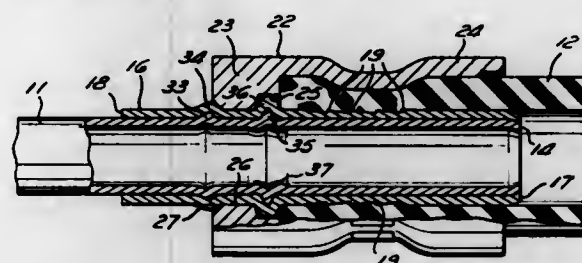
U.S. Cl. 29-452

5 Claims



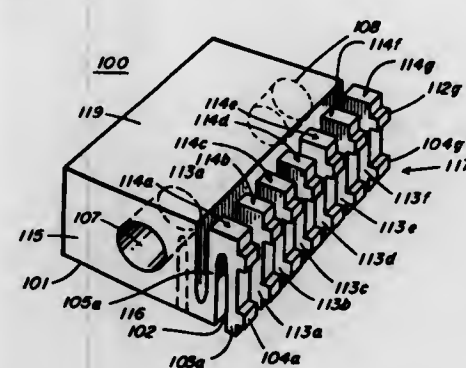
1. A method of producing a prestressed beam of steel having a flange, which comprises the steps of: securing to the flange a plurality of spaced apart transmission elements; attaching at least one tensioning wire to the transmission elements, each wire being attached to two of the transmission elements so that the respective wires extend at predetermined distances from the flange; tensioning the at least one wire so as to apply to the beam via the transmission elements in positions corresponding to each transmission element, a bending moment which is oppositely directed to that of the operating loads to be applied to the beam, and applying a stress to the beam during the tensioning of the at least one wire which substantially counteracts the bending moments, in order to create solely compressive forces in the beam; encasing the at least one wire, the transmission elements and the flange in concrete while maintaining the tensioning; and after the concrete has set, freeing the beam of the stresses counteracting the bending moments due to the tensioning of the at least one wire to allow the beam of steel to bend.

4,006,524
METHOD OF MAKING A HOSE COUPLING
Irving G. Frank, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio
Division of Ser. No. 478,582, June 12, 1974, Pat. No. 3,924,883. This application Aug. 4, 1975, Ser. No. 601,543 Int. Cl.² B21D 39/00; B23P 19/04
U.S. Cl. 29-455 R 3 Claims



1. A method of making a hose coupling comprising the steps of selecting a length of metal tube having a free end and an interior and an exterior, selecting a metal reinforcing sleeve of predetermined axial extent and having a free end and an interior and an exterior, placing the reinforcing sleeve over the exterior of the metal tube, selecting a metal collar of predetermined axial extent and having a small interior diameter body portion and a larger interior diameter skirt portion, placing the collar over the exterior of the reinforcing sleeve, applying an axial force to the end faces of the tube and reinforcing sleeve, and simultaneously radially outwardly deflecting the tube and reinforcing sleeve at axially spaced locations on each side of the collar body portion to form annular beads on both sides of the collar body portion with the beads of the tube extending into the beads of the reinforcing sleeve.

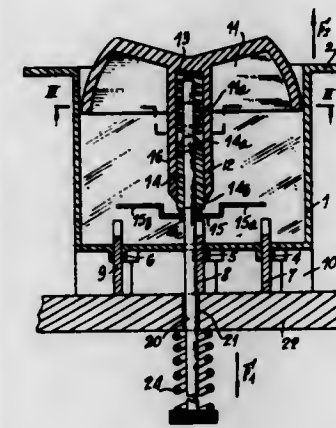
4,006,525
METHOD OF MACHINING VISE JAW FACE
Douglas J. Hennenfent, Minneapolis; Robert A. Johnson, Minnetonka, and Raymond Elmo Jutila, Wayzata, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.
Division of Ser. No. 526,555, Nov. 25, 1974, Pat. No. 3,951,395. This application Apr. 8, 1976, Ser. No. 675,092 Int. Cl.² B23P 13/04
U.S. Cl. 29-558 4 Claims



1. A method of manufacturing an improved face for a jaw of a vise intended to apply even pressure along a flat surface, including the steps of
a. machining first and second opposite exterior sides in a block of refractory material;
b. machining a gripping face intersecting both the first and second sides of the block along first and second gripping face straight lines of intersection;
c. cutting a plurality of substantially identical and parallel first slots cutting the entire breadth of the gripping face at equally spaced intervals and extending part way through the block;
d. cutting a second slot across the entire breadth of the first side along a line parallel to the first gripping face line of intersection, extending part way through the block

toward the second side, and intersecting each first slot; and
e. machining the gripping face adjacent each slot to be tangent at at least one point to a flat plane having a predetermined location adjacent the gripping face.

4,006,526
ELECTRIC COMMUTATOR-SWITCH AND METHOD FOR ASSEMBLING IT
Jacques Marie Vidalin, Bordeaux, France, assignor to Phoebe S. A., Fribourg, Switzerland
Filed May 27, 1975, Ser. No. 580,581
Claims priority, application France, May 27, 1974, 74.19451
Int. Cl.² H01H 11/00
U.S. Cl. 29-622 2 Claims

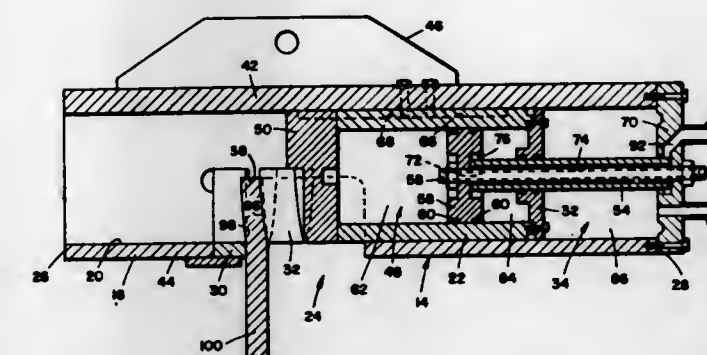


1. A method of assembling an electrical switch of the type having a casing carrying a plurality of contacts, a movable blade contact, a plunger for moving the blade contact into and out of contact with the casing contacts, a resilient element urging the plunger against the blade contact, and a tumbler having means for receiving the plunger and resilient element and for moving the plunger and resilient element therewith, said method comprising the steps of:
providing a work base with a pin projecting upwardly therefrom;
inserting said casing over said pin with said pin protruding through a hole in the bottom of said casing;
inserting said blade contact over said pin with said pin protruding through a hole in said blade contact;
inserting said plunger over said pin with said pin protruding through an axial hole in said plunger;
inserting said resilient element over said pin with said pin protruding into an axial hole in said resilient element;
inserting said tumbler over said plunger and resilient element with said plunger and resilient element received in said receiving means; and
removing the assembled casing, blade contact, plunger, resilient element and tumbler from said pin.

4,006,527
APPARATUS FOR SALVAGING SCRAP METAL
Eugene W. Sivachenko, 6851 Waverly Manner, Redding, Calif. 96001
Division of Ser. No. 464,596, April 25, 1974, Pat. No. 3,908,493. This application June 27, 1975, Ser. No. 590,978 Int. Cl.² B23D 27/00
U.S. Cl. 30-241 4 Claims

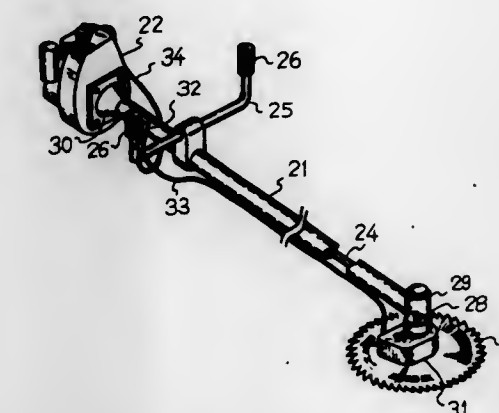
1. Apparatus for the infield salvage of large metal structures such as vessels or railroad cars and for disintegrating such structures into relatively small pieces of scrap metal, the apparatus comprising:
a tubular outer housing including first means defining a first, concave cutting edge;
a plunger having a tubular portion, the plunger being movably disposed within the housing for movement along an interior of the housing, the plunger including second

means defining a second, convex cutting edge cooperating with the first means for shearing scrap metal pieces having an arcuate outline when a portion of the structure is disposed between the first and second means; whereby the first means forms a stable support for the structure to prevent wedging of the structure, the piece or the cutting edges when the cutting edges are forceably moved towards each other;
a disc coaxially disposed within the housing and within the tubular portion of the plunger and means stationarily mounting the disc to the housing;



means sealing the tubular plunger portion from the housing interior to thereby form sealed first and second hollow chambers on respective sides of the disc;
means for alternatively subjecting the chambers to a pressurized fluid to thereby reciprocate the plunger relative to the housing and the disc in an axial direction so that the first means and the second means are moved towards and past each other for severing a portion of the structure disposed between the first and second means into small pieces of scrap metal.

4,006,528
PORTABLE GRASS AND BUSH CUTTER WITH BRAKE AND CLUTCH
Kazunari Katsuya, Okayama, Japan, assignor to Kazz Machinery Co. Ltd., Japan
Filed Nov. 5, 1975, Ser. No. 628,953
Claims priority, application Japan, Nov. 22, 1974, 49-134546; Nov. 22, 1974, 49-142516[U]; Mar. 29, 1975, 50-42149[U]
Int. Cl.² B27G 19/02
U.S. Cl. 30-276 12 Claims



1. A portable grass and bush cutter having a drive shaft, an engine and a rotary blade, bevel gear means for connecting said rotary blade to said drive shaft, means for supplying fuel to said engine, a centrifugal clutch for connecting said engine to said drive shaft, and friction brake means operable to quickly stop rotation of said rotary blade, means for carrying said grass and bush cutter in use and a control lever mounted in cooperation with said means for carrying the grass and bush cutter, two flexible wire means connected to said lever, one of said flexible wires being connected to said means for supplying

fuel to said engine, friction brake actuating means for actuating the brake, the other of said flexible wires being connected to the said friction brake actuating means, means for urging said lever into a first position in which the fuel supply to the engine is substantially shut off and in which said friction brake actuating means actuates said brake, said lever being moveable into operating position by the operator to permit fuel flow to the engine and to release the brake, said lever being automatically returnable to the first position upon release of the lever by the operator.

4,006,529

CHECK GAGE FOR ARTICLE THICKNESS

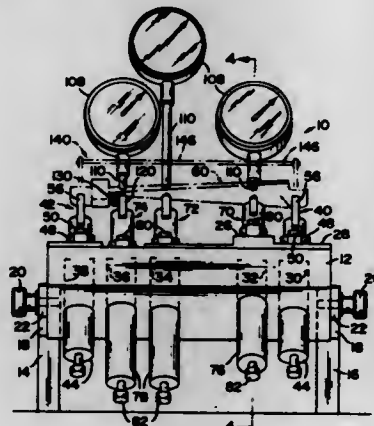
Martin A. Herman, 2085 West 114th St., Cleveland, Ohio 44102

Filed Sept. 8, 1975, Ser. No. 611,340

Int. Cl.² G01B 3/00

U.S. Cl. 33—174 L

13 Claims



1. A gaging apparatus comprising
 - a support means including a base having a plurality of longitudinally spaced bores therein,
 - a pair of test article positioner means carried by said base in individual ones of said bores and having an axially movable section operatively protruding upwardly therefrom, an article engaging member operatively positioned on each of said sections, and means to limit axial movement of said sections toward said base to seat against said base to prepare the gage for article test action,
 - a gage support means including a cylindrical carrier section positioned in at least one of said bores and on a substantially vertical axis, a positioner pin in said carrier and axially movable therein and an article locator device operatively carried by said pin for movement on the axis thereof, a vertical support bracket carried by said pin, a gage support arm pivotally carried by said vertical support bracket for movement to an inoperative position and a gage means positioned on said gage support arm above and opposed to said article locator device, and
 - means securing said gage support means to said base, said gage support means being positioned between said pair of article positioner means, a test article being engaged by said article engaging members and by said article locator device.

4,006,530

APPARATUS FOR MEASURING THE DIAMETER OF A WELL BORE

Yves Nicolas, Versailles, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 485,059, July 1, 1974, abandoned.

This application July 16, 1975, Ser. No. 596,492

Claims priority, application France, Apr. 9, 1974, 74.12370

Int. Cl.² E21B 47/08

U.S. Cl. 33—178 F

2 Claims

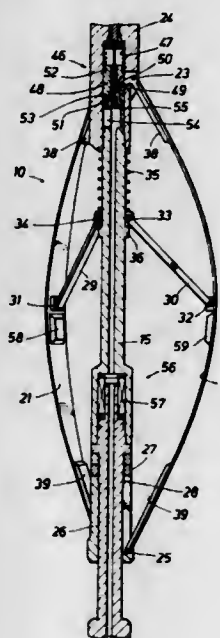
1. A well-caliper tool adapted for movement through a well bore and comprising:

a body having longitudinally-spaced upper and lower portions and adapted for suspension in a well bore;

at least three elongated bow springs circumferentially spaced in upright positions around said body with the mid-point of each of said bow springs being laterally disposed from an intermediate portion of said body situated between said upper and lower body portions;

first coupling means pivotally securing a first end of each of said bow springs to a first one of said upper and lower body portions for limiting said first spring ends to only pivotal movement in relation to said one body portion as said spring mid-points respectively move between a laterally-extended position and a retracted position adjacent to said intermediate body portion;

second coupling means cooperatively intercoupling the second end of each of said bow springs to each other for longitudinal movement together in relation to a second one of said upper and lower body portions and including a collar slidably mounted for longitudinal travel on said second body portion, means pivotally coupling said second spring ends to said collar, and stop means cooperatively arranged on said second body portion for limiting at least the longitudinal travel of said collar toward said intermediate body portion to establish said extended positions of said bow springs;



means cooperatively arranged for maintaining said spring mid-points equidistant from said intermediate body portion and including a coupling member slidably disposed on said body for longitudinal movement thereon between said first spring ends and said intermediate body portion, a corresponding number of rigid links arranged between said coupling member and about the mid-point of each of said bow springs, first pivot means pivotally intercoupling one end of each of said rigid links to about said mid-points of each of said bow springs, second pivot means pivotally interconnecting said coupling member to the other end of each of said rigid links, and biasing means normally urging said coupling member toward said intermediate body portion for coordinating the lateral movements of said bow springs and for imposing a progressively-increasing lateral force thereon as said bow springs move toward their respective extended positions;

electrical transducer means secured to said body and having a selectively-variable electrical characteristic; and

transducer-actuating means coupled to at least one of said bow spring operable upon lateral movement of said spring mid-points for proportionally varying said electrical characteristic as a function of well bore diameter.

4,006,531

GUN SIGHT

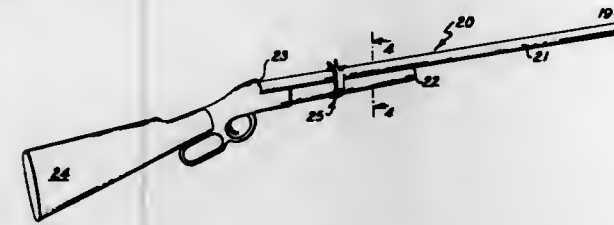
Stanley J. Kwako, Heaton, N. Dak. 58450

Filed Sept. 15, 1975, Ser. No. 613,355

Int. Cl.² F41G 1/02, 1/52

U.S. Cl. 33—261

2 Claims



1. An auxiliary lead-type gun sight adaptable for use universally with shotguns and rifles of the single-barrelled type and of the double-barrelled type disposed either vertically or horizontally, comprising a unitary, elastic cylindrical member adapted to be mounted around one barrel or two barrels and stock of guns and rifles at a suitable distance from the breech thereof, three adjacent upwardly projecting gun sights disposed and aligned circumferentially on the outer periphery of said cylindrical member, said gun sights when mounted on said barrel or barrels adapted to have the center sight project vertically at the midpoint between said barrel or barrels and the two side sights adapted to project at an outward upward angle with respect to said center sight, said cylindrical member and gun sights being integrally molded from an elastomeric material capable of being distended sufficiently to fit around each of the various configurations of said shotguns and rifles.

4,006,532

GAUGE FOR MEASURING VEHICLE FRAME ALIGNMENT

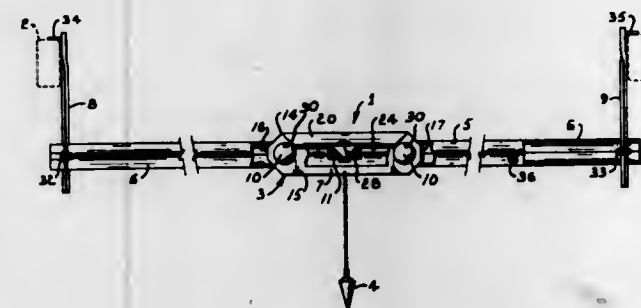
Ellis A. Hallman, Lebanon, Oreg., assignor to Kansas Jack, Inc., McPherson, Kans.

Filed Nov. 17, 1975, Ser. No. 632,562

Int. Cl.² G01B 11/27

U.S. Cl. 33—288

6 Claims



1. A self-aligning extensible gauge for measuring vehicle frame alignment comprising:
 - a. a body member having a longitudinally extending central portion and opposed laterally outwardly extending leg members thereon;
 - b. a plurality of bearing members carried by and longitudinally spaced on said central portion;
 - c. first and second elongate arms on opposite sides of said central portion and having inwardly facing surfaces movably engaging said bearing members, said arms extending longitudinally and having outer end portions in opposite directions from said body member, said arms each having outwardly facing surfaces;
 - d. guide members mounted on said leg members and having movable engagement with respective outer surfaces of said first and second arms and cooperating with said bearing members to maintain said arms movably mounted in parallel relationship, said leg members and guide members urging the respective arms laterally toward the bearing members;

- e. means on outer end portions of each of the arms for engaging a vehicle frame to be straightened and supporting said arms and body member thereon; and
- f. a sight member mounted on said body member.

4,006,533

TREATING GAS AND GRANULAR MATERIAL IN PANEL BED

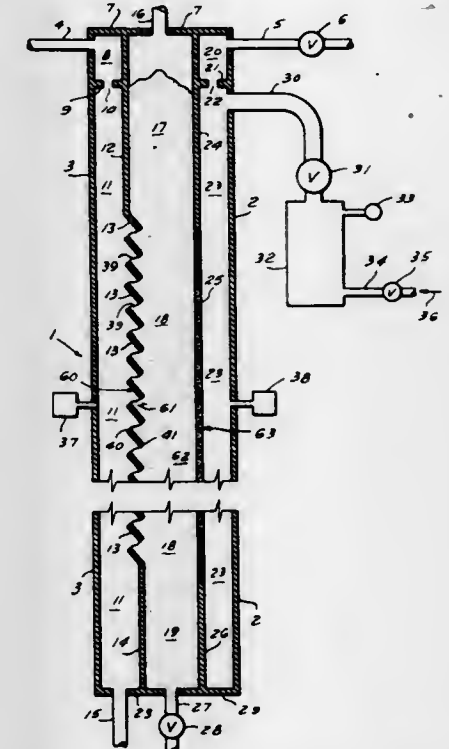
Arthur M. Squires, 245 W. 104th St., New York, N.Y. 10025

Filed Aug. 28, 1974, Ser. No. 501,276

Int. Cl.² F26B 3/00

U.S. Cl. 34—33

3 Claims



1. A method of contacting gas and granular material with each other to effect physical or chemical treatment of at least one of them, comprising:
 - a. arranging granular material having apertured outer walls in a bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces substantially contiguous with said outer edges and said bed having gas exit portions spaced from said inner edges;
 - b. forwardly flowing gas in a substantially continuing flow during said treatment through the gas entry portions of the granular material bed and outwardly from the gas exit portions to effect said treatment of one of said gas and granular material;
 - c. thereafter causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (b); and
 - d. causing said transient reverse flow to produce first, a rise in the pressure difference at a given rate of rise between the gas exit portions and the gas entry portions and subsequently a fall in the pressure difference between the gas exit portions and the gas entry portions, said pressure difference produced by said transient reverse flow remaining greater than a first critical minimum difference for a time interval between about 5 and about 50 milliseconds, said first critical pressure difference being that at which a steady flow of gas in said reverse direction just produces a localized spill of granular material from the gas entry faces, and the pressure difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in the reverse direction producing said pressure difference at said given rate of rise just initiates a body movement of the granular material supported by said members toward the gas entry faces to spill a portion of the granular material from the bed.

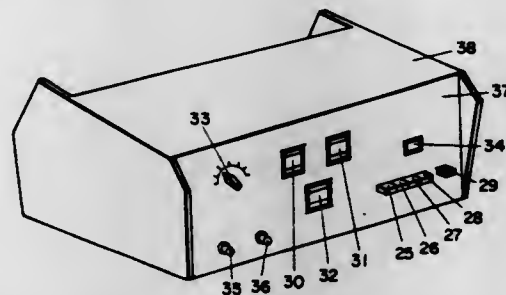
4,006,539

DEVICE FOR TESTING OF A SUBJECT'S ALERTNESS AND RATE OF PERCEPTION Waclaw Kazimierz Slomski, 426 Wilkinson St., Syracuse, N.Y. 13204

Filed Jan. 28, 1975, Ser. No. 544,204
Int. Cl.² G09B 19/00

U.S. Cl. 35—22 R

7 Claims



1. A device for testing alertness and the rate of perception which comprises:
 - a plurality of separate substantially identical visual signal means;
 - a separate substantially identical hand operated response means associated with an immediately proximate each said signal means;
 - a counter means;
 - a timer; and
 - control means for performing the functions of causing said signal means individually to emit signals one by one in a random sequence at a predetermined relatively rapid constant frequency and for a predetermined length of time governed by said timer and causing said counter means to record the number of total times in said length of time that said response means are individually activated while the individual signal means corresponding to the activated response means is emitting signals.

4,006,540

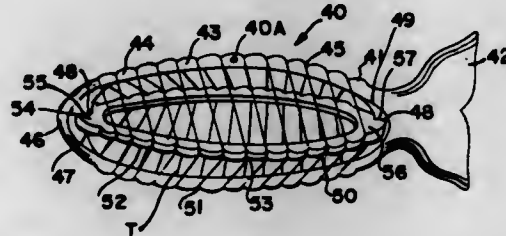
FILAMENT WINDING CRAFT

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Sept. 19, 1975, Ser. No. 615,129

Int. Cl.² B44F 7/00

U.S. Cl. 35—27

7 Claims



1. An assembly toy and craft comprising in combination:
 - a first member shaped in the configuration of a closed frame and having integrally formed therein of the material thereof a plurality of irregular formations which are configured to receive and retain a filamentary material,
 - a second member of sheet-like configuration and having the peripheral border portions thereof shaped with a plurality of irregular formations for retaining a filamentary material,
 - respective inside edge portions of said first frame member and outside edge portions of said second frame member being configured to permit the frictional assembly and retention of said second frame member within and across the inside of said first frame member whereby most of the border portions of said second frame member extend laterally outwardly of said first frame member and wherein said irregularly shaped formations of said first and second frame members are exposed to and may serve

as guides for a filamentary material such as a thread, metal wire or flexible plastic filament which is wrapped around the assembly a number of times and may be retained by the side surfaces of said irregular formations as a plurality of turns of a winding of said filamentary material around the assembly of said first and second members wherein each of said turns is substantially fixed in location on the assembly with respect to the other turns of filamentary material.

4,006,541

TACTILE LEARNING DEVICE

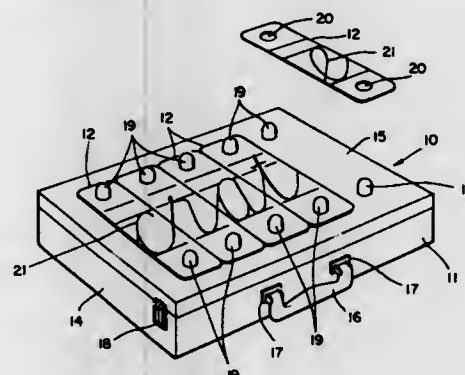
Richard Lee Miller, Box 485, Lindsborg, Kans. 67456

Filed Dec. 9, 1975, Ser. No. 639,206

Int. Cl.² G09B 1/10

U.S. Cl. 35—35 H

1 Claim



1. A tactile learning device for the programmed education of children, particularly retarded or more advanced children, in primary skills, including printing, writing, and mathematics, the device comprising in combination:
 - a conventional tape cassette player to provide audio instructions to a child;
 - a conventional storage and carrying case with compartments built therein for holding learning and stimulus cards, with the carrying case being provided with a series of pegs on the outside of the lid thereof for the attachment of learning cards thereto;
 - a series of learning cards with raised letters, numbers or symbols provided in contrasting colors so as to provide both visual and tactile perception of a word or formula to be learned, said learning cards having holes therein to match the pegs on the outside of the lid of the case to permit a correct arrangement of letters, numbers or symbols in forming a continuous word or formula;
 - and a series of stimulus cards with a given word, formula, etc. being imprinted in skewed fashion on one side thereof to show the letters, numbers or symbols required to form a given word or formula, with the answer on the reverse side of the stimulus card being provided with the proper arrangement of the letters, numbers or symbols to match the proper arrangement of the learning cards when affixed to the top of the lid of said storage and carrying case;
 - said learning cards constructed of rigid material, such as plastic, wood, or thick paper, with dimensions of approximately 8 inches long by 3 inches wide to provide easily seen and manually handled learning cards for instructional purposes.

4,006,542

SHOE INSOLE OF A SOLID CRYSTALLINE POLYMER Lester M. Larson, Wilmington, Del., assignor to Larson Corporation

Filed Nov. 4, 1974, Ser. No. 520,730

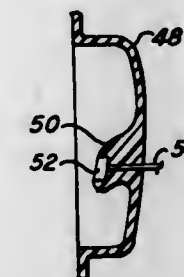
Int. Cl.² A43B 13/38; B32B 27/06

U.S. Cl. 36—43

8 Claims

1. A shoe insole comprising a heat deformed sheet of solid crystalline polymer of a solid polyolefinic compound, selected

from the group consisting of transpolyisoprene, polychloroprene and each of said polymers with polybutadiene heat softenable at about 60° C and higher and hardenable by crystallization to rigid hardness upon cooling to about 40° C, said



polymer being formed into a sheet sized and shaped to fit as an insole in a shoe and molded in its heat softened state at a body comfortable temperature to at least a portion of the wearer's foot.

4,006,543

SKI BOOTS PROVIDING AMPLIFICATION OF EDGING ACTION

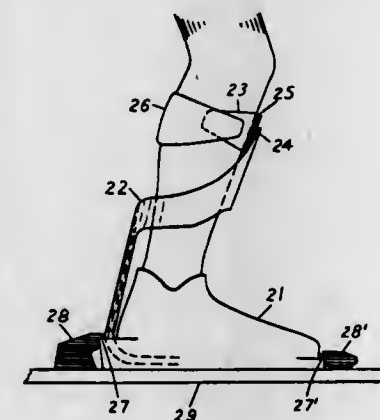
Daniel Post, P.O. Box 408, Averill Park, N.Y. 12018

Filed Oct. 7, 1975, Ser. No. 620,412

Int. Cl.² A43B 5/04

U.S. Cl. 36—121

27 Claims



1. A ski boot for association with a ski, providing amplification of edging action, comprising
 - a first means for holding the foot of a skier,
 - a lever having high lateral stiffness extending up from said first means to the front of the lower leg of said skier,
 - a second means connected to an upper portion of said lever to engage a front portion of said leg to restrict forward and lateral motion of said lever with respect to said front portion of said leg,
 - a third means engaging said leg to restrict rearward motion of said leg with respect to said lever,
 - and a fourth means whereby a ski may be firmly secured to said boot,
 - wherein the construction of said lever and the construction of structural elements connecting said lever and said fourth means provides very large resistance to lateral angular motion of said lever with respect to said ski when said ski is secured to said boot,
 - characterized by an absence of substantial restriction of rotation of said lower leg about an axis through the front of said lower leg.

4,006,544

REPLACEABLE CUTTING EDGE ASSEMBLY

Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 12, 1975, Ser. No. 576,780

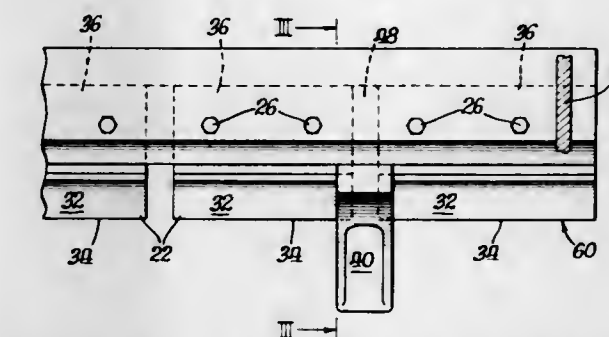
Int. Cl.² E02F 9/28

U.S. Cl. 37—141 T

8 Claims

1. A replaceable cutting edge assembly for an earthmoving bucket having a floor, comprising:

a plurality of cutting edge sections arranged along a leading edge of the bucket floor, each cutting edge section including a wedge shaped portion extending forwardly from the leading edge of the bucket floor to define a cutting edge and a flange extending rearwardly from the wedge shaped portion to form a junction therewith, each said flange underlapping the bucket floor, the flange and the bucket floor defining holes alignable one with the other for receiving bolt means to secure the cutting edge section in place, each cutting edge section also including a rearwardly facing stepped surface at the junction between the wedge shaped portion and the flange, the stepped surface being spaced apart from the leading edge of the bucket floor to form a space therebetween and a digging tooth arranged at a juncture between each adjacent set of cutting edge sections, each digging tooth being



formed with a generally wedge shaped tooth section extending forwardly of the wedge shaped portions of the cutting edge sections, a rearwardly extending overlapping portion of each tooth being configured to overlap the wedge shaped portions of the cutting edge sections with a vertically arranged, non-apertured tang extending downwardly from the rearwardly extending portion to fill the space between the leading edge of the bucket floor and the stepped surfaces of the two adjacent cutting edge sections, each digging tooth further including a rearwardly extending underlapping portion associated in an underlying relation with the bucket floor, said tang extending sufficiently downwardly to retain the tooth on the cutting edges, whereby the tang and the underlapping portion cooperate with adjacent cutting edges to retainably associate each tooth with the bucket.

4,006,545

DISPLAY DEVICE

William Mathews, 22, Queenscourt, Wembley Park, Middlesex, England

Filed Apr. 14, 1975, Ser. No. 567,809

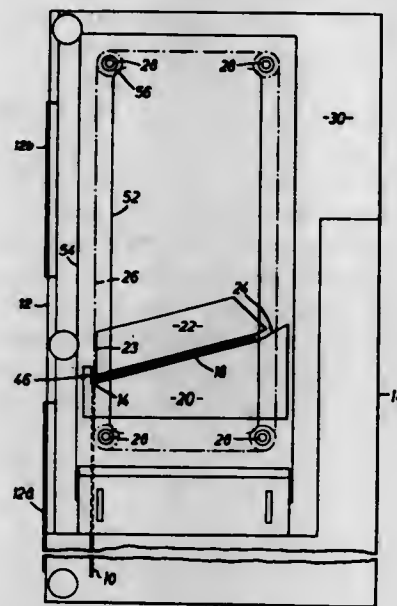
Int. Cl.² G09F 11/30

U.S. Cl. 40—36

7 Claims

1. A display device having a viewing aperture, front, back and two sides, including: a series of cards each bearing the information to be displayed, a series of support member each having two ends, each of said cards being secured to a single support member between its ends, means within the device providing an inclined surface sloping downwardly and forwardly towards the front of the device and disposed at one side of the device and a corresponding inclined surface disposed opposite and at the other side of the device such that each of said ends of the support member rests respectively on one of said sloping surfaces, a pair of continuous loops operably connected one at each side of the device, drive means for controllably driving the loops in synchronism around loop guide members defining a circuit within the device, a series of square shaped pick-up elements secured at their centers along each loop, said elements having means for engaging and lifting respective ends of each support member in a manner such that consecutive pairs of said elements are in horizontal alignment, guide means for each series of square shaped pick-up elements comprising parallel guide rails shaped and positioned to allow

the pick-up elements to move therebetween and around a closed circuit as the loops are driven but substantially to



prevent the elements tilting or pivoting relative to their associated guide means.

4,006,546

BACK-LIGHTED DISPLAY ARRANGEMENT

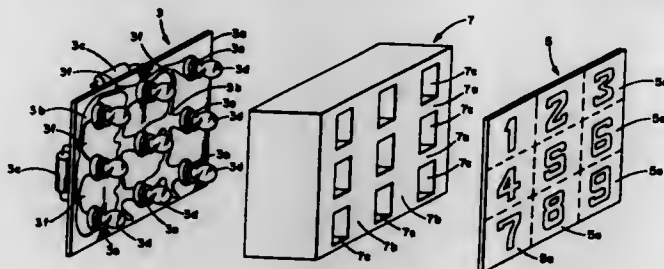
Richard W. Anderson, Reading, and Frederick F. Bodenrader, Georgetown, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 19, 1976, Ser. No. 688,058

Int. Cl.² G09F 13/00

U.S. Cl. 40—132 D

5 Claims



1. A back-lighted display arrangement, comprising:
a light source support member supporting a plurality of light source means thereon;
display means including a plurality of display areas each of which is associated with a different one of the plurality of light source means and is arranged to be back-lighted by light emitted by the associated light source means; and
a light baffle of a compressible material compressively sandwiched between the light source support member and the display means for establishing a light seal between the baffle and the light source support member and display means, said compressed light baffle having portions defining a plurality of compartments each arranged to receive a different one of the plurality of light source means whereby light emitted by the light source means is directed onto the display area associated with the light source means.

4,006,547

GARMENT HANGER WITH INDICIA MEANS

Howard Samuels, Brooklyn, N.Y., and Robert Phillips, Fort Lee, N.J., assignors to Warner Packaging Industries, Inc., Kenilworth, N.J.

Filed Oct. 2, 1975, Ser. No. 618,975

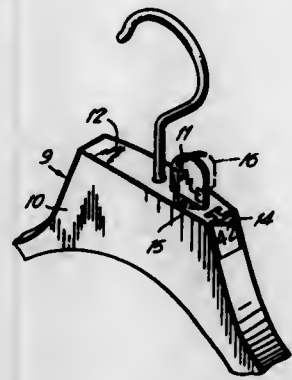
Int. Cl.² G09F 3/00

U.S. Cl. 40—322

7 Claims

1. In combination, a garment hanger of the raised neck type

and indicia means, said hanger and said indicia means including cooperating means for removably connecting said indicia means to said hanger at said raised neck, said indicia means including a substantially planar surface for receiving informa-



tion supplied thereto and said cooperating means including a plug-in member of preselected shape formed integrally as part of said indicia means and a slot of a configuration mating with said plug-in member formed integrally with said hanger, said plug-in member being removably mounted in said slot.

4,006,548

COUNTERBALANCE FOR HANDGUN

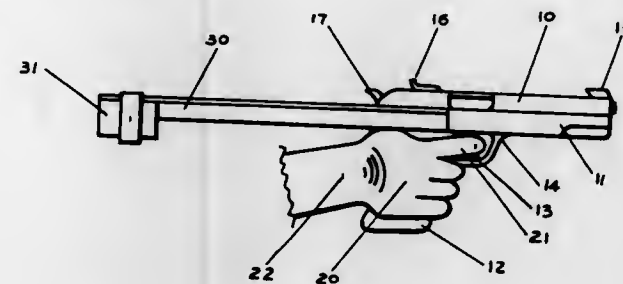
Walter R. Vignini, 1745 Congress Ave., Peekskill, N.Y. 10566

Filed Sept. 4, 1975, Ser. No. 610,098

Int. Cl.² F41C 27/00; F41G 1/38

U.S. Cl. 42—1 W

9 Claims



1. In a handgun having a barrel and a hand grip; said hand grip being adapted for engagement by the hand of the user with the gun held forwardly of the arm and wrist of the user; a counterbalance arm securable to said gun and extending rearwardly of said hand grip in a direction opposite to the barrel; said counterbalance arm being free of the hand, wrist and arm of the user; said counterbalance arm providing a rotative moment rearwardly of the wrist of the user opposite to the rotative moment of the handgun.

4,006,549

PORPOISE-RELEASING TUNA PURSE SEINE

James M. Seabrooke, 1550 Mountain View Ave., Petaluma, Calif. 94952

Filed Mar. 18, 1976, Ser. No. 668,295

Int. Cl.² A01K 73/12

U.S. Cl. 43—14

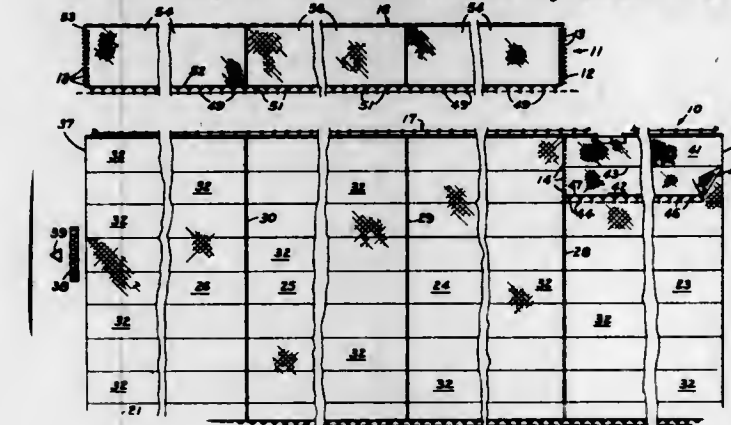
16 Claims

1. A tuna purse seine, comprising:
a main net having an upper corkline and a lower lead line, with purse rings connected to the lead line, most of the webbing of said main net being of a predetermined mesh size suitable for capturing tuna, said net having one area of webbing with a mesh size sufficiently small to avoid damaging and snagging of porpoise coming in contact therewith, said one webbing area being adjacent to one end of the net and extending from the corkline down through a portion of the depth of the net and said one

webbing area including means for releasing porpoise below the water line;

said main net further including a pursing skirt of webbing generally similar in mesh size to said one webbing area of the main net, said skirt depending from the interior side of the main net generally along a line below and spaced from the corkline, its bottom being of less depth than the bottom of the main net, the position of the pursing skirt being such that all of the main net webbing above the pursing skirt is in said one webbing area, said pursing skirt including purse rings along its lower edge;

a porpoise net for connection to the interior side of the main net, of a length generally corresponding to that of the main net less that of the pursing skirt, and of a depth generally corresponding to the depth distance between the corkline and the bottom of the pursing skirt, said porpoise net having, at least in an area adjacent to one end, webbing of mesh size sufficiently small to avoid



damaging and snagging of porpoise coming into contact therewith, said porpoise net including a corkline along its upper edge and a lead line and purse rings along its lower edge; and

means for connecting said one end of the porpoise net to the main net, between the pursing skirt and the corkline, and to the end of the pursing skirt opposite said one end of the main net along a generally vertical line, so that the porpoise net purse rings and the pursing skirt purse rings are generally aligned and continuous for receiving a common purse line;

whereby said porpoise net and pursing skirt may be pursed while said main net is independently pursed, dividing off an upper portion of the enclosed main net space and locating the divided-off portion, when the porpoise net and pursing skirt are pursed, adjacent to the porpoise releasing means so that porpoise trapped therein can be released.

4,006,550

BITE INDICATING FISHING LIGHT

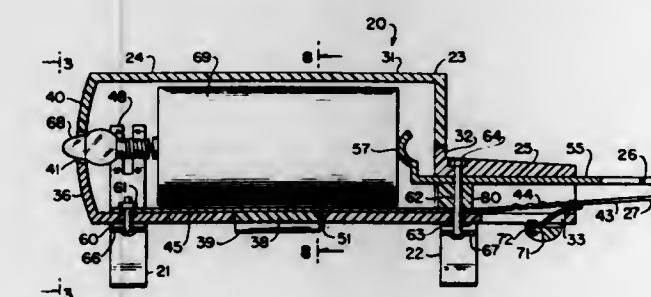
John Rizzo, 1546 W. 11th St., Brooklyn, N.Y. 11204

Filed Dec. 8, 1975, Ser. No. 638,977

Int. Cl.² A01K 97/12

U.S. Cl. 43—17

3 Claims



1. A bite indicating light to be attached to a fishing rod having a reel and a line extending therefrom, said light com-

prising, in combination, a hollow casing having first and second longitudinal halves forming a cylindrical portion having a front and rear end, said front end containing a central opening, an extension from the rear end of said cylindrical portion having a rear opening integrally formed with said first longitudinal half and a longitudinal slot along the bottom thereof, a central longitudinal tubular hinge element integrally formed with said second longitudinal half, and integrally molded fastening means on said longitudinal halves opposite said hinge element; clip means fixed to said first longitudinal half attaching said casing to a fishing rod; a lower hook projecting from said casing adjacent to said rod, said lower hook having a shank extending through said rear opening in said extension, a base from which said shank extends fixed in said first longitudinal half, a longitudinal pin bent from said base entering said tubular hinge element hinging said first and second longitudinal halves together, and upwardly bent lateral extensions of said base at the end of said base remote from said lower hook; a bulb held between said upwardly bent lateral extensions adjacent to said central opening at the front end of said casing; an upper hook projecting rearwardly from said casing above said lower hook terminating directly above said lower hook, said hooks being of conducting material, said upper hook having a shank extending through said rear opening in said extension and an upwardly bent battery contact within said cylindrical portion of said casing; a battery in said casing contacted by and disposed between said bulb and said battery contact; and a switch button slidably mounted in said longitudinal slot of said extension contacting said lower hook shank urging said lower hook upward into contact with said upper hook on the sliding of said button, said fishing line extending through said hooks so that tension on said fishing line pulls said hooks into contact with each other lighting said bulb.

4,006,551

ARTIFICIAL BAITS

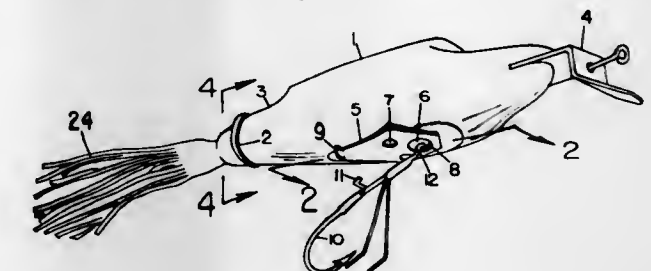
Howard E. Messacar, 696 Durie St., Toronto, Ontario, Canada (M6S 3H3)

Filed July 16, 1975, Ser. No. 596,420

Int. Cl.² A01K 85/00

U.S. Cl. 43—42.04

4 Claims



1. An artificial bait comprising:

a body portion;
a plate member secured to an underside of said body portion, the plate member having an aperture therethrough; the body portion having a blind recess in registry with said aperture;
a wire member having a free end extending upwardly into said recess and terminating in spaced relation to the end of the recess, the wire member being bent in a J-shape within said aperture and having its other end enclosed above the plate member,
and a hook having an eye at one end for engagement over said free end through the aperture.

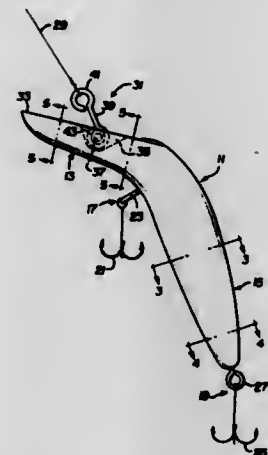
4,006,552 FISHING LURE

Patrick J. Cunningham, 12250 Wayburn Ave., Detroit, Mich. 48224

Filed Oct. 17, 1975, Ser. No. 623,481
Int. Cl.² A01K 85/00

U.S. Cl. 43—42.48

5 Claims



1. A fishing lure comprising a unitary elongated body adapted to loosely suspend hooks therefrom, said body being generally L-shaped and including an elongated head portion and an elongated tail portion, the juncture of said head and tail portions being the widest with the head portion and the tail portion each being provided with a taper near the free end thereof, said head portion having a generally flat upper surface and a plano-convex cross-sectional form throughout its longitudinal extent and a generally arcuate tapered free end, said tail portion having an arcuate convexo-convex cross-sectional form throughout its longitudinal extent, said head portion including an elongated longitudinal slot in said flat upper surface, said slot defining major side wall portions which are generally perpendicular to said flat upper surface and generally parallel to a longitudinal axis through the head portion, a mounting pin extending laterally through said slot and having the ends of the pin rigidly anchored in the major side walls of said slot, said mounting pin being essentially perpendicular to the longitudinal axis of the head portion, an elongated link having a substantially closed loop at one end thereof, said loop being disposed in said slot and being loosely mounted around said pin, said loop having a lateral width less than the lateral width of said slot and being freely movable laterally on said pin along the lateral axis thereof in a direction essentially perpendicular to the longitudinal axis of the head portion, the degree of lateral movement being limited by the major side walls of said slot, the body of said link extending outwardly from said slot and being pivotable about said pin, the other end of said link including means adapted to be attached to a fishing line for permitting a lateral fluttering motion of the tail section when the body is pulled through the water by said fishing line.

4,006,553

FISHING LURE TRAY WITH HINGED COVER

Stephen G. Porter, 1020 NW. 49th St., Fort Lauderdale, Fla. 33313, and Theodore J. Adams, 4280 NW. 10th Terrace, Fort Lauderdale, Fla. 33315

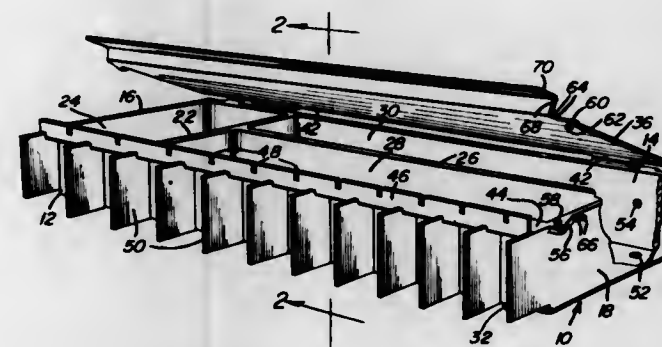
Filed Apr. 22, 1976, Ser. No. 679,313
Int. Cl.² A01K 97/06

U.S. Cl. 43—54.5 R

7 Claims

1. A tray for fishing lures, said tray including upstanding front, rear and opposite side walls and a bottom wall extending between and interconnecting the lower marginal edge portions of said front, rear and opposite side walls, the upper marginal edge portion of said front wall including a generally horizontal forwardly projecting flange extending therealong, a plurality of upstanding ribs carried by said front wall, spaced

longitudinally therealong and projecting forwardly thereof as well as said flange, the forwardly projecting flange terminating forwardly in an upstanding flange whose upper marginal portion is provided with upwardly opening notches each spaced therealong centrally intermediate adjacent ribs, said tray including a cover removably positionable in position closing the upper portion of said tray and including a forward marginal edge overlying the upper marginal edge of said front wall and including an upwardly projecting flange terminating upwardly



in a horizontal forwardly projecting lip overlying said upper marginal portion of said upstanding flange closing the upper portions of said notches from above, said ribs being spaced apart sufficiently to receive the bodies of plug type lures therebetween and said notches being of dimensions to receive the curved portions of the barbed hooks of said lures therein with the barbed portions of said hooks received above said horizontally forwardly projecting flange and between said upstanding flange and said upwardly projecting flange below said lip.

4,006,554

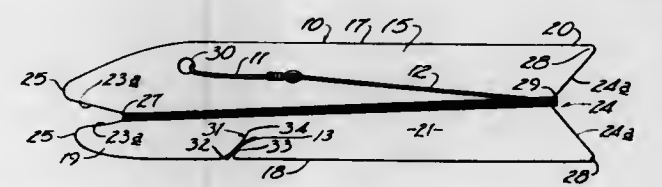
FISHHOOK REMOVER AND LEADER STORAGE DEVICE

Richard P. Tice, 3211 N. Nelson, Spokane, Wash. 99206, and Donald L. Galbraith, 6205 N. Nevada, Spokane, Wash. 99207

Filed July 17, 1975, Ser. No. 596,714
Int. Cl.² A01K 97/06

U.S. Cl. 43—57.5 R

2 Claims



1. A fishhook remover and hook and leader storage device, comprising:
an elongated body having top and bottom longitudinal edges extending between front and back ends and with planar parallel side surfaces joining said top and bottom edges and front and back ends;
a front leader receiving groove formed integrally within the body at the front end thereof extending toward the back end;
wherein the lateral distance between said top and bottom edges is sufficient to enable insertion of said body into the mouth of a fish;
wherein the front leader receiving groove is sufficiently open to enable the groove to receive a fishhook when the body is inserted into the mouth of the fish to assist in a fishhook removal operation;
a back leader receiving groove formed integrally within the body at the back end thereof and extending toward the front end;
a leader end receiving slit extending into the body from the bottom longitudinal edge toward the top edge;
wherein said slit extends in a curve inward and rearward from the bottom longitudinal edge with a diminishing

thickness between slit edges to securely grip a leader end therein; and
an open hook shank receiving hole formed through the body between the side surfaces adjacent the top edge.

4,006,555

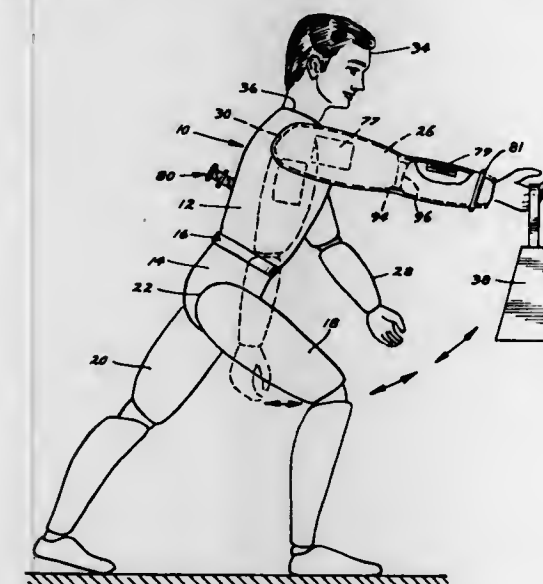
DOLL WITH INCREMENTALLY MOVABLE ARM

Donald E. England; George P. Giordano, both of Cincinnati, Ohio; Garland C. Thompson, Dillsboro, Ind., and James J. Wright, Loveland, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.

Filed June 11, 1975, Ser. No. 585,940
Int. Cl.² A63H 33/00

U.S. Cl. 46—119

20 Claims



1. An articulated toy figure comprising a torso, a head, means for movably connecting said head to the upper portion of said torso, a pair of legs, means for connecting said legs to the lower portion of said torso, a pair of articulated arms, means for connecting said arms to the torso so that they are movable with respect thereto at respective shoulder connections, means for imparting incremental movement to one of said arms relative to said torso from a first position to a second position, said movement imparting means including a transmission system mounted within said torso, said transmission system being operatively connected to said one arm, means for activating said transmission system, means for placing said transmission system in gear whereby rotational movement is imparted to said one arm in increments in response to activation of said transmission system, said means for placing said transmission system in gear permitting said transmission system to be taken out of gear so that said one arm is freely movable.

4,006,556

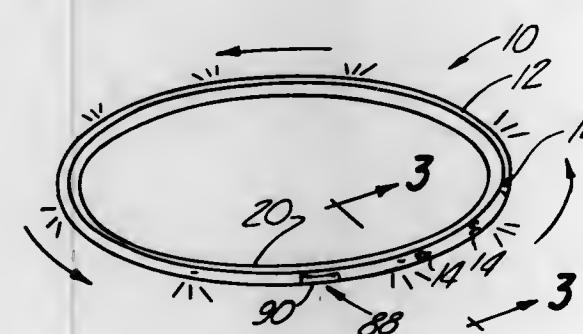
ILLUMINATED HULA HOOP

Mervin R. Williams, 305 E. Jackson Ave., Flint, Mich. 48505

Filed Aug. 11, 1975, Ser. No. 603,343
Int. Cl.² A63H 1/32, 33/26

U.S. Cl. 46—228

6 Claims



1. A hoop toy, comprising:

a. a toroidal member having a hollow interior, the toroidal member comprising:

- a first arcuate wall having a first flange and a second flange, the flanges being diametrically opposed and inwardly directed toward the radial center of the wall,
 - a second arcuate wall having a first flange and a second flange, the flanges being diametrically opposed and inwardly directed toward the radial center of the wall,
 - the first flanges and the second flanges being adapted to be in abutting engagement,
 - locking means associated with the flanges for interengaging the arcuate walls, the locking means comprising a plurality of apertures disposed around one of the first flanges and one of the second flanges and a plurality of projections disposed on the other of the first flanges and the other of the second flanges, the projections of the first flange being received by the apertures of the other first flange, the projections of the second flange being received by the apertures of the other second flange to interengage the arcuate walls, and
- b. means for emitting light disposed in the interior of the toroidal member, the light emitting means comprising a single source of power.

4,006,557

SPROUTING DEVICE

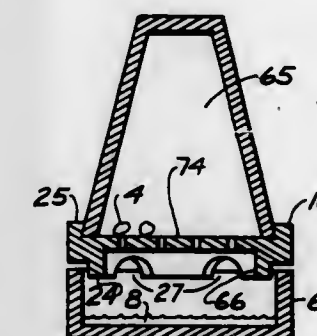
George M. Sawyer, 3435 W. 110th St., Inglewood, Calif. 90303

Continuation of Ser. No. 380,457, July 18, 1973, abandoned.
This application June 30, 1975, Ser. No. 591,656

Int. Cl.² A01G 31/02; B01D 23/00

U.S. Cl. 47—61

4 Claims



- A seed sprouting device comprising
 - an inverted transparent jar having a bottom neck forming an opening, the jar containing water and seeds prior to being inverted, said neck having a bottom level,
 - a screen across said opening, and the seeds retained in the jar above the screen, the jar having a frusto-conical side wall which tapers upwardly and inwardly above the level of the screen, the seeds being sprouted and the sprouts extending as a mass within the jar,
 - an annular body receiving said screen below the bottom level of said neck and projecting horizontally and annularly below said neck, the body defining and extending about an interior, and
 - a receptacle removably supporting said body and extending therebelow, the receptacle defining and extending about an interior, the receptacle and body interfitting annularly to close said interior of the receptacle from the exterior,
 - whereby water in the jar may drain downwardly through said neck opening, said screen and said annular body into said receptacle, while said seeds in the jar are retained above the screen,
 - the body having a depending flange which forms an air inlet to communicate between the exterior and said interior of the body, said flange relieved upwardly from the lower edge thereof to form said inlet, confined at said lower edge,
 - said screen being circular and located in the body,

- h. said body defining annular step shoulders one of which seats the jar neck and the other of which seats on the receptacle, said screen being at the level of one of said step shoulders,
- i. said jar neck, said receptacle and said body adjacent the neck being free of threaded interconnections.

4,006,558

SEEDLING PLANT PROPAGATION CONTAINER

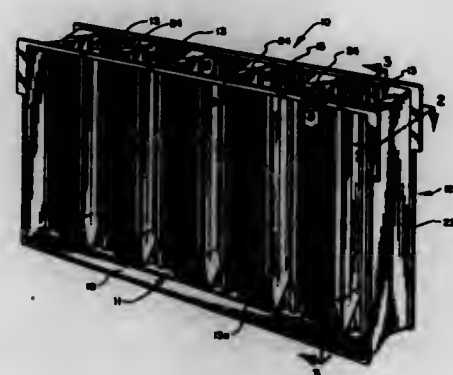
Keith S. Neddo; G. Michael Alder, both of Holaday, and James L. Gwilliam, Jr., Salt Lake City, all of Utah, assignors to Native Plants, Inc., Salt Lake City, Utah

Filed Sept. 11, 1975, Ser. No. 612,370

Int. Cl.² A01G 9/02

U.S. Cl. 47-77

7 Claims



1. A freestanding multiple cavity planting device capable of reuse comprising,
- a. two separate sidepieces of equal dimensions frictionally held together by interlocking means on both sides of each cavity, said interlocking means extending substantially the length of each cavity,
- b. each cavity having an open top, vertical corrugations running from top to bottom around the perimeter thereof and tapering in at the lower portion, terminating in an open bottom which is substantially smaller than the open top,
- c. the extreme lower portion of each sidepiece extending outwardly and downwardly from the open bottom of each cavity thereby forming a freestanding platform base wherein the open bottom of the cavity is above said base.

4,006,559

SELF-IRRIGATING DISPLAY RACK FOR POTTED PLANTS

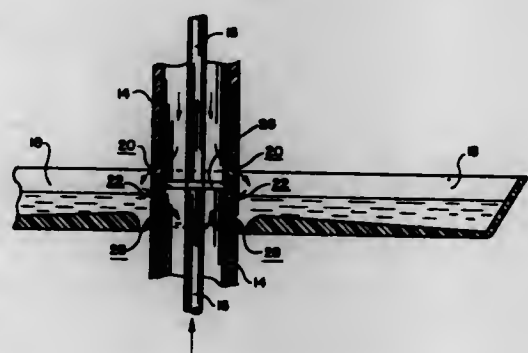
Richard A. Carlyon, Jr., 1000 Sharrow Way, Carson City, Nev. 89701

Filed Sept. 15, 1975, Ser. No. 613,079

Int. Cl.² A01G 27/00; A47G 7/02

U.S. Cl. 47-39

5 Claims



1. A display rack for potted plants, and the like, comprising: a bucket-like base forming a reservoir for irrigating water; an elongated upright tubular member supported on said base and extending upwardly therefrom; a plurality of display dishes mounted in a spaced tiered relationship on said tubular mem-

ber over said reservoir each of said display dishes having a bottom and an open top; a pipeline extending upwardly through said tubular member from the reservoir to the upper end of said tubular member; a pump mounted in the reservoir and having an outlet coupled to the pipeline for pumping irrigating water from the reservoir up through the pipeline; outlet means mounted on said pipeline at the top of said tubular member to direct water out of the pipeline into the interior of the tubular member to be returned to said reservoir through said tubular member; said tubular member having first openings therein directly over each dish supported thereon, and said tubular member further having second openings therein at a predetermined level in each dish supported thereon; and a corresponding plurality of annular plug members mounted within said tubular member coaxially with said pipeline and filling the space between the pipeline and the inner wall of the tubular member, said plug members being respectively interposed between the first and second openings in said tubular member to divert the irrigating water in the tubular member out through the first openings therein and into the display dishes, with the water being returned to the tubular member through the second openings therein after reaching a predetermined level in the individual display dishes so as to cause the display dishes from the top of the display rack down to the bottom thereof to be sequentially filled with irrigating water.

4,006,560

CHRISTMAS TREE STAND

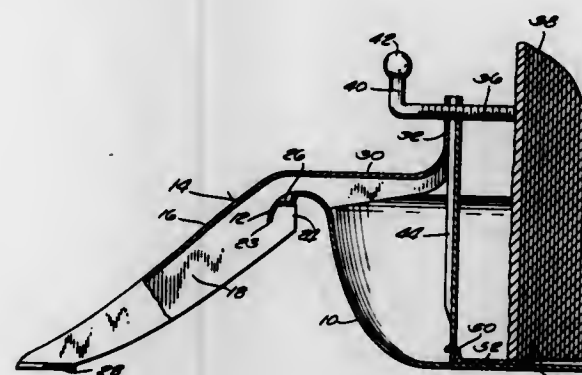
Donald A. Schulz, Milwaukee, Wis., assignor to S-B Manufacturing Co. Ltd., Milwaukee, Wis.

Filed Feb. 9, 1976, Ser. No. 656,555

Int. Cl.² A47G 33/12

U.S. Cl. 47-40.5

6 Claims



1. In a Christmas tree stand having a watering bowl, means stabilizing the tree trunk bottom with respect to the watering bowl, a plurality of legs removably connected at circumferentially spaced locations to the rim of said watering bowl and extending inwardly and outwardly therefrom, and having a tree trunk engaging screw attached to an upper portion of each of said legs, the improvement comprising a link removably connected between said upper portion of each leg and the bottom of said bowl to form a plurality of substantially triangular configurations of supporting members in which each tends to lock the corresponding leg to the rim of said bowl when the corresponding trunk engaging screw is tightened and tends to loosen the connection between said leg and the rim of said bowl when said trunk engaging screw is loosened.

4,006,561

PLANT PACKAGE AND METHOD OF PREPARING THE SAME

Gustav Thoma, Eberbach; Fritz Tcharf, Hassmersheim, and Helmut Astinet, Miltenberg, all of Germany, assignors to Pflanz-Frisch Transportsack GmbH, Hassmersheim (Neckar), Germany

Continuation-in-part of Ser. No. 222,353, Jan. 31, 1972, abandoned. This application Sept. 7, 1972, Ser. No. 286,964
Claims priority, application Germany, Feb. 5, 1971, 2105348

Int. Cl.² A01B 79/00

U.S. Cl. 47-58

12 Claims



1. A method of storing a living plant which comprises:
- a. enclosing said plant in an envelope of sheet material,
1. said envelope being permeable to not more than 30% of incident visible light, substantially impervious to infrared radiation, waterproof, permeable to the gaseous components of atmospheric air, but not substantially more permeable to gaseous oxygen, carbon dioxide, and water vapor than low-density polyethylene film having a thickness of 20 microns;
- b. storing the enclosed plant;
- c. withdrawing the stored plant from said envelope; and
- d. planting the withdrawn plant in soil.

4,006,562

DOOR SYSTEM WITH IMPROVED WEATHERSEAL

Nicholas E. Belanger, Troy; Floyd Bentley, Pontiac, and David C. Geoffrey, Troy, all of Mich., assignors to The Stanley Works, New Britain, Conn.

Filed Jan. 2, 1976, Ser. No. 646,179

Int. Cl.² E06B 1/00, 7/16

U.S. Cl. 49-380

21 Claims



1. In a weathersealed door system, the combination comprising:
- A. a door frame including a pair of spaced jambs, a sill and a header;
- B. a door in said frame;
- C. hinge means mounting one side edge portion of said door to one of said jambs for pivotal movement from a first position within said frame to a second position wherein the opposite side edge portion of said door is disposed outwardly therefrom;

- D. a sill weatherseal member extending along the bottom edge of said door, said sill weatherseal member including a tubular depending portion extending along the width of said door, said depending portion being of a height greater than the spacing between said bottom edge of said door and said sill and being deflected into close engagement with the surface of said sill in said first position of said door;
- E. a header weatherseal member extending across the top edge of said door and being resiliently deflected in said first position of said door;
- F. a first hinge jamb weatherseal member extending along the jamb to which said hinge means is mounted from said header weatherseal member to said sill;
- G. a second hinge jamb weatherseal member extending upwardly from said sill and adjacent said first hinge jamb weatherseal member, said second hinge jamb weatherseal member being fabricated of highly compressible material and of a thickness greater than the spacing between the side edge of the door and the jamb so that it is compressed when said door is in said first position by both the side edge of said door and said sill weatherseal member;
- H. a first latch jamb weatherseal member on the jamb opposite that having said hinge means mounted thereon and extending from adjacent said header to a point spaced above said sill, said latch jamb weatherseal member having a cross section providing a first portion mounted on the jamb and a deflectable portion laterally therefrom for engagement with the surface of said door in said first position thereof and providing an internal channel at least adjacent the sill end thereof; and
- I. a second latch jamb weatherseal member mounted on said opposite jamb and extending upwardly from said sill below said first latch jamb weatherseal member, said second latch jamb weatherseal member having a cross section providing a body portion, a deflectable lip portion projecting laterally from said body portion towards the door and an interseal portion projecting upwardly into said channel of said first latch jamb weatherseal member, said second latch jamb weatherseal member being fabricated of highly compressible material and being compressed by said door in said first position thereof with said lip portion abutting the side edge of the door.

4,006,563

MACHINE FOR MACHINING TWO FACES OF AN OPHTHALMIC LENS

Guy Charlot, Provins, France, assignor to Essilor International (Compagnie Generale d'Optique), Joinville-le-Pont, France

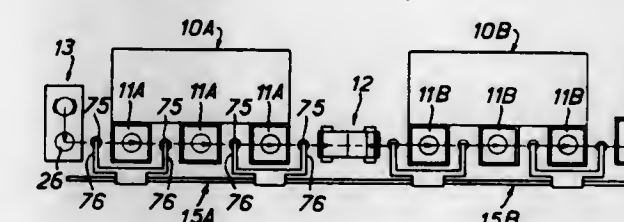
Filed July 7, 1975, Ser. No. 593,458

Claims priority, application France, July 12, 1974, 74.24280

Int. Cl.² B24B 47/02, 13/02

U.S. Cl. 51-109 R

9 Claims



1. A machine for sequential machining of two faces of an ophthalmic lens, comprising a first work station group for machining one face of each lens, a second work station group for machining the other face of each lens, transfer means for effecting advance of lenses from said first work station group to said second work station group, a lens turn-over station disposed in series between said first and second work station groups, said lens turn-over station including a conveyor means and a tipping rod disposed transverse to the direction of for-

ward movement of said conveyor means, said transfer means being operative to pick up the lens machined at said first working station group and to release said lens above and to the upstream side of said tipping rod relative to said direction of forward movement of said conveyor means with the periphery of the lens on the downstream side of said lens approximately in alignment with the tipping bar, whereby said periphery of the lens strikes said tipping rod and then an opposite portion of said lens falls onto said conveyor means which then moves said opposite portion in said direction of forward movement relative to said periphery thereby to turn the lens over.

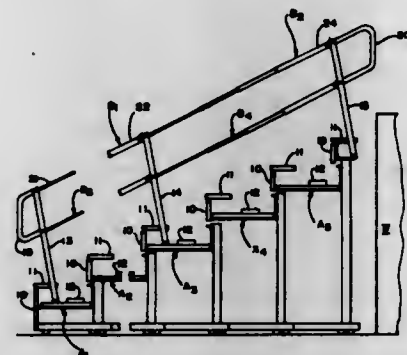
4,006,564

FOLDABLE HAND RAIL AND SEATING STRUCTURE
Harold Wiese, North Highland, P.O. Box 236, Madison, S. Dak. 57042

Filed Jan. 21, 1976, Ser. No. 650,841
Int. Cl.³ E04H 3/12

U.S. Cl. 52-9

12 Claims



1. A hand rail or the like in combination of multiple seating sections which fold from a normal seating configuration to a generally vertical storage position, comprising at least two spaced posts, means for attaching the lower ends of said posts to spaced seating sections, and a rail member having its one end pivotally connected to one of said posts, the second of said posts having an extension attached thereto which is movable upwardly of said second post, the other end of said rail member being pivotally connected to said extension, whereby when said one of said spaced seating sections is moved toward the other said extension may move upwardly of said second post.

4,006,565

SQUASH COURT CONSTRUCTION

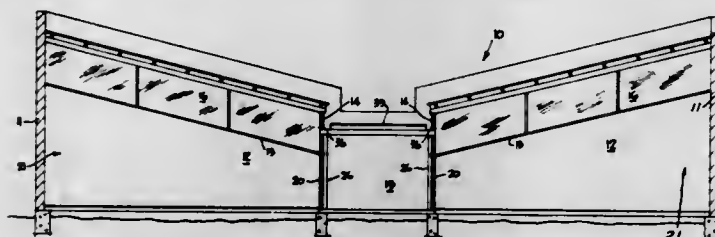
Graham Ralph Thompson, and Dean Henry Stone, both of 125 Glenn Osmond Road, Eastwood, South Australia (5063)

Filed Oct. 17, 1975, Ser. No. 623,470

Int. Cl.³ E04B 7/12; A63B 69/38

U.S. Cl. 52-18

8 Claims



1. A building containing a plurality of squash courts, comprising two spaced parallel outer side walls, two parallel outer end walls extending between the side walls and each at right angles thereto, two outer roof portions extending between the end walls and terminating at their adjacent edges above spaced parallel clerestory windows, glass walls below the clerestory windows defining between them a central gallery which extends parallel to said side walls,

a central roof portion over the gallery, and division walls parallel to the end walls and extending between the side walls and the gallery glass walls defining therebetween said plurality of squash courts, arranged in two rows one on each side of the gallery.

4,006,566

ARCHITECTURAL SYSTEM

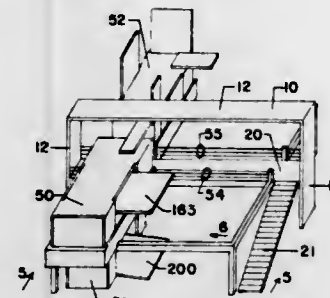
Kreso Forgiarini, 2998 N. Lake Ave., Altadena, Calif. 91101

Filed May 30, 1974, Ser. No. 474,356

Int. Cl.³ E04B 1/345

U.S. Cl. 52-64

32 Claims



1. An architectural system including a pair of main vertical columns in spaced relationship and joined by a generally horizontal elevated beam; said horizontal beam supporting a gallery of sufficient width to allow pedestrians passage; at least one pair of additional columns in spaced relationship joined by a generally horizontal beam and constituting a secondary frame; said horizontal beam being at generally the same elevation as the beam of said main frame; at least one cubicle supported by said main beam and the beam of said secondary frame for movement in the direction generally parallel to the longitudinal direction of said beam of the main frame and a beam of said secondary frame; means for providing pedestrian access between the level of the base of said columns and said gallery; said cubicle including at least one rotatable wall; said rotatable wall including shaft means horizontally mounted with respect to said cubicle and journaled for rotation with respect to said cubicle to rotate said wall; and means mounting said shaft for vertical movement with respect to said cubicle whereby said wall may be rotatable at different vertical levels.

4,006,567

MOVABLE CEILING DEVICE

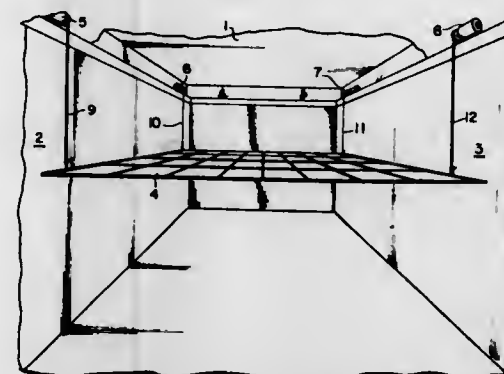
Joe W. Flannery, Toronto, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 14, 1975, Ser. No. 621,815

Int. Cl.³ E04B 5/52

U.S. Cl. 52-126

2 Claims



1. A movable ceiling device for a room having a ceiling and

a pair of opposite spaced substantially parallel walls, said ceiling device comprising

a false ceiling;
a plurality of brackets affixed to the opposite walls a close distance beneath the ceiling in mutually spaced relation;
a plurality of motors above the false ceiling and mounted on the brackets;
a plurality of pulleys, each coupled to, and rotated in opposite directions by, a corresponding one of the motors; and
a plurality of cable-type support members each having a first end affixed to the false ceiling at a corresponding point thereof and a second end affixed to a corresponding one of the pulleys in a manner whereby the false ceiling is supported in substantially parallel spaced relation with the ceiling of the room and is selectively varied in its distance from the ceiling of the room by operation of the motors.

4,006,568

BI-LAMINAR PRE-FINISHED WALL ELEMENT AND METHOD OF ASSEMBLING SAME

Peter Pertl, Tulpenweg 3, D-82 Rosenheim, Germany

Continuation of Ser. No. 581,352, May 27, 1975, abandoned.

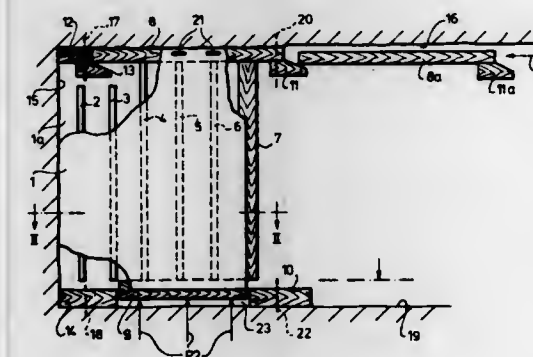
This application Apr. 30, 1976, Ser. No. 682,101

Claims priority, application Germany, May 25, 1974, 2425432

Int. Cl.³ E04B 2/80, 2/88

U.S. Cl. 52-241

5 Claims



1. Merging inner wall units for installation in building structures to have finished floors and ceilings and consisting of at least first and second prefabricated wall units, each unit having two opposed outer sheet surfaces separated by spacing members forming a frame and wherein the top and bottom edge surfaces of the wall units are provided with continuous ceiling grooves and floor channels respectively, said grooves and channels each being respectively arranged to accept a ceiling slat and a fixed floor slat of approximately corresponding rectangular cross-section, the floor slat being a part of said frame, and said ceiling slat being further arranged to be fastened to the room ceiling, said wall units being characterized in that:

- each wall unit comprises a lateral remote vertical edge and a lateral proximal edge, a ceiling inner starter slat piece having a portion projecting over the remote edge of the wall unit within said ceiling groove, with the remaining portion of said ceiling groove being arranged to receive the ceiling slat of the said wall unit, with said proximal end of said ceiling slat having a projecting portion with a projecting wedge protrusion extending slopingly downwardly and over the lateral remote vertical edge of the adjacent wall unit to be subsequently installed for receiving a ceiling slat associated with said adjacent wall unit to be subsequently installed;
- each wall unit having a floor slat element therein, said floor slat element having a length less than the width of the wall unit to which it is attached, said floor slat element being disposed along a substantial portion of said wall and extending to said proximal vertical edge and cooperating with an extension segment extending longitudinally out-

wardly from said floor slat, the proximal end of said floor slat having a wedge surface extending slopingly upwardly, and the opposed end surface of said segment having a corresponding wedge surface extending slopingly downwardly, said extension segment being arranged for accepting the floor channel of an adjacent wall unit to be subsequently installed, and being further adapted to be disposed horizontally adjacent the complementary wedge surface of said floor slat for raising said first wall unit upwardly from the floor surface.

4,006,569

PANEL MOUNTING

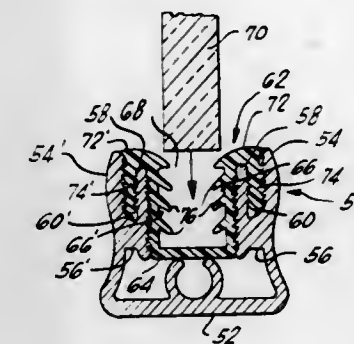
Oscar Kaln, Van Nuys, Calif., assignor to Monarch Mirror Door Co., Inc., Van Nuys, Calif.

Filed Oct. 2, 1975, Ser. No. 619,019

Int. Cl.³ E04B 1/62

U.S. Cl. 52-397

10 Claims



1. A channel and a gasket assembly for mounting an edge portion of a panel comprising:
a channel member having an elongated supporting base and an upstanding wall extending longitudinally along one edge of said base and defining a recess therewith for receiving an edge portion of a panel; and
a resilient gasket adapted to be received in said recess to provide a protective surface therein, said gasket having a web and an upstanding side wall to conform with said recess, said gasket side wall carrying a flap;
said channel member further having means forming a longitudinal slot intermediate the upper edge of said upstanding wall and the juncture with said base, said slot opening adjacent to and parallel with the upper edge of said upstanding wall, whereby said flap of said resilient gasket is fully inserted into said slot in a continuous and coextensive engagement therewith to firmly secure said resilient gasket in said channel member.

4,006,570

WALL STRUCTURE AND MANUFACTURING METHOD THEREFOR

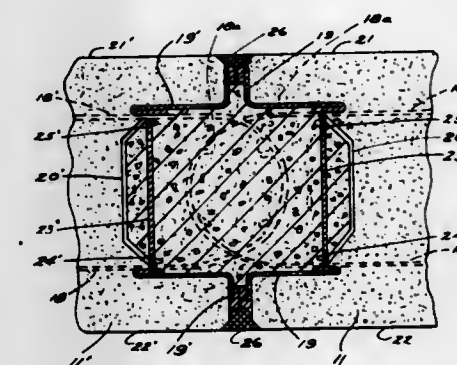
Owen M. Stolz, 845 W. Centerville Road, Dayton, Ohio 45459

Filed Apr. 1, 1974, Ser. No. 456,713

Int. Cl.³ E04B 2/00

U.S. Cl. 52-432

3 Claims



1. A structural component for use in erecting a frameless structure comprising

a panel formed of a cement material and having a pair of opposed surfaces with a peripheral edge portion extending between said surfaces, reinforcing mesh members extending through said panel and disposed closely adjacent each of said surfaces, a separator member disposed between said reinforcing members and extending along said peripheral edge portion, a truss-like member interconnected to and between said reinforcing mesh members at a location between said edge portion and said separator member and extending along the extent of and adjacent said edge portion, and walls extending between said edge portion and said separator member and defining therewith a channel disposed between said opposed surfaces and extending along said peripheral edge, said reinforcing mesh members each having curved distal ends disposed between said channel-defining walls and projecting outwardly from said separator member and beyond said peripheral edge for connection to another member when said latter member is disposed in said channel.

4,006,571

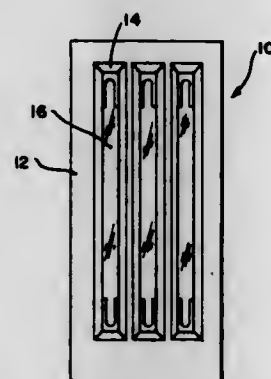
MOUNTING ASSEMBLY WITH IMPROVED FASTENER
William M. Burak, Middletown, Ohio, assignor to Pease Company, Fairfield, Ohio

Filed Apr. 30, 1976, Ser. No. 681,793

Int. Cl.³ E06B 3/58; E04F 19/06

U.S. Cl. 52—498

9 Claims



1. In a mounting assembly for supporting a panel in a receiving opening in a frame, including a pair of complementary molding members each having an outer rim sized to seat on an annular surface area of the frame surrounding the opening in which a panel is to be supported, an inner rim sized to seat on an annular surface area adjacent the periphery of a panel supported in the opening, and an intermediate portion interconnecting said inner and outer rims, the improvement comprising:

opposed, aligned studs projecting from said molding members towards each other, tubular clip means interconnecting said opposed aligned studs, said tubular clip means including cylindrical portions receiving said opposed, aligned studs, and wing portions projecting from said cylindrical portions of said clip means for supporting an edge of a panel engaged by said inner rims of said molding members.

4,006,572

SECURITY FRAME AND MIRROR ASSEMBLY
Earl L. Morris, Whittier, Calif., assignor to Acorn Engineering Company, Industry, Calif.

Filed Nov. 13, 1975, Ser. No. 631,448

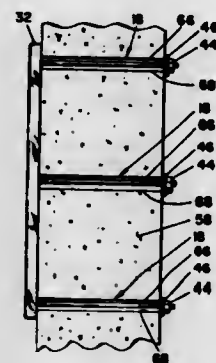
Int. Cl.³ A47G 1/16; E04B 1/38

U.S. Cl. 52—506

14 Claims

1. A security frame and mirror assembly for mounting to a wall, comprising:

- a. frame means including a sidewall with a flange thereabout;
- b. receptacle means secured directly to the back face of said flange;
- c. mirror means adapted to be nested between said receptacle means and the free edge of said flange; and



- d. anchoring means passed through the mounting wall for securing said receptacle means to said wall, whereby the anchoring means is not accessible, and, consequently, is not removable from the side of the wall to which the frame means, mirror means and receptacle means are mounted.

4,006,573

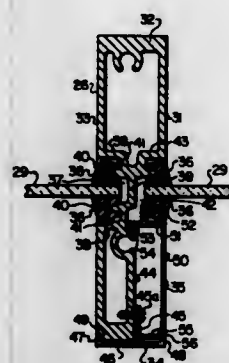
NARROW FRAME WALL STRUCTURE
Lawrence F. Blebueck, Dallas, Tex., assignor to Howmet Corporation, New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,838

Int. Cl.³ E04C 3/32; E04B 1/48; E06B 1/04

U.S. Cl. 52—732

7 Claims



1. A vertical mullion especially adapted for use in a narrow wall framing system comprising:

a mullion base piece which is generally rectangular in cross section with one quadrant of the rectangle omitted, and having a first glazing pocket formed in a long side thereof and one side and the floor of a second opposed glazing pocket formed on the long side whereat the quadrant is omitted;

a mullion stop attached to said mullion base piece at the short side thereof whereat the quadrant is omitted, said mullion stop being proportioned to establish a length for said short side substantially equal to the length of the other short side of the mullion base piece;

and a mullion filler attached to said mullion base piece at the long side thereof whereat the quadrant is omitted, and attached to said mullion stop, said mullion filler having the other wall of said second glazing pocket formed therein.

4,006,574

METHOD OF FORMING A CONSTRUCTION OF BUILDING SUBSTRUCTURES

Cornelia van der Lely, 7, Bruchsehrain, Zug, Switzerland
Continuation of Ser. No. 393,023, Aug. 30, 1973, abandoned.

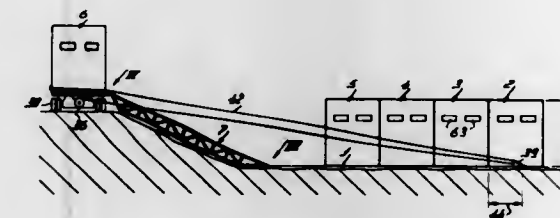
This application June 30, 1975, Ser. No. 591,947

Claims priority, application Netherlands, Sept. 1, 1972, 7211909

Int. Cl.³ E04B 1/35; E04G 21/00

U.S. Cl. 52—742

23 Claims



1. A method of forming the substructure of a building constructed by being assembled from prefabricated box-shaped elements each having dimensions compatible with being transported on highways by transport vehicles, the method comprising the steps of:

excavating a building site at a desired level below that of the surrounding terrain;

forming a concrete slab in said excavation which has a flat horizontal upper surface and a shape and area which substantially corresponds to the lower portion of the building to be erected;

transporting on a transport vehicle which is provided with winch means, at least one elongated three-dimensional concrete substructure section intended for the substructure of the building to adjacent said excavation whereby the longitudinal axis of said substructure section is substantially parallel to the place it will occupy in the completed building and its shorter ends are substantially in the same plane as they will occupy in the completed building;

providing at least two parallel bridge members directly between and connected to the portion of said transport vehicle carrying said substructure section and said concrete slab;

connecting pulley means adjacent the remote end of said slab on either side of the place said substructure section will occupy in the finished building and providing a pair of flexible members each engaging a separate said pulley with one end of each said flexible member connected to the longer side of said substructure section which is most remote from said concrete slab, the other end of each said flexible member being connected to said winch means;

displacing said substructure section across said bridge members and said concrete slab to its desired place in the building by winding each said flexible member by said winch means;

disengaging said bridge members from said transport vehicle and transporting further concrete substructure sections to substantially the same position described for said first mentioned substructure section and by the same steps heretofore described for displacing said first mentioned substructure, displacing each said further substructure section to its desired position on said slab in the completed building whereby said substructure sections are in an abutting relationship with one another and the substructure of the building is substantially completed.

4,006,575

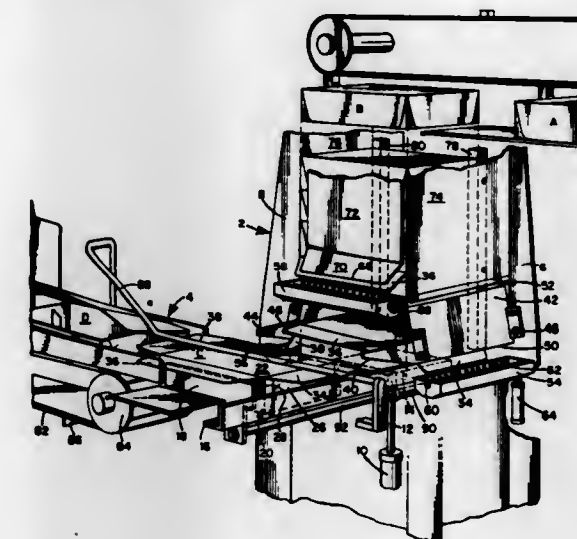
CARTON SEALING MACHINE

Richard G. Lee, Boston, Mass., assignor to Econocorp, Inc., Needham Heights, Mass.

Filed Nov. 4, 1975, Ser. No. 628,739

Int. Cl.³ B65B 7/20

9 Claims



8. The method of treating a succession of cartons whereby the lid of each carton is secured to the carton body in which each said lid has oppositely disposed and extended end flaps and an extended front flap which flaps are to be glued to their respective panels when the lid is closed, said method comprising the steps of

closing the lid of a first carton,

applying glue to the extended end flaps of the lid while the carton is at a first location,

pressing the said end flaps against their respective panels while moving the carton upward to another location,

placing a second carton in said first location with its lid closed and said end and front flaps extended,

simultaneously applying glue to the front flap of said first carton and to the end flaps of said second carton, then moving said first and second cartons simultaneously upward to a third location and said second location respectively while at the same time pressing the front flap of the said first carton against its related panel and pressing the end flaps of said second carton against their related panels,

placing a third carton in said first location with its lid closed and said end and front flaps extended and then repeating the aforesaid steps with respect to the cartons then located in said first and second locations.

4,006,576

APPARATUS FOR PACKAGING FLAT FLEXIBLE WORKPIECES, PARTICULARLY BAGS OR SACKS, IN ENVELOPING BAGS

Konrad Tetenborg, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich, Westphalia, Germany

Filed Mar. 18, 1976, Ser. No. 668,305

Claims priority, application Germany, Mar. 20, 1975, 2512277

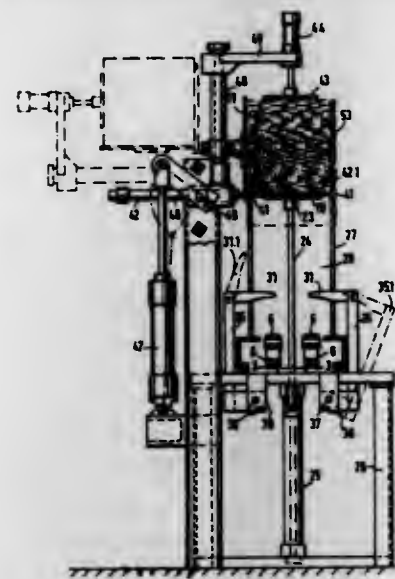
Int. Cl.³ B65B 63/02

U.S. Cl. 53—124 B

7 Claims

1. Apparatus for packaging flat flexible workpieces, particularly bags, sacks or packets of sacks, which are stacked in a shaft, in enveloping bags that are inverted over the shaft, comprising a slide reciprocable in the shaft and a backing member disposed above the shaft, characterised in that the slide consists of supporting bars (19 to 22) of upwardly open U-section steel, and that retaining bars (42.1) are provided at the top of the shaft and insertable therein, the retaining bars being insertable in the U-sections of the supporting bars when

the slide is extended and being, together with their driving and supporting means (42) as well as the supporting means (48,



49) of the backing member (43), fixed to a shaft (45) which is pivotally mounted in the frame (26).

4,006,577

GUM STICK WRAPPING MACHINE

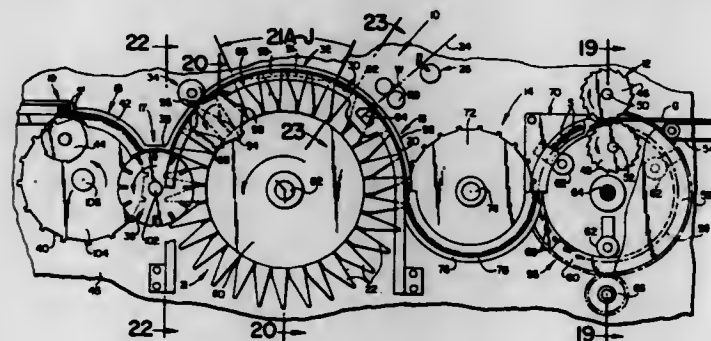
Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed June 11, 1975, Ser. No. 586,092

Int. Cl.² B65B 11/36

U.S. Cl. 53-171

26 Claims



1. A gum stick wrapping machine comprising a gum stick breaker mechanism including a rotary gum stick transfer mechanism for continuously conveying gum sticks away from said breaker mechanism, a first rotary folder including means defining an arcuate first folding channel communicating with said rotary stick transfer mechanism for receiving each successive stick therefrom, a first rotary element journaled for continuous rotation relative to said first folding channel and having a series of circumaxially arranged and radially outwardly extending flights for engaging sticks in said channel to continuously convey the sticks therealong, said first folding channel having first folding means for folding an inner wrapper to a generally U-shaped configuration about a stick advancing therein to fold one end portion of the inner wrapper against the lower face of the stick to bring the other end portion of the inner wrapper into trailing relation with the upper face of the stick and the opposite side marginal portions of the inner wrapper into outwardly extending relation to the opposite ends of the stick, second folding means associated with said first folding channel for engaging and folding the side marginal portions of the inner wrapper downwardly relative to the stick and against the opposite ends thereof and tucking the side marginal portions inwardly toward each other and below the lower face of the stick and into trailing relation with the lower face as the partially wrapped stick is advanced within said folding channel by said first rotary element, third folding means associated with said folding channel for engaging the trailing portions of the inner wrapper and folding the trailing

portions of the previously folded and tucked side marginal portions upwardly relative to the stick and against the trailing edge of the stick and into face engagement with the lower surface of the trailing upper end portion of the inner wrapper as the partially wrapped stick is continuously advanced within said first folding channel by said first rotary element, and drive means for continuously rotating said first rotary element in timed relation to said breaker mechanism and said gum stick transfer mechanism.

4,006,578

CONVEYOR FOR CONVEYING CAPSULES IN MACHINES FOR FILLING SAID CAPSULES WITH DOSES OF PULVERULENT OR GRANULAR PRODUCT

Ernesto Gamberini, via Udine, 6, Bologna, Italy

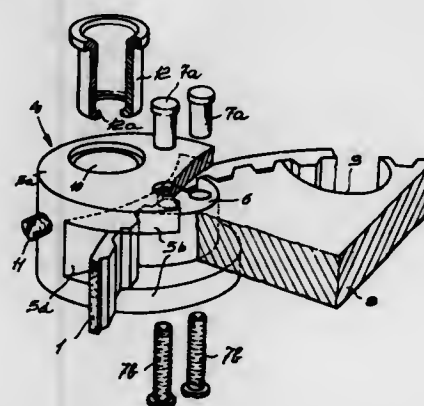
Filed Oct. 21, 1975, Ser. No. 624,638

Claims priority, application Italy, Nov. 6, 1974, 3515/74

Int. Cl.² B65B 1/04

U.S. Cl. 53-282

2 Claims



1. Conveyor for conveying capsules composed of a case and cap in machines for filling said capsules with doses of pulverulent or granular product and which comprises an assembly for feeding the capsules in their closed state and incorporating means for separating the case from the cap, a dispensing assembly arranged to insert a predetermined product dose into the capsule case, and a capsule closing assembly, the conveyor comprising a pair of toothed belts of equal length in the form of endless loops and lying in two horizontal planes, the belts being wound about idle pulleys to convey the capsules from the feed assembly to the dispensing assembly and from this latter to the closing assembly, a plurality of blocks supported at equal distances along the belts, each block of the upper belt being provided with a seat for housing the cap of one capsule, and each block of the lower belt being provided with a seat for housing the case of the same capsule, the seats being mutually aligned, at least when in a position corresponding with the capsule feed assembly, to receive the capsule and wherein each of the blocks comprises a first element composed of a member external to the belts and of cylindrical shape, rigid with which there is a species of fork comprising two arms which extend above and below the belt towards the interior of this latter, and a second element fixed between the arms of the fork to clamp the belt against the base of the fork, the second element comprising a peripheral cylindrical surface concentric with that of said member, said member and said second element comprising holes for housing sockets for supporting the capsule cap and case.

4,006,579

AUTOMATIC CARTON CLOSING MACHINE HAVING A THREE-POSITION CARTON STOP PADDLE INCLUDING A SLOPED INTERMEDIATE ONE AS AN UNFOLDED BOTTOM END FLAPS GUIDING RAMP

Winton Loveland, Fort Salonga, N.Y., assignor to The Love-shaw Corporation, Deer Park, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,416

Int. Cl.² B65B 7/20

U.S. Cl. 53-374

10 Claims

4,006,580

CUTTING HEIGHT ADJUSTING MEANS FOR LAWN-MOWERS

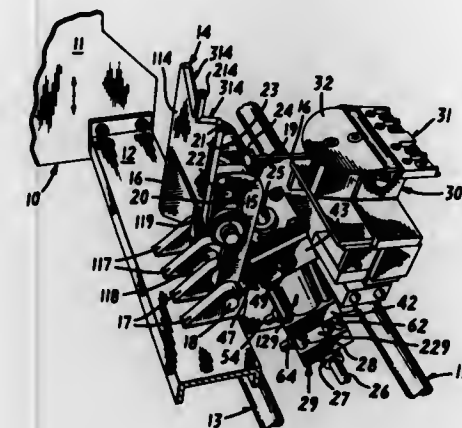
Artur Kalleicher, Klrchen, Sieg, Germany, assignor to Wolf-Gerate GmbH, Gregor-Wolf-Strabe Betzdorf, Sieg, Germany

Filed Apr. 4, 1975, Ser. No. 565,066

Claims priority, application Germany, Apr. 22, 1974, 2419364

Int. Cl.² A01D 55/32

6 Claims



1. Cutting height adjustment means for lawn mowers, wherein the mower comprises; a chassis, wheels which ride on a running surface; said wheels having an axle about which they rotate, and wherein said adjustment means is for adjusting the height of said wheel axle over the running surface with respect to the height of said chassis;

said adjustment means comprising:

a shaft pivotally connected to said chassis at a fixed location; a crank arm, said crank arm being connected to and supported on said shaft; said crank arm being rotatable with respect to said chassis around said shaft, without shifting of the position of said shaft with respect to said chassis; said axle being carried in said crank arm remote from said connection of said crank arm on said shaft;

detent means secured to said shaft and rotatable therewith; said detent means comprising a plurality of separated detents, each of which, in turn, is movable into a position to be engaged by a latch as said shaft rotates;

a latch that is so secured on said chassis so as to prevent changing the location of said latch on said chassis; said latch comprising an extension engageable in each said detent as it is rotated by said shaft into position to be engaged by said extension, and an operating member secured to said extension and normally fixed, but movable to move said latch extension into and out of engagement with said detents; said operating member being operable to shift said extension out of each said detent, thereby to permit rotation of said shaft, and also being operable to shift said extension into each said detent, thereby to prohibit further rotation of said shaft, said operating member having a bent-over portion, and a return spring disposed between said chassis and said operating member for normally biasing said extension into each detent as each said detent is presented to said extension.

4,006,581

FRUIT PICKING DEVICE

James W. Freeman, San Pablo, Calif., assignor to Sammy Joseph Jackson, San Pablo, Calif., a part interest

Filed July 14, 1975, Ser. No. 595,789

Int. Cl.² A01D 46/24

U.S. Cl. 56-333

4 Claims

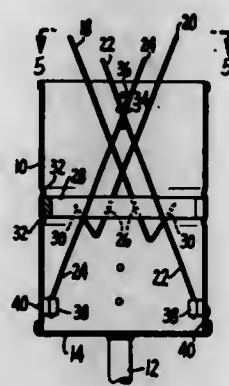
1. A fruit picking device comprising a carrier, a pair of piano wire elements having inverted U-shaped forms and residing within intersecting planes, said elements having lower portions connected to the carrier, having upper arcuate por-

1. In an automatic carton closing machine constructed to provide adhesive anchorage of unfolded bottom side flaps to infolded bottom end flaps thereof of each of successive cartons by partially swinging down the unfolded bottom side flaps to dropped oblique positions for entry into the space above the latter and below the infolded bottom end flaps of an adhesive applicator head located below the carton travel path in a forward section of the machine as the carton is advancing for application of adhesive to areas of the bottom faces of these infolded end flaps for subsequent lap by again folding these bottom side flaps up against them; the combination comprising

1. a stop paddle pivotally mounted on a transverse axis below said forward carton travel path for swing upward and rearward to a substantially upright position from a lower position for serving as a stop gate to be abutted by each oncoming carton so that each such carton is held therebehind until released by said gate as it is retracted, and swing forward and down to a prone lateral position from its upright position and passing down through an intermediate position in which it is oriented obliquely upward and forward for disposition of its top surface as an upwardly sloping ramp for guidance successively of the free trailing end of the front bottom end flap and then the free leading end of the back bottom end flap to the top of the applicator head for ride over the latter; and

2. means effecting and controlling swing of said stop paddle successively through a cycle of such swinging action during the period from a carton-receptive condition of the machine and the entry of a loaded carton through to abutment of this stop gate and then travel over the adhesive applicator head for subsequent completion of the folding of the carton closing flaps and anchorage thereof, comprising a first swinging action step of raising it from its lower position before arrival of such carton at the vicinity of said gate, a second action step of lowering it to release the carton for further advance of the latter, and a third action step of again raising it just to the intermediate ramp-forming position.

tions directed upwardly and away from each other, and having pairs of intermediate cross-over portions below and adjacent



said arcuate portions, at least one of said pairs of cross-over portions extending loosely through an oversized eye of a pin attached to said carrier.

4,006,582

METHOD AND APPARATUS FOR REDUCING THE ELECTRICAL COUPLING IN COMMUNICATING CABLES

Erdal Gürkaynak; Jürgen Spatz; Dieter Vogelsberg, and Gerhard Liedtke, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

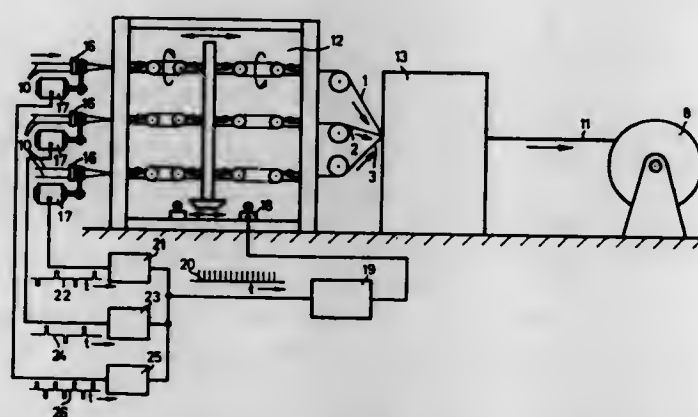
Filed July 25, 1974, Ser. No. 491,753

Claims priority, application Germany, Aug. 7, 1973, 2340351

Int. Cl.³ H01B 13/04

U.S. Cl. 57—34 AT

13 Claims



1. A method for reducing the electric coupling in communications cables by influencing the twisting process in a two-stage twisting of conductors to form twisted units and of twisted units to form a twisted group taking place in the same operation, particularly in the two-stage twisting of conductors to form pairs or quads and of the pairs or quads to form a bundle comprising:

- forming respective twisted units in which the phase of the conductors is changed such that pairs of sections of opposite phase with the phase sequence remaining the same are formed; and
- twisting the units so formed into a group in which the changes of the phase of the twisted units adjacent to each other within the twisted group are related to each such that two respective, adjacent twisted units have at least approximately the same number of parallel sections of the same and opposite phase over their entire length.

11. Apparatus for reducing the electrical coupling in communication cables by influencing the twisting process in a two stage twisting of conductors to form twisted units and of twisted units to form a twisted group taking place in a same operation comprising:

- a twisting nipple for each unit into which the conductors of the respective twisting unit to be formed are led, said

- nipple arranged between the conductor supplies in the first twisting stage and a second twisting stage;
- an aperture disk arranged ahead of each twisting nipple and supported for rotation about the twisting axis to control the phase sequence of the conductors; and
- means to vary the angular position of said disk one of continuously through $360^\circ \times n$ where n is an integer at least equal to one and in step wise intervals of one of 90° , 180° and an odd multiple thereof in one of a constant direction and alternatingly in one and the other direction.

4,006,583

ELECTRONIC DISPLAY DEVICE FOR TIMEPIECE AND THE LIKE

Raymond Vuilleumier, Neuchâtel, Switzerland, assignor to Centre Electronique Horloger S.A., Switzerland

Continuation of Ser. No. 187,613, Oct. 8, 1971, abandoned.

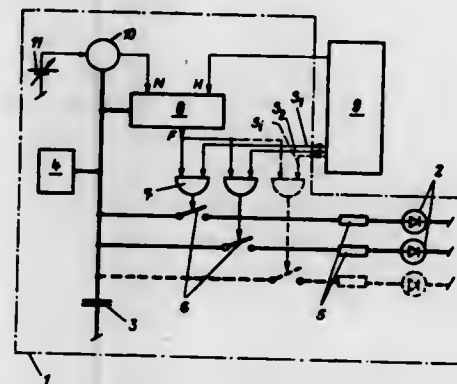
This application June 18, 1975, Ser. No. 587,983

Claims priority, application Switzerland, Oct. 30, 1970, 16170/70

Int. Cl.³ G04B 19/32; G04C 3/00

U.S. Cl. 58—23 C

15 Claims



1. In an electronic timepiece display apparatus having a clock circuit for generating a clock signal and a plurality of display signals, each generated display signal corresponding to a desired electroluminescent element to be activated, the improvement comprising: a plurality of electroluminescent display elements; a photovoltaic source generating a voltage as a function of the amount of ambient light irradiating said source;

storage means coupled to said photovoltaic source for storing the output of said photovoltaic source and for producing a voltage in relation to the stored source output;

logic circuit means coupled to said photovoltaic source and to said clock circuit for generating an output signal in the form of a series of pulses which are synchronized with the clock frequency of said clock circuit and width modulated in accordance with the output of said photovoltaic source;

switching means coupled between said storage means and each of said electroluminescent elements; and

means coupling an output of said logic circuit means and the display signal generating portion of said clock circuit to said switching means to activate a particular electroluminescent element by the corresponding display signal appearing at the display signal outputs of said clock circuit coincident with a signal appearing at the output of said logic circuit means.

4,006,584

ELECTRONIC TIMEPIECE

Shingo Hashimoto; Yasuhiko Nishikubo; Heihachiro Ebihara, and Hiroyuki Fukayama, all of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

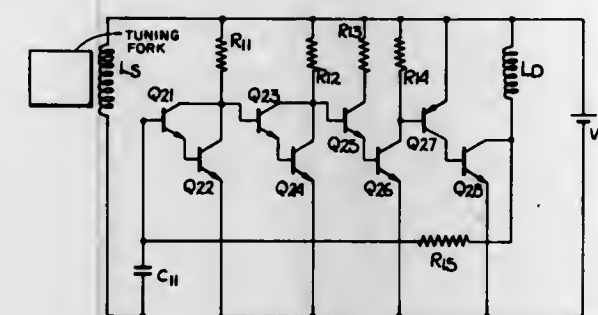
Filed May 16, 1975, Ser. No. 578,071

Claims priority, application Japan, Nov. 14, 1974, 49-131256

Int. Cl.³ G04C 3/00

U.S. Cl. 58—23 A

4 Claims



1. An electronic timepiece comprising: an oscillator of high frequency and substantially stable amplitude; a mechanical-electrical transducer for picking up signals from the oscillator; an electronic circuit for amplifying signals from said mechanical-electrical transducer; an electromechanical transducer for supplying the signals to the oscillator at a vibrations-sustaining energy; a time display device coupled to said oscillator; said oscillator, said mechanical-electrical transducer, said electronic circuit and said electromechanical transducer forming a closed loop, said electronic circuit, comprising: a capacitor; resistors R_{11} , R_{12} , R_{13} , R_{14} and R_{15} ; npn bipolar transistors Q_{21} , Q_{22} , Q_{23} , Q_{24} , Q_{25} and Q_{26} ; and Q_{27} pnp bipolar transistor Q_{27} ; each terminal of said resistor R_{11} , R_{12} , R_{13} , R_{14} is connected, together with the emitter of bipolar transistor Q_{27} , to a positive voltage terminal of a power source; in the remaining terminal of said resistors: R_{11} connects to collectors of transistors Q_{21} and Q_{22} and base of transistor Q_{23} ; R_{12} connects to collectors of transistors Q_{23} and Q_{24} and the base of transistor Q_{25} ; R_{13} connects to the collector of transistor Q_{25} ; R_{14} connects to the collector of transistor Q_{26} and the base of transistor Q_{27} ; the emitter of transistor Q_{21} connects to the base of transistor Q_{22} ; the emitter of transistor Q_{23} connects to the base of transistor Q_{24} ; the emitter of transistor Q_{25} connects to the base of transistor Q_{26} ; the collector of transistor Q_{27} connects to the base of transistor Q_{28} ; emitters of transistors Q_{22} , Q_{24} , Q_{26} and Q_{28} connect to the minus voltage terminal of the power source; one terminal of resistor R_{15} and capacitor C_{11} is connected to the base of transistor Q_{21} ; the remaining terminal of said resistor R_{15} is connected to the collector of transistor Q_{28} ; the remaining terminal of said capacitor C_{11} is connected to said mechanical-electrical transducer; and one terminal obtained by joining said resistor R_{15} and collector of transistor Q_{28} is connected to said electromechanical transducer.

4,006,585

ELECTRONIC TIMEPIECE WITH ELECTROCHROMIC DISPLAY ELEMENT

Munetaka Tamara, Tokyo; Kazunari Kume; Minoru Watanabe, both of Tokorozawa, and Hideshi Ohno, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

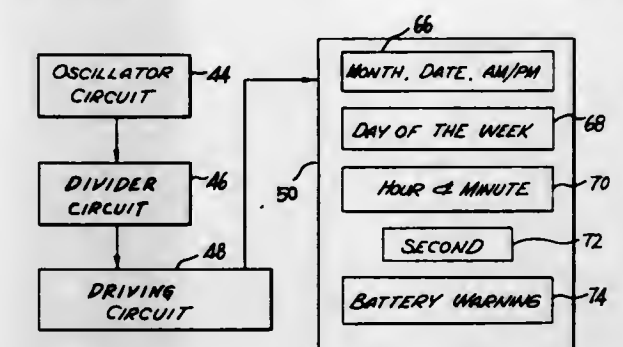
Filed Jan. 3, 1975, Ser. No. 538,327

Claims priority, application Japan, Jan. 8, 1974, 49-5498

Int. Cl.³ G04B 19/30

U.S. Cl. 58—50 R

5 Claims



1. An electronic timepiece having multi-layered electronic display elements in display functions, said timepiece having an oscillator circuit for producing a constant frequency signal, a divider circuit for dividing said signal of said oscillator circuit, and a driving circuit for decoding said divided signals from said divider circuit, said divider circuit coupled to said display element such that said display elements are activated in response to a signal from said driving circuit, said display elements comprising:

- a substrate, and substrate made of a transparent material;
- an optical conductive electrode disposed on said substrate, said conductive electrode made of a material which enables light to pass therethrough;
- at least one electrochromic material in contact with said optical conductive layer, said electrochromic material being of the type which has a coloration of a first color when a voltage of a first polarity is applied and of a second color when a voltage of second polarity is applied and which fades to transparent sometime after said voltage is removed;
- an insulating layer disposed on said electrochromic material such that said electrochromic material is interposed between said insulating layer and said optical conductive electrode; and
- a reflective electrode disposed on said insulating layer; wherein said signal from said driving circuit is a pulsating signal and is selectively applied to said display elements such that said display elements remain activated during the time when said signal is applied as well as the time when said signal is not applied thereby reducing power consumption of said timepiece and wherein said pulsating signal from said driver circuit causes said display elements to change from transparent to said first color in response to a pulse of a voltage of a first polarity, to change from said first color to transparent in response to a pulse of voltage of a second polarity, and to change from transparent to said second color in response to a pulse of voltage of said second polarity.

4,006,586

CLOCK HOUSING AND DECORATIVE MEANS THEREFOR

Frank P. Casella, 2404 Freemansburg Ave., Easton, Pa. 18042

Division of Ser. No. 442,324, Feb. 14, 1974, Pat. No. 3,889,806. This application Mar. 18, 1975, Ser. No. 559,489

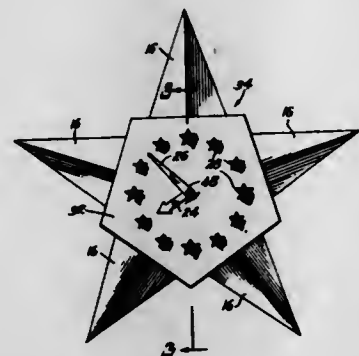
Int. Cl.³ G04B 37/00; B23P 13/00; B65D 85/10, 69/00

U.S. Cl. 58—53

2 Claims

1. A housing comprising a base, a plurality of circumferential tabs extending from the base, the tabs when taken together

substantially extending about the circumference of the base, and said tabs being folded out of the plane of said base to be perpendicular thereto with the individual tabs being positioned against the next adjacent tab, wherein the respective



tabs possess positional openings adapted to engage and hold decorative means and wherein said housing is a clock housing which further comprises openings circumferentially positioned in said base for receiving means to indicate the hours and a medially located opening.

4,006,587

WRIST-WATCH WITH WRISTLET END SECURED TO TOP OF CASE

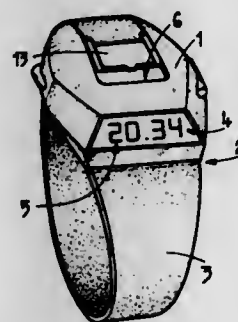
Freddy Huguenin, Lausanne, Switzerland, assignor to Ebauches Electroniques S.A., Neuchatel, Switzerland
Filed Dec. 24, 1975, Ser. No. 644,195

Claims priority, application Switzerland, Jan. 10, 1975, 274/75

Int. Cl.³ A44C 5/14; A45C 11/10; G04C 3/00

U.S. Cl. 58—88 R

8 Claims



1. Wrist-watch having a digital hour display, characterized by the fact that the display device is arranged on one of the lateral faces of the watch-casing, thus leaving its upper face free, the wristlet being secured to the casing by one of its ends and being applied, by its opposite end, onto the said upper face of the casing to which it is secured removably.

4,006,588

WRIST WATCH

Robert J. McMahon, 1105 Brennan Drive, Warminster, Pa. 18976, and Dolores A. Harmer, 1201 Easton Road, Warminster, Pa. 18976

Filed Nov. 19, 1975, Ser. No. 633,391

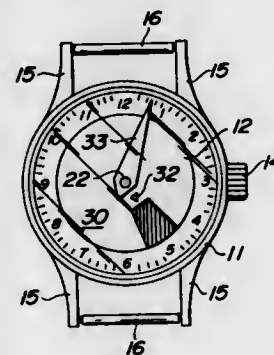
Int. Cl.³ G04B 19/00

U.S. Cl. 58—126 R

2 Claims

1. In a watch having an outer case, a transparent crystal, a watch mechanism with a rotary hour output shaft and rotary minute output shaft the improvement which includes a dial fixedly mounted within said case and provided with numerals for hour indication around the perimeter thereof, a plurality of differently colored time zones on said dial related to particular periods of time, minute indicating means driven by said minute output shaft, and hour indicating means driven by said hour output shaft,

said hour indicating means comprising a rotatable disc in covering relation to said colored time zones on said dial



and having an opening therethrough for sequential exposure of one of said time zones.

4,006,589

LOW EMISSION COMBUSTOR WITH FUEL FLOW CONTROLLED PRIMARY AIR FLOW AND CIRCUMFERENTIALLY DIRECTED SECONDARY AIR FLOWS

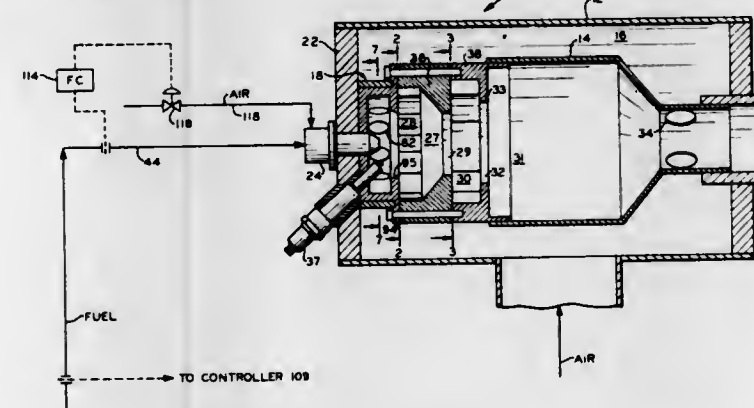
Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1975, Ser. No. 567,920

Int. Cl.³ F02G 3/00; F02C 3/00

U.S. Cl. 60—39.02

31 Claims



22. A method for the combustion of a fuel in a combustion zone to produce hot combustion gases having low emissions of NO_x, CO, and HC, said combustion zone having a first upstream combustion region, and a second combustion region located adjacent and downstream from said first combustion region, which method comprises:

introducing a stream of fuel together with a stream of assist air into the upstream end portion of said first combustion region;
introducing a first stream of air at a controlled but variable rate into said upstream end portion of said first combustion region around said fuel;
tangentially introducing a second stream of air into said first combustion region in a circumferential direction and forming a combustible mixture of said fuel and said streams of air;
causing at least partial combustion of said combustible mixture so as to form hot combustion products therefrom;
passing hot combustion products and any remaining said mixture from said first combustion region into said second combustion region;
tangentially introducing a third stream of air into said second combustion region in a circumferential direction around said hot combustion products entering said second combustion region;
controlling said variable rate of introduction of said first stream of air in accordance with the rate of introduction of said fuel; and

controlling the pressure, or the volume, of said stream of assist air in accordance with the rate of introduction of said fuel.

4,006,590

CONTROL CIRCUIT FOR GAS TURBINE ENGINE

Takane Itoh, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

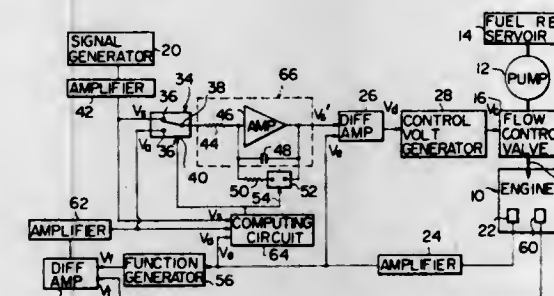
Filed May 21, 1975, Ser. No. 579,709

Claims priority, application Japan, June 13, 1974, 49-66555

Int. Cl.³ F02C 9/08

U.S. Cl. 60—39.28 R

7 Claims



1. A control circuit for controlling output speed of a gas turbine engine, comprising in combination first sensing means for detecting output speed of the gas turbine engine and producing an output signal representative of the detected engine speed, second sensing means for detecting temperature of the engine and producing an output signal representative of the detected engine temperature, first signal generating means for producing an output signal representative of a desired output speed of the engine, second signal generating means responsive to the signals from the first and second sensing means for producing an output signal representative of a difference between the detected engine temperature represented by the output signal from said second sensing means and a predetermined engine temperature varying with the detected output speed of the engine in accordance with a predetermined schedule, first switching means having a first operative condition connected to said first signal generating means and a second operative condition connected to said second signal generating means, an integrating circuit having an input terminal connected to said first and second signal generating means across said first switching means, second switching means connected across the integrating circuit for bypassing the integrating circuit when closed, triggering means having input terminals connected to said first sensing means and said first and second signal generating means for producing a trigger signal responsive to a condition in which the desired engine speed represented by the signal from said first signal generating means is higher than the detected engine speed represented by the output signal from said first sensing means by a value which is related to the detected engine speed and the detected engine temperature, said first switching means being connected to said triggering means for being held in said first operative condition in the absence of the trigger signal from said triggering means and shifted to said second operative condition in the presence of the trigger signal from the triggering means, said second switching means being connected to said triggering means for being held closed in the absence of the trigger signal from the triggering means and open in the presence of the trigger signal from the triggering means, and comparing means having a first input terminal connected in parallel to said integrating circuit and said second switching means and a second input terminal connected to said first sensing means for producing an engine speed control signal representative of a difference between the signals appearing at the first and second input terminals thereof.

4,006,591

JET REACTION TURBINE WITH ROTATING COMBUSTOR FOR BURNING SLURRY FUELS

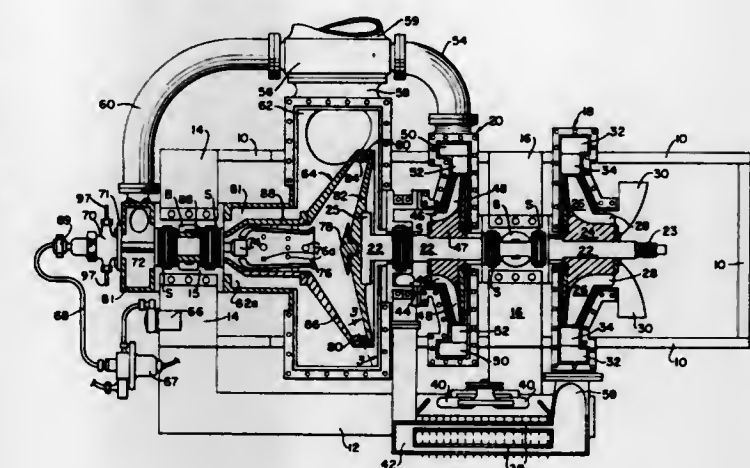
Kenneth G. Cervenka, Billings, Mont., assignor to Faith Industries, Inc., Billings, Mont.

Filed Aug. 11, 1975, Ser. No. 603,883

Int. Cl.³ F02C 3/14, 3/26

U.S. Cl. 60—39.35

6 Claims



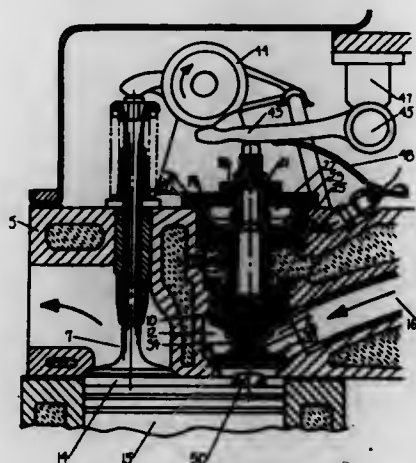
1. A reaction turbine for burning solid particulate fuels in slurry form delivered to the turbine from a fuel pressure regulator, and for discharging the resulting ash from the turbine to prevent accumulation therein, comprising:

a. a frame having axially spaced journal supports and having a shaft journaled therein and supporting rotary air compressor means delivering air under pressure to an air intake housing adjacent one of the journal supports;
b. a fuel burning rotor having an annular peripheral portion and having a first-end portion extending radially outwardly from the shaft to the peripheral portion, and having a second end portion fixed to the peripheral portion and having a central opening therethrough, the diameter of said peripheral portion being large as compared with the axial length of the rotor between said end portions;
c. an annular series of jet orifices extending through said annular portion and spaced thereabout and each oriented substantially normal to a radius of the rotor intersecting the orifice;
d. a chamber housing having one end fixed to said second end portion and communicating smoothly into said rotor thereat, and having its other end supported by journals at said one journal support and communicating with said air intake housing to receive compressed air;
e. a fuel injector connected with said regulator and extending through said intake housing and axially through said other end of the chamber housing and having a nozzle facing into the housing operative to spray fuel thereinto;
f. a combustion chamber sleeve in said chamber housing mounted concentrically therein in spaced relationship to the chamber housing and supported to rotate therewith, the combustion chamber sleeve being longer than its diameter and terminating at one end which is necked down to closely fit around the nozzle while leaving an airspace therebetween, and the other end of the sleeve being Venturi shaped and extending beyond said second end portion and flaring into the rotor; the intake air being divided so that a smaller portion of it passes into the sleeve through said airspace and a larger portion of it passes into the rotor by passing between the sleeve and the chamber housing; and
g. a solid particle fuel in slurry form, and means to ignite the fuel sprayed from the nozzle.

4,006,592

VALVE ARRANGEMENTS FOR RECIPROCATING PISTON MACHINES

Gleann B. Warren, 1361 Myron St., Schenectady, N.Y. 12309
Filed Nov. 17, 1975, Ser. No. 632,313
Int. Cl.² F02G 3/02
U.S. Cl. 60—39.63 8 Claims



1. In a reciprocating piston machine wherein inlet and discharge valve means control the flow of fluid into and out of a working cylinder of said machine in a desired timed sequence, the combination with said machine of an improved inlet valve arrangement comprising:

- a. an inlet valve having a head and a stem extending therefrom;
- b. a housing defining an enclosed cavity adjacent said cylinder and surrounding said valve stem;
- c. an annular plate carried by said valve stem within said enclosed cavity and near the bottom thereof, said annular plate having a diameter smaller than the inside diameter of said cavity and defining a metering passage therewith and a space between said annular plate and the bottom of said cavity;
- d. means for actuating said inlet valve to its open position in a direction away from said cylinder, said means including pressure producing means comprising said working piston as it approaches its top dead center position in conjunction with preselected early closing of said discharge valve means so that the pressure produced above said piston and applied to the head and stem of said valve is operative to actuate said valve to the open position; and
- e. control means operatively associated with said inlet valve for actuating said inlet valve to its closed position, said control means comprising a rotary cam means driven in timed relationship with said machine and a pivotally mounted rocker arm means operatively associated with said cam means.

4,006,593

MASTER CYLINDER ASSEMBLY FOR A VEHICLE HYDRAULIC BRAKING SYSTEM

Roy Ernest Edwards, West Midlands, England, assignor to Girling Limited, Birmingham, England
Filed June 5, 1975, Ser. No. 584,045
Claims priority, application United Kingdom, June 8, 1974, 25543/74

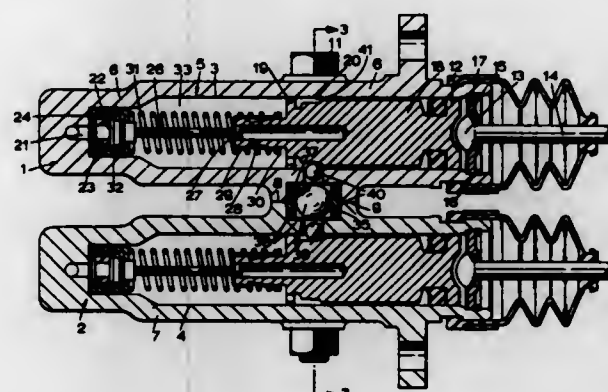
Int. Cl.² F15B 7/08

U.S. Cl. 60—581

5 Claims

1. A master cylinder assembly for a vehicle hydraulic braking system comprising a pair of master cylinders, each comprising a cylinder, and a piston working in said cylinder and movable between a retracted position and an advanced position in advance of said retracted position and in which hydraulic fluid in a pressure space in said cylinder in advance of said piston is pressurized, and said master cylinder assembly incorporates a fluid flow transfer passage connecting said pressure

spaces and through which said pressure spaces communicate when both said master cylinders are operated simultaneously, and transfer valve means are located in said transfer passage to cut-off communication between said pressure spaces when one of said master cylinders is operated on its own, wherein said transfer valve means comprises an unsprung valve mem-



ber, and a pair of spaced seatings with one of which said valve member is engageable to cut-off communication between said pressure spaces when one of said master cylinders is operated on its own, and means are provided for holding said unsprung valve member in a neutral position spaced from both said seatings when both said master cylinders are operated simultaneously.

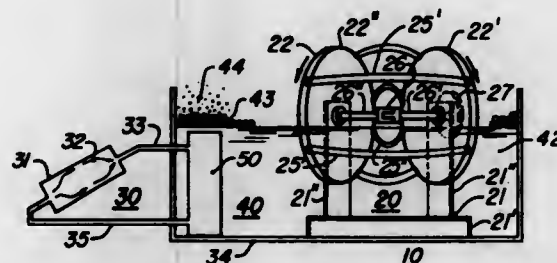
4,006,594

SOLAR POWER PLANT

Paul F. Horton, 9393 Hackamore Drive, Boise, Idaho 83705
Filed May 12, 1975, Ser. No. 576,811
Int. Cl.² F03G 7/02

U.S. Cl. 60—641

11 Claims



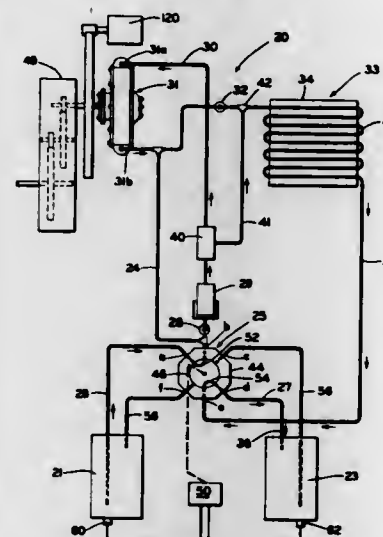
1. Apparatus for converting solar heat energy into mechanical energy which comprises:

- a converter unit, said converter unit including a frame;
- a pair of wheels rotatably mounted on said frame and set at a selected angle one to the other so that a linear force developed between corresponding points on each of said wheels will cause rotation thereof;
- a plurality of continuously driving expansile-contractile members for producing the linear force, movably mounted on and between said wheels;
- means for governing the position of each of said wheels relative to one another so that said wheels rotate as a unit;
- means for collecting solar heat; and
- means for selectively applying the solar heat so collected to said expansile-contractile members so that a hot sink and a cold sink are thereby created.

4,006,595

REFRIGERANT-POWERED ENGINE

William J. Forbes, Cocoa, Fla., assignor to Orange State, Inc., Cocoa, Fla.
Filed Dec. 30, 1975, Ser. No. 645,396
Int. Cl.² F01K 25/10
U.S. Cl. 60—651 32 Claims



1. A power system comprising first and second tank means for liquid refrigerant; means for heating the refrigerant to produce super-heated vapor; means for transferring refrigerant selectively from said first and second tank means to said heating means; engine means for converting energy of the super-heated vapor into motive power; means for condensing the super-heated vapor; means associated with said first and second tank means for detecting a low level of refrigerant contained herein; and valve means for forming (1) a first flow of refrigerant along a first closed fluid flow path from said first tank means to said second tank means and including respectively said heating means, said engine means, and said condensing means, and (2) a second flow of refrigerant along a second closed fluid flow path from said second tank means to said first tank means and including respectively said heating means, said engine means and said condensing means; said valve means being controlled to provide alternatively (1) or (2) in response to an output of said refrigerant detecting means.

4,006,596

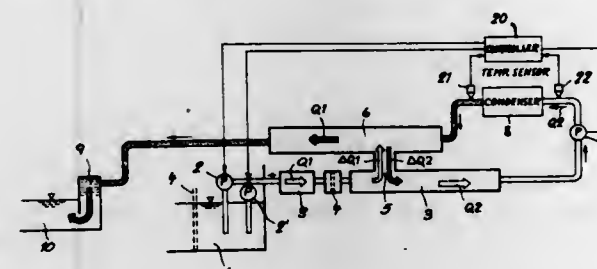
COOLING-WATER SUPPLY SYSTEM WITH SELF-ADJUSTING HYDRAULICS

Sándor Míkoltics; Károly Ziegler, and Viktor Homola, all of Budapest, Hungary, assignors to Novex Találmanyfejlesztő és Ertekesítő Kiviteléskezelő Rt., Budapest, Hungary
Continuation-in-part of Ser. No. 488,773, July 15, 1974, Pat. No. 3,927,531. This application Dec. 18, 1975, Ser. No. 642,193

Claims priority, application Hungary, July 25, 1973, MI 541
Int. Cl.² F01K 9/00

U.S. Cl. 60—690

4 Claims



1. A method of operating a cooling-supply system for the condenser of a power plant which comprises the steps of: pumping cooling water from a source through a cooling-water channel at a first location;

pumping water from said channel at a second location through said condenser and through a warm-water channel; collecting water from said warm-water channel in a reservoir; maintaining the level of water in said reservoir substantially constant; bypassing said channels into one another; and controlling the flow of water from one channel into the other at the bypass solely by the relative rates pumped at said location, thereby regulating the temperature of the water entering said condenser.

4,006,597

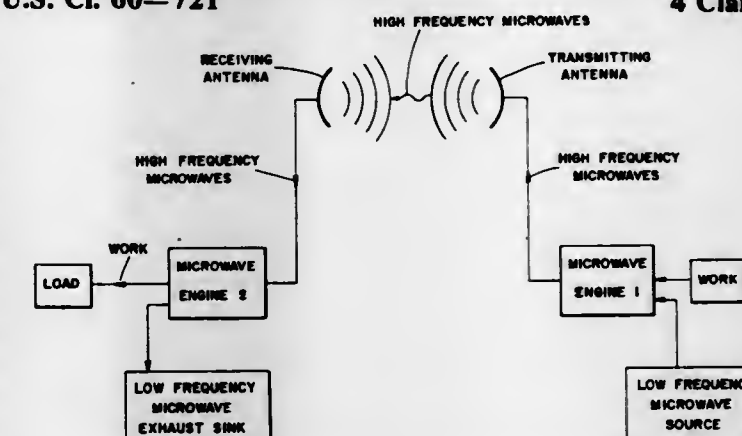
METHOD FOR MICROWAVE TRANSMISSION OF ENERGY WITH SUPERCONDUCTING APPARATUS

G. John Dick, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 606,160, Aug. 20, 1975, Pat. No. 3,983,470. This application June 3, 1976, Ser. No. 692,401
Int. Cl.² F03G 7/00

U.S. Cl. 60—721

4 Claims



1. A method of transmitting energy in the form of microwaves comprising:

- a. converting work and microwaves having an initial energy level into microwaves having an energy level higher than said initial energy level at a superconducting temperature at a first location;
- b. transmitting said microwaves having said higher energy level from said first location to a second location;
- c. receiving said microwaves having said higher energy level at said second location; and
- d. rectifying said microwaves having said higher energy level into useful work at a superconducting temperature at said second location.

4,006,598

BREAKWATER SYSTEM

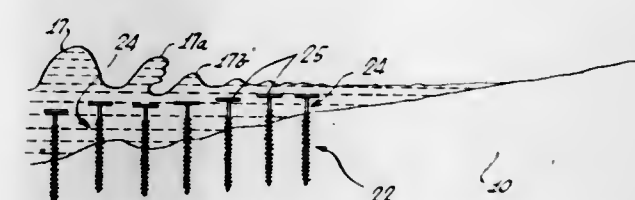
Jobst Hulsemann, 1041 Avenida Amantea, La Jolla, Calif. 92037

Filed Nov. 24, 1975, Ser. No. 634,939

Int. Cl.² E02B 3/04

U.S. Cl. 61—3

12 Claims



1. An off-shore breakwater structure for damping the energy of incoming waves to prevent damage and erosion along a shoreline comprising an array of separate, unconnected, rigid, non-buoyant, stationary, disc-shaped, horizontal, spaced-apart platforms each supported above the natural sea

floor by a single, centered, vertical pile, said platforms being arranged according to a predetermined regular pattern such that the area of the platforms covers between about 50 and 80 percent of the area of the array, thereby forming a false sea floor that induces early cresting of waves while equalizing the water pressure above and below said false sea floor.

4,006,599

PLASTIC DRAIN PIPE AND APPARATUS FOR PRODUCING THE SAME

Wilhelm Hegler, and Ralph-Peter Hegler, both of Goethe Strasse 2, 873 Bad Kissingen, Germany
Filed Mar. 4, 1975, Ser. No. 555,325
Claims priority, application Germany, June 20, 1974, 2429718

Int. Cl.² E02B 11/00; F16L 1/00

U.S. Cl. 61-11

16 Claims



1. A synthetic plastic drain pipe comprising a continuous pipe of plastic material having transverse, annular or helical corrugations, said pipe having openings for the entry of water in distinct portions of said pipe, which portions have a generally circular cross section, said openings being disposed in said pipe at regular repeating intervals between corrugated lengths of pipe no more frequent than every 20 cm. of pipe length, said pipe being free of any opening between said intervals.

4,006,600

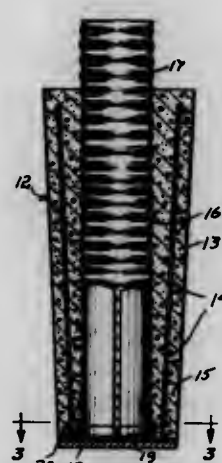
TAPERED PILE TIPS

Charles L. Gould, 7 Stone Tower Land, Barrington, R.I. 02806
Filed Nov. 6, 1975, Ser. No. 629,508

Int. Cl.² E02D 5/72

U.S. Cl. 61-53

6 Claims



1. A tip for attachment to a pile of the type consisting of at least one length of corrugated tubing and driven by means of an expansible mandrel having an end portion of a cross section less than that of the remainder of the mandrel and defining therewith a shoulder, said tip including a tapered, reinforced concrete body and a welded core assembly incorporated therein, said assembly consisting of a tubular core dimensioned to receive and be gripped by said mandrel and extending through the body from the larger upper end thereof and including a tubular member exposed at the upper end of the body and dimensioned to enable a length of said tubing to be welded thereto, a member welded to the reinforcement of the body and including a seat at the lower end of the tip engageable by the mandrel and a tubular portion receiving and

welded to the lower end of the core, and a blunt point having at its upper portion of the size and shape of said lower tip end, said blunt point of an area less than the cross sectional area of the core and means detachably attaching the point to the tip.

4,006,601

REFRIGERATING DEVICE

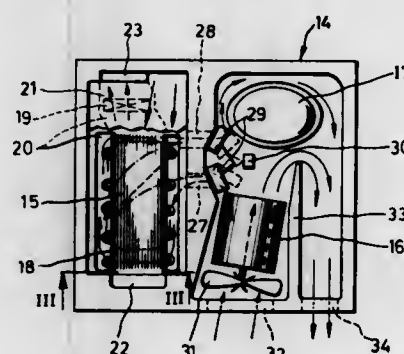
Jürgen Ballarin, and Peter Mattig, both of Giengen, Germany, assignors to Bosch-Siemens Hausgerate GmbH, Munich, Germany

Filed Dec. 2, 1975, Ser. No. 636,944

Claims priority, application Germany, Dec. 13, 1974, 2458981

Int. Cl.² F25D 21/00; F25B 47/00; F25D 17/06; F25B 41/00
U.S. Cl. 62-80

17 Claims



1. A method of operating a refrigerator having a compartment to be cooled, and an evaporator, said method comprising the steps of: circulating air in a closed cooling stream through said compartment and over one side of said evaporator; periodically circulating air at a temperature above 10° C in a defrosting stream over the other side of said evaporator; and separating said streams at all times and preventing air from said cooling stream from mixing with air from said defrosting stream.

4,006,602

REFRIGERATION APPARATUS AND METHOD

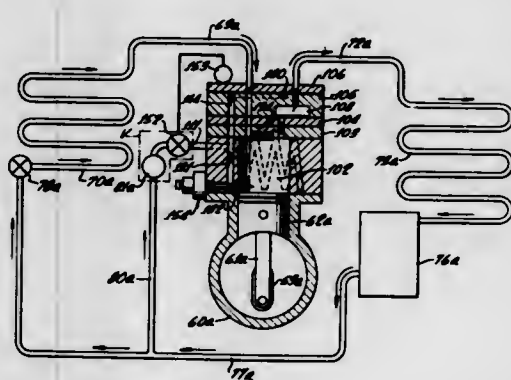
Ralph Z. Fanberg, 6908 Airway Ave., Yucca Valley, Calif. 92284

Continuation-in-part of Ser. No. 494,538, Aug. 5, 1974, abandoned, which is a continuation of Ser. No. 329,548, Feb. 5, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,898

Int. Cl.² F25B 41/04

U.S. Cl. 62-113

32 Claims



1. A method of compressing a vapor, which comprises:
a. providing a rotary-vane mechanical compressor having a compression chamber therein and incorporating a vane-type rotor to compress vapor in said compression chamber;
b. introducing a vapor into the intake of said compressor for compression in said compression chamber and subsequent discharge out the outlet of said compressor;
c. supplying to the vicinity of said compression chamber a liquid corresponding to said vapor,

d. effecting vaporization of said liquid while the vaporizing liquid is in heat-exchange relationship with said compression chamber but is not contained in said compression chamber, whereby the latent heat of vaporization of said vaporizing liquid is employed to cool said compression chamber and compensate for the heat generated due to compression of said vapor introduced into said compressor intake, and
e. mixing the vapor resulting from said vaporization with said vapor introduced into said compressor intake, said mixing being performed by injecting said vapor resulting from said vaporization into said compression chamber at a region of said chamber so correlated to the vanes of said rotor that there is always at least one vane interposed between said region and said compressor intake, whereby said injection will not interfere substantially with the suction present at said compressor intake.

4,006,603

AIR CONDITIONING SYSTEM FOR A RAILWAY VEHICLE

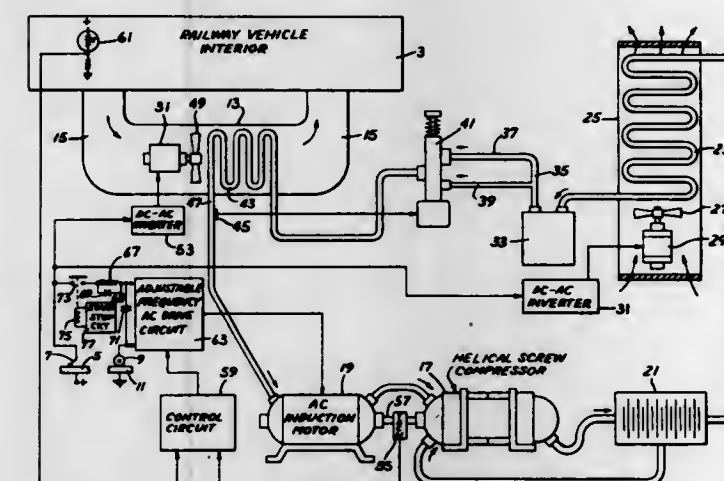
Marshall Miles, Hollywood, Fla., assignor to Vapor Corporation, Chicago, Ill.

Filed June 13, 1975, Ser. No. 586,496

Int. Cl.² F25B 27/00

U.S. Cl. 62-229

4 Claims



1. In an air-conditioning system for a railway vehicle which is operable from power lines carrying high voltage direct current, a variable speed helical screw refrigeration compressor connected in the system so that the cooling output of the system is continuously modulated by changes in speed of the compressor, and an a-c induction motor connected to said helical screw refrigeration compressor for driving the same, said motor being capable of operating over a range of speeds, the operating speed within said range being determined by the frequency of the input signal to said motor, a solid state circuit means having its input adapted to be connected to the power lines and its output coupled to the input of the motor for converting said high voltage direct current to alternating current whose frequency varies over a range of frequencies, the operating frequency within the range being determined by a control signal applied to said circuit means, and temperature sensing means for sensing the temperature within the railway vehicle and for controlling the compressor speed as a function of variations in the temperature in the vehicle and providing a control signal to the circuit means which varies over a range of values, the value of the control signal within the range being determined by the cooling demand of said railway vehicle, whereby the helical screw compressor speed is continuously modulated in response to variations in the temperature of the vehicle.

4,006,604

AIR CONDITIONED PILLOW

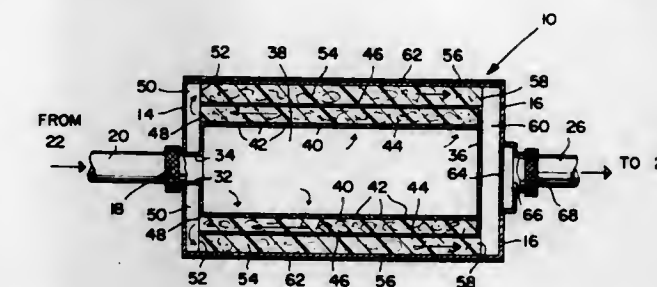
David Seff, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 23, 1976, Ser. No. 651,649

Int. Cl.² F25D 23/12

U.S. Cl. 62-261

8 Claims



1. A cooling device comprising:
a. an enclosure having thin flexible airtight walls;
b. an air inlet in a wall at one section of said enclosure;
c. an air outlet in a wall at another section of said enclosure;
d. an inner air chamber within said enclosure having flexible airtight end walls and flexible porous walls surrounding other portions of said chamber, said inlet extending through one said end wall;
e. a layer of soft pliant material surrounding said porous walls of said chamber, and
f. means for directing air from said porous walls through said layer to said outlet.

4,006,605

ICE MAKING MACHINE

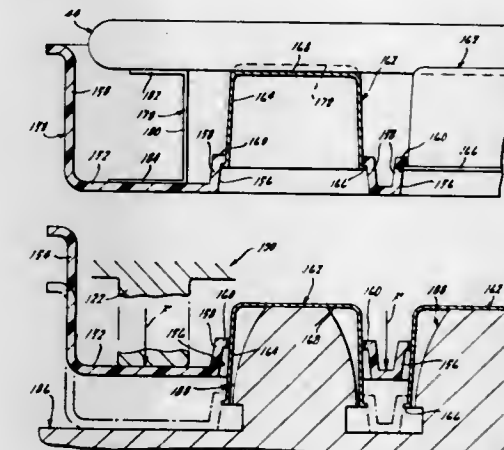
George Dickson, and Robert K. Westergaard, both of Alden, Minn., assignors to King-Seely Thermos Co., Ann Arbor, Mich.

Filed June 16, 1975, Ser. No. 587,531

Int. Cl.² F25C 1/04

U.S. Cl. 62-356

16 Claims



1. A combination evaporator and platen subassembly for an ice making machine, said subassembly comprising a platen member having a bottom portion and an upstanding peripheral wall portion, said bottom portion being formed with a plurality of openings, a plurality of inverted cup-shaped molds disposed one in each of said openings, an evaporator having portions arranged adjacent each of said cups and secured thereto, and means for urging said cups into positive sealing engagement with the peripheral portions of said openings, said last mentioned means including means disposed between said evaporator and said platen member and normally exerting a force urging said evaporator away from

said platen bottom portion and thereby causing said sealing engagement between said cups and said platen.

8. A combination evaporator, platen and ice mold comprising,

a platen member having a bottom portion and an upstanding peripheral wall portion,

said bottom portion being formed with a plurality of openings,

a plurality of inverted cup-shaped molds disposed one within each of said openings,

an evaporator having portions arranged adjacent each of said cups and fixedly secured thereto, and

at least one member interposed between the upper surface of said platen bottom portion and said evaporator and normally maintained in a state of compression for urging said evaporator away from said platen and thereby causing said molds to be biased into sealing engagement with said platen openings.

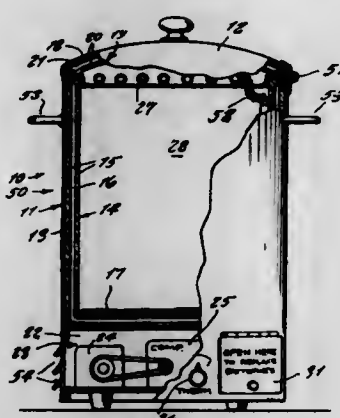
4,006,606 FREEZING POT

Joyce Underdue, 184 Hollywood Ave., East Orange, N.J. 07018

Filed June 2, 1975, Ser. No. 582,733
Int. Cl.² F25D 19/00, 3/08

U.S. Cl. 62-449

1 Claim



1. In a freezing pot, the combination of a container having an access opening at its top, a removable lid on said opening, said lid and container each being comprised of a metal outer sheath having a fiberglass insulation on their inner sides so to form an insulated interior within said freezing pot, each said insulation comprising a singular unit that includes double walls with a central insulation space therebetween, said container insulation extending around the side and bottom of said container, a resilient rubber pad placed on top said insulation bottom so to cushion the placement of items downwardly into said container, a plurality of carrying handles on an outer side of said container, a compartment below said container containing a refrigeration mechanism including an electric motor driving a compressor, an evaporator and other conventional refrigeration components, and electric power means to said motor, said lid being hingedly connected to said container, a cooling coils of said mechanism being located on an underside of said lid, a horizontal member, integral with said lid sheath, is on an underside of said coil and being provided with openings therethrough for allowing cooled air from said coil flow downward into said container interior, and a flexible hose extending between said coil and a remainder of said mechanism in said compartment below said container, said hose comprising a steel-woven mesh imbedded within a rubber casing.

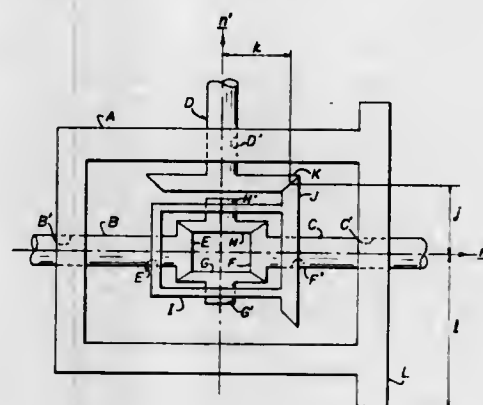
4,006,607 CONSTANT SPEED RATIO COUPLING FOR SHAFTS WITH TIME-VARYING ORIENTATIONS

Thomas R. Kane, 817 Lathrop Drive, Stanford, Calif. 94305
Filed Aug. 20, 1975, Ser. No. 606,117

Int. Cl.² F16D 3/30

U.S. Cl. 64-21

5 Claims



1. A shaft coupling comprising:

a first rigid body (A);

a second rigid body (M);

means (shafts B and C) for rotatably coupling said first and said second rigid bodies (A and M) such that said bodies are rotatable relative to each other about a common axis (m);

a first shaft means (D) having an axis of rotation (n') mounted for rotation in said first rigid body (A);

a second shaft means (N) having an axis of rotation (n) mounted for rotation in said second rigid body (M); and
means (gears E, F, G, H, J, K, L, P, Q, R, S and T) for coupling said first shaft means (D) to said second shaft means (N) whereby the ratio of the speed of rotation of said first shaft means (D) about its axis of rotation (n') relative to said first rigid body (A) and the speed of rotation of said second shaft means (N) about its axis of rotation (n) relative to said second rigid body (M) is maintained constant when said first and said second rigid bodies (A and M) are rotated relative to each other about said common axis (m).

4,006,608 TORQUE RELEASE DRIVE COUPLING

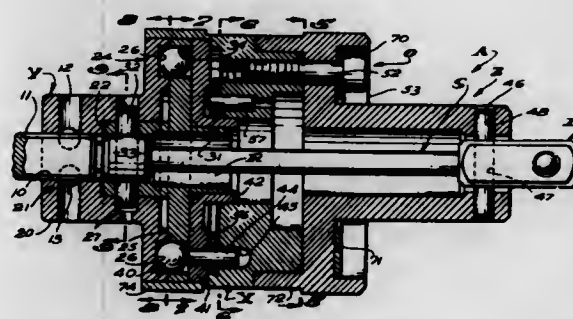
Ivan N. Vuceta, San Gabriel, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.

Filed Nov. 3, 1975, Ser. No. 628,393

Int. Cl.² F16D 3/56

U.S. Cl. 64-29

7 Claims



1. An elongate torque limiting device with front and rear ends and engageable with and between a rotating power shaft and piece of work to be torqued and including a rotatable drive section with a rear portion connected with the power shaft and a front portion with a plurality of circumferentially spaced forwardly opening ball receiving sockets in radial outward spaced relationship from the central longitudinal axis of the device, a driven plate forward of the front portion of the

drive section and having axially extending through openings normally registered with said sockets, drive balls normally engaged in and extending between the said openings and sockets and establishing driving engagement between the drive section and driven plate, an elongate central torque shaft with a rear end coupled with the driven plate and a front end connected with a work engaging drive member, a keeper plate forward of the driven plate normally overlying the said openings and holding the balls engaged in said openings and sockets and having rearwardly opening pockets normally circumferentially offset from said openings, a body section forward of the keeper plate, means connecting the body section in predetermined rotative position relative to the front end of the torque shaft, spring means normally yieldingly maintaining the keeper plate in a normal rotative position relative to the body section, said pockets being circumferentially offset from said openings a distance equal to the circumferential deflection of the torque shaft between its front and rear ends upon the conducting of predetermined torque therethrough, said drive section urging the balls forwardly from within the sockets and into the pockets when the pockets move into register with the openings whereby drive between the drive section and driven plate is broken and drive between the driven plate and keeper plate is established, said spring means and keeper plate yieldingly urge the balls rearwardly from within the pockets and into said sockets when the balls are engaged in said sockets and said openings register with the sockets, said connecting means includes a front section drivingly coupled with the torque shaft and engaged with the body section for rotation relative thereto and releasable means securing the body and front section against relative rotation with said pockets in normal predetermined circumferential spaced relationship relative to said openings.

4,006,609 MANUFACTURING OF PATTERNED DEEP PILE CIRCULAR KNITTED FABRIC

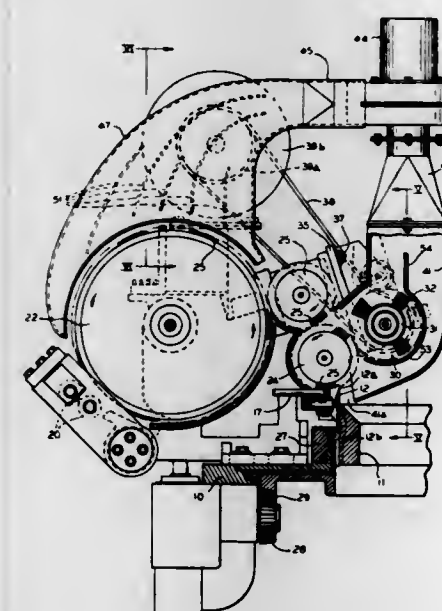
Norman C. Abler, Menominee Falls, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 29, 1974, Ser. No. 465,269

Int. Cl.² D04B 9/14

U.S. Cl. 66-9 B

17 Claims



1. In apparatus for manufacturing patterned deep pile circular knitted fabric, including means defining a fiber feed path in which fibers are transferred to the clothing of a doffer rotating in one direction, and knitting needles carried by a rotary cylinder, said needles being adapted to selectively take part of said transferred fibers from the doffer clothing but allowing some of the fibers to remain on the doffer clothing, the improvement comprising:

a scavenger roll for continuously scavenging from the doffer clothing fibers remaining nonuniformly on the doffer clothing in the area thereof between where the knitting needles may take fibers from the doffer and where the fibers are transferred to the doffer;

means defining a pneumatic passage leading away from said scavenger roll and having hood means partially enclosing the scavenger roll and having an air inlet opening adjacent to the doffer;

means in said passage for effecting movement of air inwardly through said opening and along said passage to carry away the scavenged fibers;

means for discharging the scavenged fibers from said passage and delivering the discharged fibers to a location along said fiber feed path for retransfer to the doffer;

mechanical dispersing means located in said passage whereby to assure uniform delivery of the scavenged fibers to said location;

said means defining a fiber feed path including a carding roll; and

said discharging and delivering means comprising a hood having means defining a discharge opening complementary to a substantial peripheral area of the carding roll and directed to discharge the scavenged fibers onto the periphery of the carding roll.

4,006,610 METHOD AND APPARATUS FOR FEEDING PLURAL SLIVERS SELECTIVELY TO A HIGH PILE FABRIC KNITTING MACHINE

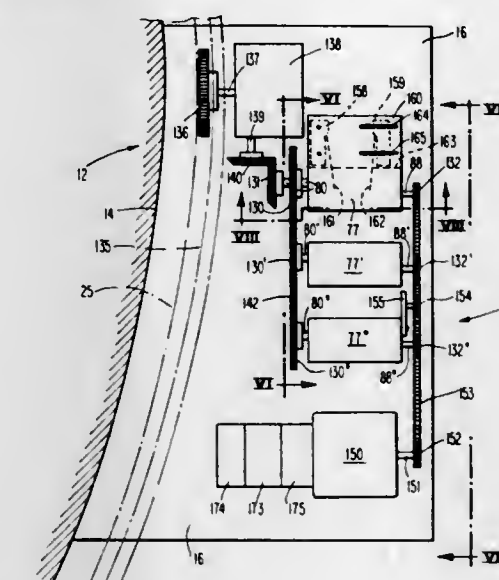
Thomas J. Thore, Tarboro, N.C., assignor to Glenolt Mills, Inc., New York, N.Y.

Filed June 10, 1975, Ser. No. 585,473

Int. Cl.² D04B 9/14

U.S. Cl. 66-9 B

12 Claims



1. In a sliver feeding device for a high pile fabric circular knitting machine, said device having a main cylinder, plural assemblies of rotatable sliver feed rolls spaced arcuately about the cylinder, sliver feed control means for activating the feed rolls during selected time intervals to deliver sliver selectively to the cylinder, said control means including a separate timing control device and a separate drive means associated with each assembly of feed rolls for rotating selectively the feed rolls to deliver sliver to the cylinder, each said drive means being connected electrically to the timing control device for its feed rolls, the improvement wherein each separate timing control device includes:

- a cam-switch assembly connected electrically to the drive means, said cam-switch assembly including a rotatable timing cam for actuating the switch selectively,
- drive means to rotate the timing cam continuously and
- control means for the timing cam to adjust the cam position continuously as the cam rotates relative to its switch,

to vary selectively the points in time when the time intervals commence and cease, and the duration of the time intervals, during which the feed rolls deliver sliver to the cylinder.

4,006,611

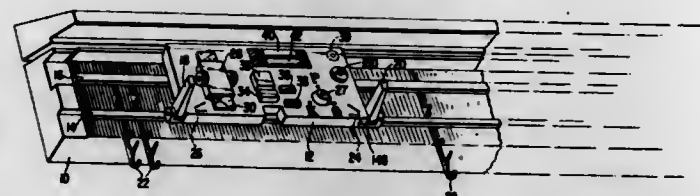
POSITIONING CONTROL FOR PROGRAMMABLE KNITTING MACHINES

William Kahan, New York, N.Y.; Howard D. Rogers, Fanwood, and Fredrick A. Rupinski, Lyndhurst, both of N.J., assignors to The Singer Company, New York, N.Y.
Continuation-in-part of Ser. No. 612,815, Sept. 12, 1975, Pat. No. 3,983,718. This application June 24, 1976, Ser. No. 699,734

Int. Cl.³ D04B 7/00, 15/66

U.S. Cl. 66—75.2

5 Claims



1. In a knitting machine, the combination comprising a needle bed supporting a plurality of needles in side by side relation, a carriage mounted on the bed for movement traversing such needles, a program card bearing patterning instructions in rows and columns to denote a design unit to be produced in courses and wales respectively of a fabric, means for reading out the patterning instructions on the card, a memory connected with the reading means for storing signals representing the patterning instructions, needle selecting means on the carriage operably connected with the memory, means for sequentially recalling signals from the memory as the carriage is moved back and forth across the bed of the machine and operating said selecting means such that the design unit may be repetitively produced across a fabric, and switch means operable to precondition the recall means with the carriage in a selected position to provide for the formation of a particular column of the design unit on a particular needle whereby the locations for repetitively produced design units in a width of said fabric is established.

4,006,612

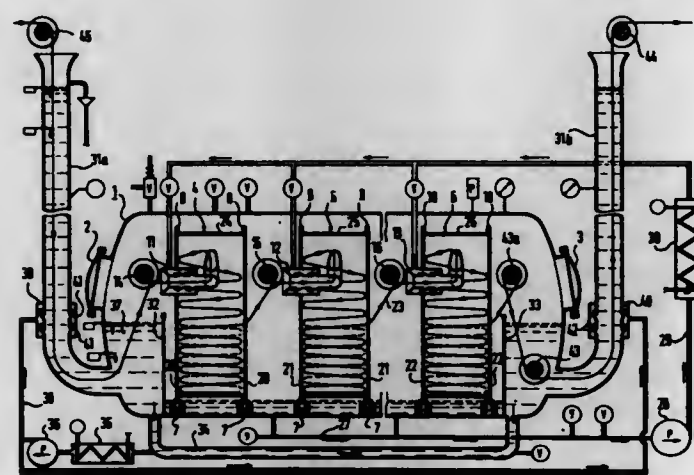
APPARATUS FOR THE WET PROCESSING OF TEXTILE STRANDS

Alfred Thies, Gerlewer Weg 56, 442 Coesfeld, Germany
Filed Dec. 16, 1975, Ser. No. 641,262
Claims priority, application Germany, Dec. 16, 1974, 2459363

Int. Cl.³ D06B 3/24, 3/28, 23/18

U.S. Cl. 68—177

12 Claims



1. An apparatus for the wet processing of an elongated flat-shaped textile strand in a processing liquor comprising

a kler capable of accommodating a long length of the textile strand;
at least two drums inside said kler, each of said drums having an annular wall and end walls;
jetting-in means associated with each of said drums for inserting said strand into its associated drum;
means in said kler radially displaced from the central axis of said drums for engaging and rotatably supporting said drums for rotation about said central axis;
means cooperating with said drums and said jetting-in means for establishing a predetermined path of travel in said kler from one drum to another in a series sequence; and
circulating system means including a pump for recirculating said processing liquor under pressure to said jetting-in means and from the bottom of said kler;
the end walls of said drums having means defining central openings to permit insertion and withdrawal of said strand, said central openings being dimensioned to avoid conflict with said jetting-in means and said strand.

4,006,613

LOCK PICK MECHANISM

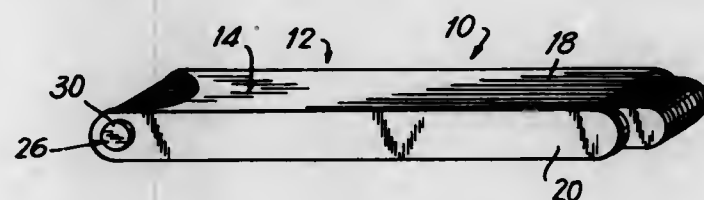
Westley Zion, New York, N.Y., assignor to Majestic Lock Co., Inc., New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,193

Int. Cl.³ E05B 19/20; A47G 29/10

U.S. Cl. 70—394

9 Claims



1. A lock pick mechanism comprising first and second housing members, first means for connecting said housing members together for pivotal movement between open and closed positions, a frame secured at one end thereof to said first means, a plurality of lock picks, second means disposed at the other end of said frame for connecting said lock picks together for pivotal movement between storage and operative positions, each of said lock picks having a pick end which faces toward said first means when said lock pick is in its storage position and which faces away from said first means when said lock pick is in its operative position, said plurality of lock picks and said housing members being adapted such that said pick ends may be contained within said frame and enclosed by said housing members when said lock picks are in their storage positions and said housing members are in their closed positions and such that any individual one of said lock picks may be rotated from its storage position to its operative position when said housing members are in their open positions, said individual lock pick being locked in its operative position with its pick end extending from said frame and said housing members when said housing members are in their closed positions.

4,006,614

WARNING LIGHT SECURITY DEVICE

Wilton K. Decker, Port Washington, Wis., assignor to Safe-Lite, Inc., Menomonee Falls, Wis.

Filed Aug. 21, 1975, Ser. No. 606,700

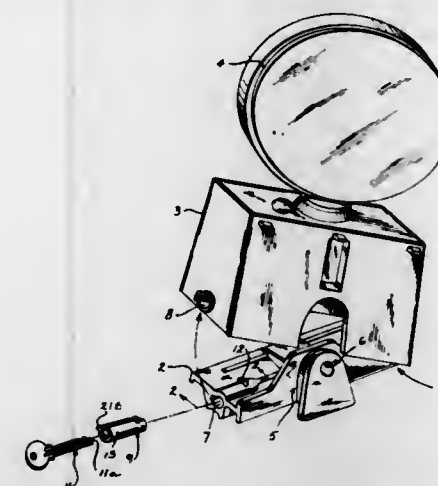
Int. Cl.³ E05B 9/04, 65/52

U.S. Cl. 70—63

10 Claims

1. In combination with a housing for a warning light of the type wherein a removable casing is pivotally connected at one end to a base, and wherein the casing has an aperture at its opposite end which aligns with an opening in the base, wherein the improvement comprises:
a key;

a plug-type lock which is received by the opening in said base and the aperture in said casing to prevent relative movement therebetween while disposed therein, said lock having:
a lock housing having an interior which receives said key;
a locking cylinder rotatable within said lock housing having a radially extending latch element, and a key receiving slot at one end that faces axially into said lock housing; said latch element extending radially outwardly from the interior of said lock housing, and being movable between locking and non-locking positions upon actuation by said



key, the locking position restraining and the non-locking position allowing removal of said lock from said base and said casing;

a key receptor rotatable within said lock housing having an axial key receiving channel, and that turns with said locking cylinder upon insertion and rotation of said key; and

an arched key restrainer within said lock housing and disposed axially between said locking cylinder and said key receptor presenting a ridge lying in a transverse plane adapted to match a key notch upon insertion and turning a proper key.

4,006,615

AXIAL TUMBLER LOCK

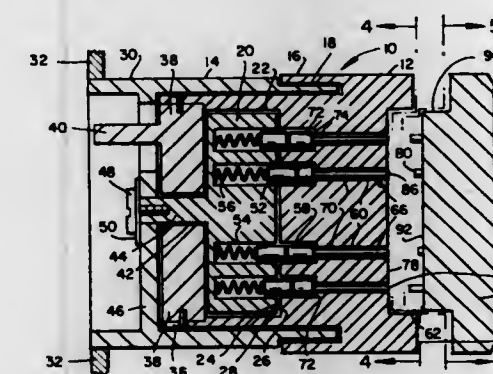
Janos Szova, 3615 Greystone Ave., Bronx, N.Y. 10463

Filed Aug. 7, 1975, Ser. No. 602,586

Int. Cl.³ E05B 27/08

U.S. Cl. 70—363

9 Claims



1. An axial tumbler lock comprising a body portion including a casing member having a plurality of axial bores extending therethrough and exposed at the forward surface thereof, a cylinder member mounted within the rear portion of said casing member with one of said members being fixed to a stationary support and the other member being rotatable relative thereto, said cylinder member having a forward surface forming a shear plane with a confronting rear surface of said casing member and having a plurality of axial bores each aligned with a corresponding bore of said casing member, latch means operatively connected to said rotatable member

for movement to a lock-open position when said rotatable member is rotated relative to said fixed member, a plurality of axial tumbler means movably mounted, one each, in selected bores of said plurality of bores, each of said tumbler means comprising a lock pin slidably mounted in a respective bore of said cylinder member, a tumbler pin slidably mounted in a respective bore of said casing member and a compression spring within said cylinder member bore normally urging said lock pin to a locked position in which it extends across said shear plane between said members, thus preventing rotation of said rotatable member relative to said fixed member, said tumbler pins having varying lengths, and key means for rotating said rotatable member to move said latch means to its lock-open position, said key means comprising a body having a plurality of posts projecting from an end surface thereof and positioned for insertion into the exposed ends of the bores at the forward surface of the casing member, said pins being sized to engage said tumbler means to slide said lock pins and tumbler pins to a position in which their confronting ends are located on said shear plane thereby permitting rotation of said movable member relative to said fixed member, and a plurality of dummy pins mounted in at least some of the axial bores of said casing member.

4,006,616

WEATHER SEALED LOCK MECHANISM

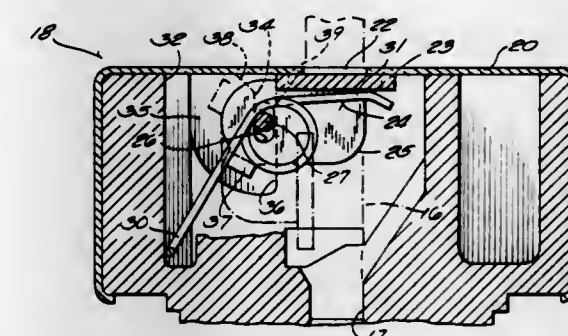
Hugo G. Rubner, Milwaukee, and Robert R. Spreng, Brookfield, both of Wis., assignors to Briggs and Stratton Corporation, Wauwatosa, Wis.

Filed Sept. 25, 1975, Ser. No. 616,580

Int. Cl.³ E05B 17/18

U.S. Cl. 70—455

11 Claims



1. A rotatable lock cylinder having in a forward end thereof a cavity in which a shutter is receivable and to the bottom of which an axial key slot opens, said cylinder also having a covering wall secured thereto normal to the cylinder axis and extending across the mouth of the cavity to close the same, said wall having a keyhole therein aligning with the key slot, said cylinder being characterized by:

A. a shutter in said cavity comprising a flap to sealingly engage the rear surface of said wall all around the keyhole therein;

B. means pivotally mounting the shutter for fore and aft rocking motion of its flap toward and from sealing engagement with the rear surface of said wall, comprising
1. a hinge pin extending across the cavity at one side of the keyhole, and

2. means on the cylinder defining sockets which open unrestrictedly to the rear surface of said wall and laterally inwardly to opposite sides of the cavity, in which sockets the opposite end portions of the hinge pin are received;

C. a spring in the cavity

1. having an arm which reacts against a surface portion on the cylinder that faces laterally into the cavity and extends substantially parallel to the hinge pin at the side thereof remote from the keyhole, and

2. having at least one other arm that acts upon the shutter to firmly but yieldingly urge its flap forwardly into sealing engagement with the rear surface of said wall; and

D. cooperating abutment means on the cylinder and the shutter engageable prior to securing of said wall to the cylinder to prevent spring propulsion of the shutter about its pivot axis beyond a position at which its flap extends only a short distance out of the cavity and defines but a small obtuse angle to the cylinder axis, said abutment means comprising

1. another surface on the cylinder, in said cavity, which faces toward the first mentioned surface portion on the cylinder and which is defined by a recess at one side of the cavity that is adjacent to one of said sockets, and
2. a lug on said shutter extending into said recess and engageable with said other surface on the cylinder upon rotation of the shutter to its said position, said lug being spaced to the side of the hinge pin that is remote from the flap and said recess being wide enough to allow movement of said lug away from said other surface on the cylinder when the flap pivots rearwardly toward the bottom of the cavity upon insertion of a key for the cylinder into said keyhole and key slot.

4,006,617

METHOD AND APPARATUS FOR ROLL FORMING TAPERED STRUCTURAL MEMBERS

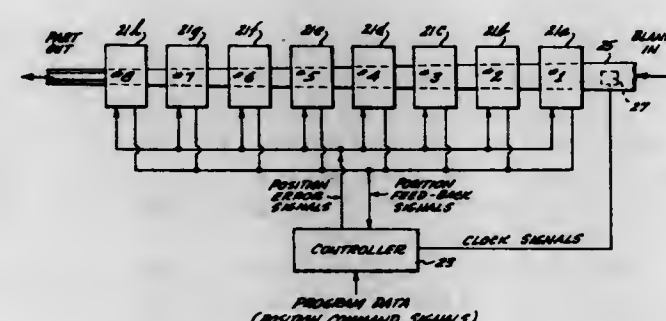
Gene B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 24, 1975, Ser. No. 634,431

Int. Cl.² B21D 5/08

U.S. Cl. 72-7

42 Claims



wardly to advance ahead of the mandrel and ahead of the cold forming means;
 c. releasing the reduced blank from tight engagement with the mandrel, but leaving the telescoped blank on the mandrel for its support;
 d. immediately thereafter and continuously pulling the blank through a drawing apparatus as it leaves the cold forming step for drawing in of the blank, all of the while the mandrel is in the blank and is still being held at its rear end; whereby the blank is drawn to final dimension continuously and immediately after it leaves the cold forming step, to be drawn in without any intermediate annealing, the removal of the mandrel from the tube occurring during the drawing process.

4,006,623

POSITIONING DEVICE

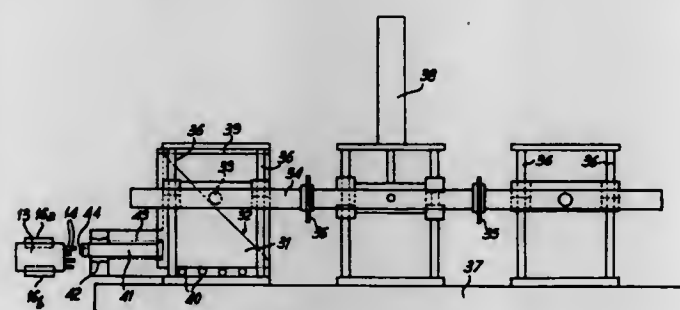
Paul Cailloux, La Varenne Saint Hilaire, France, assignor to Promecam Simon-Lehmann, Saint Denis, France
 Filed June 3, 1975, Ser. No. 583,504

Claims priority, application Italy, June 10, 1974, 23779/74; France, Oct. 15, 1974, 74.34613

Int. Cl.² B21D 11/20, 11/22

U.S. Cl. 72-461

6 Claims



1. A device for positioning articles, comprising a support; first means mounted on said support for displacement in a first direction and operative for engaging an article so as to position the same relative to said support; second means mounted on said support for displacement in a second direction substantially normal to said first direction and in a predetermined path; third means interposed between said first and second means and operative for transforming said displacement of said first means into said displacement of said second means in a predetermined ratio and including a wedge member having a sloping cam surface and connected to said second means to share said displacement thereof in said second direction, and a cam follower arrangement mounted on said first means to share said displacement thereof in said first direction and engaging said sloping cam surface of said wedge member; means for driving one of said first, second and third means so as to displace said first and second means in said ratio; and stop means mounted on said support for movement in a third direction substantially normal to said second direction and having a plurality of abutment portions sequentially projecting to various extents into said path of displacement of said second means during said movement of said stop means in said third direction to thereby limit said displacement of said second means, whereby said displacement of said first means is also limited via said third means.

4,006,624

PNEUMATIC CHROMATOGRAPH

Raymond Annino, Colds, N.Y.; Robert C. Prescott, Foxboro; Edwin L. Karas, Sharon, both of Mass., and Richard W. Kalinoski, East Providence, R.I., assignors to The Foxboro Company, Foxboro, Mass.

Filed Feb. 14, 1975, Ser. No. 549,930

Int. Cl.² G01N 31/08

U.S. Cl. 73-23.1

13 Claims

1. In chromatographic apparatus wherein a fluid sample is

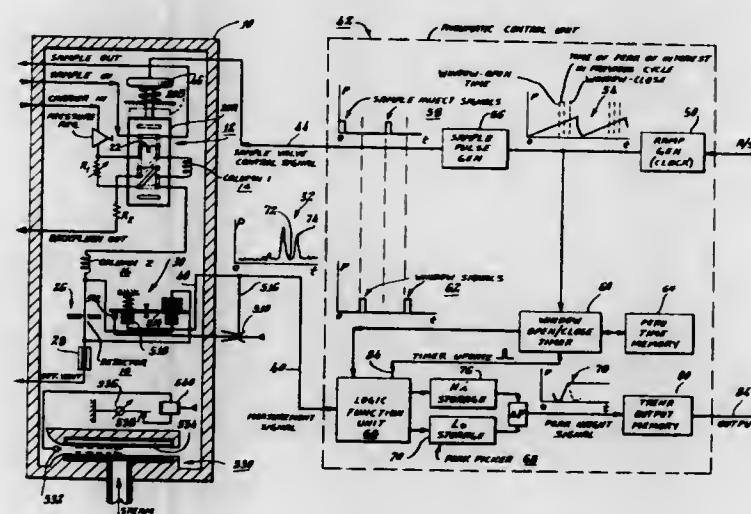
injected into a column to be carried therethrough so as to effect separation of the sample components to elute successively from the column, said apparatus further including signal-producing means responsive to the eluted sample components for producing a signal representing component concentration, and activating means responsive to a control signal for activating said signal-producing means at a time following injection of the sample into the column when one particular component of interest is expected to appear;

the improvement for producing said control signal comprising:

memory means adapted to store information corresponding to a time duration following sample injection after which said one component is predicted to appear;

timing means for measuring time after the injection of the sample;

means coupled to said memory means and to said timing means for developing a control signal which is subsequent



to sample injection by a period of time corresponding to said stored information;
 means for directing said control signal to said activating means to produce a component concentration signal for a particular component appearing after activation of said signal-producing means;
 peak-detecting means for determining when the peak of said particular component occurs; and
 means coupled to said peak-detecting means for storing in said memory means information reflecting the time between sample injection and the actual occurrence of said peak, whereby said memory means is updated to reflect the actual time currently required for the component of interest to pass through the column means, the time of occurrence of said control signal for a subsequent measurement thereby being modified so as to track the time of appearance of the component of interest when that time changes due to changes in temperature and the like.

4,006,625

AMPLITUDE SORTING OF OSCILLATORY BURST SIGNALS BY SAMPLING

Thomas J. Davis, Richland, Wash., assignor to Battelle Memorial Institute, Columbus, Ohio

Filed July 30, 1975, Ser. No. 600,418

Int. Cl.² G01H 1/00

U.S. Cl. 73-71.4

15 Claims

12. A method of acoustic emission testing of materials for different material anomalies, comprising:

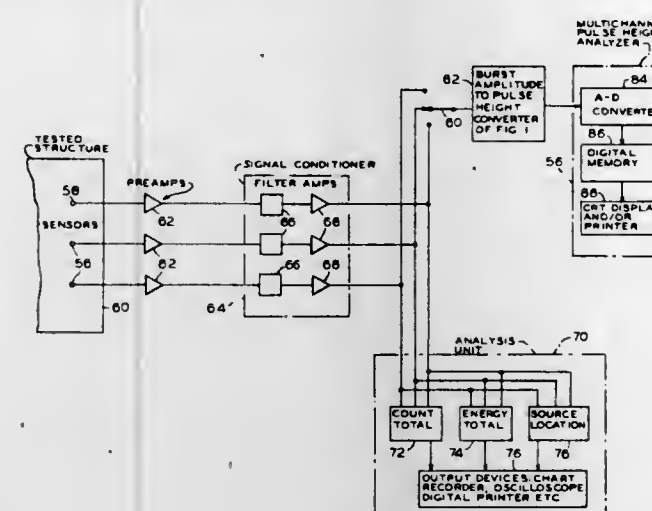
sensing acoustic emission waves emitted by flaws and other anomalies in said materials, and converting said waves into oscillatory burst electrical signals;

detecting said oscillatory burst signals to produce an envelope signal corresponding to the envelope of the detected burst signal;

sampling an intermediate portion of said envelope signal to produce a sample pulse output whose pulse height corresponds to the peak amplitude of the detected burst signal; and

sorting the sample pulses of a plurality of successive envelope signals into different groups according to their pulse

free-fall path of the ball as to permit alignment of identical marks in each set with the ball as the latter reaches its maximum rebound height.



heights, certain of said groups corresponding to a different type of material anomaly.

4,006,626

METHOD AND APPARATUS FOR EVALUATING REBOUNDING CHARACTERISTICS OF OBJECTS

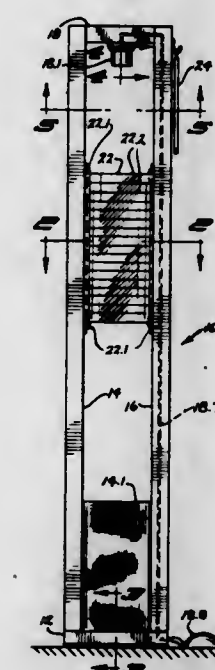
Josef Ruzicka, and Petr O. Ruzicka, both of 1705 Summit Ave., St. Paul, Minn. 55105

Filed Dec. 9, 1974, Ser. No. 530,991

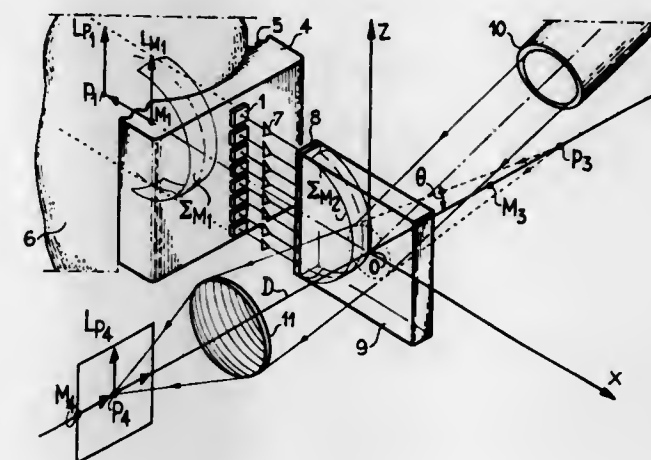
Int. Cl.² G01N 3/52

U.S. Cl. 73-13

9 Claims



1. Apparatus for testing performance characteristics of balls and ball-impacting surfaces comprising a horizontal substrate, ball releasing means supported above and in vertical alignment with the substrate and capable of releasing a ball substantially without spin, the ball releasing means comprising a downwardly open holder having inner walls parallel to or at an acute angle with the vertical, the inner surface of the wall providing a peripheral vacuum seat against which the ball is seated, means providing a pressure differential between the top and bottom of the ball to hold the ball in seating engagement therein, and means for changing said pressure differential to permit the ball to drop from the holder; means providing a free-fall path for the ball from the release means to the substrate; and a scale for measuring rebound height, the scale comprising at least two sets of vertically spaced, height-indicating rule marks with the marks of one set spaced from and horizontally aligned with identical marks of the other set, the sets of rule marks being so positioned with respect to the



1. High speed ultrasonic echo-tomographic system comprising a generator of pulsed wave trains, a first straight line alignment of electroacoustic transducers, supplied in phase by said generator, said first alignment having a longitudinal dimension large in relation to the wavelength of the ultrasonic wave emitted, and coupled to the body being studied, so as to emit a plane shaped beam passing through a cross-section of said body, a second straight line alignment of transducers electrically connected respectively to said transducers of the first alignment so as to retain the phase of the echo signals received by said first alignment, a crystalline medium, said second alignment being coupled to said crystalline medium to form in reply ultrasonic wave fronts in said medium, an optical system directing a beam of monochromatic light at an incidence substantially equal to the Bragg angle onto the fronts of waves emitted by the second alignment of transducers and optical means to collect one of the orders diffracted by said fronts from the beam emitted by said optical system.

4,006,628

MAGNETIC INDUCTION TYPE TRANSDUCER MEANS

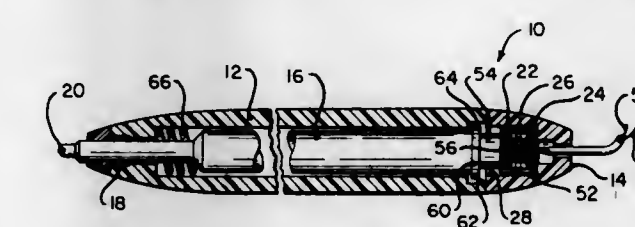
Gerald A. St. Jacques, Germantown, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 19, 1975, Ser. No. 633,327

Int. Cl.² G01L 5/00

U.S. Cl. 73-141 A

8 Claims



6. A transducer means including a stylus for generating electrical signals proportional to varying forces exerted on a surface during movement of said stylus in contact with said surface, said transducer means also comprising:
 a housing adapted to be grasped by a user;
 first and second core means being cylindrical in shape with

each having an annular recess therein and being mounted for movement relative to each other in said housing;
a resilient means positioned between and interconnecting said first and second core means;
a coil means mounted in said annular recesses of and coupled to said first and second core means;
said stylus contacting one of said first and second core means to transfer said varying forces thereto to change the coupling between said first and second core means; and
oscillator means coupled to said coil means whereby the frequency of said oscillator means changes in accordance with said varying forces to generate said electrical signals.

4,006,629

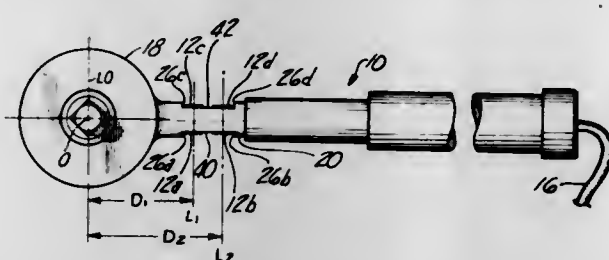
TORQUE MEASURING APPARATUS

Gary L. Barrett, Milford, and Ralph S. Shoberg, Farmington, both of Mich., assignors to GSE, Inc., Farmington Hills, Mich.

Filed July 17, 1975, Ser. No. 596,914
Int. Cl.² B25B 23/14

U.S. Cl. 73-139

11 Claims



6. A torque wrench comprising: an integral metallic body having a head adapted to engage and turn a workpiece about an axis of rotation, and a handle extending from the head and perpendicular to the axis of rotation for reacting to force applied normally to the handle and at a distance from the head; first and second transducer means operatively attached to the handle at first and second sensing points along the longitudinal axis of the handle for sensing elastic strain in the handle and producing a corresponding electrical signal, the first and second sensing points being spaced from one another so as to satisfy the relationship:

$$GF1 \cdot D1/Z1 = GF2 \cdot D2/Z2$$

where: D1 and D2 are the respective distances from the first and second sensing points to the intersection of the longitudinal axis of the handle and a line mutually perpendicular to both the axis of rotation and the longitudinal axis of the handle; Z1 and Z2 are the respective section moduli of the first and second sensing points, and GF1 and GF2 are the respective sensitivities of the transducer means; means for measuring the difference between the electrical signal values corresponding to the elastic strain at the first and second sensing points so as to provide an electrical output signal directly proportional to the torque as the rotational workpiece; and, display means for receiving the electrical output signal and translating it into a visual presentation of the torque on the workpiece.

4,006,630

WELL TESTING APPARATUS

Richard L. Cathriner, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

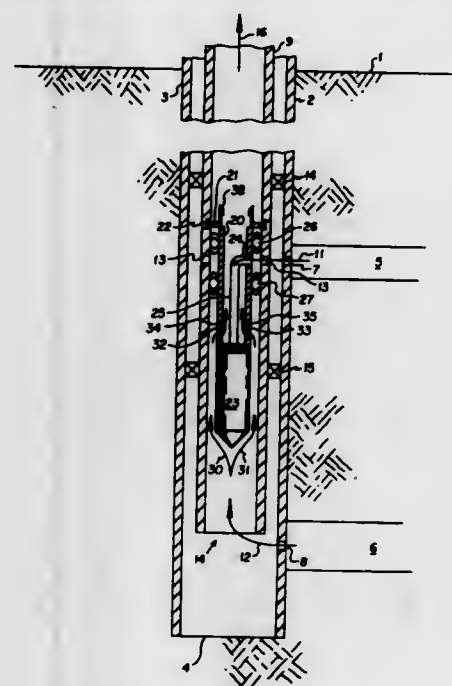
Filed May 26, 1976, Ser. No. 690,107
Int. Cl.² E21B 47/06

U.S. Cl. 73-155

4 Claims

1. Downhole well testing apparatus comprising mandrel means adapted to pass through said well to the situs of testing, said mandrel having at least one aperture communicating with the outside thereof, said mandrel carrying testing means, conduit means operatively connecting said at least one aper-

ture to said testing means, packing means carried by said mandrel for isolating said at least one aperture in an annulus



between said mandrel and a surface outside said mandrel, and by-pass means carried by said mandrel to allow fluid to pass by said mandrel after said packing means is set.

4,006,631

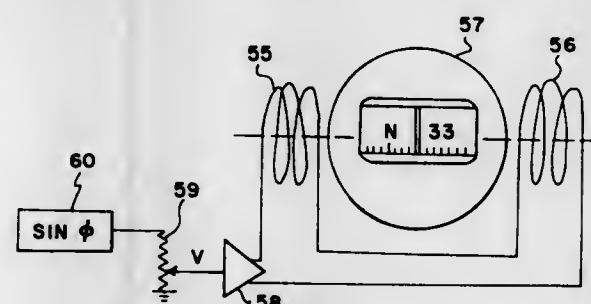
MAGNETIC HEADING REFERENCE

Howell D. Garner, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 531,647, Dec. 11, 1974, Pat. No. 3,943,763. This application Oct. 16, 1975, Ser. No. 623,156
Int. Cl.² G01C 21/00

U.S. Cl. 73-178 R

4 Claims



1. Means for correcting the northerly turning error of a magnetic compass on a vehicle comprising: means on said vehicle for generating a signal proportional to $V \sin \phi$ where V is the vertical component of the earth's magnetic field at the location of the vehicle and ϕ is the bank angle of the vehicle, and coil means surrounding said compass and receiving said generated signal for generating a force proportional to $V \sin \phi$ on the needle of said compass in a direction opposite to the force on said needle caused by the northerly turning error.

4,006,632

AIRCRAFT TURN COORDINATOR

Del Bianco Saverio, Milan, Italy, assignor to Aeritalia S.p.A., Milan, Italy

Filed Nov. 4, 1975, Ser. No. 628,737
Int. Cl.² G01C 21/00

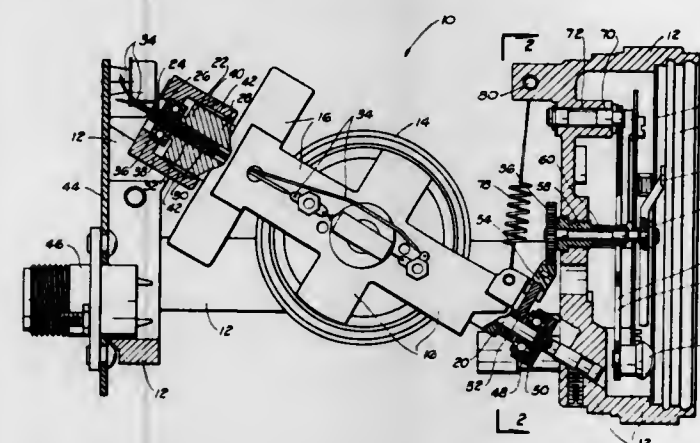
U.S. Cl. 73-178 R

6 Claims

1. An aircraft turn coordinator used in an aircraft to sense

both yaw and roll rate along the longitudinal flight axis, the coordinator comprising:

an elongated coordinator having a front, center, and rear portion;
a gyroscope;
a gimbal having a front, center, and rear portion, said gimbal suspending said gyroscope from the center portion thereof;
a front gimbal shaft attached to the front portion of said gimbal and rotatably secured to a front bearing in a front bearing housing, said front bearing housing attached to the front portion of said coordinator housing;
a rear gimbal shaft attached to the rear portion of gimbal, gimbal said rear shaft rotatably secured to a rear bearing in a rear bearing housing, said rear bearing housing attached to the rear portion of said coordinator housing, said rear gimbal shaft including a first portion and a



second portion, said first portion having a smaller diameter than said second portion, said first portion rotatably secured to said rear bearing, said second portion rotatably supported by a fluid damper means, said damper means contained between an annular surface of said second portion and an inner annular surface of said rear bearing housing;

a drive gear secured to said front gimbal shaft for driving a pinion gear, said pinion gear attached to a pinion gear shaft; and
a rotatable turn indicator arm attached to said pinion gear shaft and mounted alongside an indicator dial face and the front portion of said indicator housing, said gyroscope, said gimbal, said drive gear, and said pinion gear co-acting together with said indicator arm to indicate the amount of yaw and roll rate of the aircraft on said indicator dial face.

4,006,633

METHOD AND APPARATUS FOR DETERMINING HEAT REMOVAL FROM A CONTINUOUS CASTER

Johnson Shipman, and Herbert L. Gilles, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 22, 1976, Ser. No. 679,117
Int. Cl.² G01K 17/06; B22D 11/124

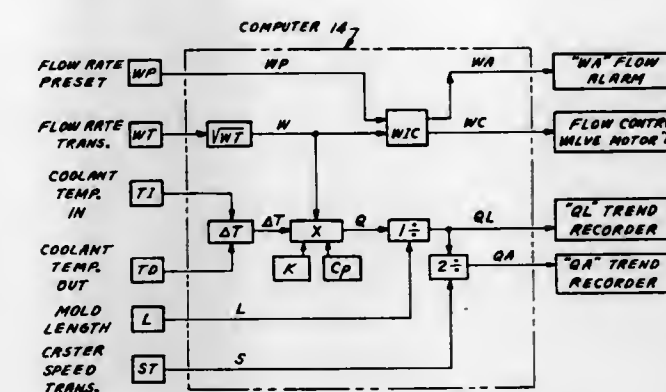
U.S. Cl. 73-190 H

24 Claims

1. In a continuous metal caster having plural solidification means for casting a single strand, each said means having a coolant flowing therethrough, a method of determining at least one thermal parameter associated with each said solidification means, which method comprises:

a. measuring coolant flow rate and coolant temperature in and out of at least one solidification means,
b. determining a length parameter associated with at least one solidification means used to solidify metal into a moving cast strand, and

c. determining heat removal rate per unit length of at least



one solidification means as a function of said means coolant and length parameters.

4,006,634

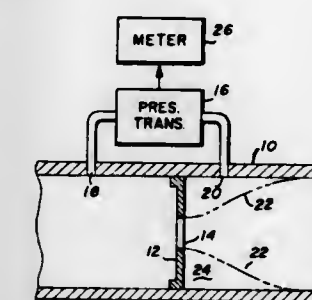
FLOW METER

Richard J. Billette, Dublin, and Arthur R. Zias, Los Altos, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 17, 1975, Ser. No. 614,329
Int. Cl.² G01F 1/22

U.S. Cl. 73-207

4 Claims



1. A flow meter comprising:

a. transducer means for sensing a pressure differential between a first port thereof and a second port thereof,
b. a conduit with said first port of said transducer means connected at a first location in said conduit and in fluid communication with fluid flowing therethrough, the fluid at a second location in said conduit being connected to and in fluid communication with said second port, and
c. an obstruction mounted in said conduit between said first location and said second location, said obstruction comprising a plurality of independently flexible spring fingers extending initially in a plane transverse to the flow of fluid in said conduit each of said fingers being compliant to said fluid flow and deflected in response to one parameter of said fluid flow whereby said obstruction to said fluid flow varies in response to said one parameter.

4,006,635

LIQUID LEVEL MEASURING PROCESS AND INDICATOR
Danny James Khol, Saint-Cloud, France, assignor to Cermat, Courbevoie, France

Filed Nov. 6, 1974, Ser. No. 521,302

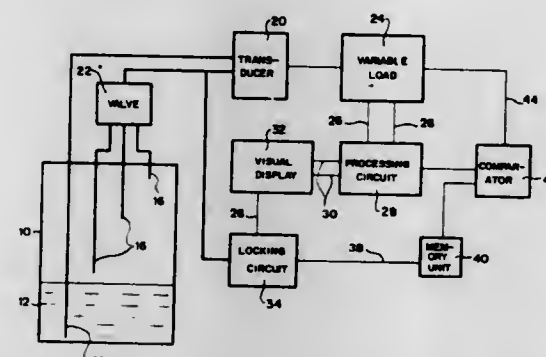
Claims priority, application France, Nov. 8, 1973, 73.39672
Int. Cl.² G01F 23/18; G01N 9/28

U.S. Cl. 73-302

6 Claims

1. An installation for continuously measuring the level and the average specific gravity of a liquid contained in a large-capacity tank, especially tanks of vessels for transporting liquefied natural gas, comprising:
a plurality of hydrostatic probes for spraying neutral gas into the tank, the outlets of said probes being at different levels within the tank,
a transducer having two inputs which are connectable to all

of said probes but are connected at any one time to only two of said probes, said transducer converting the pressure difference between neutral gas within the two probes to which it is connected into an electric signal, means responsive to the electric signal from said transducer for numerically displaying the level and the specific gravity of the liquid contained in the tank,



a variable load between said transducer and said display means for producing a signal proportional to said electric signal from said transducer, and
a circuit responsive to the liquid level reaching the outlet of one of said probes for adjusting said variable load so that the signal provided by said variable load causes the known level of the outlet of said one probe to be displayed by said display means.

4,006,636

METHOD AND APPARATUS FOR EXACT MEASUREMENT OF PRESSURES BY MEANS OF LEVEL OR PRESSURE MEASURING EQUIPMENT OF THE BUBBLE TUBE TYPE

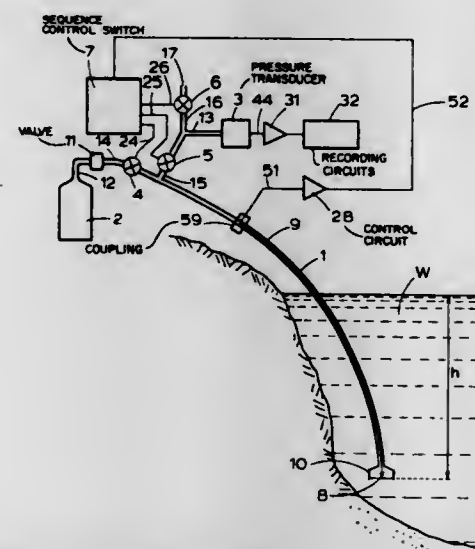
Hans Kristian Holmen, Vøyenenga, Norway, assignor to Lehmkuhl A/S, Oslo, Norway

Filed July 7, 1975, Ser. No. 593,533

Claims priority, application Norway, July 5, 1974, 742463
Int. Cl.² G01F 23/16

U.S. Cl. 73-302

22 Claims



1. A method for measuring pressures by the use of level or pressure measuring equipment of the type including a bubble tube having a first end thereof positioned in a body of liquid, a source of pressure connectable to a second end of said bubble tube via a first closeable line, a pressure transducer and recorder connectable to said bubble tube via a second closeable line, said pressure transducer being connectable to a reference pressure source via a third closeable line, said pressure transducer being deactivated to measure pressure in lines exposed thereto and deactivated to interrupt measurement; said method comprising:

opening said third line and activating said transducer and recorder to thereby measure and record said reference pressure;

closing said third line and deactivating said transducer, and then opening said first line to expose said bubble tube to said source of pressure to expell any liquid from said bubble tube;
opening said second line to expose said second line to said source of pressure;
closing said first line and stabilizing the pressure in said bubble tube and said second line for a time sufficient to achieve a static pressure condition therein;
activating said pressure transducer and recorder for a measuring interval of short duration, thereby measuring the static pressure in said bubble tube and said second line, and obtaining a desired measurement as the difference between said reference pressure and said static pressure; and
immediately after said measuring interval, deactivating said pressure transducer and recorder, closing said second line, and opening said third line to expose said pressure transducer to said reference pressure and to thereby relieve said pressure transducer.

4,006,637

ELECTRO-MECHANICAL DISPLACEMENT TRANSDUCER

Yohel Kinoshita, Horisaki-cho 1087-1, Omiya, Saitama, Japan (330)

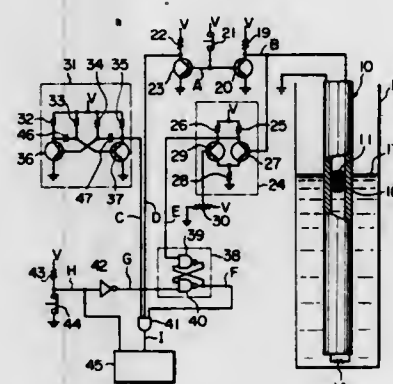
Filed May 7, 1976, Ser. No. 684,397

Claims priority, application Japan, May 16, 1975, 50-057210; Aug. 29, 1975, 50-104041

Int. Cl.² G01F 23/26

U.S. Cl. 73-313

8 Claims



1. An electro-mechanical displacement transducer comprising a probe on which shunt capacitance and series inductance are uniformly distributed lengthwise to form a distributive constant circuit, said probe including elongate substantially coaxial hollow conductor members with annular insulating means interposed therebetween, at least one of said conductor members being a tightly wound coil extending lengthwise of said probe, means having an impedance equivalent to the characteristic impedance of the distributive constant circuit and connecting said inner and outer conductor members at the receiving end of the probe, said conductor members having sending ends, remote from said receiving end, connectable to an electrical wave generating means, said probe including a hollow space extending longitudinally thereof for receiving relatively movable means introducing an impedance variation shiftable therein lengthwise of said probe, whereby the position of such impedance variation means movable inside said probe is detectable by the span of time during which an electromagnetic wave emitted from the sending end of the distributive constant circuit travels to and back from the location of said impedance variation means in said probe.

4,006,638

ALTIMETER-ENCODER

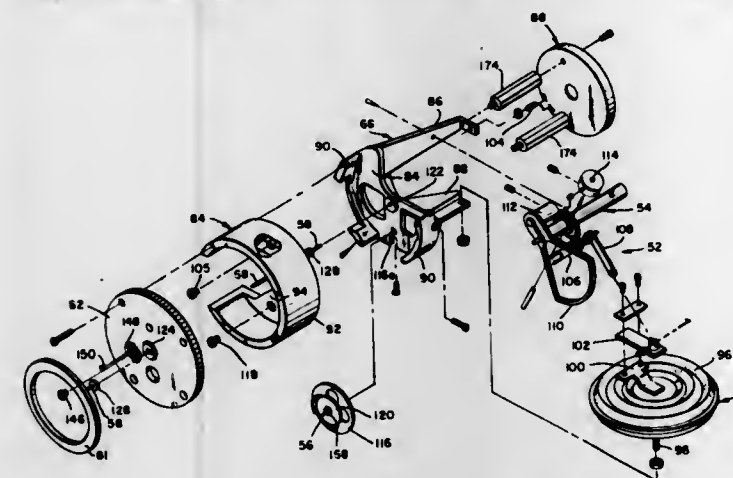
Rudolf G. Woelfl, Woodland Hills, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Oct. 24, 1974, Ser. No. 517,482

Int. Cl.² G01L 7/14

U.S. Cl. 73-387

22 Claims



1. A digital encoder adapted to be mounted in an altimeter having an aneroid bellows responsive to altitude, an indicator for visually indicating altitude and a gear train operatively interconnecting said bellows and indicator, said digital encoder including the combination of:

an encoder housing adapted to be mounted on said altimeter,

a drive gear rotatably mounted in said housing, said gear being positioned to mesh with the gear train in said altimeter and to be driven thereby when said housing is mounted in said altimeter,

a photo-optical data disc rotatably mounted on said housing, said photo-optical disc being operatively interconnected with said drive gear and driven thereby,

a series of opaque and transparent data regions on said data disc, said regions being digitally coded to correspond to altitude,

a photo-optical sensor mounted on said housing and positioned adjacent said disc for scanning said regions as said disc is driven by said gear, said sensor being effective to produce digital signals representing altitude, and

means for movably mounting said encoder housing in said altimeter whereby the housing may be moved relative to the gear train without disengaging said gear therefrom to thereby change the position of said photo-optical sensor relative to the data disc.

4,006,639

TEMPERATURE COMPENSATION FOR LIQUID FILLED PRESSURE GAUGE

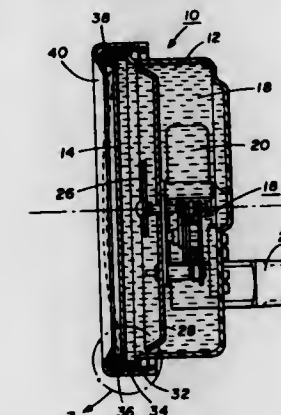
Richard H. Wetterhorn, Fairfield, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 29, 1975, Ser. No. 617,356

Int. Cl.² G01L 7/04, 19/04

U.S. Cl. 73-393

4 Claims



1. In a casing for a fluid filled pressure gauge including a

case and a crystal comprising walls supported forming a fluid-tight enclosure containing a pressure sensitive element extending to outward of the enclosure for receiving an internally applied pressure input, compensating means comprising said crystal to compensate against temperature induced volumetric changes incurred by the fluid fill, said crystal having a controlled volumetric stiffness substantially correlated to the anticipated temperature induced volumetric changes to be incurred by the fluid fill with a specific volume stiffness on the order of less than about 0.1 pounds per square inch per percent volume increase of the fluid fill.

4,006,640

SEAL FOR PROCESS PRESSURE TO CURRENT TRANSMITTER

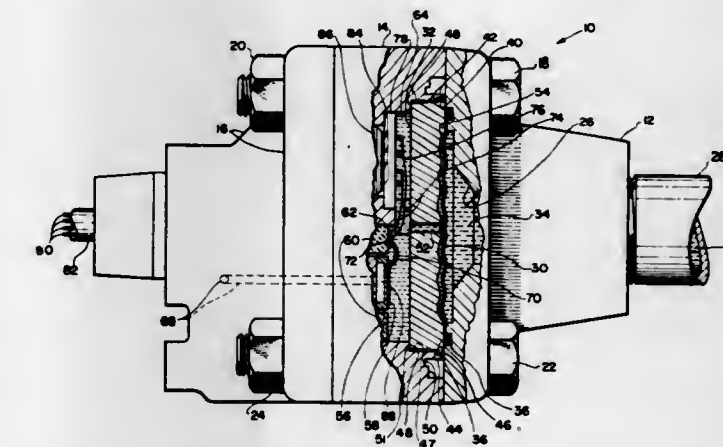
Arthur E. Gealt, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 6, 1976, Ser. No. 655,855

Int. Cl.² G01L 19/04

U.S. Cl. 73-393

10 Claims



9. A pressure to current transmitter comprising a hollow process fluid inlet portion having an inlet end and an open end, a hollow body portion having an open end facing said open end of said inlet portion,

a diaphragm, a backup plate supporting said diaphragm, across said open end of said inlet portion,

a free-standing ring integral with and extending from said body portion as an extension of said open end and positioned in a surrounding spaced relationship with said backup plate,

a welded joint extending between a surface at a free end of said ring and an adjacent surface of said backup plate, said free end of said ring being deflectable radially in a cantilever fashion upon said body portion by a force applied through said welded joint from said backup plate upon a change in ambient temperature,

fluid passage means in said backup plate to provide a fluid passage from said open end of said body portion to a volume enclosed by said diaphragm and said backup plate and

sensor means located in said body portion and arranged to detect changes in pressure of a fluid in said body portion communicating with said diaphragm in said volume by way of said fluid passage means.

4,006,641

METHOD AND APPARATUS FOR SENSING AND MEASURING FLUID PRESSURE

Ralph W. Allen, East Detroit, Mich., assignor to Dynamic Industries, Inc., Warren, Mich.

Filed Jan. 5, 1976, Ser. No. 647,259

Int. Cl.² G01L 9/02

U.S. Cl. 73-398 AR

12 Claims

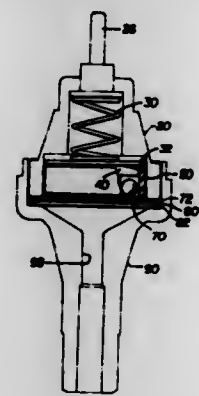
1. In an apparatus adapted to provide a normally open electrical circuit for sensing the pressure of a fluid, including:

a housing defining an internal chamber and including a bore extending from the chamber for communicating with said fluid;

a deflectable diaphragm positioned in said chamber and overlying said bore, the fluid being permitted to flow through the bore against said diaphragm but being prevented from flowing into said chamber, the diaphragm being deflected in response to fluid pressure;

a pair of spaced, electrically conductive members within said chamber providing a normally open electrical circuit, said conductive members being in general alignment with said diaphragm;

a deformable, resilient pad interposed between said spaced electrically conductive members, the pad having a plurality of openings extending therethrough substantially perpendicular to said electrically conductive members, the longitudinal dimension of each of said openings being



substantially the same and the transverse dimension of each opening being different;

an electrical contact element positioned within each of said openings providing parallel branch elements in an electrical circuit, the longitudinal dimension of each contact element being less than the corresponding longitudinal dimension of each of said openings to provide a normally opened circuit, and a resistor element associated with each contact element whereby the flow of electrical current through said normally opened circuit a proportional to the pressure of said fluid, said pad being deformed in response to the fluid pressure and to the deflection of the diaphragm such that the contact element which is in the largest of said openings closes the electrical circuit first, with the remainder of said contact elements progressively closing the circuit at increased fluid pressure to accommodate increased electrical current flow.

4,006,642

APPARATUS FOR A MULTI-PART INJECTION MOLD FOR MEASURING THE DEGREE OF FILLING OF THE HOLLOW MOLD COMPARTMENT OR THE CLOSURE PRESSURE OF THE MOLD

Eduard Hartmann, Urdorf, Switzerland, assignor to Bucher-Guyer AG, Niederweningen, Switzerland

Filed Feb. 18, 1975, Ser. No. 550,472

Claims priority, application Switzerland, Feb. 26, 1974, 2731/74

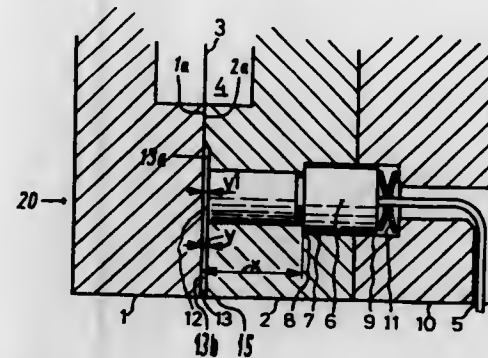
Int. Cl.² G01P 13/00; B29G 3/00

U.S. Cl. 73—432 R

8 Claims

1. A measuring apparatus for a multi-part injection mold for measuring the degree of filling of a hollow mold compartment with injected molding material or the closing pressure of the mold comprising, in combination, a mold defined by at least two mold parts forming therebetween a hollow mold compartment, a distance measuring transmitter arranged in spaced relationship from the hollow mold compartment and having an end face, means for coupling the distance measuring transmitter at a coupling location with one mold part, a surface provided for the other mold part and situated opposite said end face of the distance measuring transmitter, means provid-

ing an intermediate space between said end face of the distance measuring transmitter and the oppositely situated surface of said other mold part when the mold is closed, said distance measuring transmitter being responsive to changes of



a mold gap formed between said one mold part and the other mold part, said two mold parts being separable from one another at a mold parting plane, said coupling location of the distance measuring transmitter being arranged in spaced relationship from the mold parting plane.

4,006,643

SPEEDOMETER DRIVE ARRANGEMENT

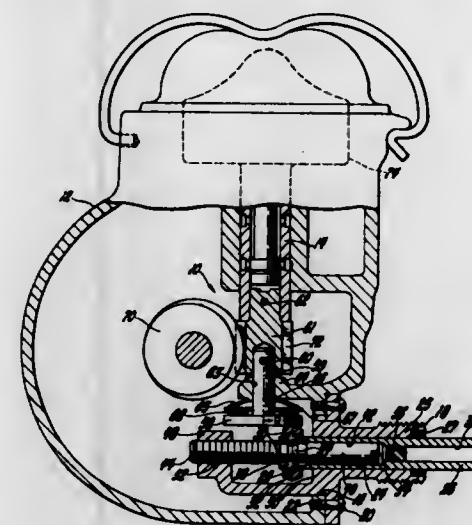
Lubomyr O. Hewko, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1975, Ser. No. 604,916

Int. Cl.² F16H 13/06, 13/10, 15/10, 37/02

U.S. Cl. 74—12

3 Claims



1. A continuously variable speedometer drive arrangement comprising a governor housing, governor drive means mounted in said housing, a connector shaft secured to said governor drive means and extending through a first fixed support abutment formed in said governor housing, a flange formed on the end of said connector shaft exterior said first abutment, preloaded spring means mounted between said flange and said first abutment, a speedometer take-off shaft rotatably mounted through an opening formed in said governor housing so as to have inner and outer ends extending therefrom and having the axis thereof perpendicular to the axis of said connector shaft, means formed on the outer end of said speedometer take-off shaft for driving a speedometer drive cable, a circular axial opening formed on the inner end of said speedometer take-off shaft, a rod member having one end thereof mounted in said circular axial opening and the other end thereof supported on a second fixed support abutment formed in said governor housing, a carrier formed on said speedometer take-off shaft adjacent said inner end thereof, a sun member formed on said rod member radially aligned with said carrier, a plurality of planets mounted in said carrier and preloaded intermediate said sun member and an outer ring, said outer ring being frictionally contacted by said

flange under the force of said preloaded spring means a predetermined distance from the axis of said connector shaft for driving said speedometer take-off shaft at a predetermined speed ratio with respect to said connector shaft, and adjustment means operatively connected to said rod member for axially moving said rod member and, hence, said inner race, said planets and said outer race for varying said distance from the axis of said connector shaft to thereby vary the speed ratio between said connector shaft and said speedometer take-off shaft.

4,006,644

APPARATUS FOR TENSIONING A SAFETY BELT

Edmar Beler, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

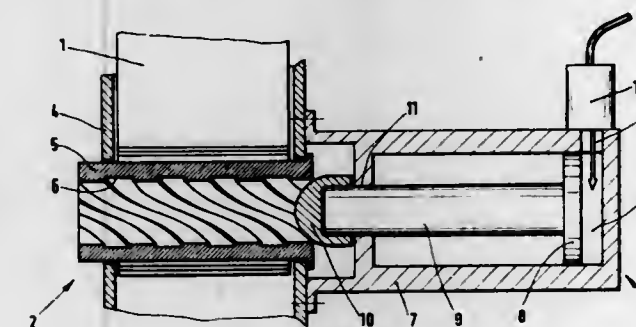
Filed Jan. 21, 1976, Ser. No. 650,879

Claims priority, application Germany, Feb. 11, 1975, 2505625

Int. Cl.² F16H 7/12, 7/10; B60K 27/00; B60M 1/04

U.S. Cl. 74—242.1 FP

5 Claims



1. Apparatus for tensioning a safety belt in response to applied gas pressure, comprising:

a hollow winding roller attached to said safety belt and having helical arial grooves on its inner surface;

a cylinder, coaxially adjacent to said roller;

a piston, arranged in said cylinder and displaceable in response to said gas pressure and having a piston rod with a soft metal sheathing to project into said roller, and burrow into said grooves, and to cause rotation of said roller in a safety belt tensioning direction.

4,006,645

X, Y, θ ALIGNMENT MECHANISM

William H. Newell, Mount Vernon, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 26, 1974, Ser. No. 509,586

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² G05G 11/00

U.S. Cl. 74—479

10 Claims

1. Positioning apparatus for positioning an object with respect to a fixed base comprising:

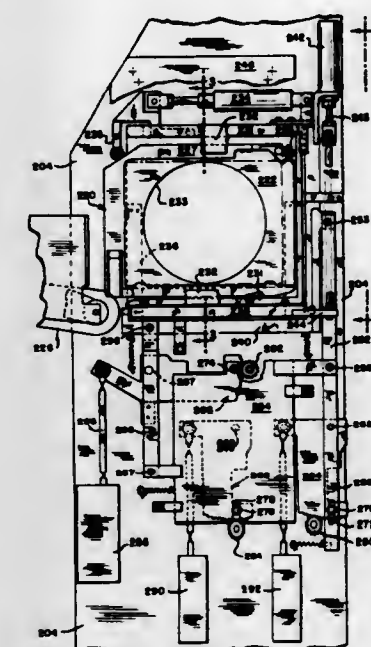
four links (240, 254, 256, 258; 300, 332, 330, 334) pivotally interconnected at points (253, 255, 257, 259; 338, 340, 337, 336) located at the corners of a parallelogram, a first link (240, 300) of said parallelogram supporting an object to be moved;

means to rotate a second link (254, 332) that is opposite said first link in said parallelogram and that is coupled to the base (204, 202);

means to translate said second link (254, 332) of said parallelogram; and

means to rotate a third link (258, 334) in said parallelogram, said links being interconnected with said second link (254, 332) so that rotation of said second link in said parallelogram rotates said object, so that translation of

said second link in said parallelogram translates said object in a first direction and so that rotation of said third



link in said parallelogram translates said object in a direction substantially normal to said first direction.

4,006,646

ANTI-FRICTION WORM AND WHEEL DRIVE

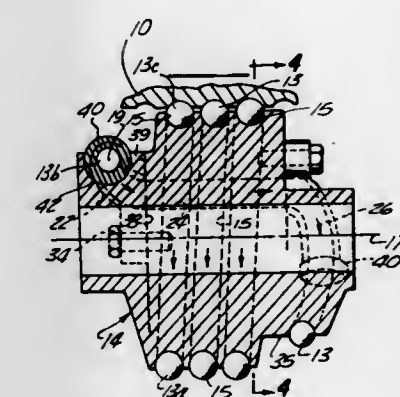
Erwin F. Geppert, Novi, Mich., assignor to The United States Government as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 9, 1975, Ser. No. 611,775

Int. Cl.² F16H 1/16, 1/20, 55/06

U.S. Cl. 74—425

5 Claims



1. An anti-friction drive comprising a worm and wheel arranged with their rotational axes at right angles to each other; said worm having a helical groove in its peripheral surface, said wheel having spaced grooves adapted to successively mate with the helical groove as the wheel moves past the worm; an internal ball passage extending through the worm; a first ball return duct at one end of the worm for delivering balls from the worm helical groove to the internal ball passage; a second ball return duct at the other end of the worm for delivering balls from the internal passage to the worm helical groove; and anti-friction balls filling a passage system defined by the worm groove, ball return ducts, and internal passage; the helical grooves in the worm and wheel cooperatively defining a circular cross section race that produces rolling movements of the balls through the aforementioned passage system when a rotational force is applied to the worm; the depth of the helical groove in the worm being slightly greater than the ball radius, whereby the worm groove defines two spaced lip areas that captively prevent the balls from escaping from the worm groove while they are out of contact with the wheel.

4,006,647

IMPACT ENERGY ABSORBING APPARATUS

Toshio Oonuma, and Yutaka Tanaka, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

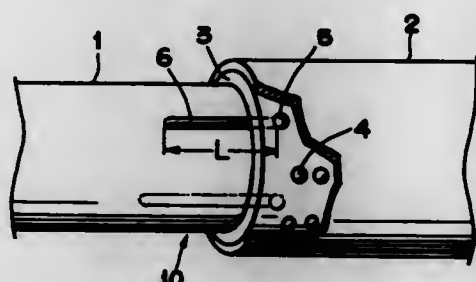
Filed Aug. 12, 1975, Ser. No. 603,809

Claims priority, application Japan, Aug. 29, 1974, 49-99160

Int. Cl.² B62D 1/18

U.S. Cl. 74-492

9 Claims U.S. Cl. 74-568 R



1. An impact energy absorbing apparatus comprising: two cylindrical post members connected for telescopic movement relative to each other under axial impact applied thereto; first rolling elements press fitted between said cylindrical post members at the telescoped connection and arranged in at least one annular row; at least one idle second rolling element snugly positioned between said cylindrical post members at the telescoped connection; a cage member between said cylindrical post members at the telescoped connection for retaining said first rolling elements and said at least one second rolling element therein; at least one axially extending guide means of predetermined axial length defined in at least one of said cylindrical post members, said guide means extending axially from the telescoped connection; and said at least one idle second rolling element being snugly received in said guide means and being axially spaced from all of said first rolling elements.

4,006,648

CAMMING SYSTEM

Cornelius J. de Keyser, Venray, Netherlands, assignor to Rank Xerox Ltd., London, England

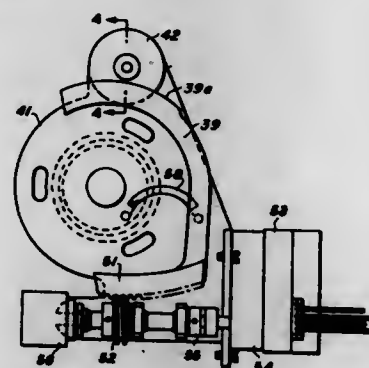
Division of Ser. No. 511,350, Oct. 2, 1974, Pat. No. 3,963,343.

This application Mar. 12, 1975, Ser. No. 557,700

Int. Cl.² F16H 53/04

U.S. Cl. 74-568 R

5 Claims



1. A camming system comprising a cam, a cam follower, means to drive the cam follower along a planar path to and from a starting position while in contact with the cam, and means to rotate the cam about a fixed axis outside the cam normal to the plane of said path.

4,006,649

SINGLE SHAFT PROGRAMMING CONTROL FOR MACHINE TOOLS

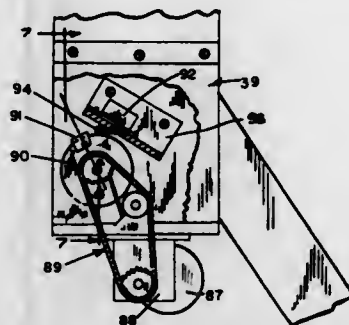
James W. Elmer, Anoka, Minn., assignor to Inventors Engineering, Inc., Minneapolis, Minn.

Division of Ser. No. 424,950, Dec. 17, 1973, abandoned. This

application May 22, 1975, Ser. No. 579,882

Int. Cl.² F16H 53/04

3 Claims



1. A programmer for controlling individual motions in a multiple operation machine tool for cyclic operation on a particular part comprising a housing, a shaft member rotatably mounted in said housing, drive means to rotationally drive said shaft member, control means to initiate said drive means, a plurality of disc members spaced axially along said shaft and driven by said shaft member, at least one adjustable cam dog member on each disc member comprising a substantially U-shaped saddle straddling the edge portion of the respective disc member, set screw means to adjustably attach the U-shaped members to the respective disc member at a desired rotational position, a separate switch positioned to be engaged by each of said cam dog members when said disc members rotate with said shaft, said switch members controlling machine tool functions.

4,006,650

INDEXING CONTROL FOR ROTATABLE PART ON A MACHINE TOOL

James W. Elmer, Anoka, Minn., assignor to Inventors Engineering, Inc., Minneapolis, Minn.

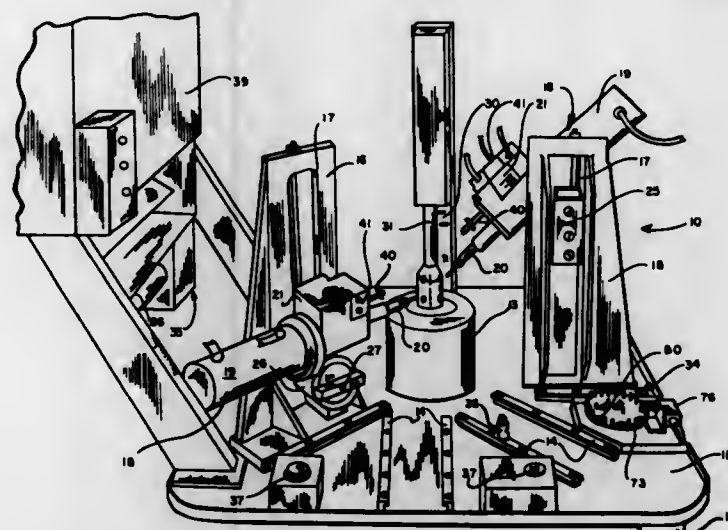
Division of Ser. No. 424,950, Dec. 17, 1973, abandoned. This

application May 22, 1975, Ser. No. 580,045

Int. Cl.² B23B 29/32

U.S. Cl. 74-813 C

5 Claims



1. An indexing control for controlling operations on an indexed part movable about an axis including a base, means to rotatably mount said part on said base for rotary indexing motion about a preselected axis, an indexing control, synchronizing drive means driving said indexing control and said means rotatably mounting said part, means to initiate said drive means at preselected times, control means controlled by said indexing control separate from said means to initiate said

drive means, said indexing control comprising a rotatable member having cam support means positioned at a plurality of locations about the axis thereof for removably mounting cam means, cam means mounted on at least one of said cam support means on said rotatable member, said control means including an actuator positioned with respect to said base at a location so cam means positioned on said rotatable member engages the actuator at a desired rotational position as the rotatable member is rotating to provide a signal indicating a rotational position of said means rotatably mounting said part which is correlated precisely with the rotational position of said part through said synchronizing drive means.

4,006,651

WORK TABLE INDEX MECHANISM

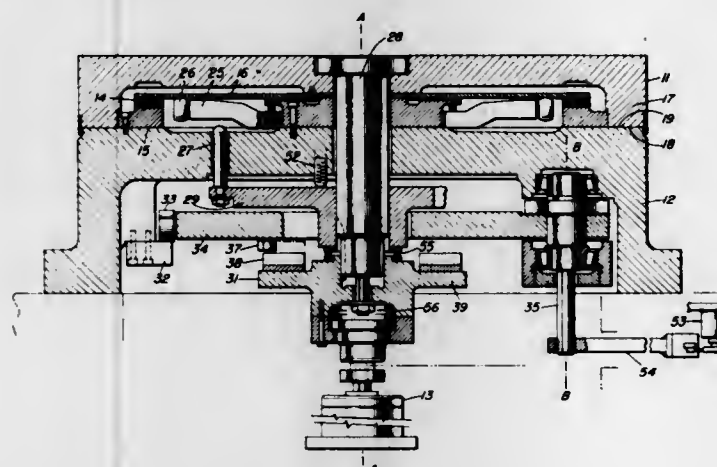
Frank R. Anderson, and James W. Nadon, both of Biggleswade, England, assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed June 13, 1975, Ser. No. 586,739

Int. Cl.² B23B 29/32

U.S. Cl. 74-826

14 Claims



5. Machine tool, comprising
 - a. a first member,
 - b. a second member,
 - c. means moving the members relative to one another,
 - d. a first curvic coupling element mounted on the first member,
 - e. a second curvic coupling element mounted on the second member in concentric relationship on a main axis with the first curvic coupling element,
 - f. apparatus mounting the first curvic coupling element on the first member allowing relative movement under force in at least one mode, but not allowing such movement in the other modes, the apparatus consisting of a circular diaphragm whose center portion is fixed to the first member and whose periphery is fixed to the first curvic coupling element, relative movement along the main axis taking place between the first and second members to completely separate the teeth of the first and second curvic coupling element, the said apparatus allowing the said relative movement under force when the teeth engage, so that the said apparatus allows the first curvic coupling to move relative to the first member during engagement of its teeth with the teeth of the second curvic coupling in:
 - a translation mode along the said main axis,
 - a rotational mode about an axis perpendicular to said main axis, and
 - a rotational mode about an axis perpendicular to both of the aforementioned axes, and so that the said apparatus does not allow the first curvic coupling to move relative to the first member during engagement of its teeth with the teeth of the second curvic coupling in:
 - a translation mode along a line perpendicular to the said main axis,
 - a translation mode along a line perpendicular to both of the aforementioned line and axis, and
 - a rotational mode about the said axis.

4,006,652

FLUID PRESSURE CONTROL SYSTEM FOR MOTOR VEHICLE TRANSMISSIONS

Noboru Murakami, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

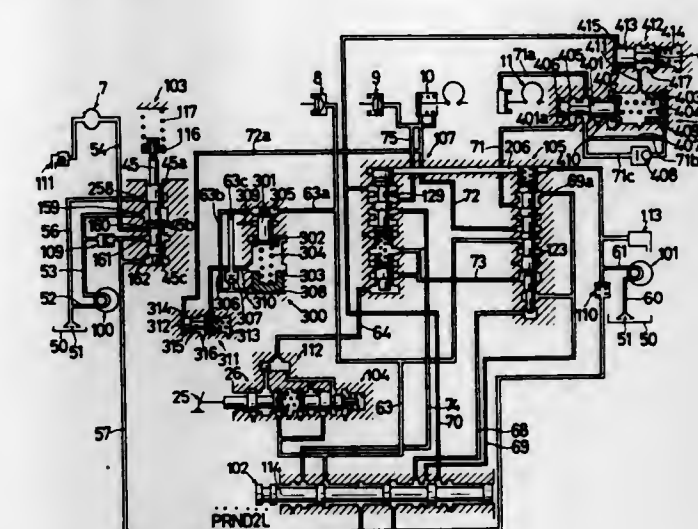
Filed Sept. 20, 1974, Ser. No. 507,800

Claims priority, application Japan, Sept. 25, 1973, 48-107833; Sept. 29, 1973, 48-109941

Int. Cl.² B60K 41/18

U.S. Cl. 74-869

8 Claims



1. A fluid pressure control system for a motor vehicle transmission, comprising:
 - a hydraulic fluid pressure source;
 - fluid pressure regulator means for regulating the pressure of said hydraulic fluid from said fluid pressure source to a particular line pressure value;
 - a plurality of frictional engaging means actuated by said line pressure from said fluid pressure regulator means for attaining a particular gear ratio within the gear trains of said transmission;
 - shift valve means operatively connected to said fluid pressure regulator means for selectively supplying said line pressure to either of said plurality of frictional engaging means;
 - a first conduit fluidically connecting said shift valve to said frictional engaging means; and
 - modulator means, disposed within said conduit and including a first piston, a first biasing spring, and a drain port through which said hydraulic pressure within said conduit is drained due to movement of said piston against the biasing force of said spring, for initially, constantly, gradually increasing said hydraulic pressure supplied to said frictional engaging means and subsequently regulating said hydraulic pressure supplied to said frictional engaging means to a substantially constant value for engaging said frictional engaging means.

4,006,653

LAMP INSERTING AND EXTRACTING TOOL

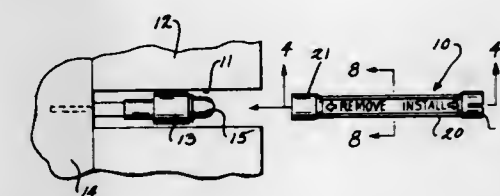
Donald W. Kuntz, West Allis, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 22, 1975, Ser. No. 615,870

Int. Cl.² B25B 13/52

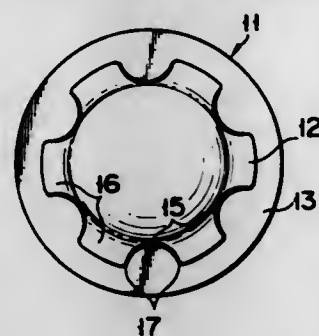
U.S. Cl. 81-64

6 Claims



1. A tool for inserting in and extracting from a relatively inaccessible area a miniature lamp bulb, or the like, arranged

portion, the outer periphery of each of said lobes in cross section forming a segmented outline of a first circle, each of said grooves in cross section forming a fractional circle, the cross section of said curved wall portion forming a curved line, the center of said fractional circle being situated at a point positioned between a point nearer to the center of the first circle than the junction of two tangential lines which are



tangent to the first circle at the intersections of the first circle and the fractional circle and a point on a chord between said intersections, and said curved line being tangentially connected to the fractional circle at a point positioned not nearer to the center of the first circle than a contact point at which a radial line extending from the center of the first circle tangentially contacts the fractional circle.

4,006,661

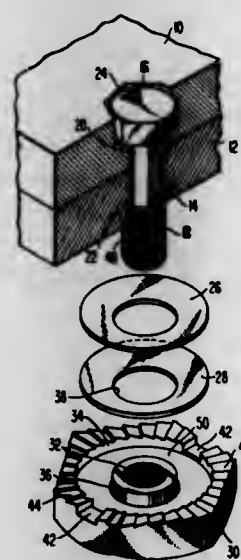
REUSABLE TORQUE LIMITING FASTENING DEVICE
Dewey McKinley Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 29, 1975, Ser. No. 617,978

Int. Cl.³ F16B 31/02

U.S. Cl. 85-62

1 Claim



1. A reusable, torque tactile feedback threaded fastening device that determines relatively accurately the tensile load in a bolt or similar fastening device comprising,

an elongated threaded member capable of being secured through one or more workpieces which are adapted to be fastened together,

a fastening member having a central threaded bore there-through threadably receivable on said elongated member for securing said workpieces together as said fastening member is tightened on said elongated member,

a pair of concave members disposed on said fastening member and being capable of deflection from a concave to a substantially flat condition as said fastening member is tightened over said elongated threaded member, said fastening member further including a pair of concentric recessed portions therein, one of said portions receiving and capturing said concave members therein, the other of said portions being shaped to permit the central area of said concave members to deflect therewithin without

abrading or frictionally engaging the elongated threaded member and one or more radial notches disposed in said fastening member permitting said concave members to be viewed as the threaded member is tightened over said workpieces, said fastening member further including a series of sawtooth lands and grooves disposed about the perimeter of one surface thereof, said notches and said lands and grooves functioning to abraid or gall the first encountered work-piece surface effective when the fastening member is tightened over said threaded member to increase the torque being applied to the device tactilely indicating to an operator that the device has compressed the concave members to a height that would generate the correct bolt tensile load.

4,006,662

HYDRAULIC STEERING APPARATUS

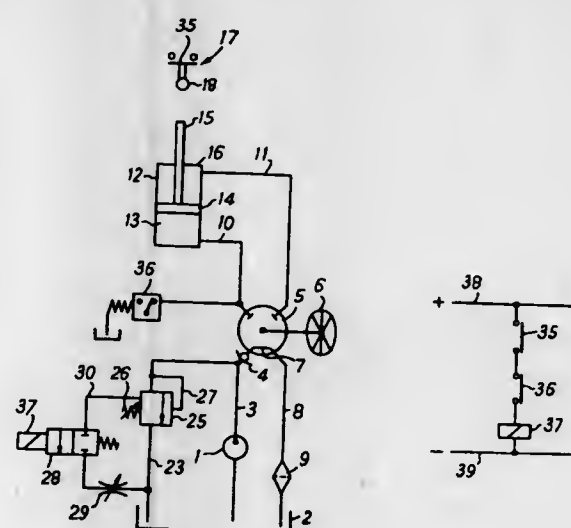
Carl Ivar Olsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 416,179, Nov. 15, 1973, Pat. No. 3,941,033. This application Nov. 28, 1975, Ser. No. 635,599
Claims priority, application Germany, Nov. 22, 1972, 2257230

Int. Cl.³ F15B 11/08, 13/042

U.S. Cl. 91-400

1 Claim



1. Hydraulic steering apparatus comprising a sump and a continuously operative pump, an operating fluid motor including an output member, a manually operated control valve device having alternately selectable output lines and having a neutral position connecting said pump to said sump through a short-circuiting path and having two operating positions selectively connecting said pump to one side of said operating fluid motor and connecting the other side of said operating fluid motor to said sump, an electrical limit switch device actuable by the output member of said operating motor, short-circuiting conduit means extending from said pump to said sump, first pressure responsive switch valve means in said short-circuiting conduit means for controlling flow in same and having a first pressure responsive portion open to pump pressure and a second pressure responsive portion, line pressure responsive electrical switch means connected to at least one of said output lines, passage means including an adjustable restriction means connected between said second pressure responsive portion of said switch valve means and said pump, electrically operated pilot valve means in said passage means controlling same when electrically operated for opening said first switch valve means, electrical circuit means connecting, said electrical limit switch device and said pressure responsive electrical switch in series with one another and with said electrically operated pilot valve means so that said pilot valve means is operable only if these switches are closed.

4,006,663

HYDRAULIC CONTROL MEANS, ESPECIALLY A STEERING MEANS

Johannes Vagn Baatrup, Sonderborg, and Thorkild Christensen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 438,003, Feb. 6, 1974, abandoned.

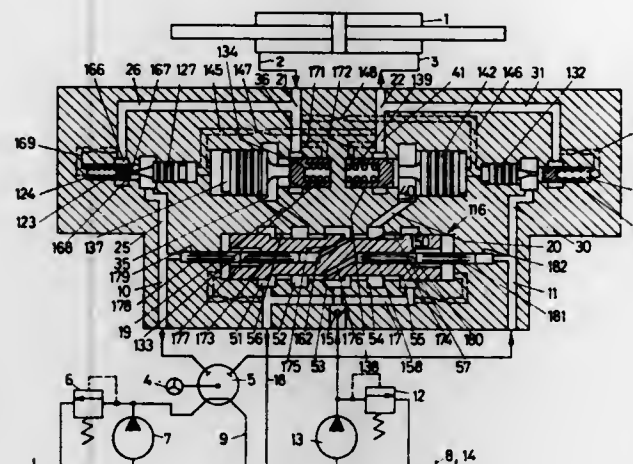
This application Apr. 2, 1975, Ser. No. 564,278

Claims priority, application Germany, Feb. 7, 1973, 2305835

Int. Cl.³ F15B 13/042

U.S. Cl. 91-29

1 Claim



1. A hydraulic power steering subassembly comprising a reversible motor having complementary expandable chambers with first and second ports for said chambers, first control and power passages connected to said first port, second control and power passages connected to said second port, first control and power throttle slide valves in said first passages biased towards opening positions by pressurized fluid in said first passages, second control and power throttle slide valves in said second passages biased towards opening positions by pressurized fluid in said second passages, resilient means biasing said throttle slide valves towards closed position, a first pair of back-to-back piston means for pressure biasing said first throttle slide valves in opening directions, a second pair of back-to-back piston means for pressure biasing said second throttle slide valves in opening direction, the pressure responsive area of each of the piston means controlling the power throttle slide valves being greater than the area of the piston means controlling the control throttle slide valves, a first pulse line for transmitting pressure from said first power passage to a point between said second piston means to modulate the openings of said second throttle slide valves in accordance with the pressure in said first power passage, a second pulse line for transmitting pressure from said second power passage to a point between said first piston means to modulate the openings of said first throttle slide valves in accordance with the pressure in said second power passage.

4,006,664

STEERING SYSTEM INCLUDING TANDEM HYDRAULIC CYLINDERS WITH SELF-SYNCHRONIZATION

Wilburn Kelly Brown, Morton Grove, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed Apr. 3, 1975, Ser. No. 564,868

Int. Cl.³ F01B 25/04; F15B 11/22

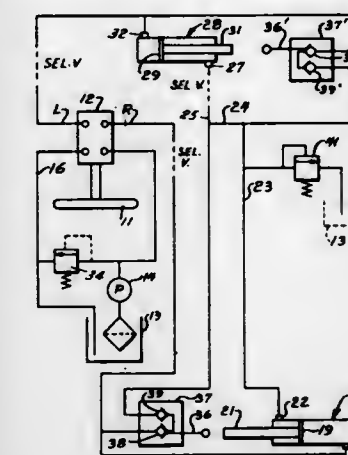
U.S. Cl. 91-171

2 Claims

1. A steering system for use with front and rear steerable wheels, including a pair of cylinder-piston combinations, one for front-wheel steering and one for rear-wheel steering, having cylinders, each with a piston rod extending through at least one end, at times connected through a tandem line connecting a rod end of each to the other, steering valve means for reversibly connecting the opposite ends at will to pressure and

return lines respectively to operate either combination as a primary piston and cylinder, with development of a primary pressure therein, and the other as a secondary piston and cylinder operated by discharge from the primary cylinder, having the improvement which comprises:

a synchronizing valve assembly including a synchronizing valve having means biasing it to be normally closed; solely-mechanical means including one of said piston rods, extending from one of said pistons and engaging the synchronizing valve to actuate said valve by force derived



from said one piston, when primary pressure moves said one piston to the extreme end of its movement, to supply pressure oil at the primary pressure through a check valve to the tandem line, thereby ensuring full movement of the other or secondary piston, said synchronizing valve being held open by said mechanical action until retraction of said one piston by pressure in the tandem line allows said synchronizing valve to close, said check valve preventing loss of pressure in the tandem line by outflow through the synchronizing valve while held open.

4,006,665

PERCUSSION TOOL

Günter Klemm, Olpe, Germany, assignor to Fa. Ingenieur Gunter Klemm Spezialunternehmen für Bohrtechnik, Olpe, Germany

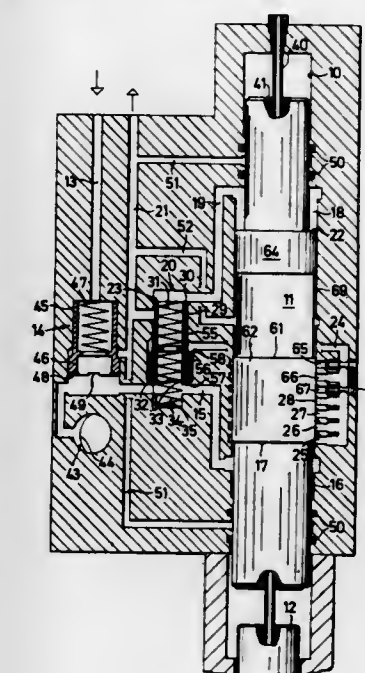
Filed May 1, 1975, Ser. No. 573,743

Claims priority, application Germany, June 11, 1974, 2428236; Dec. 27, 1974, 2461633

Int. Cl.³ F01L 25/04; F01B 7/18

U.S. Cl. 91-278

10 Claims



1. A percussion tool comprising a housing defining a chamber within which is reciprocally mounted a piston, first and

second pressure ducts in fluid communication with said chamber at respective first and second sides thereof, a return duct in fluid communication with said chamber at a point intermediate the points of entry of said first and second pressure ducts relative to said chamber, an inlet duct for delivering a pressurized fluid to said pressure ducts, movable valve means for alternately placing said inlet and pressure ducts in fluid communication in a first position of said valve means for moving said piston in a first direction and placing said first pressure and return ducts in fluid communication in a second position of said valve means while at the same time maintaining fluid communication between said inlet and second pressure ducts and closing communication between said inlet and first pressure ducts for moving said piston in a second direction opposite said first direction, said piston being thereby movable between axially opposite and terminal first and second positions, said valve means being mounted for reciprocal motion in a bore, said first and second pressure ducts opening into said bore, said return duct opens into said bore between the points of entry of said first and second pressure ducts relative to said bore, control duct means opening into said bore at a point of entry between the points of entry of said return and second pressure ducts and having at least two branch duct means opening into said chamber at points spaced from each other in the direction of piston reciprocation, a first of said branch duct means being placed in fluid communication with said return duct through said chamber when said piston is in said first position, and a second of said branch duct means being placed in fluid communication with said second pressure duct when said piston is in said second position.

4,006,666

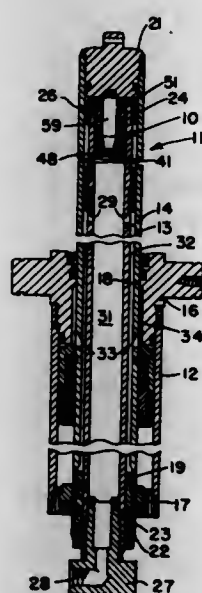
CUSHIONING DEVICE FOR A HYDRAULIC JACK
Kenneth R. Murray, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 22, 1975, Ser. No. 580,001

Int. Cl.² F15B 15/22; F01B 15/02

U.S. Cl. 91—394

2 Claims



1. In a hydraulic jack having an elongated cylinder with a closed end portion, and an elongated tubular inner member relatively movable within the cylinder, said inner member having an end portion relatively movable toward and away from the closed end portion of the cylinder, the improvement comprising:

- a cup-shaped bushing extending into the end portion of the tubular inner member, said bushing having a blind bore formed therein opening toward the closed end portion of the cylinder;
- a threaded connection securing the bushing to the end portion of the inner member;
- means forming a threaded bore in the closed end portion of the cylinder in axial alignment with the blind bore;
- an elongated plunger attached to the closed end portion

including a stem having a threaded portion thereon threaded into the threaded bore for attaching the plunger to the closed end portion in axial alignment with the blind bore, a cylindrical sleeve floatingly mounted on the stem for telescopic entrance into the blind bore as the end portions approach each other and a pair of elastomeric rings disposed between the stem and the sleeve permitting limited radial movement of the sleeve relative to the stem; and

means for metering fluid expelled from the blind bore by the progressive ingress of the sleeve into the blind bore for cushioning the end of stroke movement of the hydraulic jack as the end portions approach each other.

4,006,667

HYDRAULIC CONTROL SYSTEM FOR LOAD SUPPORTING HYDRAULIC MOTORS

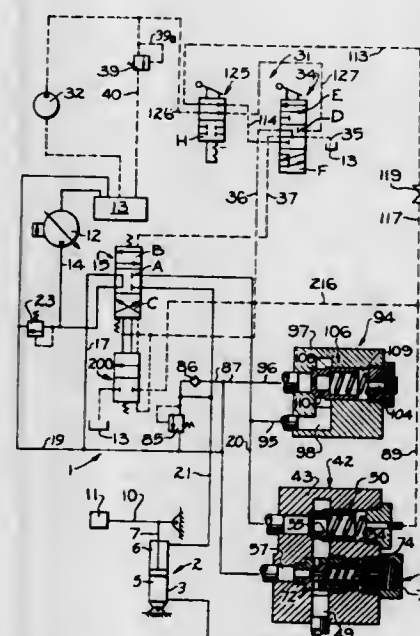
Donald L. Blanchetta, Coal City; Kenneth R. Lohbauer, Joliet, and Sammy J. Rhodes, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 437,383, Jan. 28, 1974, Pat. No. 3,906,840, which is a continuation-in-part of Ser. No. 244,822, April 17, 1972, Pat. No. 3,805,678. This application May 2, 1975, Ser. No. 574,229

Int. Cl.² F15B 11/08, 13/042

U.S. Cl. 91—445

3 Claims



1. A load supporting fluid system comprising:
 - load supporting means including a fluid motor for raising and supporting a load, said motor having a load supporting end including a fluid chamber;
 - a source of pressurized fluid for operating said motor;
 - means including a pilot operated directional control valve for selectively communicating pressurized fluid between said source and motor for raising, lowering and positioning said load supporting means;
 - said directional control valve comprising a housing, a valve spool mounted in a bore in said housing for communicating with inlet and outlet ports for defining raise, lower, and hold positions;
 - load check valve means disposed between said control valve and said motor for permitting free flow of fluid from said control valve to said motor and for normally blocking flow of fluid from said motor to said control valve;
 - said check valve means having a control chamber including restriction means communicating with said load supporting chamber, and said check valve means being responsive to fluid pressure in said load supporting chamber to bias said valve means to said fluid blocking position; and
 - vent valve means including a valve spool mounted in a bore

coaxially with said directional control valve spool at one end thereof and engageable by abutment thereby upon shifting of said directional control valve spool to said lower position to vent said control chamber to effect opening of said check valve to permit flow of fluid from said load supporting chamber to effect lowering of said load supporting means, said vent valve means comprises a separate housing, means detachably securing said vent valve housing to said control valve housing, and said vent valve spool comprises a spring biased closed cylindrical spool having an annular groove for communicating between a first port in communication with said control chamber and a second port in communication with a sump, wherein said directional control spool is pilot operated by means of pressurized pilot fluid selectively directed to either end thereof, said vent valve means being exposed to said pilot fluid and said vent valve spool includes pressure balancing means for preventing actuation thereof by said pilot fluid.

4,006,668

HYDROSTATIC PISTON MACHINE HAVING A CYLINDRICAL MOUNTING PIN

Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

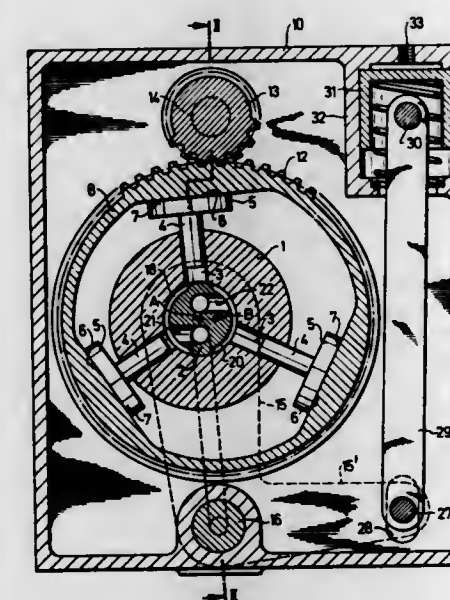
Filed Oct. 17, 1974, Ser. No. 515,540

Claims priority, application Switzerland, Oct. 23, 1973, 14907/73

Int. Cl.² F01B 13/06

U.S. Cl. 91—497

5 Claims



1. A hydrostatic piston machine comprising
 - a casing having a pair of opposed sidewalls, each sidewall having an aperture coaxially aligned with the aperture in the other sidewall;
 - a pin passing through said apertures and said casing and having a longitudinal axis;
 - a cylinder block within said casing rotatably mounted on said pin about said axis;
 - a guide member rotatably mounted about said pin in said casing, said guide member having guide surfaces disposed tangentially with respect to a circular cylinder having a second axis eccentric to said axis of said pin;
 - a plurality of pistons movably mounted in said cylinder block radially of said block, each said piston having a foot at an outer end, each said foot having a plane bearing surface disposed in guided relation on a respective guide surface of said guide member; and
 - a guide means at each end of said pin on the outside of said casing mounting said pin relative to said casing for adjusting the eccentricity of said pin axis to said second axis, said guide means including a pair of pivotally mounted interconnected levers, each lever receiving one respective end of said pin therein.

4,006,669

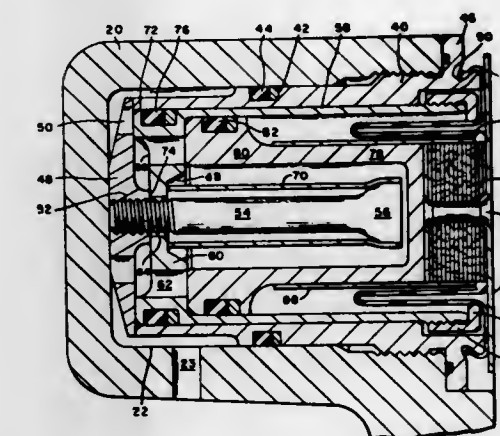
PISTON AND EXTENSIBLE CYLINDER THEREFOR
William G. Price, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed May 19, 1975, Ser. No. 578,693

Int. Cl.² F01B 31/14; F15B 15/24

U.S. Cl. 92—13.1

4 Claims



1. Fluid pressure actuated piston means and extensible cylinder means therefor comprising:
 - a casing having a cavity therein;
 - cylinder means slidably disposed therein and responsive to a pressurized fluid supplied to said cavity;
 - a piston slidably contained by said cylinder and responsive to said pressurized fluid;
 - stop means operatively engaged with said cylinder for resisting axial movement of said cylinder and adapted to be overcome in response to a predetermined pressure of said fluid to allow axial movement of said cylinder relative to said piston in response to said pressurized fluid;
 - said stop means includes a deformable member engageable with said cylinder means; and
 - a fixed deforming member engaged by said deformable member for deforming said deformable member in response to said predetermined pressure of said fluid acting against said cylinder means.

4,006,670

METHOD AND APPARATUS FOR FORMING A COLLAPSED BOX

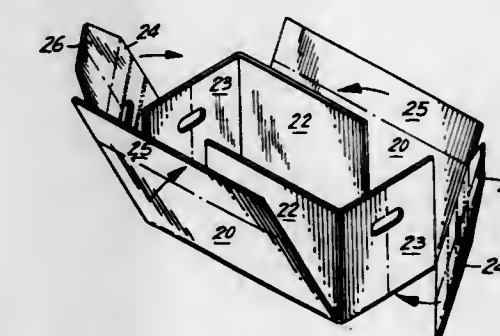
Thomas B. Royal, Homestead, Fla., assignor to International Paper Company, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,710

Int. Cl.² B31B 5/00

U.S. Cl. 93—53 M

26 Claims



1. The method of forming a box from a flat blank having a bottom panel, side panels connected to opposite sides of said bottom panel, end panels connected to opposite ends of said bottom panel, a pair of side flaps each connected to a respective one of said end panels, and a pair of end flaps each connected to a respective one of said side panels which comprises:
 - a. folding said side flaps and said end panels around a stationary mandrel;
 - b. moving said blank downwardly while folding said side panels and said end flaps; and

c. squeezing together said end flaps and said end panels.

4,006,671 CORRUGATOR

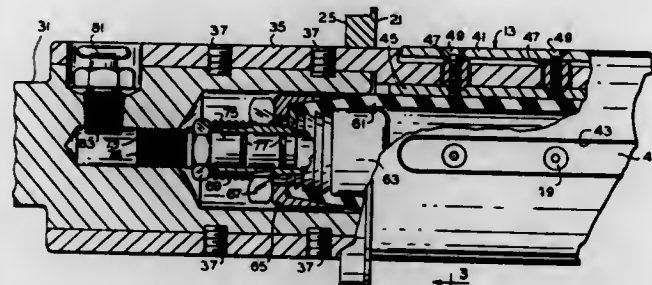
Gordon M. Ochs, Washougal, Wash., assignor to Tidland Corporation, Camas, Wash.

Filed Mar. 6, 1975, Ser. No. 555,792

Int. Cl.² B26D 7/26

U.S. Cl. 93—59 CE

3 Claims



1. A support apparatus for use in a machine performing mechanical operations on sheet material fed through an operating zone of the machine, said support apparatus comprising a rigid hollow cylindrical support member mounted for rotation in said operating zone in proximity to the sheet material fed through said zone, wherein said support member has an exterior cylindrical supporting surface,

a plurality of operating rings on said cylindrical support member each of which has a sliding fit with said cylindrical supporting surface and has an operating edge for performing mechanical operations on sheet material fed therepast;

said sliding fit enabling said rings to be slid along said cylindrical supporting surface to desired longitudinal positions with respect to the sheet material and to be rotated relative to said support member,

a plurality of pressure bar means mounted for movement to a locking position for simultaneously locking said rings against movement with respect to said support member to hold said rings so that the operating edges of said rings can cooperate with the operating edges of rings on an adjacent support apparatus to perform the desired mechanical operations on sheet material fed through the operating zone of the machine and for movement to a release position so that said rings are free to both rotate relative to said support member and slide along said cylindrical supporting surface;

each of said pressure bar means comprising a braking bar which underlies a number of said rings and which is disposed in a separate lengthwise groove formed in said cylindrical supporting surface;

and pneumatic operating means for engaging said pressure bar means for causing outward movement of said braking bars into engagement with said rings to hold them in position;

said pneumatic operating means comprising a single inflatable bag disposed within said cylindrical support member and located beneath each of said pressure bar means, wherein said air bag is adapted to receive air under pressure to inflate the bag to expand the same and cause outward movement of said braking bars into engagement with the overlying rings,

each of said braking bars having an operating face which is faced with a friction material,

each of said pressure bars means also including a leaf supported by said air bag and a plurality of spacers the spacers for each leaf being each connected at one end to said leaf and extending outwardly through an opening which communicates between the hollow interior of said support member and the bottom of the associated groove and is connected at the other end to the associated braking bar.

4,006,672 VENTILATION FAN (VENTILATION SYSTEM)

Masaya Matsuyoshi, Nagoya, and Isao Hirano, Kasugai, both of Japan, assignors to Matsushita Seiko Co., Ltd., Japan

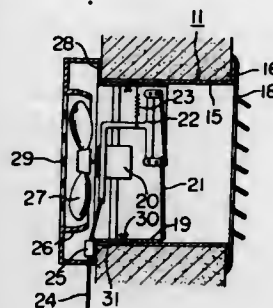
Filed Dec. 4, 1975, Ser. No. 637,710

Claims priority, application Japan, July 31, 1975, 50-94047

Int. Cl.² F24F 13/08

U.S. Cl. 98—39

2 Claims



1. A ventilation fan assembly for the wall of a building comprising a duct frame rectangular in cross section, an outside louver attached to an outside opening of said duct frame, said duct frame being fitted into a ventilation hole from the outside of said building; a ventilation fan frame, connection means for telescopically fitting said fan frame into said duct frame from the outside of said building, screws in the walls of said fan frame for securing the fan frame with respect to the duct frame, an exhaust fan installed in said ventilation fan frame, a shutter in said ventilation fan frame on the leeward side of said fan, and control means operatively connected to said shutter and to said fan motor for concurrently opening said shutter and starting said fan motor and for concurrently closing said shutter and stopping said fan motor.

4,006,673 ADJUSTABLE AIR OUTLET NOZZLE FOR AUTOMOBILE HEATING AND VENTING SYSTEMS

Ernst Meyer, and Karl Burghoff, both of Oberursel, Taunus, Germany, assignors to Max Kammerer GmbH, Oberursel, Taunus, Germany

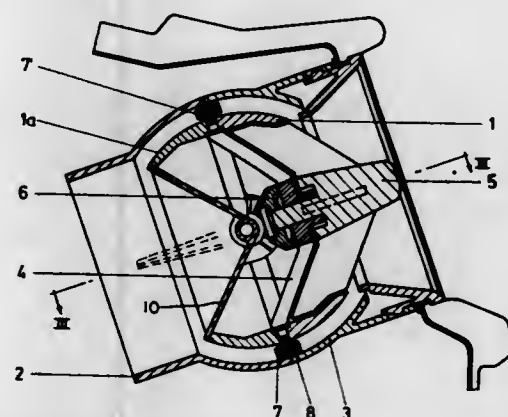
Filed Mar. 21, 1975, Ser. No. 560,940

Claims priority, application Germany, Mar. 21, 1974, 2413628

Int. Cl.² F24F 13/06, 13/10

U.S. Cl. 98—40 A

10 Claims



1. An adjustable air outlet nozzle, especially suited for automobile heating and venting or air-conditioning systems, comprising in combination:

a generally tubular stationary connector housing having a length portion defining a lodgement with a spherical inner guide surface of enlarged diameter;

a generally tubular nozzle shell received inside the lodgement of the connector housing, the nozzle shell having an outer surface in the shape of a bilaterally truncated sphere which is concentrically spaced from the guide surface of the lodgement so as to define a radial gap therewith;

a double-clappet valve mounted inside the nozzle shell on a transverse pivot shaft arranged in the vicinity of the center of the above-mentioned spherical surfaces, said valve comprising two generally flat clappets attached to axially adjacent clappet hubs and a bevel gear solidary with each clappet; the valve clappets being pivotable between an open position in which they point generally upstream, to the inside of the nozzle, and a closed position in which they are spread apart so that their rims contact the nozzle shell;

a wing knob on the downstream, outer side of the nozzle shell rotatably received inside the latter in alignment with the shell axis, the wing knob having a drive bevel gear attached thereto and arranged to mesh with both of said clappet bevel gears; and

a gimbal ring disposed in the radial gap between the housing lodgement and the nozzle shell, said gimbal ring including means for universally pivoting the nozzle shell in relation to the connector housing.

4,006,674

HUMIDIFIERS FOR FORCED AIR SYSTEMS

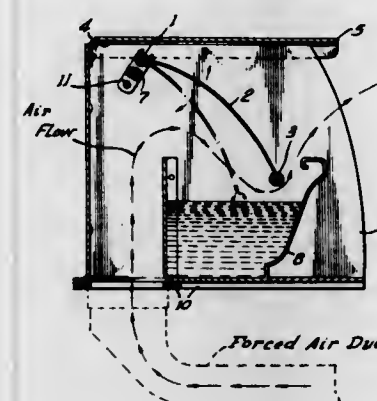
Charles V. Culver, 729 Mingus Ave., Prescott, Ariz. 86301

Continuation-in-part of Ser. No. 418,784, Nov. 23, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 552,427

Int. Cl.² F24F 13/00

U.S. Cl. 98—105

10 Claims



1. A humidifier comprising (A) a housing having an air inlet opening for communication with a source of forced air, an air outlet opening, and a water reservoir positioned therebetween with the water level thereof defining with the interior of said housing a rectilinear and main passageway for air between said air inlet and said air outlet, and (B) a thin, flexible and substantially air-impervious curtain mounted on a rectilinear support and (a) suspended from said support within and across said passageway upstream from said air outlet to constitute a freely-moving barrier substantially blocking air flow between said air inlet and said air outlet, and (b) having at least symmetrical portions of its lower edge weighted rectilinearly and adapted to extend into said reservoir beneath the water level thereof, whereby forced air entering said air inlet balloons and flexes said curtain to gently and pulsatingly elevate at least a part of its lower edge above the water surface in order to escape to said air outlet.

4,006,675

FRYING BASKET WITH MOVABLE SHELVES

Etchison G. Lill, Wheaton, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Jan. 26, 1976, Ser. No. 652,389

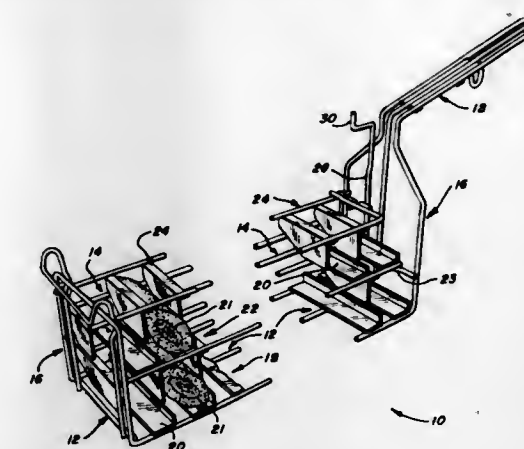
Int. Cl.² A47J 37/12

U.S. Cl. 99—417

11 Claims

1. In a frying basket for supporting food to be cooked in an immersed position in a cooking medium, said frying basket having an open-framed base supporting an open-framed back wall and two opposing open-framed end walls; a carrying handle mounted on said frying basket; food shelf means on

said base for carrying food; said frying basket defining an accessible front food loading area opposite said back wall; an open-framed retaining cover disposed parallel to, and above, said food shelf for preventing food from rising off said shelf in a food retaining position and being movable away from the shelf; and latching means mounted on said frying basket movable from a first latching position in which said retaining cover



is maintained in said food retaining position to a second unlatched position in which said cover may be moved away from said shelf to a second position spaced away from said shelf to facilitate the removal of food from said frying basket, said latching means being returnable to said first latching position to support said cover in said second position as food is being removed.

4,006,676

CREPE-MAKING PAN AND SUPPORT

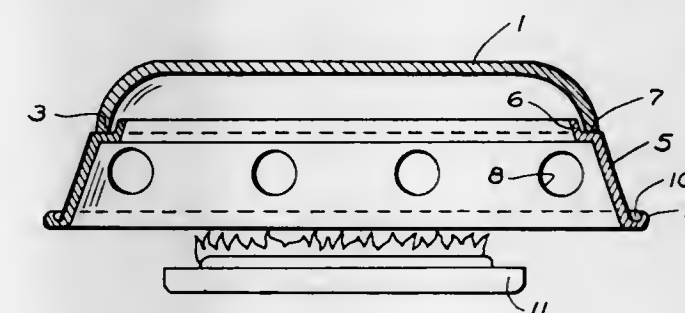
Robert J. Adams, San Mateo, Calif., assignor to Atlas Metal Spinning Company, San Francisco, Calif.

Filed Dec. 19, 1975, Ser. No. 642,403

Int. Cl.² A47J 37/10

U.S. Cl. 99—422

2 Claims



1. In combination a pan having a convex bottom and a concave interior, and a spacer band at the concave side of the pan adapted to surround a heating source, said band having spaced vents around its periphery for even distribution of the heat along the concave surface of the pan, and a manipulating handle extended from the outer periphery of said pan, said band having a shoulder extended inwardly from the outer periphery of the top of the band on which the rim edge of the concave side of the pan rests, and having an annular retaining flange spaced inwardly from the outer periphery of the band and extending from said shoulder into the concave side of the pan adjacent the rim thereof to prevent significant movement of said pan; and the distribution of weight of said pan and said handle being such that the center of gravity of said pan when resting on said shoulder is within the area of said band, the handle having a heat insulating grip thereon.

4,006,677

PEACH REPITTING MACHINE

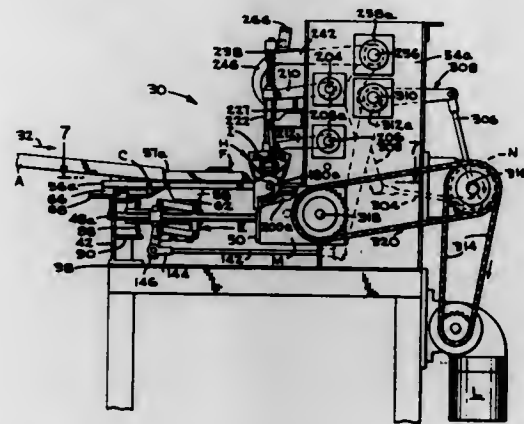
Leslie Vadas, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed June 23, 1975, Ser. No. 589,501

Int. Cl.² A23N 4/12; A27J 25/00; A23N 4/24

U.S. Cl. 99-549

15 Claims



1. A peach pitting machine for removing the pits from peach halves at a pitting station comprising:
 - a. means for assembling leading and trailing peach halves flat side down in a position upstream of the pitting station;
 - b. reciprocable means for lifting the leading peach half from said assembling means in said upstream position;
 - c. means for isolating the trailing peach half from said reciprocable means as the latter lifts said leading peach half;
 - d. means for moving said reciprocable means and the leading peach half toward said pitting station during a first cycle of operation;
 - e. said reciprocable means in the following cycle of operation pushing the leading peach half to said pitting station; and
 - f. pitting means for removing the pit from the leading peach half at said pitting station.

4,006,678

MACHINE FOR COMPRESSING, SLITTING AND BALING STACKS OF TIRES

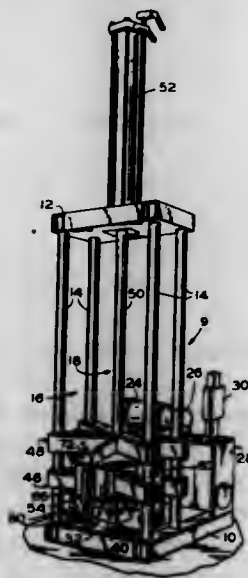
Albert F. Laurie, 7239 N. Chase, Portland, Oreg. 97217, and G. W. Bunch, 11775 SW. Warner, Tigard, Oreg. 97223

Filed Sept. 18, 1975, Ser. No. 614,550

Int. Cl.² B65B 13/20

U.S. Cl. 100-1

15 Claims



1. A machine for compressing, slitting and baling a stack of rubber tires comprising:
 - a. first vertically movable platen means supportable in an upper limit position above a stack of tires to be compressed,

second vertically movable platen means supportable in an upper limit position spaced above said first platen means, knife means projecting downwardly from said second platen means towards vertically aligned openings in said first platen means permitting passage of said knife means below said first platen means upon downward movement of said second platen means relative to said first platen means,

pressure-applying means for moving said second platen means downwardly towards said first platen means such that said second platen means applies a downward moving force to said first platen means and approaches said first platen means to project said knife means below said first platen means whereby said stack is simultaneously slit and compressed as said first and second platen means move downwardly against said stack.

4,006,679

OPPOSED BOX BALING PRESS

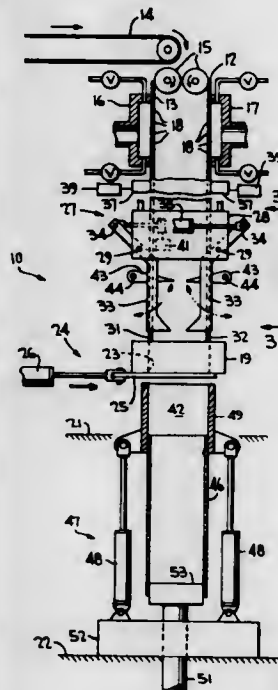
Isaac Egosi, Kiryat Mozkin, Israel, assignor to Effic Trading and Services Ltd., Zurich, Switzerland

Filed Aug. 11, 1975, Ser. No. 603,380

Int. Cl.² B30B 7/00

U.S. Cl. 100-138

11 Claims



1. A baling press arrangement for forming bales of fibrous material, comprising:
 - a. a first receptacle open at one end for the reception of the fibrous material and having a discharge opening at its opposite end;
 - means for continuously conveying the fibrous material into said first receptacle through said one end;
 - packing means axially movable along said first receptacle and being reciprocable therealong in short strokes while being movable progressively from said opposite end toward said one end, said packing means including elements projecting into and out of opposite sides of said first receptacle for continuously pre-packing the fibrous material therein in incremental amounts during the progressive movement thereof;
 - compression means disposed co-axially with said first receptacle and including a compression chamber located adjacent said discharge opening;
 - shiftable gate means disposed between said opposite end and said compression chamber for opening and closing said discharge opening;
 - said packing means being movable toward said discharge opening so as to permit said elements to discharge a pre-packed bale of fibrous material of a predetermined size through said opening and into said compression means;

said compression means further including a piston means for compressing the pre-packed fibrous material in said compression chamber to form compact bales; and means shifting said compression chamber away from said gate means for exposing the compact bales for removal.

4,006,680

TYPE CARRIER BELT FOR A PRINTER

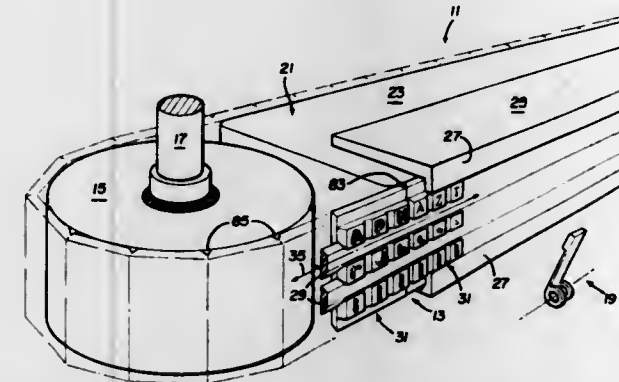
Louis Grace, Jr., 34795 Pratt Road, and Richard L. Grace, 81630 Belle River Road, both of Memphis, Mich. 48041

Filed Mar. 19, 1976, Ser. No. 668,353

Int. Cl.² B41J 1/20

U.S. Cl. 101-93.14

37 Claims



1. A type carrier assembly formed into an endless loop for use in a printing apparatus having means for rotatably driving said assembly past a printing station, said type carrier assembly comprising: a flexible elastomeric band having a trapezoidal non-rectangular cross-section, said band including means imbedded therein for reinforcing said band and controlling the elasticity thereof; and a plurality of type carrier segments disposed in a predetermined side-by-side relationship and in close proximity to adjacent segments, each of said segments including (1) a substantially planar base portion having one surface forming the interior-facing surface of said endless loop for engaging said rotatable driving means, (2) means for mounting an indicia-carrying face on a second surface of said base portion, and (3) means forming a dove tail-like slot in the surface of said base portion opposite said one surface for engagably receiving and resiliently retaining said elastomeric band therein.

4,006,681

ENDLESS TYPE FLEXIBLE SUPPORT BELT FOR A HIGH SPEED PRINTER

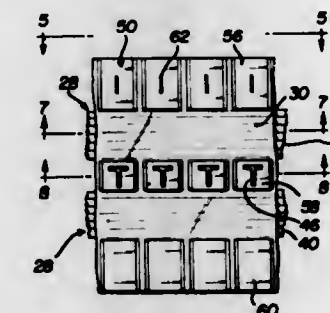
Louis Grace, Jr., and Richard L. Grace, both of Memphis, Mich., assignors to Grace Engineering, Inc., Memphis, Mich.

Filed July 9, 1975, Ser. No. 594,211

Int. Cl.² B41J 1/20

U.S. Cl. 101-111

13 Claims



1. A character support for use in a printing apparatus comprising a plurality of generally cylindrical elongated segments each having a longitudinal axis and at least two grooves substantially normal to said axis, said elongated segments being arranged in a predetermined side by side relationship and in

4,006,682

ARRANGEMENT FOR FITTING AND TENSIONING AN ENDLESS CHARACTER-BEARING BAND IN A PRINTER

Jacques Andre Louis Marie Chambolle, Danjoutin, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

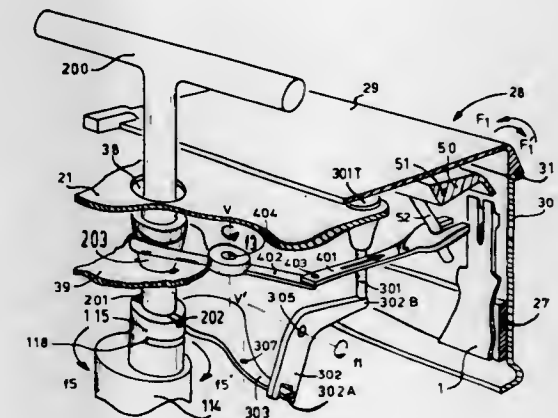
Filed Dec. 1, 1975, Ser. No. 636,455

Claims priority, application France, Dec. 11, 1974, 74.40831

Int. Cl.² B41J 1/20

U.S. Cl. 101-111

10 Claims



1. An arrangement for fitting and tensioning an endless character-bearing band in a printer of the type having a framework and wherein the endless character-bearing band is of the type having a plurality of character-bearing fingers and the printer having first and second pulleys on which the band is mounted, the pulleys having axes of rotation which are parallel with the distance between the axes of rotation being adjustable between a position in which the pulleys are closed-up and the band is not under tension and a position in which the pulleys are opened-out and the band is under tension, the printer being of the type of having means for adjusting the spacing of the first and second pulleys and a protective member hinged to the framework of the printer for protecting the character-bearing fingers by covering the top of said fingers, said arrangement including a detachable cartridge containing the band and being operatively associated with said means for adjusting the spacing of the pulleys; the improvement residing in said fitting and tensioning arrangement further including operating means connected to said protective member for operating said protective member, locking means, actuating means for actuating said means for adjusting the spacing of the pulleys, said locking means including means preventing the use of said actuating means in the absence of a cartridge in the printer, said locking means further including means actuated in response to the positioning of a cartridge for moving said locking means to a released position, said operating means including means engageable by said actuating means for operating said operating means to move said protective member above the top of said character-fingers.

4,006,683

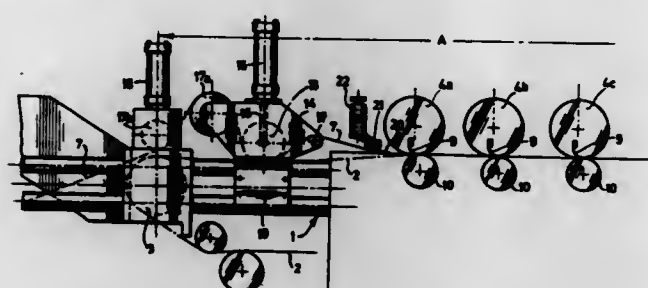
ROTARY SCREEN PRINTING MACHINE

Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands
Filed Oct. 15, 1974, Ser. No. 515,027
Claims priority, application Netherlands, Oct. 31, 1973, 7314974

Int. Cl.² B41F 15/10, 15/12

U.S. Cl. 101-118

3 Claims



1. In a rotary screen printing machine, a frame, means on said frame for driving and guiding an endless supporting belt along a path, means on said frame for rotatably supporting a plurality of thin-walled cylindrical screen stencils along said path, means for feeding a band of material to be printed onto the path of said supporting belt before the first of said plurality of stencils, a presser roller in said supporting belt path before said first stencil to press said band of material upon said supporting belt to synchronize the movement of said band and said supporting belt, means for moving said presser roller toward and away from said belt, a supporting roller spaced above said belt between said presser roller and said first stencil and said band passing over said supporting roller, and a thin resilient smoothing blade positioned above said belt between said supporting roller and said first stencil in the close vicinity of the printing area of said first stencil, said blade acting upon said band, said blade first smoothing the band of material and thereupon pressing said band on the supporting belt to prevent the formation of creases in the longitudinal direction of said band as the band and belt are passed beneath said first stencil.

4,006,684

PRINTING MACHINE

Roland Melzer, Schwelm, Germany, assignor to R. Melzer oHG Maschinenbau u. Metallverarbeitung, Schwelm, Germany

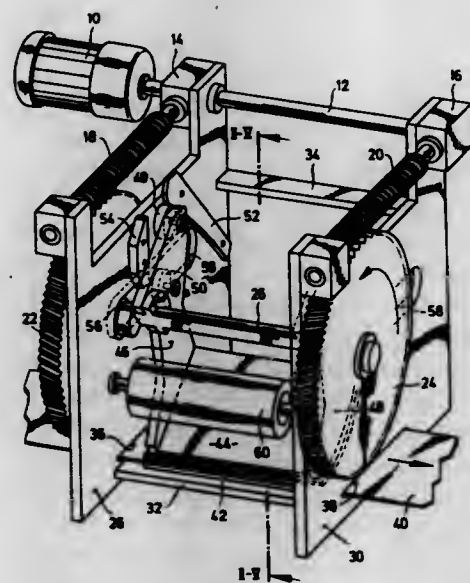
Filed Nov. 18, 1975, Ser. No. 633,156

Claims priority, application Germany, Nov. 22, 1974, 2455382

Int. Cl.² B41F 5/04

U.S. Cl. 101-212

12 Claims



1. A printing machine for printing on a discontinuously moved, flat web comprising

a frame;
a counter pressure plate mounted on said frame over which said discontinuously moved flat web passes;
means in said frame forming guide tracks which extends parallel to the counter pressure plate;
a printing block carrier having a curved jacket upon which a printing block is mounted, said carrier being journaled to rotatable bearings which are slidably positioned in said guide tracks;
drive means connected to said printing block carrier to cause rotation of the carrier about the axis defined by said bearings and to move said bearings in said guide tracks so that said printing block rolls over said web lying on said counter pressure plate; and
inking means stationarily mounted on said frame;
wherein, in use, the printing block carrier rotates in the same direction about an axis defined between said rotatable bearings, the printing block coming into contact with the inking means during each rotation before contact with the web, and the printing block carrier executing linear backward and forward movement such that its axis of rotation moves perpendicular to itself and parallel to the web, and wherein the frame is fixed and the carrier so guided in the frame as to execute the linear movement relative thereto, and the inking device is arranged to contact the printing block as the carrier executes rotary movement at one extreme of its linear movement.

4,006,685

AXIAL AND CIRCUMFERENTIAL REGISTER CONTROL APPARATUS FOR A CYLINDER IN A PRESS FRAME

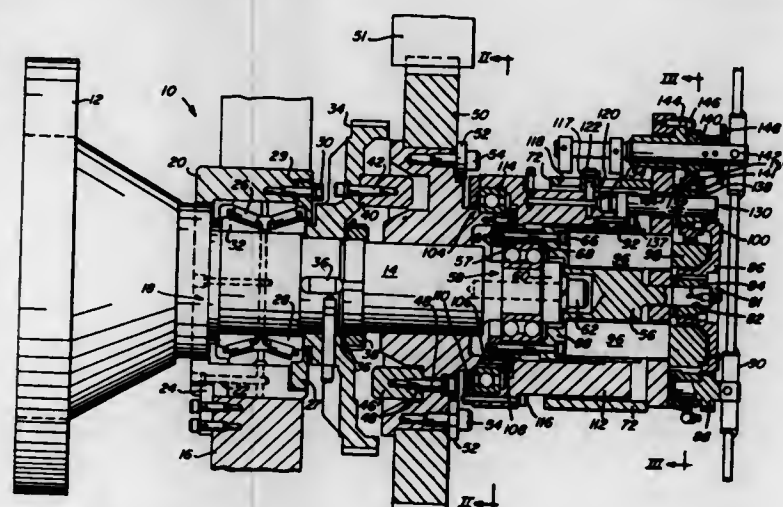
Robert L. Mosemiller, Pittsburgh, Pa., assignor to Miller Printing Machinery Co., Pittsburgh, Pa.

Filed Sept. 22, 1975, Ser. No. 615,596

Int. Cl.² B41F 13/24

U.S. Cl. 101-248

19 Claims



1. Apparatus for adjusting the position of a cylinder in a press frame comprising,
a cylinder having a shaft end portion,
frame means for rotatably supporting said shaft end portion, said cylinder mounted for axial movement relative to said frame means,
a housing rotatably secured to said shaft end portion for axial movement relative to said frame means, said housing having a threaded end portion,
adjacent supporting means extending outwardly from said frame means for non-rotatably supporting said housing, said adjacent supporting means non-rotatably fixed to said frame means,
said housing axially movable relative to said adjacent supporting means,
resilient means for axially moving said housing in a preselected direction relative to said adjacent supporting means, said resilient means positioned within said housing and having one end portion fixed to said adjacent supporting means and the other end portion abutting said housing, and

4,006,687

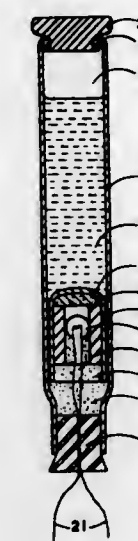
SAFE DETONATOR DEVICE

John Jerold Ridgeway, Paris, France, assignor to Imperial Chemical Industries Limited, London, England
Filed Nov. 15, 1974, Ser. No. 524,269

Int. Cl.² F42B 3/12

U.S. Cl. 102-28 R

21 Claims



1. In a detonator device an elongated container defining an elongated chamber, removable stopper means closing one end of said container, said stopper means having an outer end portion which projects outwardly of said container to facilitate removal of the stopper means, explosive initiator means located in the other end of the elongated chamber in contact with a first liquid component of a two-component liquid explosive composition, the space between said initiator means and said stopper constituting the major portion of said chamber and being essentially unobstructed except for said first liquid component and of such capacity to provide ullage space to enable a second liquid component, mixable with said first component to form the two-component liquid explosive, to be added upon removal of the stopper, to said first component and mixed therewith in the container, the strength of the container being sufficient to contain the pressure generated by the initiator means in the event of premature detonation thereof and to transmit said pressure to the stopper so that the latter and the first component are expelled from the container.

4,006,688

SHOT DISPERSION CONTROL DEVICE FOR SHOTGUN SHELLS

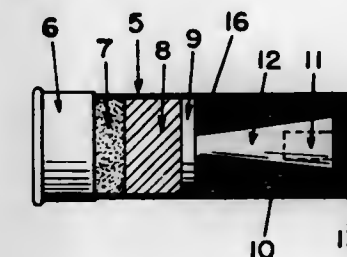
William J. Craft, Rte. 1, P.O. Box 668, Greensboro, N.C. 27406, and Carroll B. Williams, P.O. Box 333, Banner Elk, N.C. 28604

Filed June 4, 1975, Ser. No. 583,600

Int. Cl.² F42B 7/02

U.S. Cl. 102-42 R

6 Claims



1. A shotgun shell containing a shot dispersion control device comprising; a base casing, a cylindrical body extended from said casing, a powder charge and wadding positioned in said base casing, a shot dispersion control device positioned in said cylindrical body intermediate its length, and shot surrounding said device, said device having stabilizing means at one end thereof, a longitudinal member having a surface of

adjustment means secured to said housing threaded end portion and rotatably fixed to said adjacent supporting means for axially moving said housing in a preselected direction relative to said frame means,
said adjustment means operable to axially move said housing in one direction and thereby axially move said cylinder in a corresponding direction and to axially move said housing in an opposite direction and thereby move said cylinder in a corresponding direction.

4,006,686

BLANKET FASTENING MEANS FOR A CYLINDER BLANKET

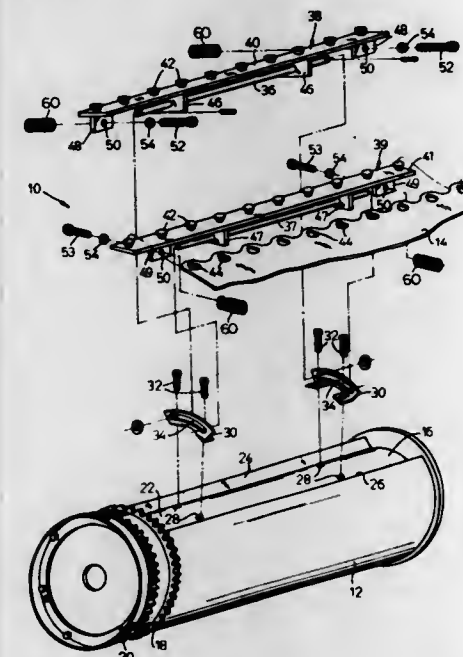
Stephen P. Ackerman, 244 Elmwood Drive, Mundelein, Ill. 60060

Filed Sept. 18, 1975, Ser. No. 614,555

Int. Cl.² B41F 27/12

U.S. Cl. 101-415.1

5 Claims



1. A blanket hooking means for securing a blanket around a blanket cylinder having a longitudinal axis and including a cylindrical outer surface and wherein said blanket cylinder includes a narrow elongated longitudinal cylinder opening in said cylindrical outer surface extending parallel to the axis of the cylinder and having longitudinally extending generally opposed cylinder opening walls defining generally radially extending planes with respect to the longitudinal axis of said cylinder and intersecting the cylindrical outer surface and wherein said blanket includes opposite ends and a plurality of aligned slots in said ends, said blanket hooking means comprising: bracket means removably secured to said blanket cylinder and disposed within said cylinder opening between said cylinder opening walls, a pair of elongated longitudinally extending blanket hooking members supported adjacent to said cylinder opening walls and in spaced parallel relationship to each other, at least one of said blanket hooking members being slidably supported by said bracket means for slidable movement toward and away from one of said cylinder opening walls, said hooking members including a plurality of projecting blanket securing projections aligned parallel to the longitudinal axis of said cylinder for receiving said aligned slots in the ends of said blanket, and means for adjustably forcing said at least one blanket hooking member away from said one of said cylinder opening walls for stretching said blanket around said cylinder, said bracket means including a pair of arcuate brackets received in said cylinder opening in longitudinally spaced apart relationship, said arcuate brackets each including an arcuate slot therein, and wherein said hooking members each include a rod secured thereto, said rod being slideably supported by the pair of arcuate brackets in said arcuate slots whereby each of said hooking members is slideable along said slot.

which a major portion monotonically increases from said stability means, said longitudinal member having an end opposite said stability means, said opposite end including a recess therein for receiving shot, whereby shot surrounding said longitudinal member will be dispersed upon firing depending upon the monotonic increase of said longitudinal member's outer surface.

4,006,689

PYROTECHNICAL SAFETY RELAY

Robert Guy Emile Bastide, Toulon, France, assignor to Etat Français, Paris, France

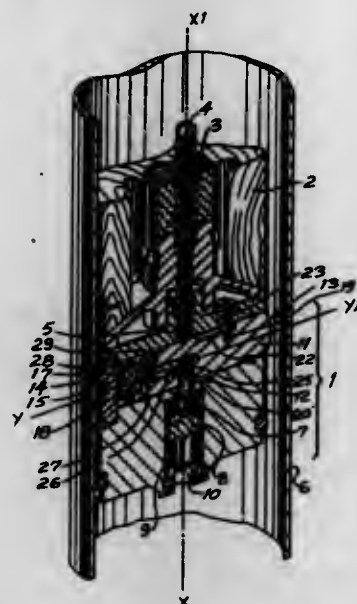
Filed July 29, 1975, Ser. No. 600,094

Claims priority, application France, Aug. 1, 1974, 74.26707

Int. Cl.³ F42C 15/20, 9/10

U.S. Cl. 102-70 R

8 Claims



1. A pyrotechnical safety relay for controlling the firing of a main pyrotechnical charge carried by a projectile launched from a tube, said relay comprising a finger slidable in a transverse bore provided in the projectile, said finger having an initial inoperative position and a displaced operative position, the bore having an open extremity and a closed extremity, said finger having a blind longitudinal bore containing an auxiliary pyrotechnical charge and an opening at the extremity of the finger situated adjacent said closed extremity of said transverse bore, means for igniting said charge in the blind bore with said finger in said initial inoperative position such that the finger is displaced to said operative position, and means for igniting the main pyrotechnical charge from the auxiliary pyrotechnical charge with the finger in displaced operative position.

4,006,690

MECHANISM FOR FIRING A PROJECTILE SUCH AS A RIFLE GRENADE

Suzanne Stockman, and Leon Stockman, both of 156, avenue des Aubeplines, 1180 Brussels, Belgium

Filed May 6, 1975, Ser. No. 575,015

Claims priority, application Belgium, May 6, 1974, 143966; Apr. 23, 1975, 155660

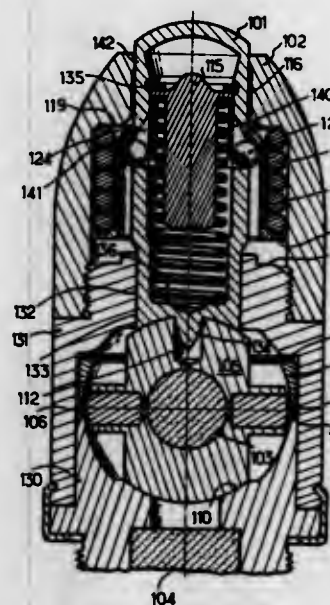
Int. Cl.³ F42C 15/26

U.S. Cl. 102-80

12 Claims

1. In a projectile such as a rifle grenade, a firing device comprising a striker placed along the center line axis of said projectile and projecting from the latter at the front end thereof, a detonator associated with said striker and fired by the latter when the front end of the projectile hits upon an obstacle and a charge ignited by the detonator, said detonator being movable between two positions the first one of which is a safety position whereas the second one is an operative working position enabling to ignite the charge, said detonator being

kept in said first position by said striker retracted into said projectile and retained by a locking arrangement which is unlocked through inertial effect when the projectile has been shot, wherein said locking arrangement comprises a first inertia block movable within said striker between a front abutment and the bottom of said striker, a calibrated return spring for urging said inertia block towards said abutment, a second cylindrical annular inertia block surrounding said striker within said projectile and movably mounted between a front shoulder and a rear shoulder of the body of said projectile, slots extending through the body of said striker for receiving locking balls held within said slots between said first inertia



block and said second inertia block when said striker and detonator are in the safety position before the shooting of said projectile, said first inertia block having, between said front abutment and said bottom of the striker, a relatively very long stroke for uncovering said slots of said striker and releasing said locking balls only at the end of the stroke, so that said locking arrangement on the one hand remains insensitive to very violent and short accelerations such as those induced by a shock before shooting said projectile and on the other hand releases said detonator only after a bounce at the end of a shooting acceleration thereby enabling said detonator to be in an operative working position at the end of a constant and predetermined time period after shooting of said projectile.

4,006,691

TRAIN HOLDING DEVICE

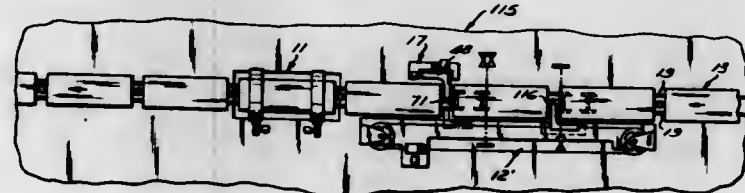
Ivan R. Kacir, Highland Heights; Edward T. Manning, Jr., Bay Village, and Donald A. Schmeley, Brook Park, all of Ohio, assignors to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed June 11, 1975, Ser. No. 586,057

Int. Cl.³ B61B 9/00; B61J 3/06; B61K 7/16

U.S. Cl. 104-176

10 Claims



1. Apparatus for handling the cars of a train at a work area, comprising a train positioner station and a train holding station, said train positioner station including a carriage and a guideway for guiding the carriage along a path adjacent and parallel to the tracks of the train, an arm mounted on the carriage and movable from a retracted position out of the path of the train to an extended position, said arm including means for controlling the position of a car when said arm is in its

extended position, means to drive the carriage along the guideway with the arm extended to index the train a unit distance equal to one or more car lengths and return the carriage to a rest position with the arm retracted, said holder station including a stationary base, an arm movable in a vertical plane from a retracted position out of the path of the train to an extended position between a pair of coupled cars, said holder arm having a coupler engaging head, said head having means to prevent significant trackwise movement of said train in either direction when it is in engagement with a car coupler, and means responsive to the positioning of a car at the completion of an indexing stroke to initiate extension of the holding arm and engagement of its head with an adjacent coupler.

4,006,692

HOPPER CAR OUTLET GATE AND SEAL

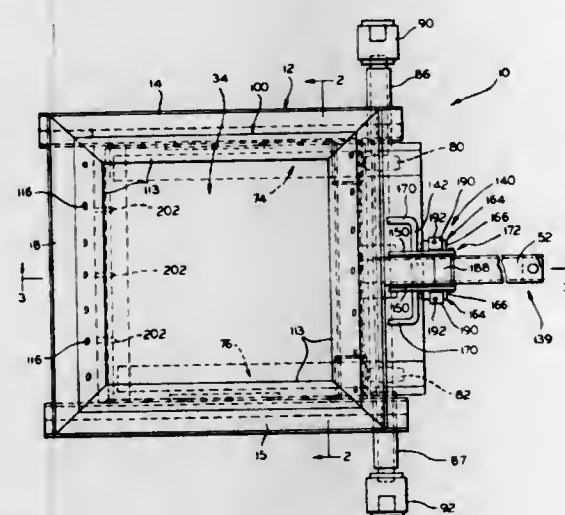
Osvaldo F. Chierici, Elmhurst, Ill., assignor to Holland Company, Lombard, Ill.

Filed May 2, 1975, Ser. No. 573,807

Int. Cl.³ B61D 7/20, 7/22, 7/26, 49/00

U.S. Cl. 105-282 P

6 Claims



1. In a hopper outlet gate assembly for bulk material carrying railroad hopper cars in which the car hopper has a discharge opening, with the assembly including a frame having four planar sheets in downwardly converging relation and forming a funneling portion terminating in an outlet port of quadrilateral configuration, a gate for closing the port, a slideway for the gate, which slideway extends sidewise and across the outlet port, and means for moving the gate longitudinally across the port to close same and a second position in which it is disposed to one side of the port and away from overlapping with the port to render the port fully open for discharge of the bulk materials therefrom,

the improvement including:

a seal stripping secured to said funneling portion about the port and disposed adjacent to but above the port and the slideway for forming a top seal for the gate, said stripping being of open centered quadrilateral configuration defining rectilinear sides merging into corners at adjacent ends of the stripping sides, which corners respectively complement corners defined by said sheets, said stripping defining thereabout a lip portion disposed about the port defining a flap that projects centrally of the port and that is disposed about the port for sliding engagement with the upper side of the gate when the gate is moved between its said positions, said flap defining an upwardly facing side adapted to be engaged by the lading when in the funneling portion, and a downwardly facing side disposed for face to face sealing engagement with the gate said upper side when the gate is in its said first position,

said gate comprising a planar member of molded one piece construction formed from an ultra high molecular weight

polymer having self lubricating characteristics and characterized by its surfacing being resistant to adherence thereto of the bulk material,

with said gate upper side being substantially planar across the length and width of same and said gate under side being in sliding engagement with said slideway for movement therealong by said gate moving means between said positions thereof,

said gate and said stripping flap being disposed in parallel planes extending transversely of said funneling portion, with said stripping flap being formed from resiliently flexible plastic material,

said stripping being formed to bias said flap against the gate upper surface for wiping engagement therewith for effecting said sealing engagement with said gate upper side when said gate is disposed in vertical alignment with said flap,

said gate having formed in the underside of same rack means extending parallel to said slideway and that are free of engagement with said slideway,

gear means journaled in said frame and meshing with said rack means,

and means for reversibly rotating said gear means to move said gate between said positions thereof,

said rack means, said gear means, and said gear reversibly rotating means comprising said gate moving means,

whereby said gate is free from adherence of the bulk materials carried by the car adhering thereto, and said stripping flap wipes the gate said upper side free of the bulk materials free of disturbance of said flap sealing engagement

when the gate is moved from said first position to said second position by said gate moving means,

and effect the case of moving same from said first position when the car hopper is loaded with bulk material, under the gravity biasing action of the bulk material on said top seal and on said gate upper side within the confines of said stripping.

4,006,693

COMBUSTION FURNACE CONSTRUCTION PARTICULARLY A REFUSE INCINERATOR

Hans Künstler, Eulenweg 25, Zurich, Switzerland (8048)

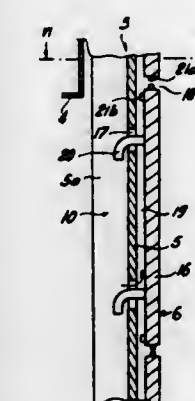
Filed Nov. 15, 1973, Ser. No. 416,235

Claims priority, application Switzerland, Nov. 30, 1972, 17496/72

Int. Cl.³ F23G 5/00; F23L 1/00, 9/00

U.S. Cl. 110-8 R

10 Claims



1. A combustion furnace particularly for refuse incineration, comprising furnace walls enclosing a fire chamber having a grate extending across at least a portion of the fire chamber above the bottom thereof, said furnace walls having a portion adjacent said grate comprising inner and outer spaced metal walls with a hollow space between said walls, a metal shield plate spaced inwardly from said inner furnace wall and extending around at least the substantial portion of the periphery of said grate which is adjacent said furnace walls and defining an intermediate hollow space between said shield plate and said inner furnace wall, said inner metal wall having openings

communicating said hollow space with the space between said inner wall and said shield plate, said shield plate having openings communicating the intermediate space between said shield plate and said inner furnace wall with said fire chamber, and air supply means for supplying air into the hollow space between said inner and outer metal walls.

4,006,694

HAND HELD TUFTING MACHINE

Fred A. Thaheld, and Fred H. Thaheld, both of Minden, Nev., assignors to Rumpelstiltskin's Craft Shop, Inc., Portland, Oreg.

Filed June 12, 1975, Ser. No. 586,264

Int. Cl.² D05C 15/06

U.S. Cl. 112-80

2 Claims



1. In a hand powered tufting machine adapted to be manually supported and guided over a base fabric, the combination of: a support plate, a manual crank and gearing driven thereby mounted on one side of said support plate, a rotary eccentric on the other side of said support plate driven by said gearing, a grip handle at the upper end of the support plate having extensions extending laterally in opposite directions from the support plate and parallel to the axis of the crank for manual support and movement of the device, a body having its upper end encompassing said eccentric to provide orbital movement, said body having parallel guide surfaces extending longitudinally, a hollow needle fixed to the lower end of the body, a stationary guide ring on said support plate slidably guiding said hollow needle, a crank arm adjacent said rotary eccentric driven by said gearing, a slide block guided for longitudinal movement between said parallel guide surfaces on said body, a solid inner needle fixed to said slide block and extending through said hollow needle, the hollow needle having a yarn-receiving window near its lower end, and a link connecting said crank arm to said slide block, whereby said inner needle may be caused to reciprocate from a position above said window to a position below the lower end of hollow needle.

4,006,695

APPARATUS FOR APPLYING SLIDE FASTENER CHAIN TO TUBULAR GARMENT

William Frederick Van Amburg, Meadville, Pa., assignor to Textron, Inc., R.I.

Filed May 30, 1975, Ser. No. 582,161

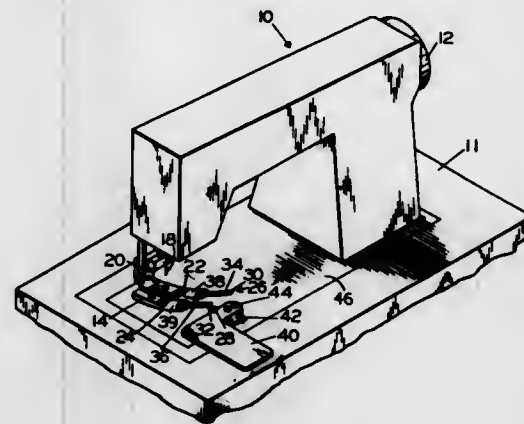
Int. Cl.² D05B 3/12

U.S. Cl. 112-104

2 Claims

1. An apparatus for sewing a pair of stringers of a slide fastener chain to opposite edge portions of a seam opening in a tubular garment, the apparatus comprising a sewing machine having a tabletop, two stitching means, each including a needle, and means for feeding the pair of stringers together with the respective opposite edge portions of the seam opening in the garment simultaneously and in parallel through the respective stitching means, and

a plate mounted in a raised horizontal position above and spaced from the tabletop in front of the two stitching means and the feeding means for engaging the portion of



the tubular garment opposite the seam opening to prevent the engaged portion of the garment from being fed through the stitching means.

4,006,696

FLOATING PRESSER FOOT FOR QUILTING MACHINE

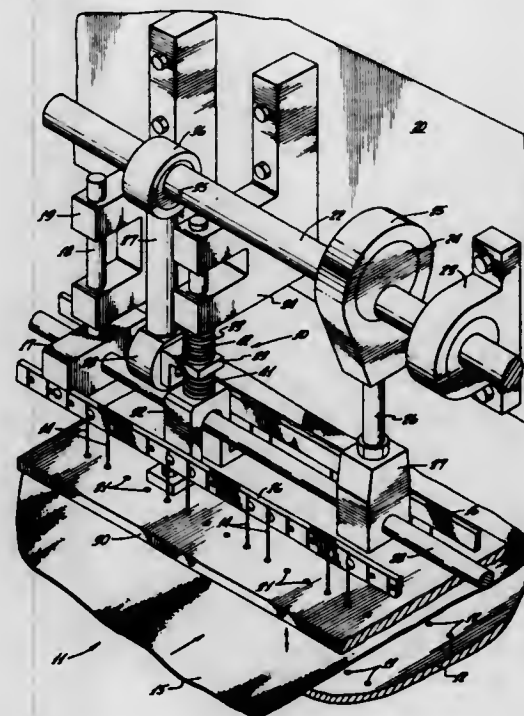
Joe E. Robertson, Santa Ana, Calif., assignor to Kirsch Company, Sturgis, Mich.

Filed Jan. 12, 1976, Ser. No. 648,003

Int. Cl.² D05B 11/00

U.S. Cl. 112-117

13 Claims



1. In a quilting machine of the type including a bed plate, means for conducting material to be quilted over said bed plate, vertically reciprocal needles positioned above said bed plate for moving sewing threads through said material to form stitches therein, presser foot means positioned above said bed plate, means for supporting said presser foot means for vertical reciprocation relative to said bed plate between upper and lower positions for periodically compressing and releasing said material, and means for driving said presser foot means, the improvement wherein said presser foot means driving means comprises:

means including a pair of opposed, balanced springs for biasing said presser foot means in a position intermediate said upper and lower positions; and means for cyclically, alternately, increasing and decreasing the compression of one of said springs and simultaneously decreasing and increasing the compression of the other of said springs to reciprocate said presser foot means between said upper and lower positions.

4,006,697

HIGH SPEED QUILTING MACHINE

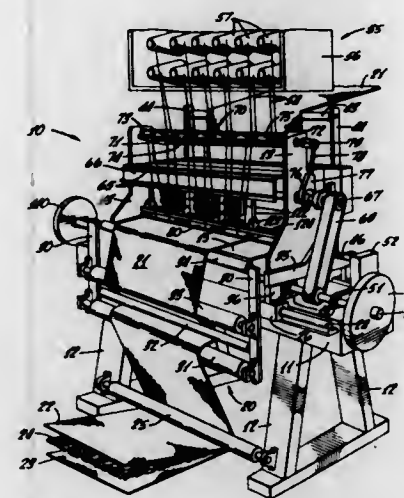
Joe E. Robertson, Santa Ana, Calif., assignor to Kirsch Company, Sturgis, Mich.

Filed Jan. 12, 1976, Ser. No. 648,002

Int. Cl.² D05B 11/00

U.S. Cl. 112-118

28 Claims



1. In a quilting machine of the type including a bed plate, material supporting means including material feeding means for conducting material to be quilted over said bed plate, sewing thread supply means, vertically reciprocal needles positioned above said bed plate for moving sewing threads through said material and said bed plate, horizontally reciprocal shuttles mounted beneath said bed plate and cooperating with said vertically reciprocal needles for forming lock stitches in said material, vertically reciprocal presser means positioned above said bed plate for holding said material on said bed plate during formation of said stitches, thread take-up means positioned between said thread supply means and said needles for controlling the tension in said threads during said formation of said stitches, and pattern controlling means for moving said material supporting means laterally in a preselected relationship with said material feeding means for obtaining sewing patterns, the improvement comprising: means for driving said needles continuously between upper and lower positions, with no delay or dwell time at the ends of the strokes of said needles and with no hump or other irregularities in the movement thereof.

4,006,698

SEWING DEVICE FOR PERFORMING SEAMS ON SIMILAR WORKPIECES OF DIFFERENT LENGTH

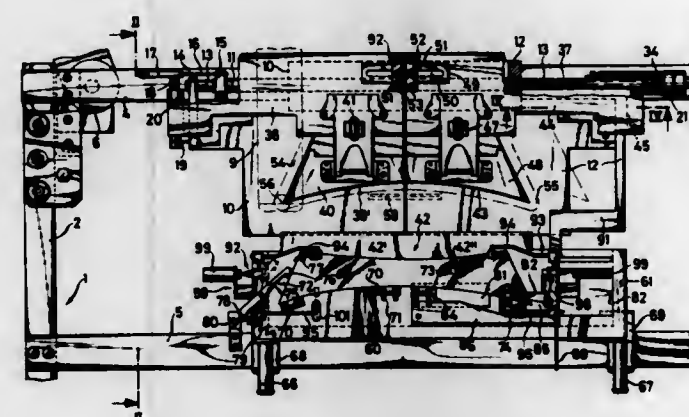
Hans Scholl, Oerlinghausen-Lipperreihe; Wolfgang Sugland, Herford, and Jochen Fischer, Brackwede, all of Germany, assignors to Kochs Adler AG, Bielefeld, Germany

Filed Jan. 17, 1975, Ser. No. 541,784

Int. Cl.² D05B 19/00, 3/00

U.S. Cl. 112-121.11

4 Claims



1. A sewing device with guided control of a sewing cycle,

comprising, in combination a support means, a sewing machine having a reciprocating needle, movable carrier means for said sewing machine, an adjustable master cam consisting of two halves having a peripheral edge and a bridging rail overlapping said two halves, for forming a continuous cam edge for said master cam, a driven roller secured to said movable carrier means for said sewing machine and engaged with said peripheral edge of said master cam and coaxial with said needle, a bipartite workpiece clamping means having left lower and upper clamping plates, right lower and upper clamping plates, and lifting means for said left and right upper clamping plates, a stationary carrier body for receiving one of said two master cam halves and said left lower and upper clamping plates, a slidable carrier body for receiving the second half of said two master cam halves and said right lower and upper clamping plates, and provided with stop means, a rod secured to said support means for slidably receiving said slidable carrier body, a limit stop carrier pivoted on said rod, a plurality of adjustable limit stops of different lengths circularly attached to said limit stop carrier and cooperating with said stop means of said slidable carrier body, and means for intermittently revolving said limit stop carrier about said rod.

4,006,699

THREAD GUIDE MEANS FOR SEWING MACHINE

Kimikazu Matsuda, Hirakata, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

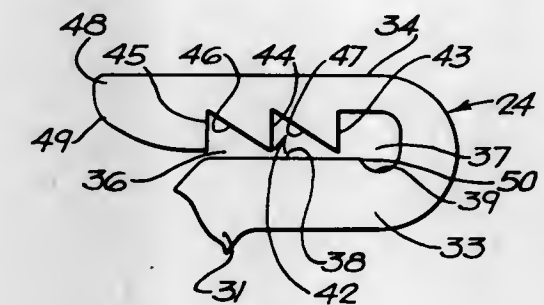
Filed Nov. 19, 1975, Ser. No. 633,587

Claims priority, application Japan, June 13, 1975, 50-73395; Apr. 26, 1975, 50-52983

Int. Cl.² D05B 49/00

U.S. Cl. 112-241

6 Claims



1. In a sewing machine, a take-up lever having a thread guide including a first arm portion and a reversely directed second arm portion overlying the first arm portion in spaced relation and providing an elongated slot therebetween, said slot being open at one end and communicating with an aperture spaced from said open end for accommodating the thread during the sewing operation, the edge of said first arm portion defining the lower boundary of said slot being substantially a straight line, said second arm portion including a detent constituting a depending straight edge extending in angular relation to said boundary edge with the lower end of said straight edge being disposed in confronting spaced relation to said boundary edge, said detent being spaced from said aperture in the direction of said open end and being adapted normally to prevent a thread from moving outside of said slot during the operation of said take-up lever.

4,006,700

METHOD FOR MAKING CONTAINER CLOSURES

Walter Carl Lovell, Wilbraham, and Frederick Gerard Joseph Grise, Osterville, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed May 5, 1975, Ser. No. 574,643

Int. Cl.² B21D 51/40

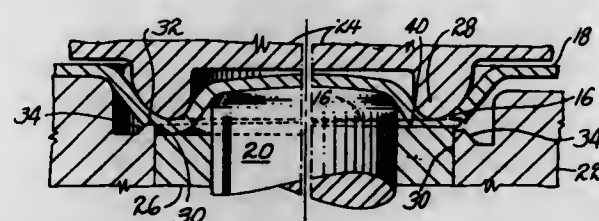
U.S. Cl. 113-121 C

6 Claims

1. The method of making a digitally disruptable line in sheet metal having opposite generally planar surfaces which method

consists in substantially simultaneously bending a portion of the metal to form a wall with a locality bowed in tension adjacent to one surface thereof, and longitudinally coining

lapsible marker portion is comprised of a continuous strip of resilient, semi-rigid material, said strip having a first inwardly disposed lip on the top edge thereof and a second outwardly



said tensioned surface and locality of the wall as it is being thus bent to create in the residuum thickness adjacent to the opposite surface of said wall locality a fractured but integral section defining said line.

4,006,701

SEGMENTAL SAIL FOR BOATS

Glauco Corbellini, Via Carducci, 33100 Udine, Italy

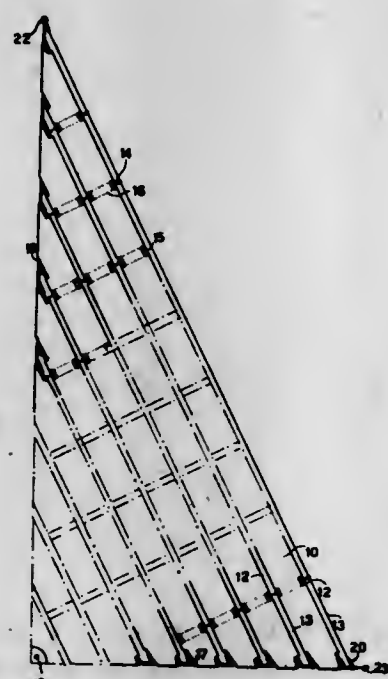
Filed Mar. 10, 1975, Ser. No. 556,803

Claims priority, application Italy, Mar. 8, 1974, 83319/74

Int. Cl.² B63H 9/04

U.S. Cl. 114-102

17 Claims



1. A sectional sail for boats including in reciprocal combination and cooperation a plurality of sections parallel to one side of the sail, each of said sections being provided with a luff-rope and a leech-rope at the fore and aft vertical edges of said sections, and means for tensioning and tightening said ropes; stiffening battens arranged on said sections between said luff-and leech-ropes and extending substantially from edge to edge of said sections for maintaining a constant distance between the edges for entry and exit of the wind between said sections; means for securing the ends of said sections, and means for connecting the edges of said sections, said ends of said sections being substantially aligned and axially successive.

4,006,702

ROAD BUOY

Napoleon St. Cyr, 10 Overland Drive, Stratford, Conn. 06497

Filed Aug. 28, 1975, Ser. No. 608,579

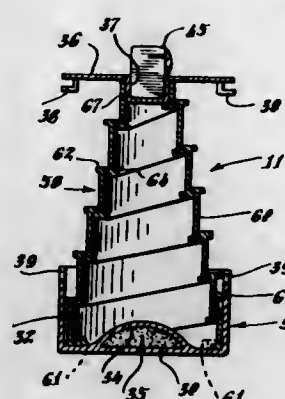
Int. Cl.² E01F 9/10

U.S. Cl. 116-63 P

4 Claims

1. A road buoy comprising a weighted base and a marker portion detachably secured thereto, said marker portion expandable to an operational height and collapsible with respect to said weighted base to reduce said road buoy to a compact size for storage and transportation thereof, wherein said col-

lapsed lip on the bottom edge thereof, said strip spirally coiled so that said first lip and said second lip of successive coils interlock when said collapsible marker portion is telescopically expanded.



4,006,703

FOAMED WAX APPARATUS

Judson L. Smith, 5432 Lighthouse Lane, Tempe, Ariz. 85283

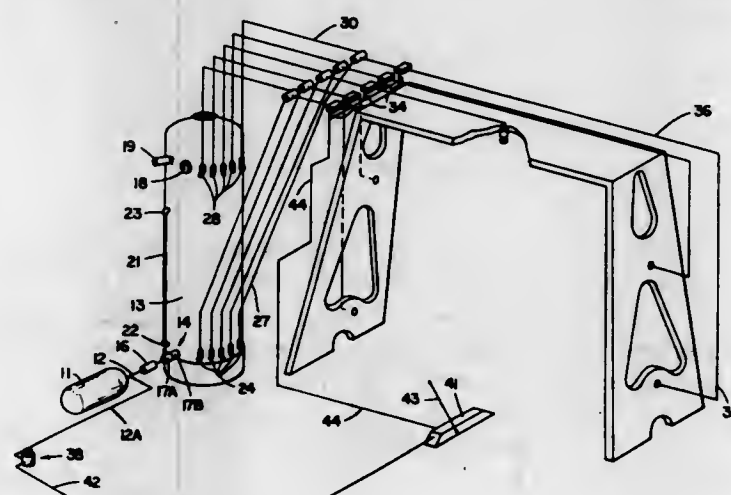
Division of Ser. No. 432,815, Jan. 14, 1974, abandoned. This

application Nov. 10, 1975, Ser. No. 630,654

Int. Cl.² B05C 13/00; B05B 13/00

U.S. Cl. 118-2

8 Claims



1. A wax dispensing apparatus comprising:
a. a tank which is adapted to hold and dispense a mixture of liquid wax and foaming agent,
b. a water supply conduit,
c. means for combining said liquid wax-foaming agent mixture with said water,
d. means for introducing air into said water, liquid wax-foaming agent combination to cause said liquid wax combination to foam, and
e. a means for spraying said foam on a surface to be waxed, said tank having air compressed therein, said air introducing means including air injecting means connected to said tank below the level of said liquid wax-foaming agent combination therein.

4,006,704

STRAIGHT LINE GLUER

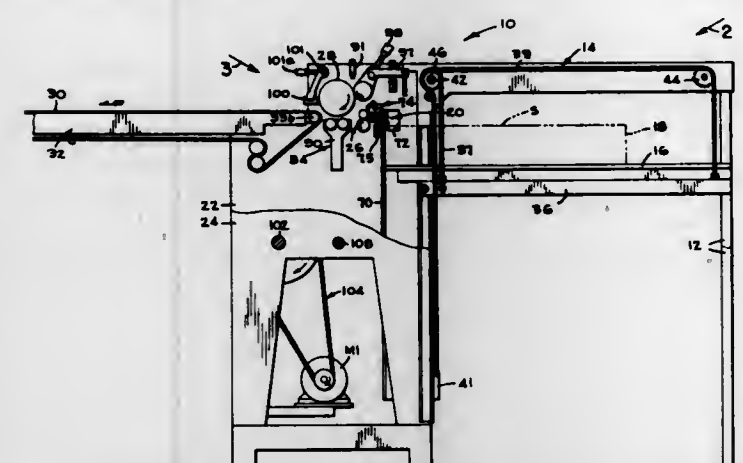
Giorgio Perondi, Milanino, Italy, assignor to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 497,008, Aug. 13, 1974, abandoned. This application Apr. 10, 1975, Ser. No. 567,042

Int. Cl.² B05C 1/02

U.S. Cl. 118-50

6 Claims



1. In a gluing machine of the type including a frame, a magazine for supporting an upright stack of sheets, a vacuum head for removing the uppermost sheet from the magazine at a pickup position and feeding it from the stack to a sheet delivery position, feed rolls for gripping and transporting the fed sheet, a glue roll in rolling contact with said sheet for depositing a film of adhesive thereon, a sheet support device beneath said glue roll and a conveyor for transporting the coated sheet to a downstream station; the improvement comprising laterally spaced upright lever means, means for pivotally mounting one end of said lever means for coaxial swinging movement of the other end substantially along the path of the sheet between a rearward sheet pickup position over the magazine and a forward sheet delivery position; means for swinging said lever means about said pivot means between advanced and retracted position, a rock shaft mounted in said frame, crank means on said rock shaft connected to the associated pivot means of said lever means for raising and lowering said lever means by oscillation of said rock shaft and independently of the swinging movement of said lever means, continuously operating power means for oscillating said rock shaft, shaft means for mounting said vacuum head rotatably mounted on the other ends of said lever means, said shaft means having laterally spaced arms mounting an offset vacuum tube that carries said vacuum head, and means for independently turning said shaft means to control the position of said head.

4,006,705

LIMITED PRESSURE APPLICATOR

Tipton L. Gollas, and David Mayes, both of Beaumont, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Division of Ser. No. 620,736, Oct. 8, 1975. This application

Apr. 12, 1976, Ser. No. 676,171

Int. Cl.² B05C 1/02

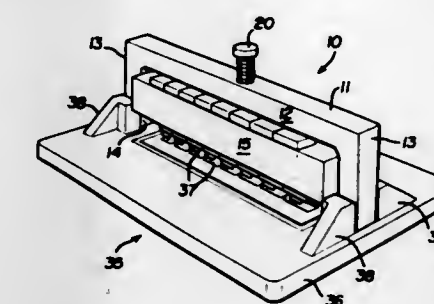
U.S. Cl. 118-221

4 Claims

1. In an apparatus for transferring uniform samples of blood or the like from a reservoir to a sample support, the improvement of a carrier to which the sample adheres by surface tension comprising:

a generally U-shaped yoke having an elongated base and terminating in a pair of opposed legs which are adapted to be supported on a platform, each of said legs having an inwardly facing opposed longitudinal groove therein;
an elongated slide bar slidably mounted in said grooves parallel to said elongated yoke base and resiliently urged toward the yoke base, said slide bar having an elongated slot extending therethrough; and
an applicator element freely suspended from said bar and

through said slot and extending below the bottom of said guide bar away from the yoke base so that upon sliding said guide bar in said groove against said resilient urging, said applicator element then extends outwardly beyond



the legs of the yoke and is adapted to contact, solely under the influence of gravity, either a sample in a reservoir or an absorbent sample support, whichever is supported on the platform.

4,006,706

DEVICE FOR APPLYING GLUE TO CHIPS

Wilhelm Lödige, Elsener Str. 9c; Fritz Lödige, Leuschnerstr. 12, and Josef Lücke, Im Lohfeld 13, all of 4790 Paderborn, Germany

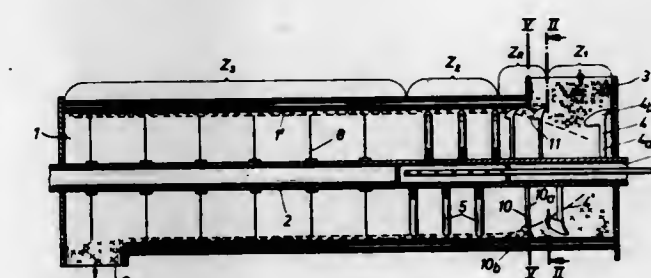
Filed June 16, 1975, Ser. No. 587,318

Claims priority, application Germany, June 14, 1974, 2428588

Int. Cl.² B05C 5/00; 259 9/10

U.S. Cl. 118-303

22 Claims



1. An apparatus for applying glue to chips, fibers, and similar parts of cellulose containing substances such as wood and bagasse, which includes: an at least approximately cylindrical chamber comprising an inlet chute at one of its ends and an outlet at its other end and when viewing from said inlet chute toward said outlet also comprising successively an inlet zone and a ring forming zone and a gluing zone, and a post-mixing zone, a rotatable shaft longitudinally extending within said chamber from said inlet zone to said other chamber end, conveyor tool means arranged within said inlet zone and keyed to said shaft for rotation therewith, said ring forming zone being formed by the transition between said inlet zone and said gluing zone, a plurality of glue applying tools arranged within said gluing zone and connected to said shaft for rotation therewith while extending from said shaft in the direction toward the inner peripheral surface of said chamber, loosening-up and drawing-in tools connected to said shaft for rotation therewith and arranged in said ring forming zone while extending from said shaft toward the inner periphery of said chamber, and post-mixing tools connected to said shaft in axially spaced relationship to each other within said post-mixing zone, the latter extending from said gluing zone to said other end of said chamber, the working surface of said loosening-up and drawing-in tools in said ring forming zone having a tapering decreasing working surface ending in a tip, the tip of said working surface forming the radially farthest outward portion of said working surface.

4,006,707

ULTRASONIC COATING APPARATUS

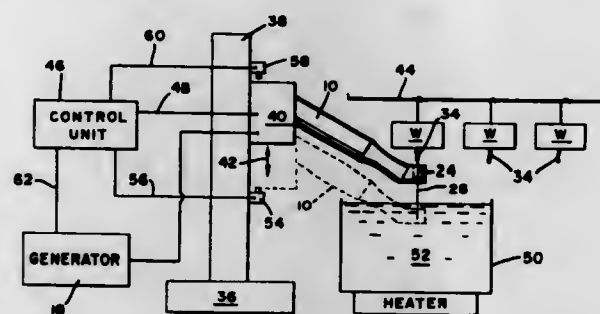
Clark A. Denslow, Wilton, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed May 10, 1976, Ser. No. 684,472

Int. Cl.² B05C 3/04

U.S. Cl. 118—612

3 Claims



1. An ultrasonic processing apparatus comprising:
 - a support;
 - a tank adapted for holding a liquid;
 - an elongated resonator dimensioned to be resonant along its longitudinal axis at a predetermined high frequency of vibration having two ends;
 - electroacoustic converter means coupled to said resonator at one end thereof for imparting vibrations of said predetermined frequency to said resonator and causing said resonator when resonant to exhibit at least two antinodal regions and one nodal region of longitudinal vibration;
 - said resonator including a liquid retaining recess formed therein at said other end substantially at an antinodal region of longitudinal vibration, and
 - motive means coupled to said electroacoustic converter means and said elongated resonator for periodically moving said resonator along said support for causing said liquid retaining recess to become submerged in the liquid of said tank for replenishing the liquid in said liquid retaining recess and for lifting said resonator after replenishing the liquid in said liquid retaining recess.

4,006,708

ELECTROGRAPHIC DEVELOPMENT APPARATUS

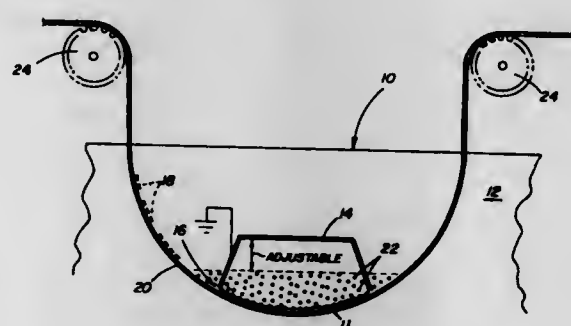
Peter M. Stacy, Webster, and Richard A. Weltzel, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1975, Ser. No. 573,658

Int. Cl.² G03G 13/08

U.S. Cl. 118—650

6 Claims



4. Electrographic apparatus for applying a single component, dry, electrically conductive developer material to an elongated recording element bearing a latent electrostatic image pattern on one surface thereof, said apparatus comprising:
 - means defining a recording element feed path, at least a portion of said path being of U-shape;
 - a transport mechanism for advancing the recording element along said feed path with the image-bearing surface of the recording element facing upwardly so that the recording element forms a self-contained, open-topped, developer reservoir for the developer material; and

an electrically conductive, grounded, apertured member positioned in the developer reservoir in close proximity to the image-bearing surface of the recording element so as to provide a tumbling action to the developer material and an electrically conductive path which rapidly dissipates any electrical charges generated on the developer material.

4,006,709

DEVELOPING UNIT FOR ELECTROPHOTOGRAPHY

Seiichi Miyakawa, Nagareyama, and Toyoo Okamoto, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Japan

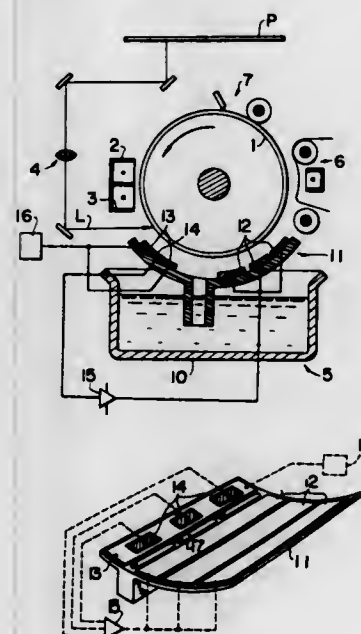
Filed Dec. 15, 1975, Ser. No. 640,846

Claims priority, application Japan, Dec. 24, 1974, 49-3293

Int. Cl.² G03G 13/10

U.S. Cl. 118—648

5 Claims



1. In a developing unit for electrophotography comprising,
 - a. means, having a surface movable in a predetermined direction past a developing station, for forming an electrostatic latent image on said surface,
 - b. developing electrode means disposed at said station in opposite relationship with said surface,
 - c. a plurality of detection electrodes each disposed in opposite relationship with said surface upstream of and adjacent said developing electrode means for sensing respective instantaneous potentials of portions of the electrostatic latent image on said surface opposing thereto so as to produce respective output signals,
 - d. means responsive to said signals for applying a potential slightly higher than the lowermost one of said sensed potentials to said developing electrode means, and
 - e. means for supplying a developing agent between said surface and developing electrode means, the improvement comprising,
 - f. protective electrode means disposed close to said detection electrodes in opposite relationship with said surface, and
 - g. means for applying a potential near those on said detection electrodes to said protective electrode means.

4,006,710

ARTISTIC BED FOR AQUARIUMS AND THE LIKE

Katherine A. Van Berkum, 25 Emerald Lane, Omro, Wis. 54963

Filed July 25, 1975, Ser. No. 599,168

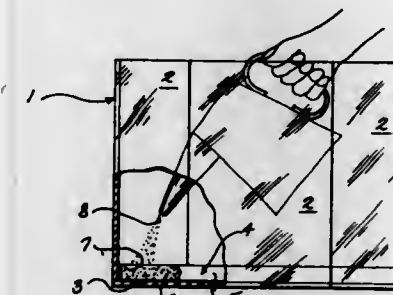
Int. Cl.² A01K 64/00

U.S. Cl. 119—5

3 Claims

1. The method of forming an artistic bed in an aquarium, comprising the steps of:
 - a. providing a thin-walled form having a peripheral edge

- wall and a plurality of interior walls forming separate chambers open at the top and bottom,
- b. placing said form on the bottom of an empty aquarium,
- c. pouring flowable materials of different types and/or colors into each chamber until the material fills the chamber to slightly below the top edge of said form to create the bed design with the portions of the latter maintained separate,



- d. subsequently pouring water into said aquarium to thereby increase the cohesiveness and reduce the flowability of said materials by water saturation,
- e. and subsequently removing said form upwardly from the saturated bed and through the water so that the design remains intact.

4,006,711

UNITARY LINER FOR AN AQUARIUM

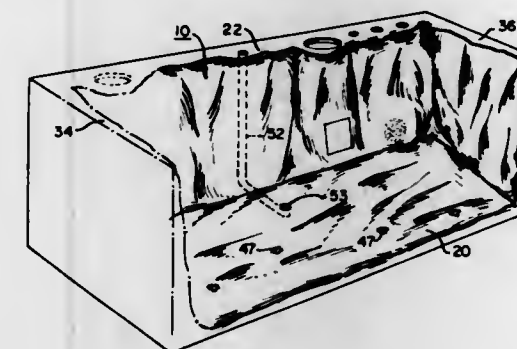
Michael G. Frank, 204 Weeping Willow Lane, Fairfield, Conn. 06430

Filed July 28, 1975, Ser. No. 599,680

Int. Cl.² A01K 64/00

U.S. Cl. 119—5

19 Claims



1. An aquarium liner for insertion in an aquarium so as to conceal aquarium accessories while providing for their unhampered operation and eliminating the need for sand and gravel comprising:
 - A. a bottom member dimensioned for insertion in an aquarium over substantially the entire inner bottom surface of the aquarium, said bottom member having an upper surface and a first aeration conduit passageway having an aperture passing through the upper surface of the member; and
 - B. a diorama backdrop member dimensioned for receipt within the aquarium so as to cover substantially the entire inner rear surface of the aquarium, having a lower region dimensioned for integral combination with the rearward region of the bottom member, an upper surface extending near and substantially parallel to the rearward, upper termination of the aquarium, and an outer surface facing toward the inner, front surface of the aquarium, said backdrop member having, at least one recess formed therein behind the outer surface and extending through its upper surface for receipt of aquarium accessories, a porous region passing through the outer surface of the diorama backdrop and communicating with at least one

of said recesses for circulation of water therethrough, and a second aeration conduit passageway communicable with the first aeration conduit passageway so as to provide oxygen to the aquarium water.

4,006,712

MILKING APPARATUS

John Forth Peel, Kellyville, Australia, assignor to Nealeforth Farms Pty. Limited, Canberra City, Australia

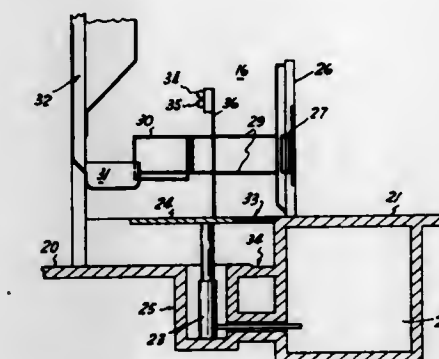
Filed Nov. 12, 1975, Ser. No. 631,089

Claims priority, application Australia, Nov. 18, 1974, 9656/74

Int. Cl.² A01K 1/00

U.S. Cl. 119—14.03

7 Claims



1. Milking apparatus comprising a plurality of milking stations located between a cow entry area and a cow exit area, the entry area being elevated relatively to the exit area, each milking station comprising a vertically moveable cow supporting platform capable of movement between a milking position substantially at the level of said entry area and an exit position substantially at the level of said exit area, said platform being hydraulically operated with sufficient lifting pressure being applied to said platform during lowering thereof to the exit position as to enable the platform automatically to rise to its milking position upon the cow stepping off the platform at its exit position.

4,006,713

COLLAPSIBLE DOG HOUSE

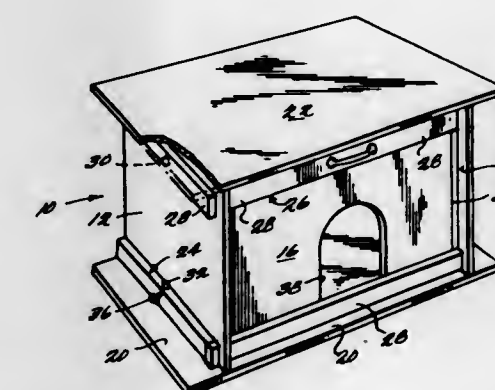
Charles B. Hawley, III, 10 Quincy St., Chevy Chase, Md. 20015

Filed Dec. 23, 1975, Ser. No. 643,643

Int. Cl.² A01K 1/02

U.S. Cl. 119—19

9 Claims



1. A collapsible dog house, comprising:
 - six separable panel members including a floor, a roof, two opposite side walls and a front wall and a rear wall, each being generally rectangular;
 - means defining a dog entrance opening through the front wall;
 - a depending skirt on the underside of the roof, including a forward element, a rear element and two opposite side elements;

an upstanding skirt on the upper side of the floor, including four elements corresponding to those of the roof skirt, and being correspondingly placed, so that the two skirts may be placed in confronting engagement; cooperative retaining and securement means on the roof and on the floor, which are engaged when the two skirts are in confronting engagement for maintaining the confrontation against axial and lateral disengagement; distance between the roof underside and floor upper side when the two skirts are in confronting engagement being sufficient to permit the two opposite side walls, the front wall and the rear wall to be enclosed therebetween in a stack, surrounded by the skirts;

handle means provided on at least one of the floor and roof members, sited to permit the dog house, when the two skirts are maintained in confronting engagement and house said stack, to be carried thereby, brief case fashion, that is, with the floor underside and roof upper side generally vertically oriented;

means defining four notches in each side wall, including: a first notch in the upper edge thereof near the front edge thereof;

a second notch in the upper edge thereof near the rear edge thereof;

a third notch in the lower edge thereof near the front edge thereof; and

a fourth notch in the lower edge thereof near the rear edge thereof;

the notches being respectively shaped and positioned to receive:

the forward element of the depending skirt;

the rear element of the depending skirt;

the forward element of the upstanding skirt; and

the rear element of the upstanding skirt, when the side walls are erected between the roof and the floor;

means defining two generally vertically extending channel on the inner side of each side wall, including:

one disposed to the rear of the first and third notches on the same side wall; and

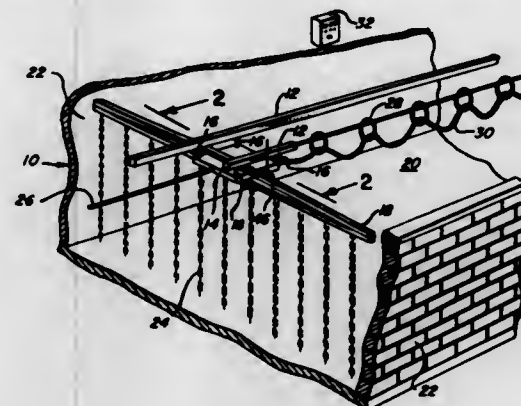
the other disposed to the fore of the second and fourth notches on the same side wall;

the one grooves of the two side walls being respectively shaped and positioned to receive the opposite vertical edge margins of the front wall when the side walls and front wall are erected on the floor;

the other grooves of the two side walls being respectively shaped and positioned to receive the opposite vertical edge margins of the rear wall when the side walls and rear wall are erected on the floor;

the dog house may be erected by erecting the side walls on the floor, inserting the respective edge margins of the front wall and rear wall in the respective grooves to erect the front wall and rear wall on the floor, and lowering the roof until the forward and rear elements of the depending skirt are received in the respective first and second notches of the respective side walls.

spaced points on said cross arm and hanging downwardly therefrom forming a barrier across the passage; and means for selectively connecting said conductors with a source of electrical energy, whereby said conductors may be connected with said electrical source during move-



ment of the carriage along the passage from the entry to the exit encouraging the animals to move ahead of the barrier toward the exit and said conductors may be disconnected from the electrical source when the barrier is positioned adjacent said entry, allowing animals to move through the barrier into the passage.

4,006,715

FARROWING CRATE ASSEMBLY

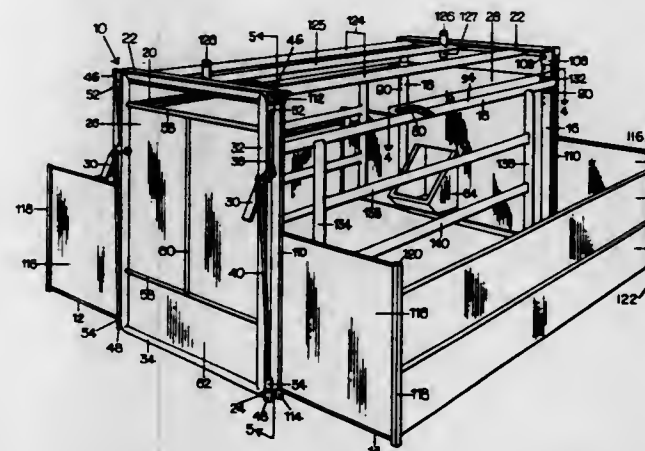
Jackson T. Redmon, Billings; Irvin Haldle, Fallon; Donald Herzog, Rapelle, all of Mont., and Joel C. Greene, Greer, S.C., assignors to Agribest, Inc., Billings, Mont.

Filed Dec. 5, 1975, Ser. No. 638,149

Int. Cl.² A01K 1/02

U.S. Cl. 119-20

13 Claims



1. A farrowing crate assembly for a sow and her piglets and the like including a farrowing crate and a pair of associated side pens connected on each side of said farrowing crate, said farrowing crate comprising:

a plurality of spaced vertical standards;

a pair of interchangeable opposed side members slideably received over said spaced vertical standards spacing said vertical standards longitudinally, said side members being interchangeable on said standards;

an upper and lower bridger flange carried between the top and bottom, respectively, of said vertical standards so as to space said vertical standards and said opposed side members apart laterally;

a pair of interchangeable door members carried by said bridger flanges;

attachment means carried adjacent each side of said door members providing a pivotal attachment at each upper and lower bridger flange so that said door members can be selectively opened from either side;

said interchangeable side members each having offset side

4,006,714

TRAINER AND CROWD GATE

Louis Goossen, Beatrice, Nebr. 68310

Filed June 16, 1975, Ser. No. 587,155

Int. Cl.² A01K 3/00

U.S. Cl. 119-20

10 Claims

1. A crowd gate for urging animals to move through a passage from an entry at one end to an exit at the opposite end, comprising:

an overhead track extending along said passage;

a carriage movable on said track;

means for moving said carriage on the track along the passage between the entry and exit;

a cross arm mounted on said carriage and extending across said passage;

a plurality of elongate electrical conductors suspended from

frame portions so as to vary the width of the crate interior between said opposed side members when carried by said standards in said interchangeable manner so as to be selectively offset inwardly or outwardly; and locking means carried by said interchangeable side members cooperating with said vertical standards to lock said side members in a desired height position along the vertical length of said standards;

whereby said interchangeable side members may be interchanged varying the width of the crate interior to accommodate different size sows, said door members may be interchanged permitting entry of the sow through either end of the crate, and said door members may be opened from either side providing a highly versatile farrowing crate which may be utilized in a variety of configurations and spaces.

4,006,716

MINIATURE ANIMAL-WATERING VALVE

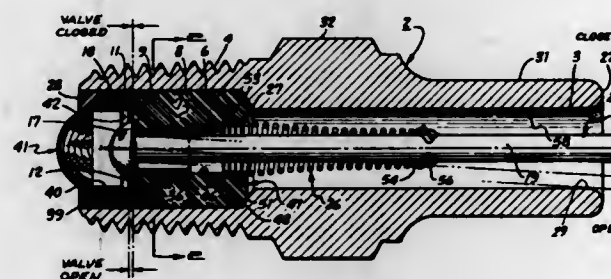
David L. Cross, Napa, Calif., assignor to Atco Manufacturing Co., Inc., Napa, Calif.

Filed Dec. 1, 1975, Ser. No. 636,700

Int. Cl.² A01K 7/00

U.S. Cl. 119-72.5

3 Claims



1. A miniature animal-watering valve comprising:

a. an elongated housing formed with a cylindrical passage therethrough; and adapted for connection to a water supply;

b. a cylindrical valve seal member having a passage therethrough and an outside wall dimensioned to sealably engage the inner wall of said housing passage, and the upstream end of said seal member is formed with an inwardly sloping conical surface;

c. a valve lever member having a valve head member formed with an annular small radius outer edge positioned for "line-point" contact with said sloping conical surface of said valve seal member and said valve lever member also having a lever arm extending from said head axially through said housing passage and spaced from said inside wall and extending slightly beyond the distal end of said housing;

d. biasing means mounted in said housing and engaging said lever arm for centering said valve lever member;

e. means holding said valve seal member in a fixed position within said housing;

f. said means holding said valve seal member consists of a plurality of annular indents formed in said housing protruding into said cylindrical passage;

g. one of said annular indents is formed immediately downstream of the lower edge of said valve seal member and is in contact with said member; and

h. said valve seal member is formed with a downstream portion having a gradually increasing outside diameter for positively engaging said downstream indent.

4,006,717

CONTROL MECHANISM FOR A DRAFTING RACE
Walter John Hicks, Post Office, Pingrup, Western Australia, Australia (6343)

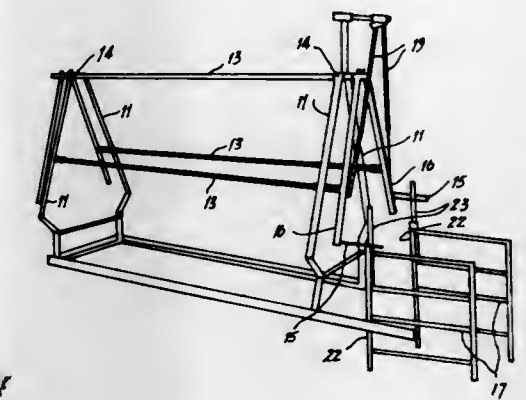
Filed Aug. 25, 1975, Ser. No. 607,532

Claims priority, application Australia, Aug. 23, 1974, 8639/74

Int. Cl.² A01K 29/00

U.S. Cl. 119-155

6 Claims



1. A control mechanism, for operating a drafting gate of a drafting race of the kind having an elongated structure defining a passage for animals and a drafting gate pivotably mounted for lateral movement across an end of said structure such that an animal emerging from said passage passes to one side or the other of said gate, said control mechanism comprising a superstructure adapted to be mounted above said race structure, an elongated operating handle disposed along and adjacent to said race structure at a position such that it can be gripped by an operator standing at one side of the race structure, said handle being suspended from said superstructure and pivoted thereto for rocking movement about a substantially horizontal axis, and means for coupling said operating handle to said drafting gate to permit pivoting of said gate.

4,006,718

MISFIRE DETECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Toshiaki Konomi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

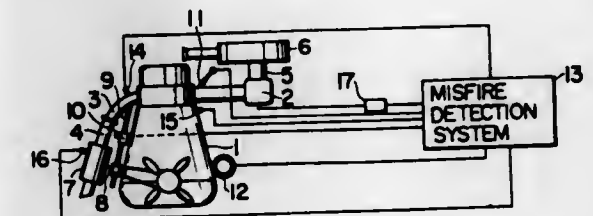
Filed May 20, 1974, Ser. No. 471,558

Claims priority, application Japan, May 31, 1973, 48-60312

Int. Cl.² F02M 51/00

U.S. Cl. 123-32 EA

5 Claims



1. In a misfire detection system adapted for use with an internal combustion engine having an exhaust portion and a fluid adjustment portion, comprising first generating means in an exhaust portion of an engine, and coupled to an adjustment portion for generating a first signal indicative of the oxygen concentration of exhaust gas from an engine to adjust the supply of a first fluid to an engine, and second generating means responsive when the first signal remains above a given value at the conclusion of a prescribed duration of such fluid supply adjustment for generating a second signal indicative of an engine misfire, means responsive to the first signal and operative at a sampling rate for generating a first binary value whenever the first signal is above the given value and a second binary value whenever such first signal is below the given value; a reversible counter; means for incrementing the

counter in one of two opposite directions upon each occurrence of the first and second binary values, respectively, means rendered effective when the counter has been incremented to the limiting value associated with a prescribed direction for thereafter separately accumulating subsequent occurrences of the corresponding binary value; and means rendered effective when a predetermined number of such subsequent additional occurrences of the corresponding binary value has been accumulated for producing the second signal.

4,006,719

VORTEX ACTION FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINE

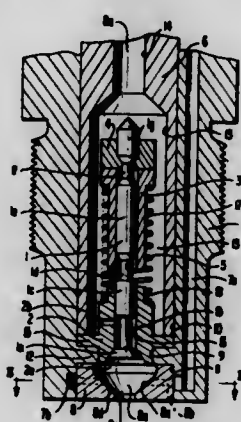
Fumio Kanda, Ogawa, and Kousel Nakajima, Hanazono, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Feb. 18, 1975, Ser. No. 550,798

Claims priority, application Japan, Feb. 19, 1974, 49-19338[U]

Int. Cl.² F02B 3/00

U.S. Cl. 123—32 JV

4 Claims



1. In a fuel injection valve for an internal combustion engine which includes a valve body terminating at one end in an annular, diverging valve seat wall in a direction, axially outward of said body, a needle valve slidably mounted within the valve body and terminating in an enlarged radial flange portion having an outwardly diverging surface which mates with the diverging annular valve seat wall and forms therebetween an annular gap when said needle valve flange portion moves outwardly and away from said valve seat wall, means for supplying liquid fuel under pressure to said needle valve for flow through said gap, and means spring biasing the needle valve towards closed position, the improvement comprising: an annular member constituting an axial extension of said valve body, downstream of said valve seat wall and including a circular wall extending circumferentially about said annular valve seat and radially outwardly therefrom and forming an air vortex chamber such that fuel injection through the gap formed between the diverging valve seat wall and said needle valve flange portion collides with the vortex chamber inner wall, said circular wall including a lower wall portion which converges axially away from said needle valve and a plurality of circumferentially spaced air passages within said annular member opening tangentially into the vortex chamber in said lower wall portion at a plane which coincides with the line of impact of the fuel injected through said gap onto the vortex chamber wall; whereby said plurality of air passages creates a uniform high speed vortex within said vortex chamber, and wherein fuel impingement in the plane of entry of said tangential air passages significantly decreases the velocity of the fuel and promotes improved atomization of the fuel within the vortex air stream.

4,006,720

DIVIDED CHAMBER TYPE DIESEL ENGINE

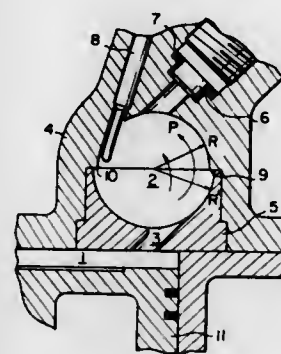
Takasi Sato, and Hiroshi Yosizaki, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Apr. 21, 1975, Ser. No. 570,093

Claims priority, application Japan, Aug. 27, 1974, 49-102652[U]

Int. Cl.² F02B 19/00

U.S. Cl. 123—32 C

3 Claims



1. A divided chamber type of diesel engine including a block containing a cylinder; a cylinder head mounted on the block; a piston in the cylinder; a main combustion chamber defined between the piston and the cylinder head; a cavity formed in the cylinder head and opening into the main combustion chamber; and an insert member rigidly fitted into the opening of the cavity provided in said cylinder head, the insert member having a cavity facing the cavity in the cylinder head to define a pre-combustion chamber and a port connecting the pre-combustion chamber to the main combustion chamber, wherein the improvement comprises:

the cross-sectional configuration of said pre-combustion chamber is substantially circular, and the radius R of the cross-sectional portion of said pre-combustion chamber formed by the cavity in said cylinder head is slightly smaller than the radius R' of the cross-sectional portion formed by the cavity in said insert member ($R < R'$), whereby a step portion is formed on the inner circumferential wall of said pre-combustion chamber for controlling the swirl generated in said pre-combustion chamber during the compression stroke of the diesel engine in order to reduce the NO_x emissions in the exhaust gases.

4,006,721

CONTROL APPARATUS FOR EXHAUST GAS RECIRCULATION SYSTEM

Yasuo Takagi, Kazuo Hioki, and Syunichi Aoyama, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

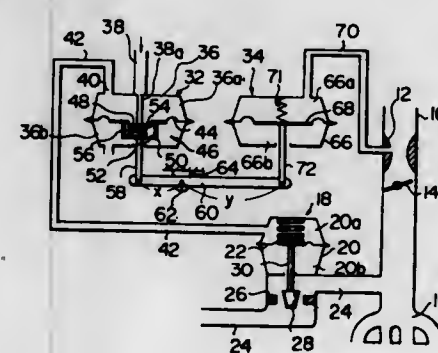
Filed May 30, 1975, Ser. No. 582,384

Claims priority, application Japan, June 24, 1974, 49-72081

Int. Cl.² F02M 25/00

U.S. Cl. 123—119 A

10 Claims



1. In an internal combustion engine having a carburetor provided with a venturi and an intake manifold, a control

apparatus for an exhaust gas recirculation control valve comprising a first flexible diaphragm responsive to a venturi vacuum in said carburetor, a second flexible diaphragm defining a vacuum chamber and responsive to vacuum output present therein, said second flexible diaphragm having a valve opening providing communication between said vacuum chamber and an atmosphere, a control valve cooperating with said second flexible diaphragm and opening and closing said valve opening, and a control arm connected between said first and second flexible diaphragms and rotatable about a fulcrum, said control arm transmitting movements of said first flexible diaphragm to said second flexible diaphragm, whereby said second flexible diaphragm is moved in response to the movements of said second flexible diaphragm and the vacuum output in said vacuum chamber for controlling said control valve to open and close said valve opening for thereby regulating the vacuum output in said vacuum chamber, and regulated vacuum output being fed to said exhaust gas recirculation control valve to actuate the same.

4,006,722

METHOD AND DEVICE FOR CLEANING GASES EXHAUSTED FROM MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

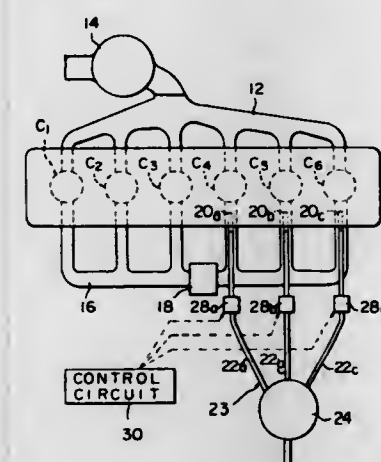
Yoshitaka Hata, Fujisawa; Kenji Ikeura, Yokohama, and Haruhiko Itzuka, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 31, 1975, Ser. No. 545,915

Claims priority, application Japan, May 16, 1974, 49-54112
Int. Cl.² F02M 23/04

U.S. Cl. 123—124 A

9 Claims



4. A multi-cylinder internal combustion engine having first and second groups of cylinders, comprising:
a carburetor supplying a first air-fuel mixture richer than stoichiometric air-fuel mixture into all the cylinders of the engine;
an intake manifold connecting said carburetor to all the cylinders of the engine;
supplemental air feed means feeding air into the second group of cylinders of the engine such that the second group of the cylinders receive a second air-fuel mixture leaner than the stoichiometric air-fuel mixture.

4,006,723

CONTROL SYSTEM FOR STARTING AND STOPPING AN INTERNAL COMBUSTION ENGINE

Paul Schmidli, Birmensdorfstrasse 240, Zurich, Switzerland
Continuation-in-part of Ser. No. 382,171, July 24, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,653

Claims priority, application Switzerland, July 25, 1972, 11100/72; Oct. 6, 1972, 14699/72; Jan. 19, 1973, 737/73

Int. Cl.² F02N 17/00

U.S. Cl. 123—179 B

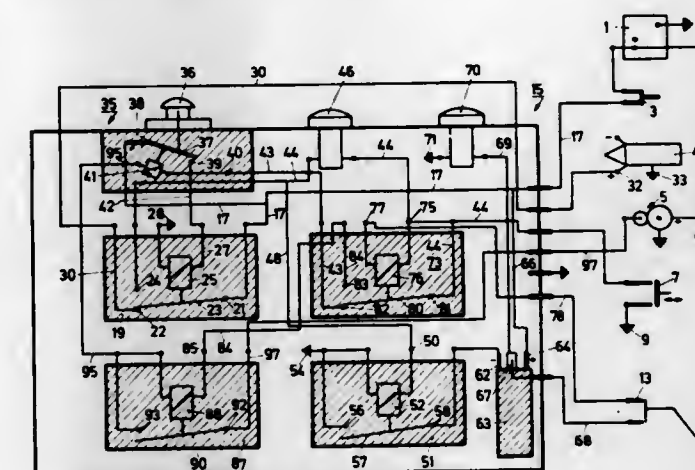
14 Claims

1. A control system for stopping and starting an internal combustion engine provided with an ignition circuit and a starter motor, comprising:

a starter circuit coupled to said starter motor for controlling operation of the starter motor to start the internal combustion engine;

first operator actuated switch means for interrupting the ignition circuit to stop the internal combustion engine and for rendering said starter circuit capable of operation upon actuation thereof;

second switch means connected to said starter circuit and responsive to the operating state of the internal combustion engine, said second switch means being inoperative when the internal combustion engine is running to disable said starter circuit and operative when the engine is stopped to enable said starter circuit;



third operator actuated switch means connected to said starter circuit for closing said starter circuit and actuating said first switch means to close the ignition circuit upon actuation thereof to operate the starter motor and start the internal combustion engine, said second switch means being rendered inoperative when the internal combustion engine is started to terminate operation of the starter motor; and

a time delay switch in said starter circuit rendered operative upon actuation of said first switch means to permit repetition of the starting operation during a predetermined time after actuation of said third switch means to close the ignition circuit.

4,006,724

ARRANGEMENT FOR MOUNTING ELECTRONIC CIRCUIT BOARDS ON AN ENGINE-AIR INTAKE STRUCTURE

Ivor W. Carter, Grosse Pointe Woods, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 582,465, May 30, 1975, abandoned. This application Mar. 18, 1976, Ser. No. 668,026

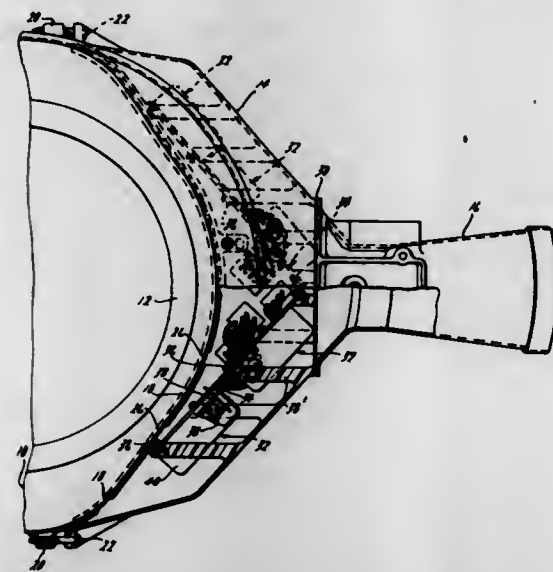
Int. Cl.² F02B 77/00

U.S. Cl. 123—198 E

18 Claims

1. In an engine powered vehicle having an induction air intake system for the engine including an air filter housing and including electronic engine control circuitry, the improvement comprising: means mounting at least portions of said control circuitry on a circuit board, and

means mounting said circuit board on said air filter housing



in the path of induction air drawn into said air filter housing by the engine.

4,006,725

SPARK PLUG CONSTRUCTION FOR LEAN MIXTURE BURNING INTERNAL COMBUSTION ENGINES

Tadeusz A. Baczek, and Leslie M. L. James, both of New Bedford, Mass., assignors to Baczek and James Company, Inc., New Bedford, Mass.

Continuation-in-part of Ser. No. 558,921, March 17, 1975, abandoned. This application Mar. 12, 1976, Ser. No. 666,196 Int. Cl.² F02B 19/10, 19/18

U.S. Cl. 123-32 SJ

11 Claims



1. An internal combustion engine for minimizing unwanted emissions and achieving fuel economies by combustion of a lean fuel-air mixture to drive the pistons of the engine, a cylinder bore in the engine having a crank-connected piston movable therein and having walls coactively defining with the piston a main combustion chamber above the piston, means providing a first and second different fuel sources, the first fuel source providing a lean fuel-air mixture, a first fuel supply conduit connected to the first fuel source for supplying the lean fuel-air mixture to said main combustion chamber, a second fuel conduit connected to the second fuel source, a spark plug mounted in the engine communicating with the main combustion chamber having an elongated body supporting electrodes defining a spark gap at one end thereof, the spark plug including a metallic tubular dome defining a spark ignition chamber of limited volume surrounding and enclosing the spark gap and having exit ports for discharge of flame outwardly therethrough, screw thread formations on the spark plug body for screw mounting the spark plug in a conventional threaded spark plug opening in the engine at a position where the dome formation protrudes inwardly within the upper portion of the main combustion chamber, the spark plug body including a branch formation having a valved branch passage therethrough opening at its inner end into said spark ignition chamber within said dome and connected at its outer end to

said second fuel conduit to supply fuel from the second fuel source to the spark ignition chamber for providing a rich fuel-air mixture therein to be ignited by a spark at the spark gap and produce flames discharging through said exit ports into the main combustion chamber to ignite the lean fuel-air mixture in the latter, valve means in said branch passage for introducing the second source fuel into the spark ignition chamber, the engine having valve means for introducing the lean fuel-air mixture through said first supply conduit directly into the main combustion chamber, said valve means in said branch passage comprising a valve seat and a valve member resiliently biased to normally closed position against said valve seat and responsive to reduced pressure communicated through said branch passage from said main combustion chamber during a suction stroke of the piston to open and admit the fuel from said second fuel source to the spark ignition chamber defined within said dome said elongated body of said spark plug housing an elongated center electrode rod extending along a rectilinear center axis throughout the length of the spark plug and terminating in an externally exposed terminal cap formation at the end of the center electrode opposite the spark gap, and said branch passage extending along a substantially rectilinear axis inclined at an acute angle to the axis of said center electrode diverging laterally therefrom progressively from the inner end of the branch passage to its outer end whereby the outer end of said branch passage defines a connection to be coupled to said second fuel conduit located laterally adjacent the terminal cap formation of said center electrode.

4,006,726

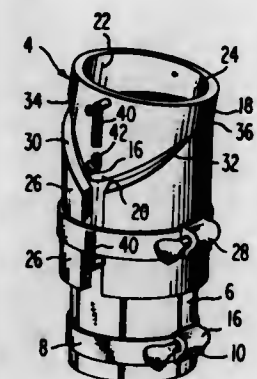
OSCILLATOR TYPE BALL DEFLECTOR

Gerard F. Sweeton, Skillman, N.J., and Howard Head, Baltimore, Md., assignors to Prince Manufacturing, Inc., Princeton, N.J.

Continuation of Ser. No. 418,100, Nov. 21, 1973, abandoned. This application Dec. 4, 1975, Ser. No. 637,618 Int. Cl.² F41D 11/00

U.S. Cl. 124-81

13 Claims



1. For use with a ball projecting device, a ball directing means comprising a deflecting means adapted to be mounted on the device in a position to be engaged by successively discharged balls, said deflecting means being pivotally mounted and having a plurality of alternatively engageable positions, said deflecting means being responsive to engagement with successively discharged balls to assume one of the plurality of ball engaging positions, and a releasable holding means for holding said deflecting means in a predetermined position until engaged by a discharged ball.

4,006,727

ANGLE DRESSING TOOL

Seth E. Hancock, 3502 Carla Drive, Austin, Tex. 78754 Filed Dec. 3, 1975, Ser. No. 637,288

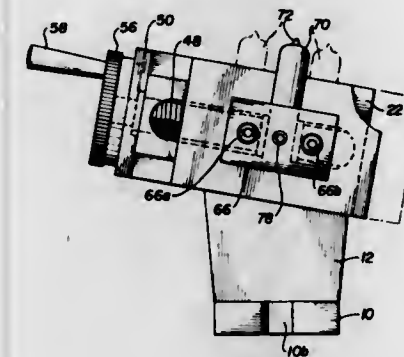
Int. Cl.² B24B 53/04

U.S. Cl. 125-11 AT

4 Claims

1. An angle dressing tool for dressing angular surfaces of

rotating grinding wheels and the like comprising: a horizontal base plate; a planar-faced upright member mounted on said base plate and extending transversely thereacross; a dovetail way member and a dovetail slide member having complementary ways enabling the slide member to be translated in linear directions along the way of the way member; means mounting said dovetail way member flush against the rear planar face of the upright member and for releasably securing said way member in a selected angular position about a horizontal axis extending through a hole provided in said upright member, said means including a bushing having axial length greater than the thickness dimension of said upright member mounted in said hole, bolt and clamp-washer means for securing said bushing in said hole in an axial position such that its front-end face is flush with the front planar face of said upright member and that its opposite end projects beyond the rear face of said member and terminates in a recess provided for its reception



in a planar rear face provided on said way member and which is sized to snugly receive said projecting end, whereby said projecting end provides a short axial-length hub about which the dovetail way member is turnable, said bolt and clamp-washer means including a headed bolt whose threaded shank has length such that its end extends beyond the rear end face of the bushing and threads into an internally threaded opening provided therefor in the recess of said way member; means operable upon release of said way-member securing means for setting the dovetail way member in a selected angular position comprising pin-and-hole means operable from the front planar face of said upright member; means carried by said way member for imparting linear motion in one or the other opposite direction to the dovetail slide member, means affixed to the front face of said dovetail slide member for movement therewith, said last means mounting an upright shaft-form member provided at its upper end with a diamond dressing element.

4,006,728

ROOM HEATING APPARATUS USING COMBUSTION

Atsuyoshi Nishi; Shizuo Futaguchi; Akio Ishida, all of Nakat-sugawa; Toshio Ito; Tamotsu Nomaguchi, both of Amagasaki; Toshihiko Makino, and Tatsuo Saito, both of Nakat-sugawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 475,841, June 3, 1974, abandoned, which is a continuation of Ser. No. 225,805, Feb. 14, 1972, abandoned. This application May 29, 1975, Ser. No. 581,948 Claims priority, application Japan, Feb. 13, 1971, 46-7696; Mar. 24, 1971, 46-17102

Int. Cl.² F24H 3/10

U.S. Cl. 126-110 R

11 Claims

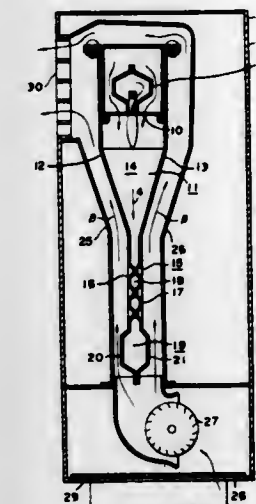
1. A room heating apparatus using combustion gas comprising:

- a linear type burner having a comb-tooth shaped flame hole plate comprising a plurality of slits disposed between front and back burner outer walls, said slits being open from the bottom of said burner when in use and being used as flame holes, the depth of said flame holes being within the range of 3-15mm;
- a combustion chamber having a substantially flat shape supporting said linear type burner in the upper part

thereof and providing an inner space for conducting combustion for transmitting heat energy to the outside by heat exchange;

a first blower disposed adjacent to said combustion chamber for supplying combustion air to said linear type burner;

a heat exchanger having a substantially flat shape being disposed below said combustion chamber and having an inner space connected to the inner space of said combustion chamber for passing combustion gas from the inner



space of said combustion chamber to the inner space of said heat exchanger for transmitting heat energy to the outside of the heat exchanger; an exhaust duct disposed below said heat exchanger for exhausting combustion gas from the inner space of said heat exchanger to the outdoors; and a second blower independently operable of said first blower disposed below said heat exchanger for recycling air into the room by passing air over the outer surfaces of said heat exchanger and said combustion chamber.

4,006,729

FIREPLACE

Valentin Cesa, 37 rue Eugene Meyzonier, Annonay (Ar-deche), France (07100)

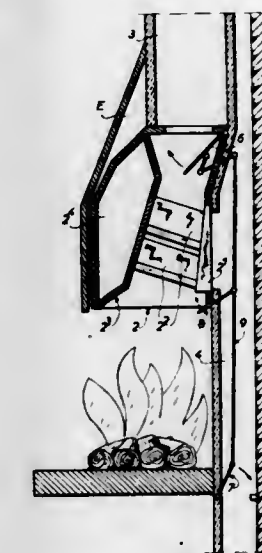
Filed Mar. 4, 1975, Ser. No. 555,188

Claims priority, application France, Mar. 12, 1974, 74.09358

Int. Cl.² F24B 1/18

U.S. Cl. 126-121

3 Claims



2. A fireplace for the heating of fresh exterior air and the recirculation of room air comprising:

- a. a chimney hood casing having a plurality of first openings communicating with said room;
- b. A chimney hood within the chimney hood casing having

- second openings in registration with said first openings communicating with the interior of said casing;
- c. a first chamber for receiving fresh air and a second chamber within said hood;
- d. heating tubes within a portion of said hood joining said first and second chambers for the flow of fresh air therebetween, said heating tubes being generally rectangular in cross section;
- e. a shaft for supplying fresh air to said first chamber and a chimney pipe for evacuating said portion of said hood;
- f. a first damper located in said shaft and a second damper located between the portion of said hood and the chimney pipe; and
- g. means for interconnecting said dampers for simultaneous control whereby the amount of fresh air supplied to said first chamber may be maintained in direct proportion to the amount of air evacuated by said chimney pipe.

4,006,730

APPARATUS FOR STORING ENERGY FROM ELECTROMAGNETIC RADIATION

Peter Brian Clapham, Chertsey, and Michael Christopher Hutley, Hanworth, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

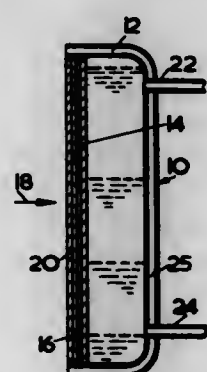
Filed Feb. 26, 1975, Ser. No. 553,407

Claims priority, application United Kingdom, Feb. 28, 1974, 9235/74

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

7 Claims



1. Apparatus, for storing energy from incident electromagnetic radiation, having a radiation energy absorbing means; an optical reflection filter which has a regular array of protuberances, the spacing of said protuberances being less than the smallest wavelength of visible radiation and the height of said protuberances being no less than one-third of the longest wavelength of visible radiation, the filter being positioned relative to the said energy absorbing means so that incident electromagnetic radiation can pass through the filter to reach the absorbing means, but energy reemitted by the absorbing means in the direction of the filter is substantially returned by the filter to the absorbing means; an output channel for drawing off energy from the energy absorbing means; and means for restricting the outflow of energy otherwise from the energy absorbing means.

4,006,731

BUILDING DECK CONSTRUCTION

Frank E. Carroll, Barrington, Ill., assignor to Decks, Incorporated, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 515,872, Oct. 18, 1974, Pat. No. 3,918,230. This application Nov. 10, 1975, Ser. No. 630,504

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

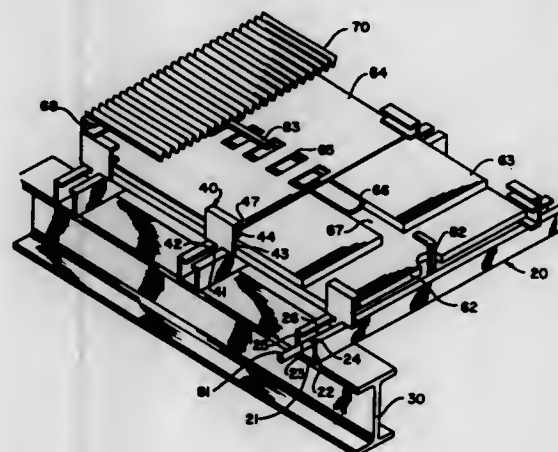
10 Claims

1. A synthetic polymeric surface roof deck structure comprising the combination:

sub-purlins of sheet metal structural shapes of a box section having a horizontal base, opposing vertical sides and upper horizontal flanges extending inwardly from the top of said sides forming an open slot between the terminus of said flanges, said sub-purlins at right angles to and said base resting on top of said purlins;

formboard adjacent to and secured against the top of said upper horizontal flanges of said sub-purlins and insulating synthetic organic polymer foam on top of said formboard making a formboard-foam assembly;

sheet metal clips having a vertical portion extending upwardly and downwardly from opposing slots, each of said



- opposing slots engaging one of said horizontal flanges of said box section when the axis of said clip and box section are at about 90° to each other, said upwardly extending vertical portion bending to a horizontal portion to engage the top of said formboard-foam assembly securing the formboard against the top of said flanges;
- structural sheet roof support shapes fastened to the top of said clips; and
- structural polymeric sheet roofing fastened to said support shapes forming the structural sheet and weather surface of said roof deck structure and with said clips and box sections providing a composite structure.

4,006,732

ICE FISHING HEATER

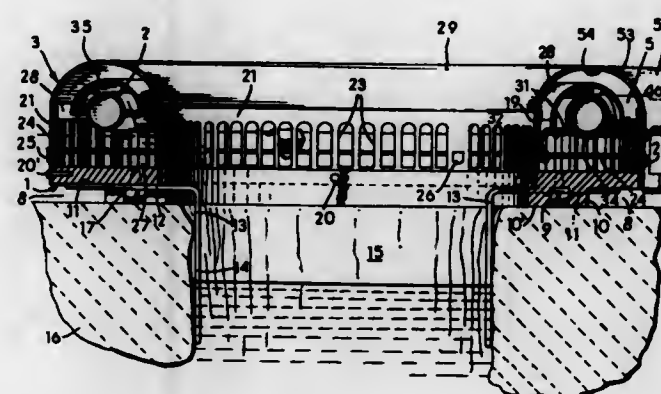
Donald W. Schumm, P.O. Box 246, Leo, Ind. 46765

Filed Mar. 31, 1975, Ser. No. 563,582

Int. Cl.² F23C 5/24

U.S. Cl. 126—271.1

13 Claims



7. A device for preventing water in a hole in a layer of ice from freezing, said device comprising an annular base for disposition on ice above and about a hole and forming an opening, an annular tubular heater means forming an unobstructed opening, means for supporting said heater means above and in spaced relation to said base for locating said unobstructed opening above said base opening, and said heater means being provided with at least one inner outlet port through which heat may be caused to emanate generally

toward the center of the device when connected to means for supplying heat.

4,006,733

FREE STANDING FIREPLACE FOR MOBILE HOMES

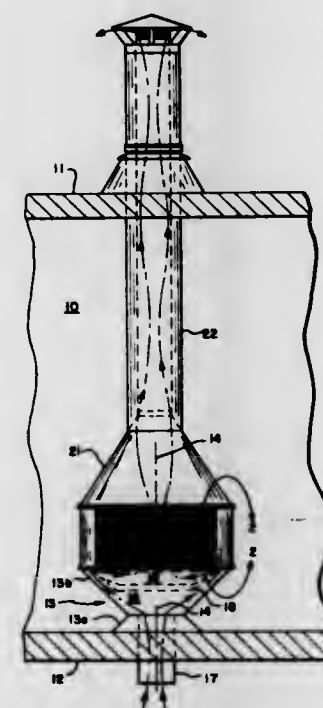
Glen D. Crownover, Santa Rosa, Calif., assignor to Malm Fireplaces, Inc., Santa Rosa, Calif.

Filed July 14, 1975, Ser. No. 595,447

Int. Cl.² F24B 13/02

U.S. Cl. 126—143

4 Claims



1. A free standing fireplace for a mobile home having a floor and ceiling comprising: a base for resting on said floor forming a cavity and having a central vertical axis; elongated vent means having an axis substantially coincident with said central axis forming the lower boundary of said cavity for extending through said floor to the outside atmosphere; concave fire bowl means for retaining fuel suspended in and forming the upper boundary of said cavity said fire bowl means being spaced from the wall of said cavity for forming a flow space from said vent means to said fuel; hood means juxtaposed above said base and fire bowl means; and a chimney connected to said hood and having an axis coincident with said central axis for extending through said ceiling to the outside atmosphere.

4,006,734

STORAGE HEATER BRICKS

Gordon Cunningham Eadie, Wentwood, near Usk, and Christopher Frederick Hinsley, Newport, both of Wales, assignors to British Steel Corporation, London, England

Filed Nov. 26, 1974, Ser. No. 527,437

Int. Cl.² F24H 7/00; C09K 53/00

U.S. Cl. 126—400

13 Claims

1. A process for producing a heat storage medium which comprises the steps of heating a mix of ferric oxide and an additive including a calcium oxide or a compound capable of yielding a calcium oxide at an elevated temperature effective to react the additive with the ferric oxide to improve its volumetric heat capacity with the mole ratio of the ferric oxide to the calcium oxide residue of said additive lying within the range 0.6:1 to 3.9:1, reducing the reaction product to particles, compacting the particles, and sintering the compacted particles.

4,006,735

PRESSURE SENSOR APPARATUS

Fred Hittman, Baltimore, and Lewis Fleischmann, Randallstown, both of Md., assignors to Hittman Corporation, Columbia, Md.

Filed July 16, 1974, Ser. No. 488,987

Int. Cl.² A61B 5/00

U.S. Cl. 128—2 A

9 Claims



1. A pressure sensor apparatus comprising a housing having first and second regions, a first non-radioactive fluid contained within said first region and a second non-radioactive fluid contained within said second region, a radioactive fluid contained within said housing between said first and second non-radioactive fluids, said radioactive fluid being immiscible with at least one of said first and second non-radioactive fluids, radiation shielding means associated with said housing for shielding a portion of said radioactive fluid, pressure communication means impermeable to said non-radioactive fluid in communication with said first region so that pressure acting upon said pressure communication means will cause said radioactive fluid to move, and resilient means closing said second region of said housing for permitting movement of said radioactive fluid, said radioactive fluid being moved in said housing as a function of the pressure acting upon said pressure communication means whereby said portion of radioactive fluid shielded by said shielding means varies as a function of said pressure.

4,006,736

ANGIOGRAPHIC INJECTOR

Rudolph J. Kranys, Allison Park; Marlin S. Hellman, Gibsonia; Ronald J. Zdrojowski, and George R. Swann, both of Pittsburgh, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Nov. 27, 1974, Ser. No. 527,520

Int. Cl.² A61B 6/00; A61M 5/20

U.S. Cl. 128—2 A

31 Claims

1. An apparatus for injecting a contrast media into the vascular system of an animal, the apparatus comprising: a head portion means for supporting a plurality of cartridges housing contrast media and provided with a motor means to drive the contrast media out of said cartridges; and a control unit means; said head portion comprising a rotating turret for housing at least two syringe cartridges in readiness for injection.

4,006,737

ELECTROCARDIOGRAPHIC COMPUTER

Isaac Raymond Cherry, Mission Viejo, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

Filed Jan. 4, 1974, Ser. No. 430,704

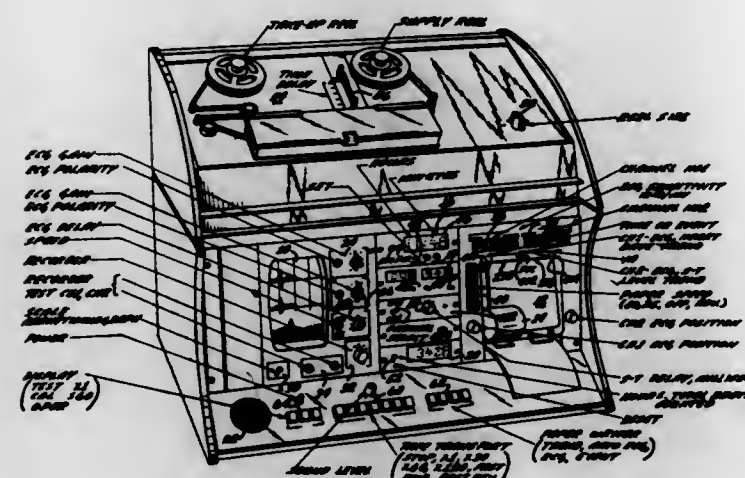
Int. Cl.² A61B 5/04

U.S. Cl. 128—2.06 G

64 Claims

1. A dynamic multispeed ECG for reproducing ECG information contained on a recording medium recorded at a particular speed, including
- a plurality of readout positions,
- first means for moving the recording medium past the plurality of readout positions,
- second means coupled to the first means for controlling the first means to move the recording medium at a plurality of speeds including a movement at a particular speed corresponding to the particular speed of recording and including movements of the recording medium at more than one speed greater than the particular speed to pro-

vide real time and multispeed high speed playbacks of the recorded information,
third means located at a first one of the readout positions for reproducing the recorded information when the first means moves the recording medium to provide real time playback,



fifth means coupled to the third and fourth means and responsive to the control of the playback speed by the second means for compensating the reproduced information for frequency and amplitude variations in accordance with the different speeds, and
sixth means coupled to the fifth means and responsive to the compensated reproduced information for producing a visual indication of the reproduced information.

4,006,738

OTOSCOPE CONSTRUCTION

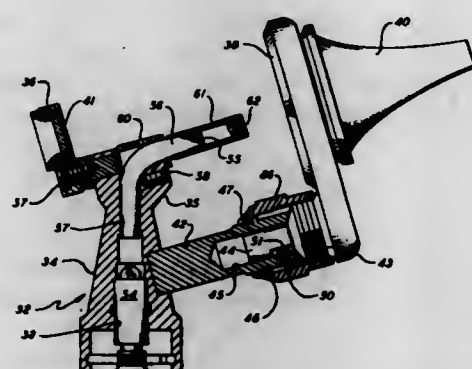
William C. Moore, Skaneateles; John D. Connors, and Richard W. Newman, both of Auburn, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed June 4, 1975, Ser. No. 583,748

Int. Cl.² A61B 1/22

U.S. Cl. 128-9

9 Claims



1. A high light output otoscope comprising an upper portion having a viewing passage therethrough and a base portion adapted to be releasably connected to a battery handle, the upper portion including a removable speculum, a recess in the base portion for receiving a larger than normal otoscope lamp, and a bundle of optical fibers mounted in the otoscope, the bundle having a light receiving end positioned adjacent the lamp and a light emitting end positioned so as to direct light received from the lamp in a path substantially parallel to the viewing passage, the light emitting end of the bundle terminating at a point adjacent the proximal end of the removable speculum and being located close to the projected center line of the speculum.

4,006,739

BACK MASSAGER

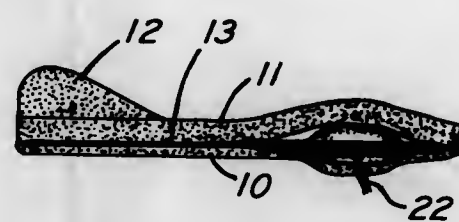
Joha F. Wahl, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.

Filed Nov. 7, 1975, Ser. No. 629,780

Int. Cl.² A61H 1/00

U.S. Cl. 128-33

6 Claims



1. A back massager comprising a cushion having a front padding and a rear padding, the top end portion of said cushion being the pillow portion and constituting a head rest and the lower third part of said cushion being a back supporting portion, a frame member extending between said paddings, a casing mounted on said frame member and located between said front and rear paddings at said back supporting portion of the cushion, said casing being at a position in which it is substantially even with the lumbar region of an adult person when said cushion is at said person's back, vibratory mechanism contained within said casing for imparting vibrations to said casing, and a flexible cover about said paddings, said front padding having a section which is thicker than the remainder of the sheet and which is located at said pillow portion of the cushion, said cover being enlarged at said pillow portion to accommodate said enlarged section of said front padding.

4,006,740

SURGICAL APPARATUS FOR EXTERNAL TRANSOSTEAL FIXATION OF BONE FRAGMENTS AND JOINT ENDS

Mstislav Vasilievich Volkov, 1 Stroitel'naya ulitsa 6, kor. 1, kv. 63, and Oganies Vardanovich Oganiesian, ulitsa Pervomaiskaya, 74, kv. 87, both of Moscow, U.S.S.R.

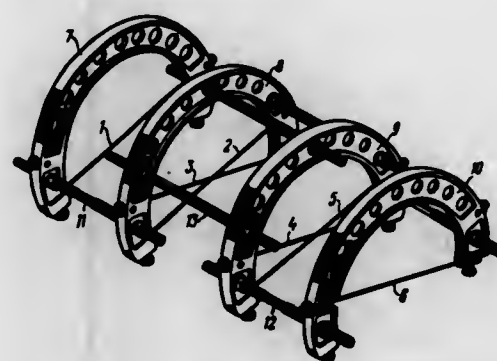
Filed July 8, 1975, Ser. No. 593,976

Claims priority, application U.S.S.R., July 22, 1974, 2052127

Int. Cl.² A61F 5/04

U.S. Cl. 128-84 B

4 Claims



1. In a surgical apparatus for external transosteal fixation of bone fragments and joint ends, a needle to be driven through a bone, said needle having at one end region a relatively sharp tip and at an opposed end region a bulged portion the cross-sectional area of which is greater than the cross-sectional area of the remainder of the needle, a brace having diametrically opposed portions respectively formed with bores which respectively receive said end regions of said needle, said brace carrying at its bore which receives said one end region of the needle which has said relatively sharp tip a screw means which fixes said needle at said one end region thereof to said brace, an axially bored drive screw extending into the bore of the brace which receives the opposed end region of the needle which has the bulged portion, said opposed end region of the

needle extending into the axially bored drive screw, and the latter having in its axial bore a shoulder directed away from the relatively sharp tip of the needle and against which the bulged portion of the needle is seated, said drive screw having an external flat and said brace carrying a set screw engaging said flat to prevent turning of said drive screw, and said drive screw having an external thread, and a nut threaded onto said external thread of said drive screw and cooperating with said brace for urging said drive screw away from said relatively sharp tip of the needle to press the shoulder in the axial bore of the drive screw against said bulged portion of the needle to maintain the latter under tension.

4,006,741

ORTHOPEDIC DEVICE

Elmer M. Arluck, New York, N.Y., assignor to Yardney Company, New York, N.Y.

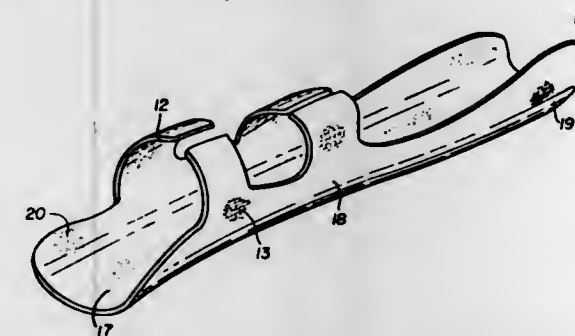
Continuation-in-part of Ser. No. 465,404, April 29, 1974, Pat. No. 3,906,943. This application July 29, 1975, Ser. No. 600,082

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.² A61F 5/04

U.S. Cl. 128-90

33 Claims



1. An integral formable orthopedic device comprising a plastic sheet member and integral therewith an insulating layer on one side of said plastic sheet member; and a protective layer on the other side;
said plastic sheet member being at least about 40 mils thick, and having a tensile strength at yield of at least about 20,000 psi, a flexural strength of between 3,000 and 14,000 psi, a flexural modulus of between about 0.5×10^5 and 7×10^5 psi, a Vicat softening point of between 60° C. and 80° C., and a Rockwell hardness of between 15 on the R scale and 55 on the D scale;
said insulating layer being at least about 10 mils thick and having a coefficient of heat transfer below about 2 cal/sec/cm²/cm/°C $\times 10^{-4}$.

4,006,742

POSITIVE PRESSURE RESUSCITATOR

Stephen Donald Flynn, 7410 Manion Road, Mississauga, Ontario, Canada

Continuation-in-part of Ser. No. 428,823, Dec. 27, 1973. This application June 25, 1975, Ser. No. 590,106

Int. Cl.² A62B 7/02

U.S. Cl. 128-145.8

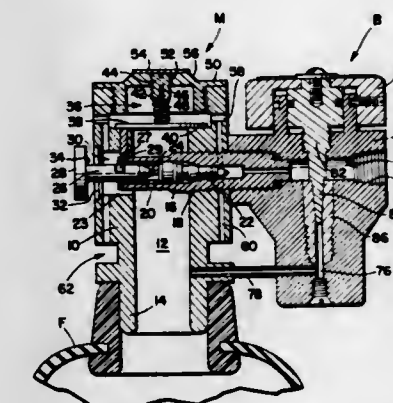
4 Claims

1. Apparatus for the administration of pressurized gases, such as for resuscitation, inhalation or the like, said apparatus comprising:

- a chamber having side walls, and an outlet adapted to communicate with patient administration means for administration of said gas;
- a gas delivery conduit for delivering said gas from a suitable source of gas at an elevated pressure into said chamber said conduit having a free end terminating in said chamber and a gas flow orifice in a side wall thereof adjacent said free end for discharge of gas into said chamber;
- a manually operable gas flow control valve disposed in said conduit and movable between a closed position and,

when released, remaining in its said closed position, for selective delivery of gas from said gas flow orifice into said chamber;

- a normally open, free breathing air vent opening in a side wall of said chamber in registration with the free end of said conduit, permitting unrestricted free inhalation and exhalation through said chamber and said vent opening;
- a valve stem extending from said flow control valve, through said vent opening for operation of said valve;
- a button on said valve stem, outside said chamber and having an outer and inner face, the inner face defining a vent closure for said vent opening said button being movable between a normally open, and a closed position thereby selectively opening and closing said vent opening movement of said button also causing operation of said



gas flow valve whereby to cause delivery of gas from said orifice to said chamber when the vent opening is closed by the inner face of the button, said vent opening remaining open, and permitting inhalation and exhalation unless manually closed;

- a pressure relief valve opening communicating with said chamber and a valve closure member normally closing the same and being responsive to the development of an overpressure in said chamber for discharging the same to atmosphere;
- a gas bypass connection connecting said gas delivery conduit upstream of said flow control valve with said chamber for receiving gas independently of the control valve;
- a gas bypass flow valve disposed in said by-pass connection and manually operable between open and closed positions.

4,006,743

SYSTEM FOR CONTINUOUS WITHDRAWAL OF BLOOD

Avinoam Kowarski, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 323,985, Jan. 15, 1973, Pat. No. 3,908,657. This application June 17, 1975, Ser. No. 587,724

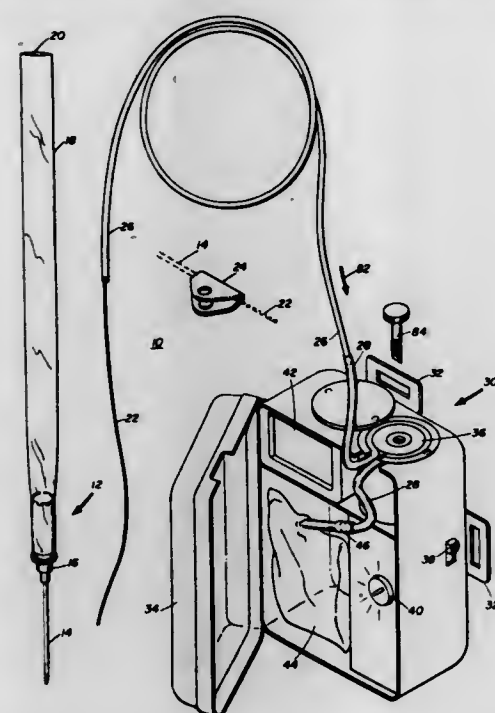
Int. Cl.² A61B 5/00; A61M 1/00

U.S. Cl. 128-214 R

5 Claims

1. A method for continuously withdrawing blood from a subject, comprising the steps of:
inserting a catheter having a nonthrombogenic passageway therethrough into a vein of a subject;
causing blood to move continuously from the vein into and through the passageway;
continuously collecting said blood withdrawn through the catheter; and

controlling the continuous withdrawal of said blood slowly from said vein at a pre-determined constant rate and for



a pre-determined extended time during which the catheter is in the vein of the subject.

4,006,744

LOCKING CANNULA MOUNT

Peter Leslie Steer, East Grinstead, England, assignor to Abbott Laboratories, North Chicago, Ill.

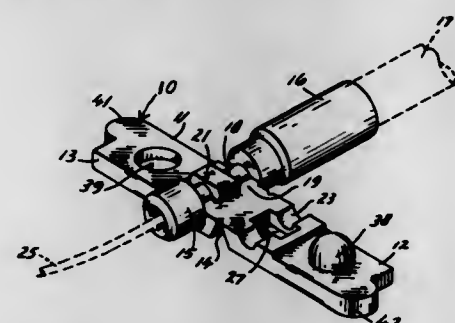
Filed June 23, 1975, Ser. No. 589,278

Claims priority, application United Kingdom, June 24, 1974, 27854/74

Int. Cl.² A61M 5/00

U.S. Cl. 128—214 R

10 Claims

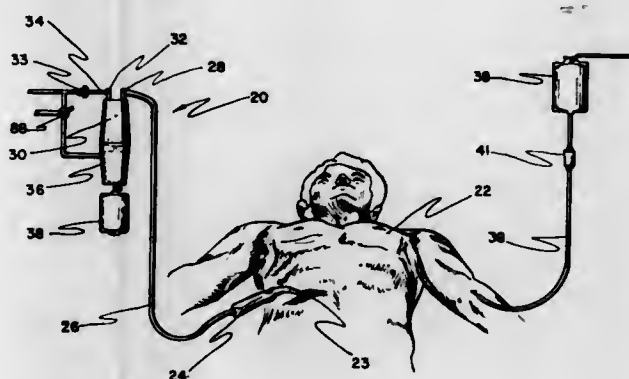


1. A device for securing a length of cannula tubing to facilitate the introduction of fluids into said tubing comprising: a body member defining an inlet passage for said cannula tubing, an opposing entry passage for contact with a source of fluid and an intermediate section, a length of intermediate flexible tubing secured to said intermediate section and communicating with said opposing inlet and entry passages, said length of intermediate flexible tubing adapted to receive an end portion of said cannula tubing, means to secure said length of intermediate flexible tubing between said inlet and entry passages, said body member further defining a hinged clamping member constructed and arranged to engage said intermediate flexible tubing and to compress said intermediate tubing against said cannula tubing in a fluid tight manner, and means operatively associated with said body member to tentatively retain said hinged clamping member in engagement with said intermediate flexible tubing.

4,006,745
AUTOLOGOUS TRANSFUSION SYSTEM AND METHOD
James L. Sorenson; Karl A. Pannier, Jr., both of Salt Lake City, and Gordon S. Reynolds, Bountiful, all of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah
Continuation-in-part of Ser. No. 580,087, May 22, 1975. This application Nov. 13, 1975, Ser. No. 631,584
Int. Cl.² A61M 1/00, 5/00

U.S. Cl. 128—214 R

22 Claims



1. An autologous transfusion system comprising in combination:
means for aspirating blood from a patient;
a first blood-receiving receptacle comprising means connected to the aspirating means for conducting blood from a patient to the interior of the first receptacle, means for imposing a negative pressure within the first receptacle of sufficient magnitude to accommodate aspiration of blood through the aspirating means;
a second blood-receiving receptacle connected to the first receptacle by a hollow conduit which communicates the interior of the second receptacle with the interior of the first receptacle, said second receptacle also comprising means for unidirectionally controlling blood flow from the first to the second receptacle;
means for conducting a pressurizing fluid selectively into and out of the second receptacle;
means for reducing the pressure exerted by the pressurizing fluid in the second receptacle below the pressure in the first receptacle so as to transfer blood from the first to the second receptacle;
means for removably attaching a blood transfer bag to the second receptacle so that blood communication from the second receptacle to the blood transfer bag is accommodated; and
means for delivering the pressurizing fluid under positive pressure to the second receptacle of sufficient magnitude in relation to the pressure maintained in the first receptacle to expel the blood from the second receptacle into the blood transfer bag without interrupting the negative pressure in the first receptacle.

4,006,746

SURGICAL KNIFE

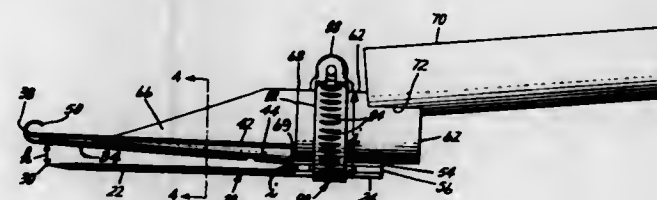
John Edwards, 645 Riverside Ave., Fort Wayne, Ind. 46805

Filed Apr. 28, 1975, Ser. No. 572,108

Int. Cl.² A61B 17/32; B26B 29/00

U.S. Cl. 128—305

7 Claims



1. A surgical knife assembly comprising:
a handle portion;
an elongated knife blade having a cutting edge and a trans-

versely spaced opposite edge; said knife blade being secured at its base end to said handle portion;
an elongated blade guide secured at a base end to said handle portion in overlying spaced relation to said blade and having a surface portion overlying said blade in substantial parallelism therewith and defining a cutting clearance therebetween;
said blade guide having a transverse dimension greater than the transverse dimension of said knife blade;
said blade guide extending transversely beyond the opposite edges of said blade, respectively, a distance to resist tilting of the blade about its longitudinal axis when the latter is inserted into the flesh in a position which disposes the blade guide surface portion in flat engagement with a patient's skin;
said guide having a base edge, a distal edge and two side edges, said side edges being substantially longer than said distal and base edges, said guide being tapered from said base edge to said distal edge with one side edge being substantially parallel to said cutting edge,
said side edges and said distal edge being arcuately formed to provide a rounded edge surface extending away from the plane of said knife blade; and
a guide shank on said base edge and extending longitudinally therefrom.

4,006,747

SURGICAL METHOD

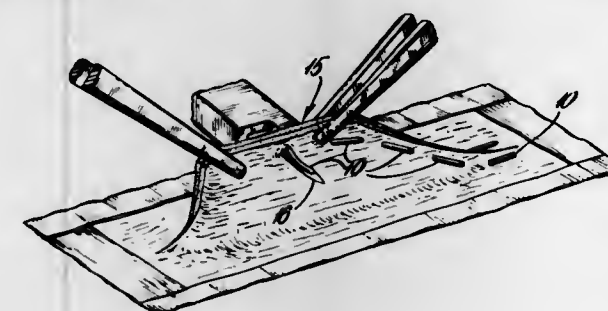
Richard L. Kronenthal, Fairlawn, and Matthew H. Wykoff, Somerville, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Apr. 23, 1975, Ser. No. 571,043

Int. Cl.² A61B 17/04

U.S. Cl. 128—335

15 Claims



1. A method of closing a wound or incision in mammalian tissue to facilitate the healing thereof which comprises (a) approximating the tissue at the wound; (b) inserting a hollow needle through the approximated tissue and across the wound whereby the needle is in communication with the surface of the tissue on either side of the wound; (c) passing one end of a fastener device comprising a filament member terminated at each end by first and second anchoring means at one end of the fastener device is discharged from the end of said needle external of said tissue on one side of said wound; and (d) withdrawing the hollow needle from the tissue while maintaining the fastener device substantially stationary relative to the tissue until said fastener device is disengaged from the needle with said second anchoring means external of said tissue on the other side of said wound, whereby the fastener device remains in the tissue with the filament member traversing the wound through the tissue and with said first and second anchoring means maintaining the tissue in approximation at the wound from points on the surface of the tissue on either side of the wound.

4,006,748

IMPLANTABLE UNIPOLAR PACEMAKER WITH IMPROVED OUTER ELECTRODE PLATE

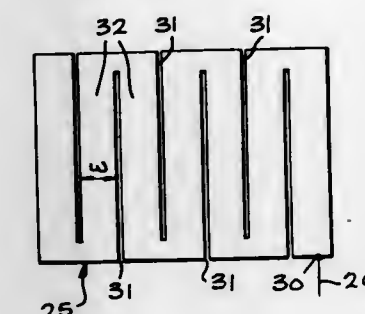
Joseph H. Schulman, Los Angeles, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Jan. 29, 1976, Ser. No. 653,463

Int. Cl.² A61N 1/04

U.S. Cl. 128—419 P

19 Claims



1. In a unipolar implantable living tissue stimulator of the type including pulse generating means, a stimulating electrode electrically connected to said pulse generating means and locatable at the tissue to be stimulated by pulses supplied to said stimulating electrodes by said generating means, and outer electrode means connected to said generating means and in direct electrical contact with body saline solution which extends from said stimulating electrode to said outer electrode means to thereby provide an electrical conductive path therebetween, the improvement comprising:
outer electrode means defining an electrically conductive surface of preselected area which is in direct electrical contact with the body saline solution when said stimulator is implanted in a body, said outer electrode means defining a plurality of electrically conductive elements whereby any substantially square area on the surface of any of said elements does not exceed a preselected maximum value which is significantly smaller than the total area of the conductive surface of said outer electrode means.

4,006,749

REMOVAL OF HARMFUL COMPONENTS FROM TOBACCO SMOKE

Carl Horowitz; Michael Dichter; Nathan Abrams, all of Brooklyn, and Duryodhan Mangaraj, Staten Island, all of N.Y., assignors to Consolidated Cigar Corporation, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,988

Int. Cl.² A24B 15/07

U.S. Cl. 131—17 R

26 Claims

1. A method of activating tobacco to remove an undesirable component of tobacco smoke passing therethrough, the method comprising grafting a polymer onto the tobacco substrate, the polymer having free functional groups available active to combine with and retain the undesirable component of the tobacco smoke which it is desired to remove.

4,006,750

DISPOSABLE FLOSSER

Ingram S. Chodorow, Hartsdale, N.Y., assignor to Placental Inc., Briarcliff Manor, N.Y.

Continuation-in-part of Ser. No. 267,219, June 28, 1972, abandoned. This application Dec. 28, 1973, Ser. No. 429,654

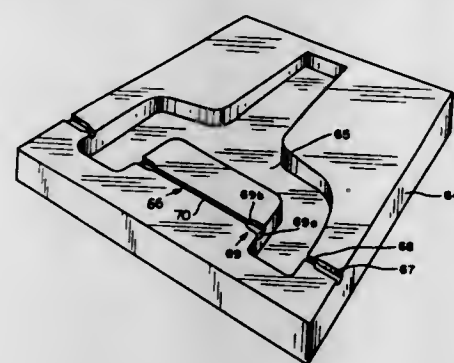
Int. Cl.² A61C 15/00

U.S. Cl. 132—91

6 Claims

1. A method of making from fluid plastic a solid flosser having a handle part and extending therefrom two arms spaced apart with a strand of floss having a central part spanning the space between said arms and having end-parts embedded within said arms, the method comprising forming a

mold and cavity therein defining handle and arm parts corresponding closely to said handle and arm parts of said flosser, positioning the central part of a strand of floss to span the space between said arms of the cavity and said end parts to traverse said arms of the cavity prior to flowing fluid plastic therein, flowing fluid plastic into said cavity by an injection



molding process, and thereby embedding with plastic said end parts of the strand in said arm parts of the cavity, and thus coating with said plastic substantially the entire outer peripheral surface of said end-parts, hardening said fluid plastic and thereby in substantially a single step forming said solid flosser and securing said floss end-parts in and integrally with the flosser's arm parts.

4,006,751

METHOD AND APPARATUS FOR ROTATING HYDRAULIC CONTROL RODS

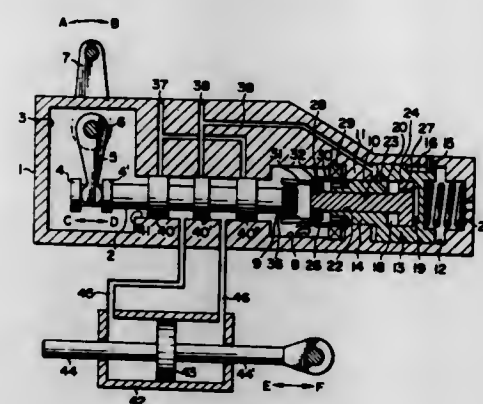
Toshio Kamimura, Gifu, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Nov. 12, 1975, Ser. No. 631,397

Claims priority, application Japan, Mar. 11, 1975, 50-29734

Int. Cl.² F16K 29/00

U.S. Cl. 137-1



1. A method for imparting rotational movement to a control rod which is inserted reciprocally in a hydraulic circuit to control flow of fluid pressure from a pressure source to an actuator, comprising:

- providing a rotating mechanism in disengageable association with one end of said control rod;
- driving said rotating mechanism to engage and rotate said control rod at a suitable time during operation of said hydraulic circuit; and,
- by-passing operating fluid pressure of said hydraulic circuit to said rotating mechanism, thereby driving said rotating mechanism to engage and rotate said control rod upon actuation of said hydraulic circuit.

4,006,752 CONTROL FOR FLUID FLOW SYSTEM

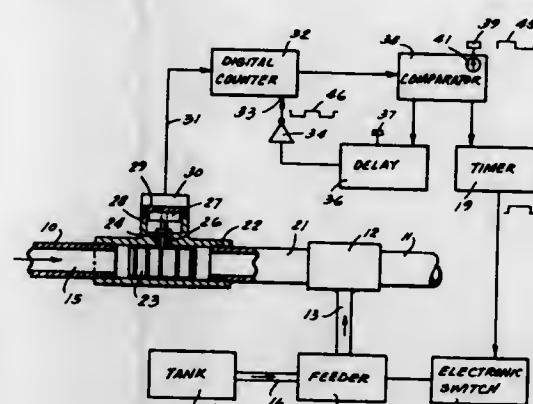
Donald P. De Vale, Sycamore, Ill., assignor to Everpare, Inc., Westmont, Ill.

Filed Oct. 24, 1975, Ser. No. 625,535

Int. Cl.² G05D 11/00

U.S. Cl. 137-101.21

7 Claims



1. Apparatus for supplying an additive to a fluid flowing in a pipe comprising a magnet rotatably supported and driven by said fluid such that it rotates at a speed proportional to the velocity of the fluid, a Hall effect device mounted adjacent said magnet and producing output pulses in response to rotation of the magnet, a digital counter receiving the output of said Hall effect device and counting said output pulses, a comparator having a preset count receiving the output of said counter and having two different output states corresponding to the conditions when said comparator has received less pulses from said counter than said preset count and pulses equal to said present count, a timer receiving an output of said comparator, an electronic switch receiving the output of said timer, a feeder connected to said pipe and receiving an output of said electronic switch and controlled by said comparator to turn the feeder off and on in response to said two states of said comparator, and a container connected to said feeder to supply an additive to said fluid when said feeder is on, and wherein said counter has a reset terminal and said comparator supplies an output to said reset terminal.

4,006,753

ROTARY DISC VALVE

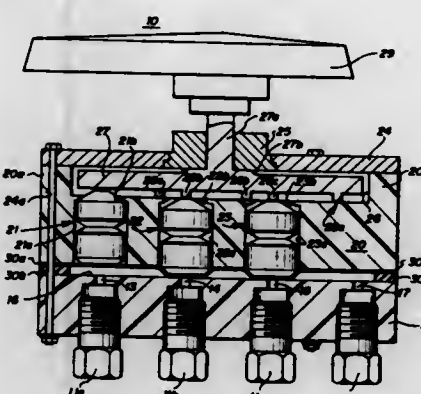
James R. Ingram, Jr., Dallas; Richard T. Kushmaul, Irving, and John T. White, Grand Prairie, all of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed July 30, 1975, Ser. No. 600,398

Int. Cl.² F16K 11/00

U.S. Cl. 137-607

15 Claims



1. A valve system for controlling the flow of fluids from a pressurized source, which comprises:

- a. a valve plate having a plurality of valves positioned therein, each valve including first and second pistons, a pair of spacer discs interposed between said pistons and a spring means interposed between said pair of spacer discs;

- b. a reservoir plate having a plurality of inlet parts and an outlet part, each of said inlet parts facing one of said valves;
- c. a resilient diaphragm interposed between said valve plate and said reservoir plate for isolating said plurality of valves from the flow of said fluids;
- d. a conduit diaphragm interposed between said resilient diaphragm and said reservoir plate, and having a central opening of width corresponding to the width of said valve and providing fluid communications between all of said parts; and
- e. a single cam means contiguous to the side of said valve plate opposite said diaphragms actuating said valves in sequence to force said resilient diaphragm onto said inlet parts and to close the same.

4,006,754

FLUID PRESSURE OPERATED VALVE

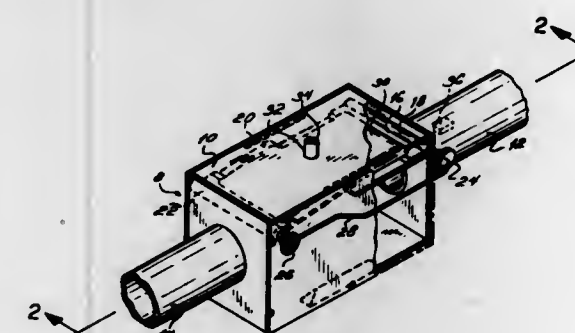
William T. Houston, Star Rte. 93B, Oak Drive off Bald Rock Road, Berry Creek, Calif. 95916

Filed May 19, 1975, Ser. No. 578,487

Int. Cl.² F16K 31/126

U.S. Cl. 137-614.21

2 Claims



- 1. A fluid pressure operated valve comprising:
 - a. a housing formed with an input aperture and an output aperture;
 - b. flap means movable in said housing and adapted to close said input and output apertures, said flap means comprising two flaps adapted for respective imposition across said input and output apertures, said flaps when imposed across said apertures forming in combination with said housing an uninterrupted enclosure;
 - c. an elastomeric expansible means positioned in said housing adapted to be coupled to a source of fluid pressure and selectively operable to expand and tightly seal against the interior of said housing thereby regulating the flow through the valve and to simultaneously drive said flaps into closing engagement across their respective input and output apertures, said expansible means in its fully expanded condition being contained by the enclosure formed by said flap means and said housing; and
 - d. means to synchronize the movement of said flaps, said synchronizing means comprising crank means driven by said flaps and link means coupling said crank means to effect synchronous movement thereof.

4,006,755

ELECTROFLUIDIC CONVERTER

Walter Kranz, Taufkirchen, and Heinz Thilmann, Ottobrunn, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed Oct. 22, 1975, Ser. No. 624,842

Claims priority, application Germany, Oct. 23, 1974, 2450329

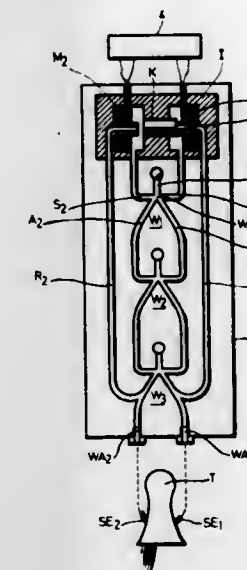
Int. Cl.² F15C 1/08

U.S. Cl. 137-831

5 Claims

1. An electrofluidic converter, for converting electric signals into corresponding fluid signals, comprising, in combina-

tion, a plurality of series-connected bistable fluidic elements each having a supply input, for pressurized fluid, two outputs separated by a jet splitter, and two control inputs, the outputs of each bistable fluidic element being connected to respective control inputs of the next preceding fluidic element; respective feedback conduits branched from the outputs of the last fluidic element and connected, in a chamber sealed against atmospheric pressure, to the control inputs of the first fluidic element; electromagnetic valve means in said sealed chamber



operable to alternately close or clear said feedback conduits; and an electric control circuit energization of said electromagnetic valve means to effect switching thereof between closing and clearing positions; said plurality of series-connected bistable fluidic elements providing a constant phase lag between an electric switching signal effecting closing of one feedback conduit, and the fluidic output signal of said one feedback conduit, for seating of said valve means before application of a counter-fluid-pressure thereto.

4,006,756

FIBER REINFORCED REGENERATED CELLULOSE SAUSAGE CASING FOR DRY SAUSAGES

Günter Gerigk, Oberursel, and Rudolf Stryk, Wiesbaden-Bierstadt, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

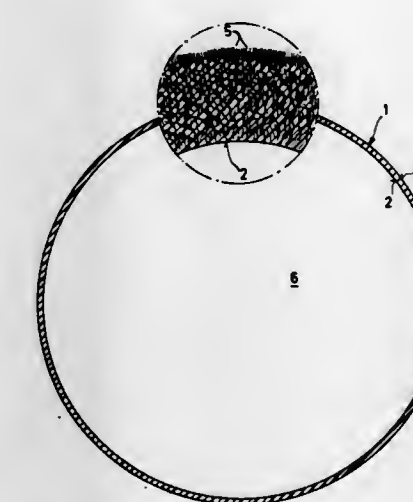
Filed Sept. 13, 1972, Ser. No. 288,479

Claims priority, application Germany, Sept. 15, 1971, 7135052[U]

Int. Cl.² A22C 13/00

U.S. Cl. 138-118.1

1 Claim



1. In a regenerated cellulose sausage casing having a fiber fleece embedded therein, for dry sausages, the improvement comprising an outer surface exhibiting at least part of the fibrous roughness of the fiber fleece embedded therein.

4,006,757

PIPE BELL END HAVING A THICKENED PORTION AND APPARATUS FOR FORMING THE BELL END
Petrus Marinus Acda, and Jacob Karreman, both of Enkhuizen, Netherlands, assignors to Polva Nederland B.V., Netherlands

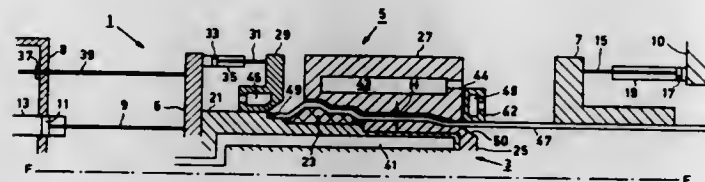
Filed Aug. 26, 1975, Ser. No. 607,770

Claims priority, application Netherlands, Feb. 28, 1975, 7502374

Int. Cl.² F16L 9/00, 11/00

U.S. Cl. 138—109

5 Claims



1. A pipe having a longitudinal center line, a wall of given thickness symmetrical about the center line, a pipe inside diameter, and a bell end formed from a portion of the pipe wall and having an end portion, the bell end having an inner diameter increasing from said pipe inside diameter to a maximum value and then decreasing toward the end portion, the wall thickness of the bell end being at least equal to said given thickness, the bell end comprising an annular sealing chamber having a sealing face, wherein the wall thickness increases in the direction of the end portion of the bell up to a maximum wall thickness at the sealing face.

4,006,758

NARROW WEB LOOM

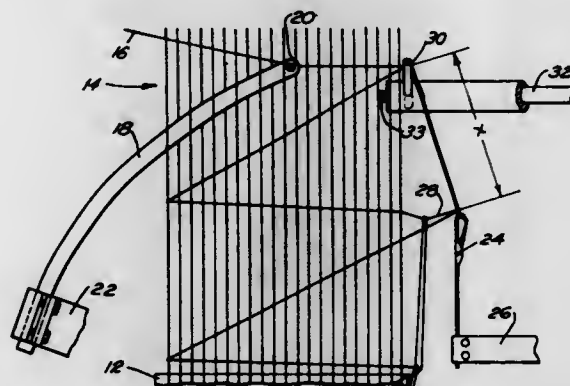
Carl F. Libby, 1212 West St., Stoughton, Mass. 02072

Filed Aug. 15, 1975, Ser. No. 604,957

Int. Cl.² D03D 47/04, 47/42, 45/50

U.S. Cl. 139—116

3 Claims



1. A method of forming a narrow fabric with low pick count comprising providing a plurality of parallel warp yarns, providing means to insert weft yarns in said warp in alternate sheds, catching each insertion with a needle on the side of the warp opposite from the supply, forming a loop of weft yarn as the insertion means withdraws on the selvage edge adjacent the needle and drawing the weft into a loop previously inserted weft yarn, and providing means on the side of the warp remote from the supply to engage the weft in its withdrawal movement that will determine the amount of inserted weft yarn and establish a measured loop as the weft is drawn into a previously inserted weft yarn loop, the inserted weft yarn in one shed lying at an acute angle to its position in the previous and successive sheds.

4,006,759

LOCKED TOGGLE BEATER DRIVE FOR TRIAXIAL WEAVING MACHINE

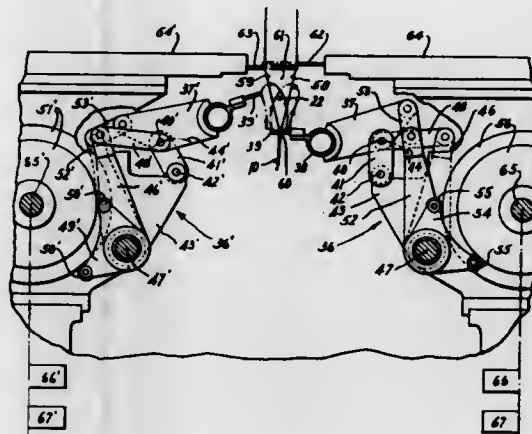
Burns Darsie, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Apr. 21, 1976, Ser. No. 678,943

Int. Cl.² D03D 49/68, 41/00

U.S. Cl. 139—191

8 Claims



1. A beater drive for a reed beating-up the fill threads by movement of the reed toward and away from the fell of a fabric being woven in a weaving machine, said drive comprising a fulcrum, means for moving said fulcrum along a fixed path toward and away from said fabric, a beater bar arm pivoted on said fulcrum, a beater arm pivoted about a fixed axis, means for variably positioning said beater arm in a predetermined program about said axis, and a toggle link coupling the beater bar to said beater arm, said moving and positioning means cooperating when the reed is in beat-up position against the fell such that the toggle link and the beater arm are maintained in substantially aligned compression.

4,006,760

FABRIC CONNECTOR SEAM

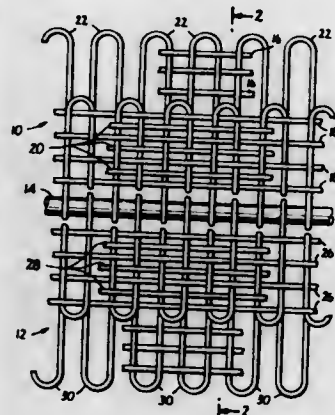
Eric R. Romanski, Delmar, and Orrin C. Stevens, Greenville, both of N.Y., assignors to Albany International Corporation, Albany, N.Y.

Filed Jan. 8, 1976, Ser. No. 647,616

Int. Cl.² D03D 25/00; D21F 7/10, 1/12

U.S. Cl. 139—383 A

7 Claims



1. A fabric connector seam having two identical seam-halves joined by a pintle in which each seam-half contains first, second and third warp systems and a single filling system, said first and second warp systems respectively providing with said filling, face and back weaves, said face weave overlying said back weave for a portion thereof providing a double layer zone and said third warp system binding said face and back weaves together in the double layer zone, and said filling system woven in folded position along an edge to enable said face weave to overlie said back weave to form alternately

displaced protruding loops along said edge for intermeshing with like loops formed along the edge of a like seam-half for receipt of said pintle.

4,006,761

EQUIPMENT FOR BOTTOM LOADING OF LIQUID PRODUCTS

Maurice Bonafous, Gurmencon, France, assignor to Applications Mecaniques et Robinetterie Industrielles A.M.R.I., Paris, France

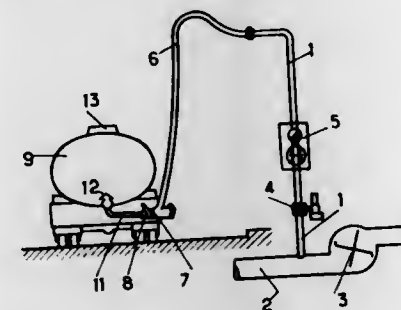
Filed Apr. 23, 1975, Ser. No. 570,797

Claims priority, application France, May 2, 1974, 74.15261

Int. Cl.² B65B 3/30

U.S. Cl. 141—94

17 Claims



1. Apparatus for supplying a liquid product to a pipe connected to the bottom of vessel from a flexible conduit connected to a distribution station, said apparatus comprising a tank valve including a hollow body constituted by two parts inclusive of a rear part adapted for connection to the pipe connected to the bottom of the vessel and a front part provided with a large aperture and having coupling means, a flap valve for closing said aperture, means for actuating said flap valve comprising a connecting rod supporting said flap valve, a profiled lever forming a knuckle joint with said connecting rod, an operating shaft rotatably supported by said hollow body, a gusset connected to said operating shaft, said profiled lever being pivotally connected to said gusset, an operating lever extended externally of said body and connected to said shaft to rotate the same.

a coupling for connection with the coupling means of the tank valve and the flexible conduit connected to the distribution station, said coupling comprising a main casing connected to the flexible conduit, a connecting nose on said casing for lockable connection with the coupling means of the body of the tank valve, a rear casing including mechanical and hydraulic safety means, a closure member in said main casing for controlling flow of liquid product from the flexible conduit to the tank valve and means for actuating said closure member by remote control,

said flap valve being applied against said closure member in coupled and closed position of the tank valve such that upon separation of the tank valve from the coupling at the end of supply of liquid to the vessel only a negligible quantity of liquid product is released.

4,006,762

FUEL TANK LEVEL DETECTOR AND SHUT-OFF VALVE
Everett H. Badger, La Habra, Calif., assignor to Textron, Inc.

Filed Aug. 11, 1975, Ser. No. 603,424

Int. Cl.² B65B 3/26, 57/14

U.S. Cl. 141—198

14 Claims

1. A liquid level control system for disposition in a tank and for use in automatically shutting off liquid flow when a desired liquid level in said tank has been reached, said system comprising:

a. inlet valve means coupled to said tank to receive liquid under pressure from a source thereof, said inlet valve means being normally closed and opened responsive to

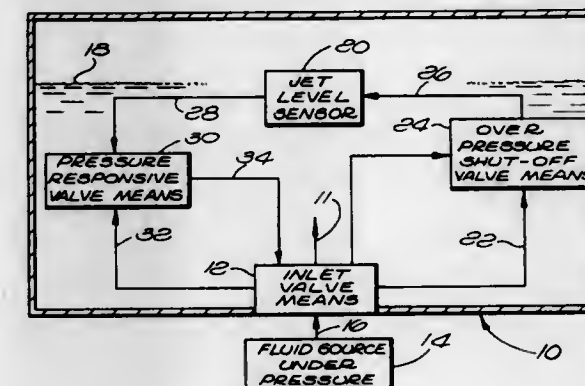
said liquid under pressure thereby to provide liquid flow through said inlet valve means directly into said tank, said inlet valve means also having means responsive to a flow of liquid in a predetermined direction to close said inlet valve means;

b. jet level sensing means having an input and an output for detecting the level of liquid in a tank, said jet level sensing means including

1. ejector means for providing liquid flow into said tank, 2. receiver means spaced from said ejector means and aligned to receive said liquid flow from said ejector means thereby to provide an output liquid pressure signal from said jet level sensing means when the liquid level in said tank is below a pre-determined level, said output signal being interrupted when the liquid level in said tank is at said pre-determined level;

c. means connecting said inlet valve means to said jet level sensing means to supply a flow of liquid to the input of said jet level sensing means;

d. first pressure responsive valve means connected between said output of said jet level sensing means and said inlet



valve, said valve means being movable from a first position into a second position responsive to said output liquid pressure signal from said jet level sensing means, and includes means to retain said valve in said first position in the absence of said output liquid pressure signal, said connection between said first valve means and said inlet valve providing flow of liquid from said source, through said first valve means when in said first position, and to said inlet valve to close said means responsive to a flow of liquid in a predetermined direction of said inlet valve; and

e. second pressure responsive valve means disposed in said connecting means, said second valve means being movable from a first position to a second position responsive to a predetermined liquid pressure in said tank and includes means to retain said second valve means in said first position in the absence of said predetermined pressure in said tank, said second valve means when in said second position interrupting the liquid flow to said jet level sensing means thereby precluding liquid leakage into said tank through said jet level sensing means.

4,006,763

IMPACT REACTION HAMMER

Emil Ordenez, Las Vegas, Nev., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 3, 1975, Ser. No. 619,402

Int. Cl.² B25C 1/00; B25D 1/00

U.S. Cl. 145—29 R

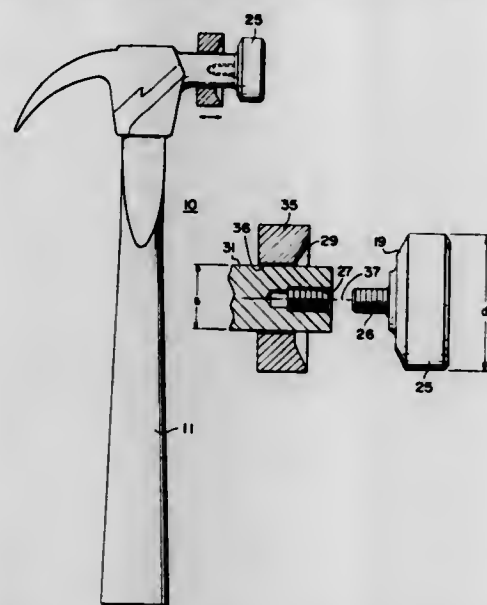
2 Claims

1. An improved hammer for manual use, comprising a hammer head fastened to

a handle, said hammer head formed with a cylindrical shank section projecting from the juncture of the hammer head and attached handle, and with said shank section extending along an axis generally perpendicular to the axis of the handle, with a knob detachably fastened to an end of the said shank section,

said knob being of a generally cylindrical shape, with the sectional diameter of the external cylindrical surface of the knob being greater than the sectional diameter of the external cylindrical surface of the said shank section, together with

a weighted closed ring loosely fitted about said shank section, said ring formed with a circular hole of greater diameter than the said sectional diameter of the shank



section and of lesser diameter than the said sectional diameter of the knob, such that said shank section passes freely through said hole, said ring being of a lesser width than the length of said shank section so that the ring may freely slide along the length of said shank section to strike said knob when the hammer, in use, in swung by the handle to cause the knob to impact against an object, said closed ring being removable from said shank section when the shank section is detached from the knob.

4,006,764

PROTECTION CASE FOR TAPE-RECORDER OR RADIO-SET

Kozo Yamamoto, Hirakata, and Takuro Ibi, Kashiwazaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 8, 1974, Ser. No. 513,134

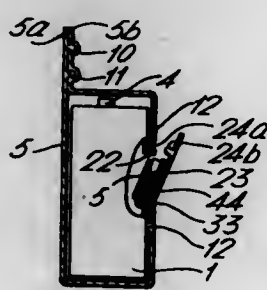
Claims priority, application Japan, Oct. 12, 1973, 48-119303[U]; Oct. 12, 1973, 48-119304[U]; Oct. 12, 1973, 48-119305[U]; Oct. 15, 1973, 48-119986[U]; Oct. 15, 1973, 48-119987[U]

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B65D 65/06

U.S. Cl. 150—52 R

1 Claim



1. A protection case for an audio instrument and operational controls, having speakers, said case being formed of waterproof sheet material in a shape roughly conforming to the shape of said instrument, said case having a first opening through which said instrument can be inserted and taken out, with plastic engaging portions on opposing surfaces adjacent said first opening to form a zipper for closing said opening in

air and water tight relation with said instrument therein, said case further having a region of reduced thickness on the inner surface thereof so as to form an air space between said speaker and said case, said case further having a plurality of flexible bellows adjacent said control for operating said controls by manually flexing said bellows, said case further having transparent and opaque portions with the transparent portions being located so as to permit viewing from outside of the operation of said instrument, and said case having a further opening for inserting a cassette into said case with engaging portions of opposing surfaces adjacent said further opening to form a zipper for closing said further opening in air and water tight relation with said instrument therein.

4,006,765

WHEEL HAVING RESILIENT SPOKE MEANS

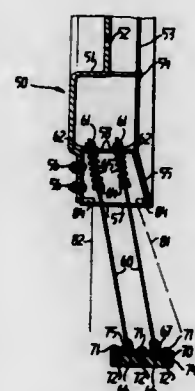
Penrose Lucas Albright, 1523 Woodacre Drive, McLean, Va. 22101

Continuation of Ser. No. 309,698, Nov. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 871,656, Nov. 14, 1969, abandoned, which is a continuation of Ser. No. 725,336, April 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 504,949, Oct. 24, 1965, Pat. No. 3,380,779. This application Nov. 25, 1974, Ser. No. 527,018

Int. Cl.² B60B 9/04

U.S. Cl. 152—12

9 Claims



1. A wheel which comprises axle means, an expansible periphery means, resilient means including spoke means interconnecting said axle means and said expansible periphery means and lying in a conical surface having its apex in said axle means, whereby said spoke means are resiliently movable relative to said axle means in directions substantially parallel to the wheel's axis of rotation, said periphery means and said resilient means being rigidly secured by securing means to said axle means, said periphery means, said resilient means and said securing means comprising an endless member composed of resilient material.

4,006,766

RADIAL TIRES

Toshiki Takayanagi, Kodaira; Hiroaki Tsubakihara, Kurume, and Hiroshi Fukuyama, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Division of Ser. No. 464,667, April 26, 1974, abandoned, which is a continuation of Ser. No. 212,937, Dec. 28, 1971, abandoned. This application July 9, 1975, Ser. No. 594,539

Claims priority, application Japan, Dec. 29, 1970, 46-120690

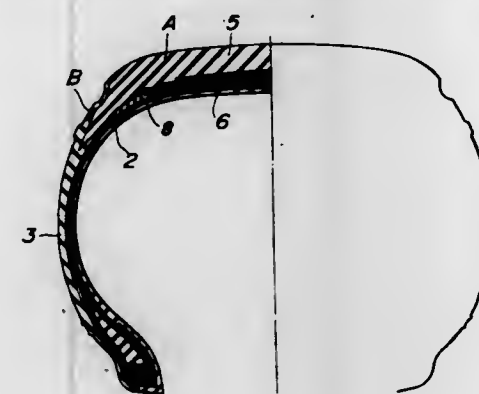
Int. Cl.² B60C 9/04

U.S. Cl. 152—354

6 Claims

1. A pneumatic radial tire comprising a carcass means having at least one rubberized carcass ply consisting of cords disposed at 70° to 90° to the equatorial direction of the tire, a pair of flexible side rubber layers secured to said carcass ply and forming the outer covering of the sidewalls, each side rubber layer composed of flexible rubber having a Shore A

hardness upon vulcanization of 40° to 55°, a rubberized breaker layer and a tread rubber layer secured to the tire crown, said breaker layer consisting of cords disposed at 10° to 30° to the equatorial direction of the tire, said tread rubber layer having a width substantially equal to the width of the tire crown and at least a portion of the shoulders and being made of a highly abrasion-resistant hard rubber material with a Shore A hardness upon vulcanization of 55° to 75°, each of said flexible side rubber layers integrally bonded to said tread



rubber layer to cover the respective opposing side edges thereof, each of said flexible side rubber layers extending over the respective edge portion of the tread rubber layer and being bonded thereto, and each of said flexible side rubber layers further extending underneath the respective edge portion of the tread rubber layer and being bonded between the bottom of the tread rubber layer and the carcass to form a tire having protective flexible rubber covering the opposing side edges of the abrasion-resistant hard tread rubber.

4,006,767

PNEUMATIC TIRES

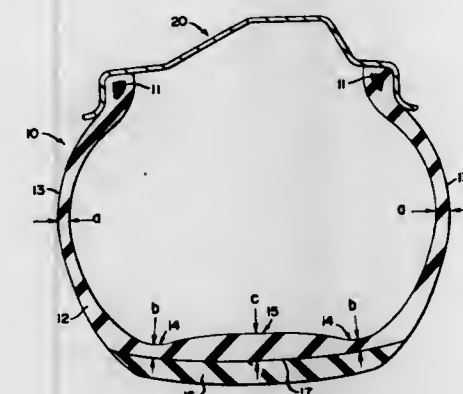
John Learned Ford, N. Canton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 8, 1975, Ser. No. 620,514

Int. Cl.² B60C 5/12, 1/00

U.S. Cl. 152—357 A

6 Claims



1. A cordless, pneumatic tire comprising an annular, rubber tread and a cast body of viscoelastic material having a Young's modulus of between 5,000 and 15,000 psi, said body having an annular crown region located between two annular shoulder regions and sidewall regions connecting the outer edges of said shoulder regions to tire beads, said crown and shoulder regions located underneath said rubber tread and axially inwardly of the outermost edges of said rubber tread, said crown region having a crown section measured at the circumferential centerline of the tire, each said shoulder region having a shoulder section measured at the thinnest point of said shoulder region and each said sidewall region having a mid-sidewall section measured at the maximum axial width of the sidewall on standard inflation, said crown section having a structural stiffness at least 4 times the structural stiffness of said mid-sidewall section and said shoulder section having a structural

stiffness at least 1.5 times the structural stiffness of said mid-sidewall section, said structural stiffness of said crown being substantially greater than said structural stiffness of said shoulder section.

4,006,768

SECURITY SCREEN

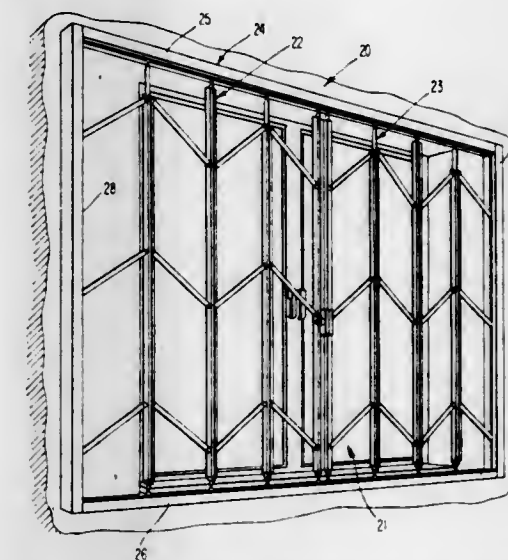
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Filed Nov. 22, 1974, Ser. No. 526,101

Int. Cl.² E06B 3/92

U.S. Cl. 160—136

18 Claims



1. A foldable security screen apparatus of the optionally openable and closeable type for use in covering an opening of the window, door or other types comprising:

- a plurality of longitudinally disposed laterally repositionable bars,
- a plurality of links extending between and connecting adjacent said bars, each link having one end pivotally anchored on a said bar and each pivotally connected at its opposite end to a next adjacent said bar,
- guide means disposed at opposite ends of said bars forming guide paths for guiding the lateral movement of said bars upon lateral repositioning thereof, wherein said guide means comprise laterally movable means at the ends of said bars and fixedly disposed track means for guiding movement of said laterally movable means relative thereto,
- said bars each being connected to said guide means at both opposite ends of each said bar,
- said bars being telescopically extensible and contractible and comprising means that include main bar portions between bar ends, for expansion and contraction in effective bar length between said guide means whereby the bars can automatically accommodate to variations in said guide paths by permitting corresponding automatic variations in effective bar length between ends thereof, whereby the bars can, upon installation optionally accommodate an infinite variety of opening lengths within a preselected range, and whereby the bars facilitate screen opening by lengthwise movement of some of the main bar portions relative to associated said bar ends, and
- said bars including means for selectively limiting relative telescopic movement between at least some of said main bar portions and associated bar ends, whereby upon installation the spacing between selected ones of said bars may be optionally adjusted for accommodating an infinite variety of lateral opening sizes within a preselected range, and whereby desired selected spacings between adjacent bars may be established.

4,006,769

VERTICAL VENETIAN BLIND CONSTRUCTION

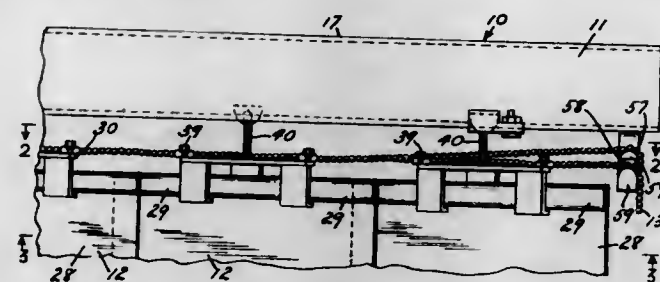
Allan S. Woodie, 420 Mount Pleasant Ave., Mamaroneck, N.Y. 10543

Filed June 22, 1976, Ser. No. 698,530

Int. Cl.² E06B 9/26

U.S. Cl. 160-166 A

3 Claims



1. In a vertical venetian blind construction of a type including a horizontally oriented support element defining an elongated slot forming a track, a plurality of vertically oriented slats having slat support means at an upper end thereof engaging said track for longitudinal and rotational movement relative thereto, and linking means interconnecting portions of each of said slats for simultaneously imparting rotational movement thereto between relatively open and closed positions, improved means for guiding each of said slats to a common angular position irrespective of minor variations in the length of ball chain segments interconnecting adjacent slats, said means comprising: each of said slats support elements including a vertically oriented shaft member penetrating said elongated slot in said blind support element, a spherically shaped enlargement adjacent an upper end of said shaft, the lower surface of which slidably engages the edges of said elongated slot, there being a pair of oppositely disposed flat surfaces forming camming detents extending inwardly from the spherical surfaces thereof, and adapted to rest upon said edges of said elongated slot when said slats are in relatively closed condition in which the longitudinal edges of said slats are in mutually overlapped relation.

4,006,770

WINDOW SHADE ASSEMBLY

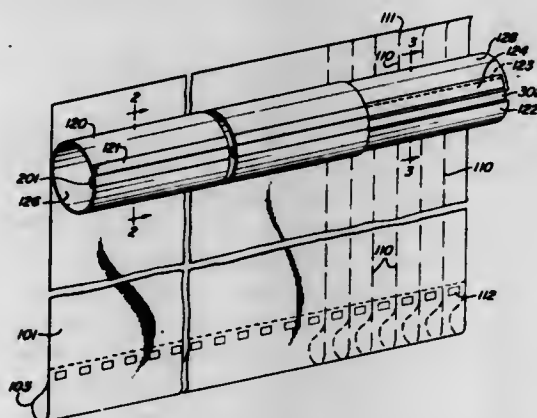
Thomas A. Ferguson, 411 W. Galena, Freeport, Ill. 61032

Filed June 16, 1975, Ser. No. 586,873

Int. Cl.² A47G 5/02

U.S. Cl. 160-263

12 Claims



1. In an extensible and retractable roll window shade assembly which is width adjustable and installable by the consumer without the use of tools or cutting elements, the combination of

- a telescoping roller assembly, said telescoping roller assembly including
- a first roller section,
- said first roller section having a constant external diameter from end portion to end portion,

the outer end portion of said first roller section having first means for supporting the window shade assembly from a first support location,

the inner end portion of said first roller section having an opening therein of a size to receive

a second roller section,

said second roller section having a constant nominal external diameter from end portion to end portion,

the outer end portion of said second roller section having second means for supporting the window shade assembly from a second support location,

said second roller section being telescopically, slidably received within the first roller section

whereby the length of the roller assembly can be adjustable within the limits of the range of telescoping movement,

means for precluding relative rotation between the first and second roller sections,

a shade of flexible sheet material,

a first portion of the upper end of the shade being secured to the first roller section,

one side portion of the shade having a plurality of lines of weakness which extend from the upper end of the shade to the lower end of the shade

whereby the width of the shade can be adjusted to a desired width by separating a portion of the side of the shade from the balance of the shade, said separated portion being bounded, on the outside, by the original shade edge and, on the inside, by a line of weakness along which said portion is separated from the balance of the shade,

said first and second telescoping roller sections being adjustable to an overall length which is at least as wide as the length of the final shade width without severance of any portion of either section,

securement means for securing the second portion of the upper end of the shade, which is generally aligned with the second roller section, in fixed relationship to the second, smaller external diameter roller section with a substantially constant securing force from point to point along the length of the portion of the second roller section which extends beyond the end of the first roller section,

whereby the positions of the first and second roller sections are fixed with respect to one another and to the shade throughout the entire area of overlap of the shade and the roller assembly.

4,006,771

MEANS FOR MAINTAINING A PAINTING AGAINST SHRINKAGE AND WARPING

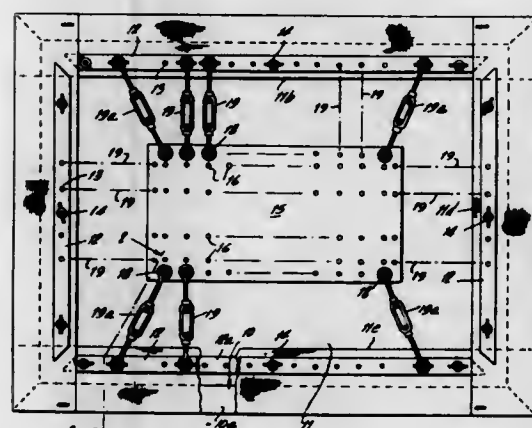
Hermann Spurkel, 21-64 41st St., Long Island City, N.Y. 11105

Filed July 21, 1976, Ser. No. 707,226

Int. Cl.² E06B 9/24

U.S. Cl. 160-378

4 Claims



1. The combination with a painting on a canvas, comprising:
 - a. a rigid frame having frontward and rearward sides;
 - b. the canvas surmounting the frontward side of said frame and overlapping the rearward side thereof;

- c. a rigid member disposed within the frame and rearwardly of the canvas surmounting the frontward side of the frame;
- d. supporting means engaging the edges of the canvas overlapping the rearward side of the rearward side of the frame;
- e. a plurality of adjustable stretching means depending from opposing portions of said rigid member and said supporting means;
- f. said adjustable stretching means being disposable at a plurality of predetermined locations on said rigid plate and said supporting means.

4,006,772

METHOD AND APPARATUS FOR CASTING STEEL INTO A CONTINUOUS CASTING MOLD

Peter J. Koenig, Zumikon, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed June 17, 1974, Ser. No. 480,060

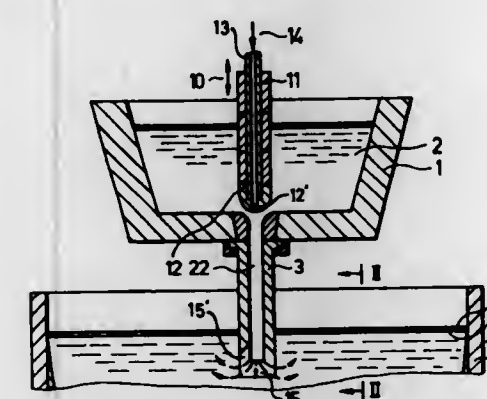
Claims priority, application Switzerland, June 22, 1973, 9161/73

The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.

Int. Cl.² B22D 11/10

U.S. Cl. 164-66

12 Claims



1. A method of pouring molten metal, especially steel, into a continuous casting mold of a curved casting installation having an inner radius comprising the steps of conducting the steel by means of a pouring tube to a location beneath the level of the liquid metal pool in the mold, admixing with the steel at a time prior to its departure out of the pouring tube an inert gas while forming small gas bubbles, introducing the resultant steel-gas mixture into the mold in the form of a thin, coherent pattern of substantially constant width which is simultaneously directed both downwardly and laterally into the liquid metal pool in the mold and directing the pattern of the steel-gas mixture during its outflow into the liquid metal pool so as to be located in a plane which is inclined at an angle with respect to a vertical plane and which inclined pattern is directed towards the inner radius of the curved casting installation.

6. The apparatus as defined in claim 4, wherein said predetermined angle is in the order of between about 4° and 6°.

4,006,773

CENTRIFUGALLY CASTING MACHINE HAVING AN AXIAL SUPPORT DEVICE

Francois Zusatz, Pont-a-Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed May 3, 1976, Ser. No. 682,536

Claims priority, application France, June 18, 1975, 75.19037

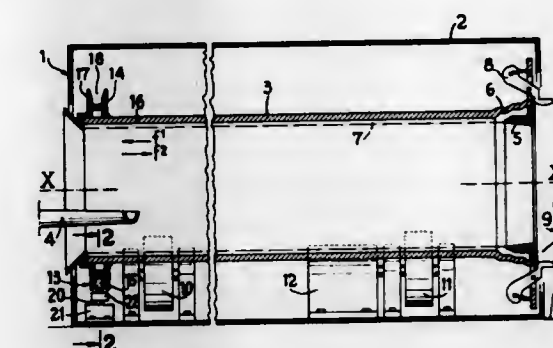
Int. Cl.² B22D 13/02

U.S. Cl. 164-298

3 Claims

1. A machine, in particular for centrifugal casting, comprising a fixed frame, a case of revolution mounted relative to the frame to be rotatable about the axis of the case, an axial

device operative in either direction for axially supporting the case and comprising a ring contained in a plane perpendicular to said axis and integral with the case, a journal which is integral with the frame and has an axis disposed radially with respect to the case in the normal position of the mean plane of the ring, a lever mounted on the journal and having an axis perpendicular to the journal and freely rotatable relative to



the journal, two support rollers having axes of rotation contained in a plane containing the axis of the journal and the axis of the lever and mounted to be freely rotatable on the lever, the ring defining two main annular non-axially extending bearing surfaces between which surfaces the rollers are located, the distance between the bearing surfaces in the axial direction allowing an angular movement of the lever.

4,006,774

DIE CASTING APPARATUS WHICH ELIMINATES SHOT SLEEVE-METAL CONTACT

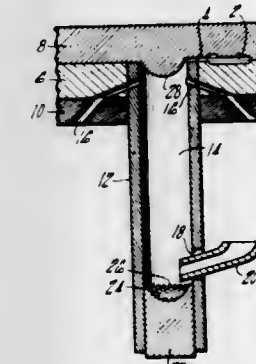
Walter Edward Mikulski, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 19, 1976, Ser. No. 687,772

Int. Cl.² B22D 17/08

U.S. Cl. 164-312

8 Claims



1. In a casting machine for the production of cast articles wherein first and second die halves cooperate to define a die cavity in the shape of the article to be cast and a narrow runner opening into said cavity, the improvement which comprises, in combination:

- a. a shot sleeve having an upwardly oriented injection chamber extending therethrough, the shot sleeve being connected to one of said die halves such that a portion of said shot sleeve defining a top end of the injection chamber is in communication with the runner opening into the die cavity, the shot sleeve having access means in a portion of said shot sleeve defining a lower end of the injection chamber through which casting material, such as a molten metal charge, is introduced;
- b. a plunger disposed for reciprocating motion in the injection chamber, the upper face of the plunger including a concavity for receiving at least sufficient casting material to form the article and for carrying the casting material out of contact of the shot sleeve when the plunger is advanced upwardly in the injection chamber;
- c. at least one die half which further defines a convexity

projecting into the top of the injection chamber, the convexity being suitably positioned and shaped to cooperatively mate with the concavity in the upper face of the plunger and displace casting material therefrom, through the runner and into the die cavity when the plunger is advanced to the top of the chamber.

4,006,775

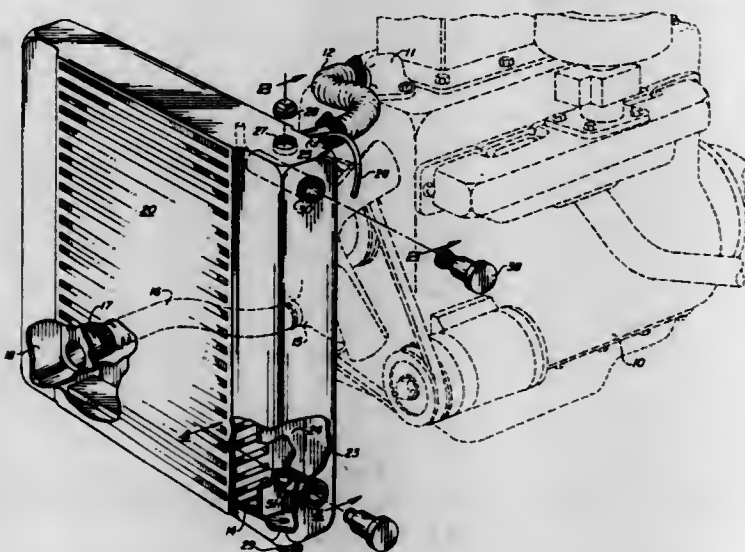
AUTOMATIC POSITIVE ANTI-AERATION SYSTEM FOR ENGINE COOLING SYSTEM

Walter C. Avrea, 4540 S. Rural Road, Apt. L-7, Tempe, Ariz. 85282

Continuation-in-part of Ser. No. 449,025, March 7, 1974, abandoned. This application July 18, 1974, Ser. No. 489,584

Int. Cl.² F01P 11/02

U.S. Cl. 165—51



1. For use in combination with a cooling radiator for a liquid-cooled internal combustion engine, said radiator comprising

core means providing indirect heat exchange between engine coolant liquid flowing internally therethrough and an external cooling fluid,

an inlet header tank enclosing the inlet of said core means and adapted for fluid connection to the coolant liquid outlet of said engine, and

an outlet header tank enclosing the outlet of said core means and adapted for fluid connection to the coolant liquid inlet of said engine,

the improvements comprising an automatic, positive anti-aeration system adapted to function cooperatively with said radiator as an integral unit, said improvements comprising:

a. means defining a liquid-tight coolant liquid accumulator;

b. means defining an inlet port in said accumulator;

c. first passage means providing a first separate path of fluid communication between said accumulator inlet port and the upper portion of a first one of said header tanks;

d. normally closed first valve means for closing said first passage means, adapted to open when the pressure in said first header tank reaches at least a first predetermined pressure higher than ambient atmospheric pressure, allowing coolant liquid and gases trapped in the upper portion of said first header tank to flow into said accumulator;

e. means for venting gases entering said accumulator to the atmosphere;

f. means defining an outlet port in the lower portion of said accumulator;

g. second passage means separate from said first passage means providing a second separate path of fluid communication between said accumulator outlet port and the lower portion of one of said header tanks;

h. second valve means for closing said second passage means, adapted to open when the pressure in said radiator falls at least below a second predetermined pressure lower than said first predetermined pressure, allowing

coolant fluid in said accumulator to flow into said radiator; and

i. means for introducing an initial quantity of make-up coolant liquid into said accumulator,

said accumulator being shaped and dimensioned to receive an initial quantity of coolant liquid, the surface level of which is above said outlet port, and to receive and temporarily store at least the volume of coolant liquid which flows through said accumulator inlet port when the pressure in said first header reaches said first predetermined pressure.

4,006,776

PLATE TYPE HEAT EXCHANGER

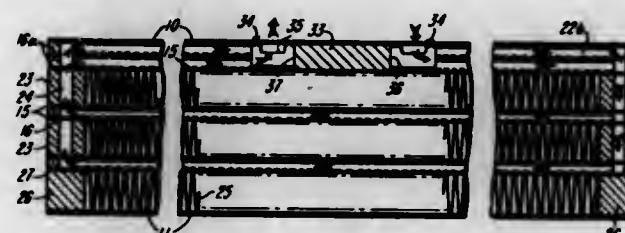
Robert R. Pfouts, Dayton; Anson S. Coolidge, and Daryl D. Peter, both of Findlay, all of Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed Mar. 31, 1975, Ser. No. 563,860

Int. Cl.² F28F 3/08

U.S. Cl. 165—166

9 Claims



1. An all brazed heat exchanger, including:

a. upper and lower core sheets, one of which has side by side inlet and outlet openings for a first fluid,

b. a plurality of tube sheets positioning between said core sheets in a separated spaced relation to said core sheets and to one another,

c. at least certain of said core sheets having end apertures within the margins thereof,

d. a frame member of continuous peripheral configuration positioned between tube sheets of at least one adjacent pair and indented at its ends within its margins to form end apertures registering with the end apertures in overlying and underlying tube sheets;

e. first corrugated fin material having its corrugations extending longitudinally within said frame member between shoulders as defined by end indentations therein and confined at its sides by peripheral side portions of said frame member,

f. said first fin material cooperating with said frame member to define flow passage means for said first fluid,

g. end nose pieces positioned to space said pair of tube sheets from an adjacent tube sheet,

h. said nose pieces each having a through aperture registering with apertures in said tube sheets and in said frame member,

i. second corrugated fin material having its corrugations transverse to said first fin material confined between said nose pieces and positioning between said pair of tube sheets and said adjacent tube sheet,

j. said second fin material cooperating with said nose pieces and with tube sheets between which it is positioned to define flow passage means for a second fluid,

k. and separator means between said one core sheet and the next adjacent tube sheet positioned to lie intermediately of said inlet and outlet openings,

l. said first fluid flowing in said inlet opening to an end aperture in said next adjacent tube sheet, through an aperture in a respective one of said nose pieces and to flow passage means as defined by said first fin material and across the heat exchanger for similarly confined reverse return flow to said outlet opening,

m. the defined parts being brazed into a unitary structure with peaks and valleys of said fin material in a contacting connecting relation to adjacent tube sheets with said

separator means in a connecting relation to said one core sheet and said next adjacent tube sheet.

4,006,777

FREE FLOATING CARRIER FOR DEEP WELL INSTRUMENTS

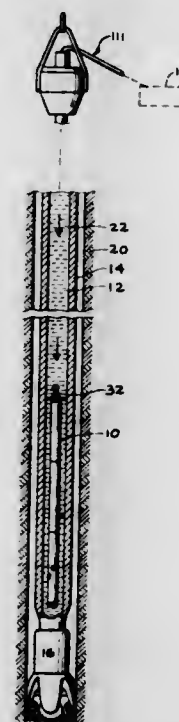
Leo C. LaBauve, 1506 Center St., New Iberia, La. 70560

Filed Feb. 6, 1976, Ser. No. 655,687

Int. Cl.² E21B 47/00

U.S. Cl. 166—250

13 Claims



1. Apparatus for conveying deep well instruments into and out of a well bore, comprising:

means for maintaining a column of fluid extending downwardly in the well bore to a region at which a test is to be made;

means operable to controllably produce a flow of fluid downwardly through said column to said region and to halt said flow as desired; and

a carrier in said fluid column for holding an instrument or instruments adapted to test and/or obtain test records of said region, said carrier and its contents being movable downwardly by the flow of fluid in said column to said region and being sufficiently buoyant to float to the surface in said fluid column when fluid flow downwardly therethrough ceases.

12. The method of testing a subsurface region in a well containing a column of fluid, said method comprising:

introducing into the fluid column a test unit having an effective overall density to be buoyant in said fluid;

producing a flow of fluid downwardly in the well at a velocity conveying said test unit downwardly with the fluid to said region;

conducting a test by said unit while the unit is at said region; and

allowing said unit to float upwardly by its buoyancy through said fluid column and to the surface of the earth.

4,006,778

THERMAL RECOVERY OF HYDROCARBON FROM TAR SANDS

David A. Redford, Fort Saskatchewan, and Stephen M. Creighton, Edmonton, both of Canada, assignors to Texaco Exploration Canada Ltd., Calgary, Canada

Filed June 21, 1974, Ser. No. 481,581

Int. Cl.² E21B 43/24

U.S. Cl. 166—261

8 Claims

1. A method for the recovery of hydrocarbons from subterranean hydrocarbon-bearing formations traversed by at least one injection well and at least one production well, and having fluid communication therebetween, comprising the steps of:

a. injecting via said injection well a mixture of steam having a quality of not more than 100 percent and an oxygen-containing gas, said mixture being injected at a temperature corresponding to the saturation temperature for saturated steam at the pressure of said formation,

b. thereafter producing said hydrocarbons from said production well.

4,006,779

LIGNOSULFONATES AS SACRIFICIAL AGENTS IN OIL RECOVERY PROCESSES

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed June 30, 1975, Ser. No. 591,574

Int. Cl.² E21B 43/20, 43/22

U.S. Cl. 166—275

9 Claims

9. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein a micellar dispersion is injected into the injection well in order to drive the oil to the production well wherein it is produced the improvement which comprises:

injecting into the injection well in admixture with the micellar dispersion lignosulfonates.

4,006,780

RUPTURING HEAD FOR FIRE EXTINGUISHERS

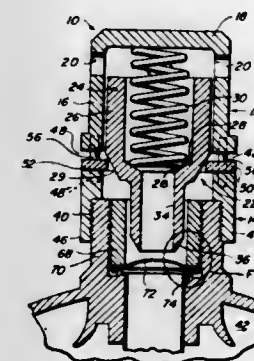
William J. Zehr, Des Plaines, Ill., assignor to The Protectoseal Company, Bensenville, Ill.

Filed May 24, 1976, Ser. No. 689,098

Int. Cl.² A62C 35/02; F16K 13/04; A62C 37/30

U.S. Cl. 169—26

4 Claims



1. A head for rupturing a disk in the cylindrical neck of a container for emission of fire extinguishing material, said neck having male threads around the exterior wall of the neck and a rupturable disk in said neck, in combination with a hollow housing having a top and side wall, the upper portion being cylindrical, and having an integrally formed substantially square in cross-section lower portion, said lower portion having a top and side and end walls, the lower end of said lower portion being internally threaded for securement to the neck of the container, said lower portion provided with a pair of opposed slots in said side walls and partially into said end walls, a pair of vertically disposed roll pins anchored to said side walls and each spanning one of said slots, a hollow punch having a cylindrical spring loaded seat positioned interiorly in the upper portion of said housing and a hollow tubular member integrally formed on the lower end of said seat and offset from said seat, the free end of said tubular member being sharpened to form a cutting edge, a pair of arms each positioned in one of said slots, one end of each of said arms pivotally secured to one of said roll pins, a hooked portion on the opposite end of each of said arms and a fusible link secured to said hooked portions to position said arms in parallel and support said seat in inoperative position.

4,006,781

ROTARY SOIL-ENGAGING MEMBERS

Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

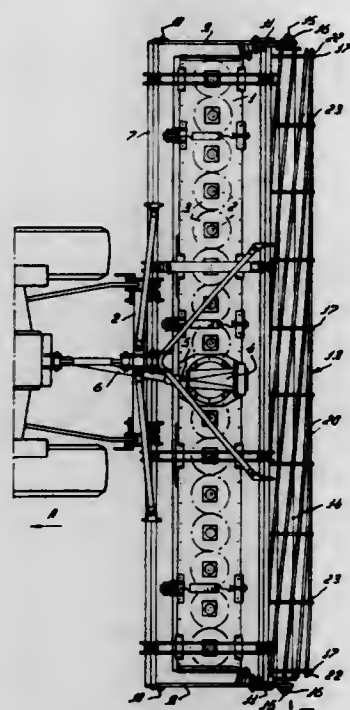
Filed July 17, 1973, Ser. No. 380,114

Claims priority, application Netherlands, July 18, 1972, 7209885

Int. Cl.² A01B 21/00

U.S. Cl. 172-532

13 Claims



1. An elongated roller member comprising a substantially central and horizontal axle portion, said axle portion having ends for rotatably supporting said roller member, a plurality of supports mounted along the length of said axle portion at spaced apart intervals, a plurality of spaced apart elongated elements mounted adjacent the outer peripheries of said supports and said supports providing bearing surfaces for said elements, said elements comprising an outer soil engaging peripheral surface for said roller member, retaining means for securing each of said elements in at least two alternate longitudinal settings with alternate supported regions cooperating with the bearing surfaces of said supports, said supports including two outer supports positioned adjacent said ends of the axle portion and one of said outer supports being located a different distance from one of said ends than the second of said outer supports from the opposite of said ends, said retaining means cooperating with said outer supports to retain said elongated elements in each of said alternate longitudinal settings.

4,006,782

TWO-WAY BULLDOZER MECHANISM

Shigeru Nishino, and Tomio Uchida, both of Sagami-hara, Japan, assignors to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,487

Claims priority, application Japan, Apr. 4, 1975, 50-40442

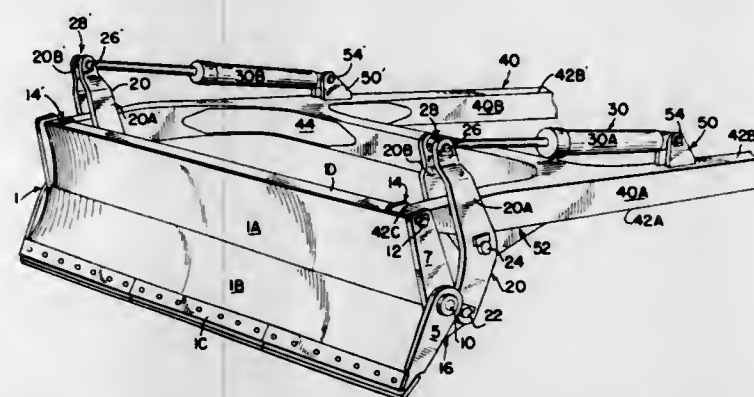
Int. Cl.² E02F 3/76

U.S. Cl. 172-806

9 Claims

1. A two-way bulldozer mechanism comprising: a pair of elongated push arms with each push arm having a forward tip portion provided thereon; an upper blade having an upper edge pivotally connected to the forward tip portions of the push arms for pivotal movement thereabout; a lower blade hingedly connected to a lower edge of the upper blade for limited relative rotational movement to permit the attitude of the upper and lower blades to be adjusted from a first position suitable for forward bulldozing to a second position suitable for reverse bulldozing;

a pair of lever means individually pivotally connected at their intermediate portions to the push arms, each of said lever means having its lower end pivotally connected to the lower blade, the lever means cooperating with the upper blade for controlling the attitude of the blades; and a pair of hydraulic cylinders mounted on the push arms,



each hydraulic cylinder having an extensible and retractable piston rod pivotally connected to an upper end of one of the lever means whereby extending the piston rods pivots the lever means to position the lower and upper blades in said first position and retracting the piston rods pivots the lever means to position the lower and upper blades in said second position.

4,006,783

HYDRAULIC OPERATED ROCK DRILLING APPARATUS

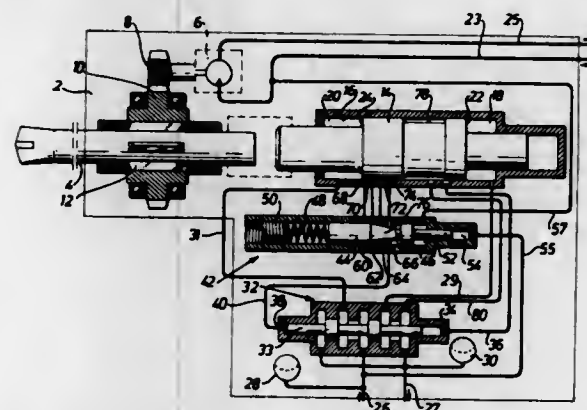
Sven Granholm, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Mar. 17, 1975, Ser. No. 558,688

Int. Cl.² E21C 3/20

U.S. Cl. 173-12

18 Claims



1. A rock drilling apparatus, comprising a machine housing, means for mounting a drill in said housing, a hydraulically operated rotary motor for rotating said drill, a percussion motor with an impact piston hydraulically operable to perform a power stroke to and a return stroke from said drill for transferring impact energy thereto, said piston defining together with said machine housing first and second pressure chambers for receiving pressure liquid to move said piston to and from the drill, respectively, said percussion motor having a hydraulic circuit including a high pressure side and a low pressure side, a pressure liquid distributing valve having a control input for receiving a control pressure, said distributing valve being located in said hydraulic circuit of the percussion motor for alternately connecting at least one of said pressure chambers to the high pressure side and low pressure side, respectively, of said hydraulic circuit in response to said control pressure, said rotary motor having a hydraulic circuit separate from said hydraulic circuit of the percussion motor and including a high pressure side and a low pressure side separate from the high and low pressure sides of the percussion motor, and a control valve for controlling said control pressure in response to the pressure at the high pressure side of said rotary motor, the

control valve being responsive to the pressures at the high pressure sides of both hydraulic circuits to open and close a control pressure supply line to said control input of said distributing valve for controlling the connection of the high pressure side of the hydraulic circuit of the percussion motor to said first chamber, via said distributing valve.

4,006,784

FLUID OPERATED POWER TOOL

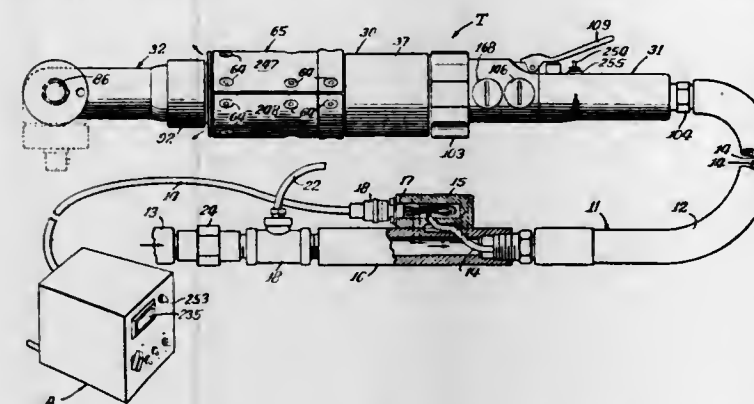
Edmund C. Dudek, St. Charles, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Division of Ser. No. 359,640, May 14, 1973, Pat. No. 3,920,082. This application Oct. 6, 1975, Ser. No. 620,018

Int. Cl.² B23Q 5/06

U.S. Cl. 173-12

3 Claims



1. An arrangement for routing electrical conductors through the interior of the body portion and hollow handle of a power tool, said body portion including an elongated tubular housing having said handle at one end thereof and adapted to receive a torque output attachment at the opposite end thereof, a motor having a generally cylindrical casing mounted in said housing, bearing support plates at each end of said motor casing and engaging the inner surface of said housing, a reduction gear case member for supporting reduction gearing in said housing, said reduction gear case member engaging the inner surface of said housing and disposed between one of said motor casing bearing support plates and the torque output end of said housing, said other gear case member including a cylindrical transducer, said routing arrangement comprising an annular clearance between said other gear case member and the inner surface of said housing, at least one axially extending groove in the outer surface of said reduction gear case member, an axial bore in said motor casing having one end registering with the bore in said last mentioned motor bearing support plate and its other registering with an axial bore in the bearing support plate adjacent to said handle, said bore in said bearing support plate adjacent to said handle communicating with the hollow interior of said handle.

4,006,785

POWER TOOL

Karl Roll, Leinfelden, and Klaus-Peter Fritsch, Merklingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 12, 1975, Ser. No. 631,187

Claims priority, application Germany, Dec. 19, 1974, 2460072

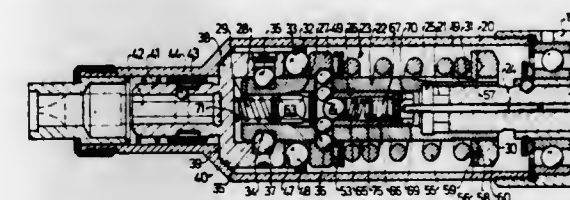
Int. Cl.² B25B 23/14

U.S. Cl. 173-12

10 Claims

1. A power tool, particularly a hand-held pneumatically driven power screwdriver or other hand-held power tool, comprising, in combination, a tool housing, a drive motor in the housing, a spring-loaded release valve device arranged in an energy supply conduit leading to the motor for blocking and unblocking the energy supply conduit, a tool holder rotatably mounted at the front of the housing, a clutch including a

hollow driving part connected to the motor and a driven part connected to the tool holder, the clutch being axially shiftable together with the tool holder, the driven part having a plurality of clutch depressions bounded by sloping clutch ridges, the clutch including clutch elements located in the clutch depressions, the clutch including an axially shiftable pressure body surrounding the driving part, adjustable-stress first spring means causing the pressure body to urge the clutch elements to the bottoms of the clutch depressions, the driving and driven parts being immovable relative to each other in axial direction, the driving and driven parts becoming rotatable relative to each other when the torque transmitted by the clutch reaches a predetermined value causing the clutch elements to climb up the associated sloping clutch ridges and out of the clutch depressions, the clutch further including a locking bolt guided in the interior of the driving part for axial movement relative to the driving part and being coupled to transmit force to the release valve when axially moved, the locking bolt being guided in the driving part non-rotatable relative to the latter and having at least one radial bore, the driving part having at least one radial bore which can be



brought into register with the radial bore of the locking bolt, the clutch further including at least one outer and one inner radially shiftable locking element in the radial bores the inner one of which serves when the bores are in register for locking the driving part and the locking bolt together for joint axial movement so that axial movement of the clutch in response to axial movement of the tool holder causes the locking bolt to transmit force from the driving part to the spring loaded release valve device, the pressure body having a cam surface which faces towards the driving part, the clutch further including second spring means operative for causing the inner locking element to urge the outer locking element radially outward into abutment against the cam surface, the cam surface being so configured that when the clutch elements climb out of the clutch recesses and push back the pressure body against the opposition of the first spring means the cam surface of the pressure body drives the locking elements radially inward to a position in which the locking elements no longer lock the driving part and locking bolt together for joint axial movement, whereby the locking bolt can no longer transmit axial force from the clutch to the release valve.

4,006,786

POWER ACTUATED PORTABLE MARKING TOOL

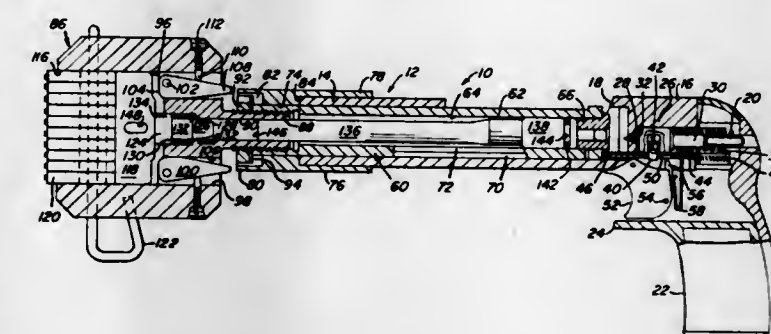
Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.

Filed July 22, 1975, Ser. No. 598,116

Int. Cl.² B44B 5/00

U.S. Cl. 173-15

10 Claims



1. A power actuated marking tool comprising, a longitudinal housing having a forward end portion and a

rearward end portion, said longitudinal housing having a bore therethrough,
 a barrel assembly positioned within said housing bore for relative movement therein, said barrel assembly having a bore coaxially aligned with said housing bore,
 said barrel assembly having a cartridge receiving chamber positioned within said housing rearward end portion,
 a tool holder secured to said barrel assembly adjacent said forward end portion of said housing, said tool holder having a bore therethrough coaxially aligned with said barrel assembly bore,
 tool support means positioned for reciprocal movement within said tool holder bore for retaining marking elements in said tool holder,
 said tool support means having an anvil end portion axially positioned within said tool holder bore,
 a piston member positioned for reciprocal movement within said aligned barrel and tool holder bores and arranged to abut the forward end portion of said cartridge receiving chamber,
 firing means positioned in said housing rearward of said cartridge receiving chamber for actuating forward movement of said piston member in said barrel assembly to strike said anvil end portion and transfer a marking force to said tool support means,
 safety means pivotally connected to said tool holder within said bore thereof for restraining rearward movement of said tool holder and barrel to prevent cocking of said firing means when in a first position, and
 said safety means operable to assume a second position relative to said tool holder to permit rearward movement of said tool holder and barrel to permit cocking of said firing means.

4,006,787

DRILLING TOOL WITH DRILL AND RECEIVING ELEMENT

Gerhard Rumpp, Inning; Karl-Heinz Gürtner, Munich, and Wilm Krüger, Puchheim, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

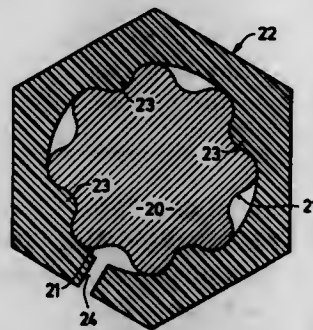
Filed Aug. 28, 1975, Ser. No. 608,688

Claims priority, application Germany, Sept. 19, 1974, 2444899

Int. Cl.² B25D 17/02; E21C 13/06

U.S. Cl. 173—132

12 Claims



1. A drilling tool comprising an axially elongated drill having a leading or cutting end and a trailing end, the leading end effecting the cutting or drilling action when it is placed against the material to be drilled and the trailing end being insertable into the retainer on a drilling device such as a drill hammer or the like, said drill having an axially extending cutting portion extending from its leading end toward its trailing end and an axially extending shank portion extending from its trailing end toward its leading end, an axially extending tubular shaped receiving member laterally encircling at least a part of said shank portion, said receiving member having an inner surface and an outer surface, said shank portion having an axially extending outer surface facing toward the inner surface on said receiving part, wherein the improvement comprises that the trailing end of said shank portion projects outwardly from the trailing end of said receiving member, a first axially ex-

tending part of the inner surface of said receiving part and a first axially extending part of the outer surface of said shank portion are disposed in engagement and a second axially extending part of the inner surface of said receiving part and a second axially extending part of the outer surface of said shank portion are disposed in spaced relation forming therebetween at least one axially extending passageway opening between the trailing end of said shank portion and the trailing end of said cutting portion, at least one of the first part of the inner surface of said receiving part and the first part of the outer surface of said shank portion comprises a projection extending into contact with the first part of the surface it faces and the first part of the surface it faces having a recess into which the projection seats, a plurality of said projections form the first part of the inner surface of said receiving part with said projections disposed in spaced relation and extending radially relative to the axis of said shank portion into recesses in said shank portion, and said projections being elastically deflectable so that under a certain torque said projections are deflected out of the recesses permitting the receiving part to rotate relative to the shank portion.

4,006,788

DIAMOND CUTTER ROCK BIT WITH PENETRATION LIMITING

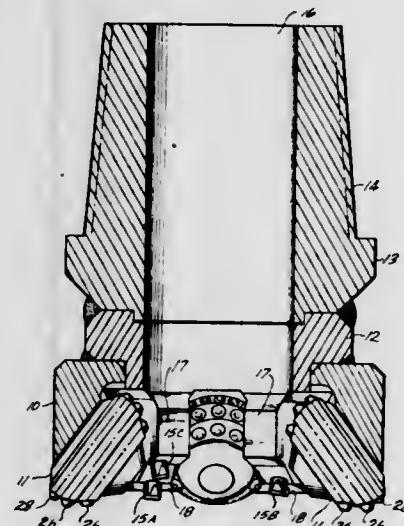
Lloyd L. Garner, Los Alamitos, Calif., assignor to Smith International, Inc., Irvine, Calif.

Filed June 11, 1975, Ser. No. 585,975

Int. Cl.² E21B 9/36

U.S. Cl. 175—330

41 Claims



11. A rotary rock bit comprising:
 a bit body;
 a plurality of diamond cutters on the bit body each with a cutting edge extending from the bit body a selected distance for engaging the bottom of a hole being drilled at a selected rake angle and shearing rock during drilling; and
 means on the rock bit for engaging the rock being drilled and limiting depth of penetration of the diamond cutters into rock during drilling to a depth of more than about one-fourth and less than about three-fourths of the length of the diamond cutters extending from the body.

4,006,789

SCALE FOR WEIGHING HOSPITAL PATIENTS IN THEIR HORIZONTAL POSITION

Frederick L. Stultz, Concord, and George C. Clark, Oakland, both of Calif., assignors to Acme Scale Company, Oakland, Calif.

Filed Jan. 21, 1976, Ser. No. 650,823

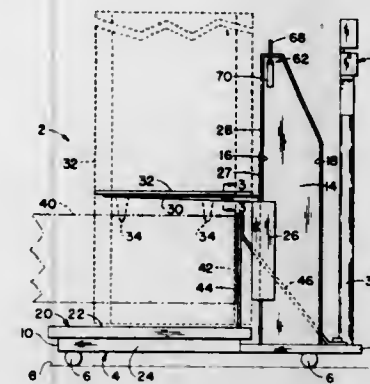
Int. Cl.² G01G 21/00, 19/00, 21/22

U.S. Cl. 177—126

17 Claims

1. A scale for weighing a patient in the horizontal position comprising: a support frame; a weighing mechanism carried by the support frame including a generally horizontally pro-

truding member connected to the weighing mechanism; a weigh-board; means connecting the weigh-board to the horizontal member for pivotal movement of the board about a horizontal axis between a first, horizontal position and a second, vertical storage position; means for retaining the weigh-board in the vertical position including stop means positioned to engage a portion of the weigh-board for preventing pivotal



movement of the weigh-board about said horizontal axis past its vertical position, said stop means comprising a locking member defined by a protrusion and means for selectively moving the protrusion into and out of engagement with the weigh-board when the weigh-board is in its vertical position to thereby selectively lock the weigh-board in its storage position while the board is not in use.

4,006,790

ELECTROMAGNETIC GUIDANCE SYSTEM

Shigeyoshi Kawano, Hitachi, Ltd.; Hisao Hanamura, and Masayoshi Sunada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

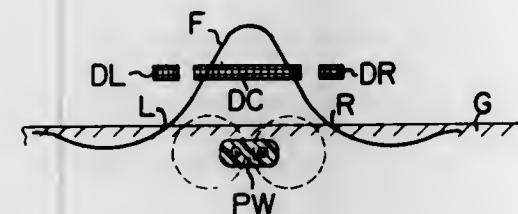
Filed Jan. 8, 1975, Ser. No. 539,424

Claims priority, application Japan, Jan. 11, 1974, 49-5979; July 8, 1974, 49-77271

Int. Cl.² B60K 27/06

U.S. Cl. 180—98

10 Claims



1. An electromagnetic guidance system comprising two conductors disposed parallel and closely adjacent to each other and laid down in a predetermined pattern; means for connecting the two conductors in series with each other; means for supplying current for the conductors; and means for detecting magnetic field induced by the current, wherein a desired apparatus is controlled to be guided along the conductors according to the output of the detecting means, and wherein the two conductors are vertically parallel to each other.

4,006,791

DEVICE FOR REGULATING THE TRAVELING SPEED OF A MOTOR VEHICLE

Joachim Feldmann, Helstorf; Arnold Mann, Bieber, and Ludolf Heimbach, Frankfurt, all of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

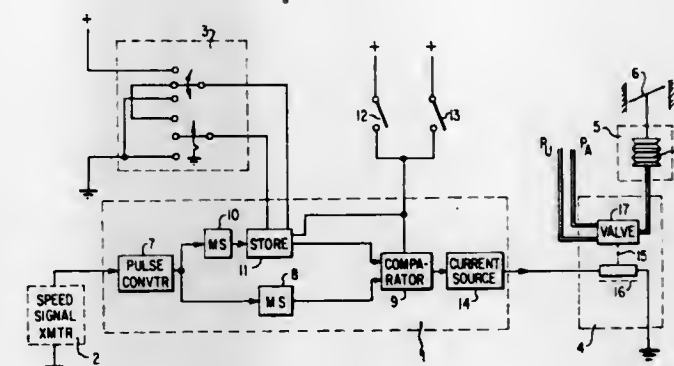
Filed Nov. 4, 1974, Ser. No. 520,782

Claims priority, application Germany, Nov. 9, 1973, 2356012

Int. Cl.² B60K 31/00

U.S. Cl. 180—108

9 Claims



1. In a device for regulating the traveling speed of a motor vehicle, comprising:

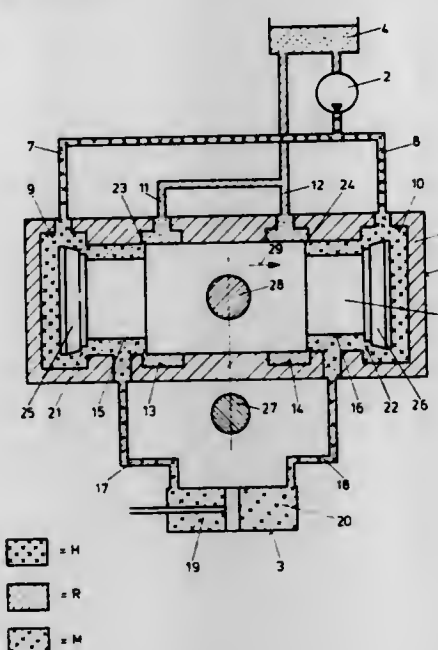
- A. an electric regulator means acted upon by a speed-responsive signal for comparing the prevailing traveling speed with a prespecified desired traveling speed and, in the case of a deviation of the actual traveling speed from the prespecified one, for emitting an error signal proportional to the deviation variable,
- B. a pneumatic adjusting drive means for acting upon an element affecting the ratio between fuel and air in the fuel-air mixture fed to the motor vehicle engine, and
- C. a control stage means controlled by a signal emitted by the regulator means for controlling the drive means by means of air pressure, the improvement wherein the control stage means comprises:
 - D. a first source of air at a first pressure,
 - E. a second source of air at a second pressure,
 - F. a chamber of selectively variable air pressure pneumatically connected to operate the adjusting drive,
 - G. a first valve seat in fixed interposition between the first source of air and the chamber,
 - H. a second valve seat situated between the second source of air and the chamber and arranged to be displaceable from or toward the first valve seat,
 - I. first and second valve plug means for respectively checking air flow past the first and second valve seats, said valve plug means being rigidly connected to one another, and
 - J. electromagnetic means responsive to the error signal for moving the second valve seat in either of two directions from an equilibrium position for unseating only the first valve plug when moving in one direction, for unseating only the second valve plug when moving in the other direction, and for unseating neither valve plug when in the equilibrium position, whereby air flow past the valve seats when needed to change the pressure of the chamber, but substantially no air flows past the valve seats when the pressure of the chamber is correct.

4,006,792

STEERING SYSTEM WITH AUXILIARY POWER ASSIST
 Albert Bundschuh, Waldstetten, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany
 Filed Oct. 29, 1975, Ser. No. 626,771
 Int. Cl.² B62D 5/08

U.S. Cl. 180-143

5 Claims



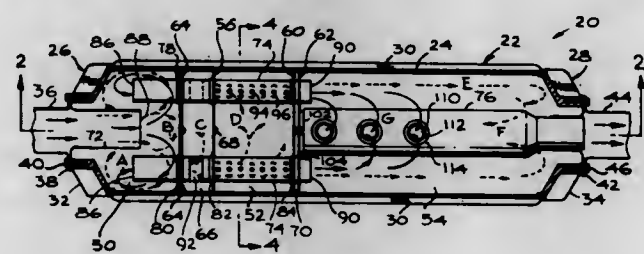
1. In combination with a vehicle steering system having an engine driven servo pump (2 or 102) supplying fluid at a flow rate that is an inverse function of engine speed above a predetermined value, at least one control valve (5 or 105) through which the fluid is supplied to a servo motor (3), a torsion spring connected to the control valve for resisting displacement thereof with an increasing bias (27 or 127) and means (28) to which a manual effort is applied for displacing the control valve against the bias of said torsion spring, the improvement including flow regulating surface means (25, 26, or 125, 126) formed on the control valve for varying the output flow rate to the servo motor as a function of displacement of the control valve, whereby the manual effort required to meet increasing steering resistance at engine speeds above said predetermined value increases more rapidly than the increase in the steering effort at engine speeds below said predetermined value.

4,006,793

ENGINE MUFFLER APPARATUS PROVIDING ACOUSTIC SILENCER
 Joseph D. Robinson, 1209 159th St., Gardena, Calif. 90247
 Filed Nov. 14, 1975, Ser. No. 631,866
 Int. Cl.² F01N 1/08

U.S. Cl. 181-53

28 Claims



1. An exhaust muffler apparatus for internal combustion engines and the like, which comprises:
 a. an elongate, tubular housing having a central portion and upstream and downstream end portions,
 b. first and second transverse wall means for internally dividing the housing longitudinally into a first upstream chamber, a second central chamber and a third downstream chamber;
 c. an exhaust inlet duct extending through the upstream housing end portion into the first chamber, the duct having open upstream and downstream end portions.

d. an exhaust outlet duct extending through the downstream end portion into the third chamber, the outlet duct having an open downstream end portion and having at least one inlet opening formed in an upstream portion thereof disposed in the third chamber; and
 e. at least one elongate, internal duct longitudinally disposed within the housing, the internal duct being laterally displaced out of alignment with the inlet and outlet ducts and being open at both ends and extending through the first and second wall means into the first and third chambers and entirely through the second chamber, the upstream end of the internal duct being positioned upstream of the downstream end of the exhaust inlet duct and the downstream end of the internal duct being positioned downstream from the upstream end of the exhaust outlet duct, the internal duct including means defining a number of expansion nozzle apertures in the portion of the duct disposed within the second chamber.

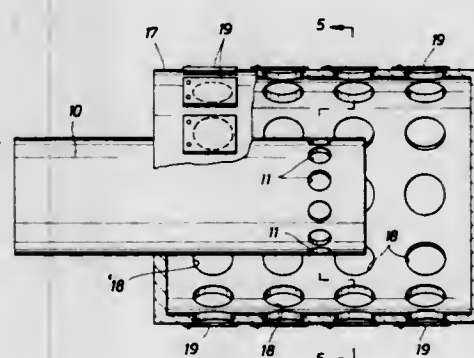
4,006,794

SEISMIC PNEUMATIC ENERGY SOURCE WITH FLAP VALVES FOR ATTENUATION OF BUBBLE PULSE AMPLITUDE AND REDUCTION OF PERIOD OF BUBBLE OSCILLATION

Oswald Alfonso Itria, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.
 Division of Ser. No. 411,986, Nov. 1, 1973, Pat. No. 3,923,122, which is a continuation of Ser. No. 220,940, Jan. 26, 1972, abandoned. This application Aug. 25, 1975, Ser. No. 607,307
 Int. Cl.² G01V 1/38

U.S. Cl. 181-115

14 Claims



1. A method for attenuating the amplitude and reducing the period of bubble pulses resulting from a primary seismic energy pulse generated by a rapid expansion of gases underwater from an air gun having a single row of perforations therearound mounted inside of a body having a multiplicity of rows of perforations therein comprises the steps of,
 a. aligning the air gun single row of perforations between two of the rows of perforations in the body,
 b. generating with the air gun an expanding gas bubble around the body, and
 c. preventing any portion of the generated gas bubble from contracting into the body for attenuating the sudden contraction and collapse of the gas bubble.

4,006,795

MEANS FOR SEISMIC PROSPECTING FROM BULK LIQUID CARRIERS

Nigel A. Anstey, Sevenoaks, England, assignor to Seiscom Delta Inc.

Filed Apr. 27, 1972, Ser. No. 248,023
 Claims priority, application United Kingdom, Apr. 28, 1971, 11952/71

Int. Cl.² G01V 1/14

U.S. Cl. 181-121

2 Claims

1. A seismic system for exploration of geological features beneath a body of water from a bulk liquid carrier having liquid containing cargo tanks comprising:

4,006,797

CAM ACTUATED LUBRICATION PUMP

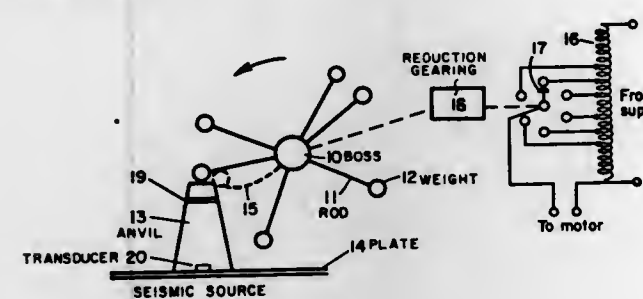
Frank E. Keske, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 15, 1975, Ser. No. 577,810

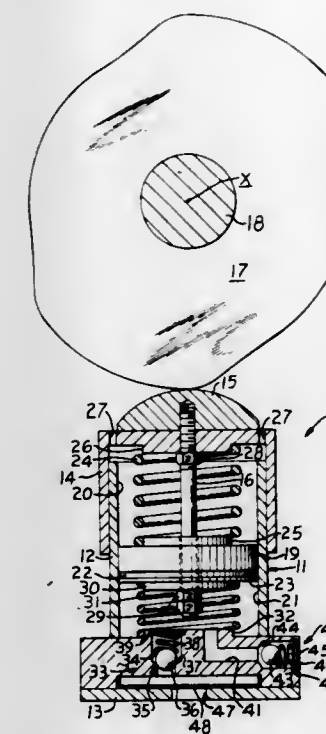
Int. Cl.² F16N 13/10

U.S. Cl. 184-27 R

9 Claims



d. means for mounting said anvil means with the ship so that the impact of said weight means on said anvil means is transmitted into the body of water;
 e. means for increasing the period of repetitive impacts in the periodic cycle; and
 f. array means mounted in a cargo tank of the ship for sensing a seismic reflection signal returned from the geological strata.



1. A pump adapted for use in a lubrication system comprising
 a housing,
 a cup-shaped member reciprocally mounted on a first end of said housing,
 a rod fixedly secured to said member and disposed internally thereof,
 a piston reciprocally mounted on said rod to define a pair of isolated and expansible first and second chambers on either side thereof,
 first compression spring means disposed in said first chamber between said piston and said member and second compression spring means disposed in said second chamber between said piston and said housing,
 inlet means, including normally closed first valve means, for communicating fluid into said second chamber upon expansion thereof in response to reciprocal movement of said piston in a first direction and
 outlet means, including normally closed second valve means, for communicating pressurized fluid from said second chamber and exteriorly of said pump upon contraction of said second chamber in response to reciprocal movement of said piston in a second direction opposite to said first direction,
 said pump being operable to automatically limit fluid flow through said second valve means when the combined pressure of the fluid and the spring in said second chamber equals the compression force of the spring in said first chamber.

4,006,798

DRIVE-UP SERVICE ARRANGEMENT FOR BANKS, AND THE LIKE

Fred W. De Mund, Box 612, Morgantown, W. Va. 26505
 Filed Mar. 29, 1976, Ser. No. 671,714

Int. Cl.² E04H 3/04

U.S. Cl. 186-1 C

12 Claims

1. An extensible chain arrangement of personnel enclosures comprising a plurality of interconnected cell modules, a first module of said chain securely attachable to a building proper and including passageway therebetween, additional ones of said modules being successively and securely attached to said first module and to each other to thereby form said chain

4,006,796

EARPIECE WHICH SUBSTANTIALLY CONSISTS OF A THIN-WALLED FLEXIBLE CAPSULE FILLED WITH A LIQUID MEDIUM

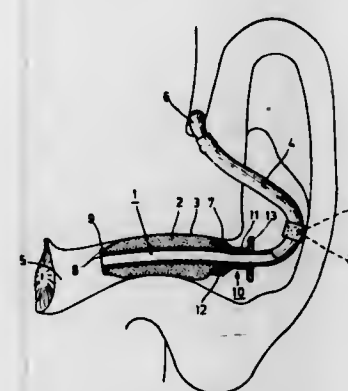
Robert Francois Coehorst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 529,339, Dec. 4, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 533,245
 Claims priority, application Netherlands, Dec. 21, 1973, 7317546; Dec. 4, 1974, 7415788

Int. Cl.² H04R 25/02; A61B 7/02

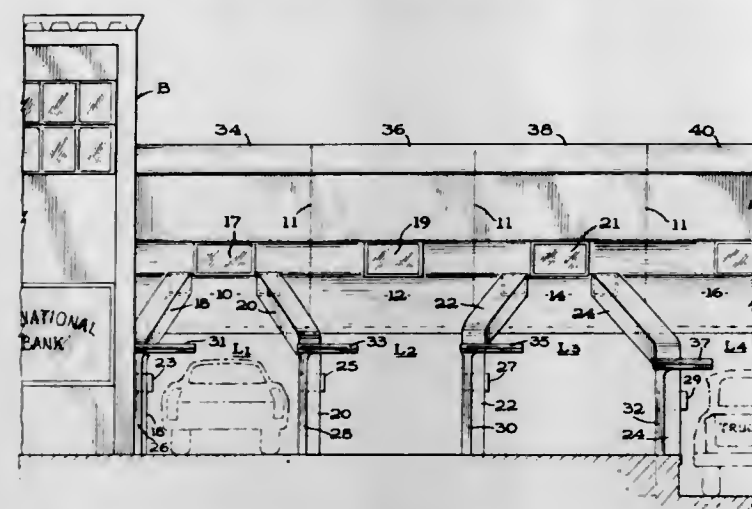
U.S. Cl. 181-130

17 Claims



1. An earpiece comprising, an oblong thin-walled flexible container made of a plastic foil filled with a jelly-like paste material and having an acoustic duct extending therethrough in the longitudinal direction, and a flexible plastic tube which is less pliant than the plastic foil container and is located in the acoustic duct and is adapted for acoustically coupling the duct to a hearing aid, said container being disposed around and at one end of the plastic tube.

including passageway therethrough, and means supporting said chain above ground level whereby a plurality of motor vehicle lanes are formed for passage of vehicles thereunder, with at least one of said modules being equipped with a con-



veyor means extending forwardly and down to ground level whereby transactions may be carried out between at least one of said modules and occupants of vehicles in separate lanes at ground level.

4,006,799

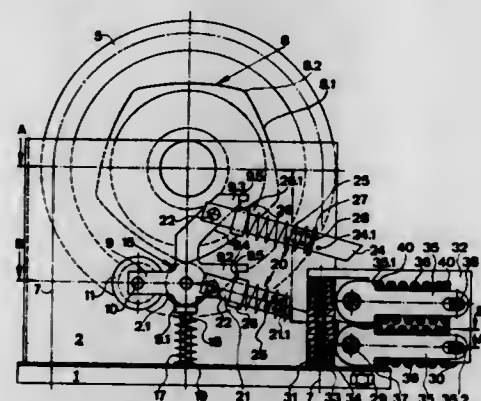
SPEED LIMITING DEVICE FOR LIFTS OR THE LIKE
Heinrich Binder; Rudolf Glawion; Ernst Gruessy, all of Lucerne; Peter Hitz, Ebikon; Kurt Oetterli, Eschenbach; Hans Seidl, Ebikon, and Hans Stoeckli, Emmenbrücke, all of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland
Filed June 20, 1975, Ser. No. 588,940

Claims priority, application Switzerland, June 24, 1974, 8610/74

Int. Cl.² B66B 5/04

U.S. Cl. 187—38

6 Claims



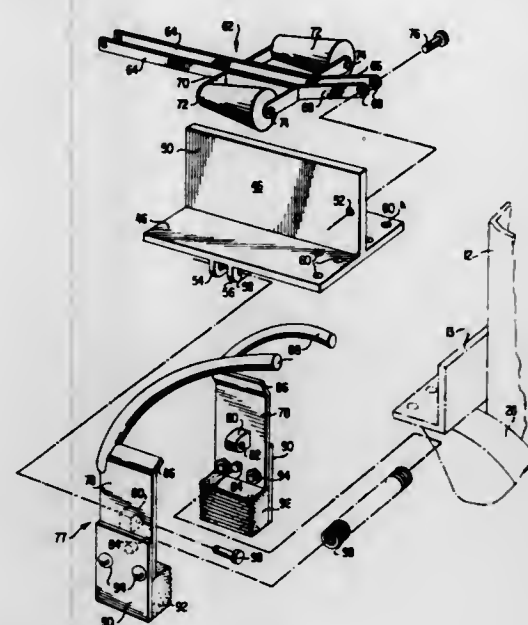
1. A speed limiting device for lifts or the like including a lift cabin, comprising a limiter cable attachable to the lift cabin, a cable wheel drivable by means of the limiter cable, a shaft, a cam disk fixedly connected with the cable wheel and seated together with said cable wheel upon said shaft, a support which is moved by said cam disk, a separate cable brake acting upon the limiter cable, actuation means which upon activating the separate cable brake is actuated with a tilting action, said actuation means possessing at least one mass body which is accelerated substantially proportionally to the lift travel speed by the support when the cam disk rotates, said mass body upon exceeding a predetermined travel speed being movable relative to the support under the action of the inertia forces for releasing the actuation means, a bearing plate, said support comprising a single-arm lever rotatably mounted in said bearing plate, said lever being branched at one end thereof to form an upper branched portion and a lower branched portion, each branched portion being provided with an inclined portion and a notch, a roller rotatably mounted at said lever, and spring means for pressing said roller against the periphery of the cam disk.

4,006,800
LEVER ACTUATED BRAKE ASSEMBLY
Jack Peters, 24008 Bessemer St., Woodland Hills, Calif. 91364, and DeLoris Joan Barrett, 6206 Satsuma Ave., North Hollywood, Calif. 91606
Continuation-in-part of Ser. No. 486,704, July 8, 1974, Pat. No. 3,945,472. This application Mar. 15, 1976, Ser. No. 666,542

Int. Cl.² F16D 55/228

U.S. Cl. 188—72.7

9 Claims



1. A brake apparatus, comprising:
a first pivoted lever;
means for transferring force from said first pivoted lever at a steadily increasing distance from said first pivoted lever as said brake apparatus is applied;
at least one pivoted brake lever;
at least one brake shoe supported by said at least one pivoted brake lever;
means responsive to the pivoting of said first pivoted lever for applying a force from a first point which moves relative to the pivot of said first pivoted lever in a direction to increase the mechanical advantage of said first pivoted lever, to a second point which moves relative to the pivot of said at least one pivoted brake lever to concurrently increase the mechanical advantage of said at least one pivoted brake lever, whereby pivoting said first pivoted lever to apply braking force produces a continuous change in the effective length of both levers and a continuous increase in the mechanical advantage of both said first pivoted lever and said at least one pivoted brake lever.

4,006,801
AUTOMATIC SLACK ADJUSTERS FOR VEHICLES
John Patrick Bayliss, Redditch, England, assignor to Girling Limited, Birmingham, England
Filed Sept. 30, 1975, Ser. No. 618,226
Claims priority, application United Kingdom, Oct. 16, 1974, 44743/74

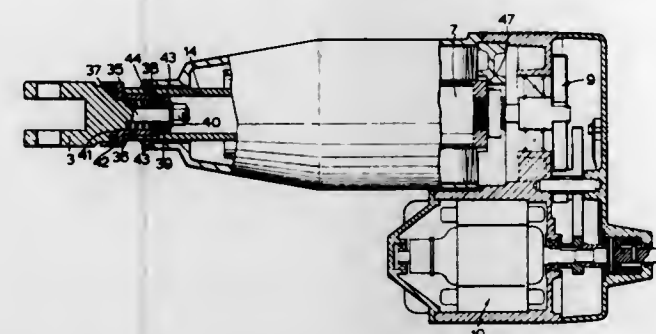
Int. Cl.² F16D 65/56

U.S. Cl. 188—196 BA

10 Claims

1. Vehicle brake applying means comprising a load transmitting assembly for transmitting a brake applying force from an actuator to a braking mechanism, and adjuster means for increasing automatically the effective length of said load transmitting assembly to maintain braking clearances at a constant value, said load transmitting assembly incorporating first and second parts which are relatively movable in an axial direction between an advanced position in which the sum length of said parts is at a maximum value and a retracted position in which the sum length of said parts is at a minimum value shorter than the maximum value, a first pair of abutment

surfaces being in engagement in said advanced position and being spaced apart in said retracted position, and a second pair of abutment surfaces being spaced apart in said advanced position and being in engagement in said retracted position, and resilient means acts between said first and second parts normally to urge said first and second parts into said advanced position to take up slack and maintain friction pads of a braking mechanism spaced from a rotatable braking member by a



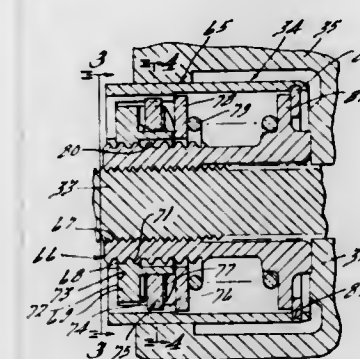
distance comprising said braking clearances determined by said adjuster means, said resilient means being overcome after said braking clearances have been taken up on each brake applying movement and the resistance is greater than the loading of said resilient means whereafter the sum length of said parts reduces to the said minimum value and the brake applying force is transmitted to said braking mechanism through an engagement between said second pair of abutment surfaces.

4,006,802
AUTOMATIC ADJUSTOR FOR A BRAKE MECHANISM
Anthony C. Evans, Westland, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 446,735, Feb. 28, 1974, Pat. No. 3,934,684. This application Oct. 21, 1975, Ser. No. 624,549
Int. Cl.² F16D 65/56

U.S. Cl. 188—196 D

5 Claims



1. An automatic adjuster for a disk brake assembly or the like comprising a housing adapted to be received in a piston of an associated brake, a threaded member rotatably supported within said housing, said threaded member having internal threads adapted to engage an externally threaded member and external threads of a different pitch from said internal threads, a drive ring rotatably positioned within said housing and having a threaded connection with said external threads of said threaded member, means for transferring an axial force from said housing to said drive ring for differential thread rotation of said threaded member upon axial movement of said housing relative to said threaded member, and one-way brake means interposed between said drive ring and said housing for limiting the degree of reverse rotation of said threaded member upon return action of the associated brake.

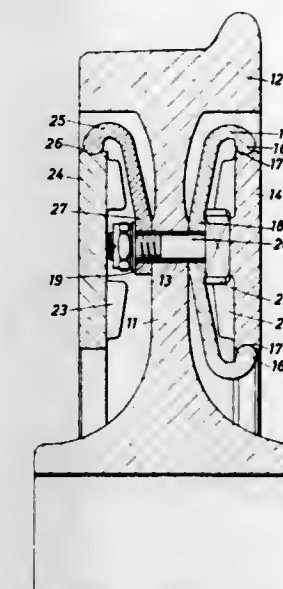
4,006,803
WHEEL WITH BRAKE DISCS FOR RAIL VEHICLES
Willi Klein, Remscheid; Henning Rocholl, Radevormwald; Hermann-Josef Feldhoff, and Alfred Otto, both of Remscheid, all of Germany, assignors to Bergische Stahl-Industrie, Remscheid, Germany

Filed July 11, 1975, Ser. No. 595,230

Int. Cl.² F16D 65/12

U.S. Cl. 188—218 XL

3 Claims



1. A rail vehicle wheel, having a radially outer rim and a central hub and also comprising wheel disc means interconnecting said hub and said rim, which includes: brake disc means having an inner and an outer circumference and arranged at least on one side of said wheel disc means, that side of said brake disc means which faces said wheel disc means being provided with radially extending cooling fins, force transmitting means interposed between said wheel disc means and said brake disc means for transmitting forces acting upon said brake disc means onto said wheel disc means, preloaded elastically deformable holding means connected to said wheel and holding under pre-load at least one of said inner and outer circumferences of said brake disc means, said holding means including clamping means positively connected to said wheel disc means, and bolt means connecting said clamping means to said wheel disc means and having a head with radial surfaces which is located between said clamping means and the respective adjacent brake disc means, said last mentioned disc means having that side thereof which faces the respective adjacent bolt head provided with a groove having radial and axis-parallel surfaces engaged by said radial surfaces of said bolt head.

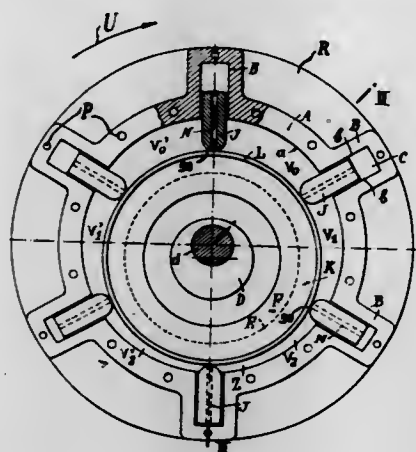
4,006,804
ELECTROMAGNETICALLY-ACTUATABLE ROTARY VANE PUMP FOR USE AS A HYDRAULIC BRAKE
Henri Fehr, Montmorency, France, assignor to Compagnie de Construction Mécanique Sulzer, Paris, France
Filed Apr. 21, 1975, Ser. No. 569,787
Claims priority, application France, Apr. 29, 1974, 74.14846; July 18, 1974, 74.25010
Int. Cl.² F16D 57/02, 57/06

U.S. Cl. 188—293

11 Claims

1. A rotary vane pump, comprising a rotor housing filled with a braking fluid, a stator eccentrically arranged within the rotor housing, said stator possessing a constant eccentricity with respect to the rotor housing, a plurality of radially displaceable sliding vanes disposed within the rotor housing, each sliding vane having a longitudinal edge coacting with the stator, each two successive sliding vanes forming therebetween a working chamber, the braking fluid in the working chambers to each side of each sliding vane being at different pressures during operation, means for electromagnetically

actuating said sliding vanes to enable said rotary vane pump to function as a hydraulic brake, said electromagnetically actuating means comprises an excitation winding carried by said stator, the flow of an excitation current through said excitation winding producing an electromagnetic force acting upon said sliding vanes, and wherein said electromagnetic force can be adjusted by varying the current intensity of the current



flowing-through said excitation winding, each said longitudinal edge being configured such that fluid passing thereunder forms a fluid wedge for exerting a braking effort upon the rotor housing, said fluid wedge having a thickness governed by the electromagnetic force and the pressure differential developed between two neighboring working chambers adjacent the associated sliding vane.

4,006,805

CLUTCHES WITH BYPASS INCHING VALVE

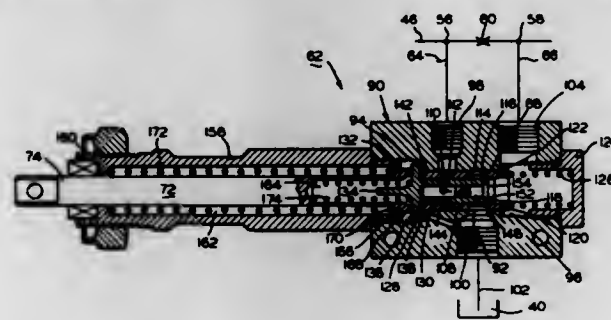
Burton S. Zeller, and Ronald L. Sisson, both of Jackson, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed June 30, 1975, Ser. No. 591,570

Int. Cl.² B60K 29/02

U.S. Cl. 192—4 A

10 Claims



1. In a hydraulic control system for a vehicle, including brake means, comprising first hydraulic passage means connecting a source of pressure fluid to fluid actuated frictional engaging means, said source being provided with pressurizing means for providing pressurized fluid in an amount proportional to the speed of the engine of said vehicle, and a bypass type inching valve system connected and parallel with said first hydraulic passage means for selectively manually reducing the hydraulic pressure supplied into said frictional engaging means in proportion to the degree of actuation of said brake means, said bypass type inching valve system including a fluid flow constricting means disposed within said first passage means and an inching valve, said inching valve comprising:

- an elongated valve body forming a first bore therein with a closed end, said body having inlet, outlet and drain ports in said body which communicate with said first bore;
- first conduit means connecting said inlet port with said first hydraulic passage means upstream from said fluid flow constricting means;

- second conduit means connecting said outlet port with said first hydraulic passage means downstream from said fluid flow restricting means;
- sleeve spool means forming a second bore therein retained within said first bore and having a first annular groove with first radial apertures aligned with said inlet port, said sleeve spool means also having a second annular groove with second radial apertures aligned with said drain port;
- regulating spool means, actuatable between a first and a second position, disposed within said first bore, said regulating spool means having a flange portion which, in the first position of said inching valve, abuts one annular end surface of said sleeve spool means, said regulating spool means also having a cylindrical annular portion, depending from one side of said flange portion and forming a third bore therein open on one end, slidably disposed within said second bore, with an outer end portion of said cylindrical annular portion, in said first position, closing off the communication between said second bore and said drain port, said cylindrical annular portion also having a third annular groove with third radial apertures therein substantially aligned with said first radial apertures in said first position;
- first means for biasing said regulating spool means to said first position;
- actuating means, operatively connected with said brake means for overcoming said first biasing means and permitting said regulating spool means to move to said second position; and
- second means for biasing, interposed between said regulating spool means and said actuating means, tending to balance the forces exerted on said regulating spool means by the pressure fluid, said actuating means also progressively decreasing the force of said second biasing means as the degree of actuation of said brake means is increased, whereby when said regulating spool means is in said first position, the pressure fluid can freely flow into, through and out of said inching valve and effectively bypass said fluid flow constricting means, however, in said second position, the fluid flow through said third annular groove is blocked and thereafter said drain port is progressively opened thereby regulating the force of the pressure fluid acting on said regulating spool means, and the pressure fluid is forced to flow solely through said fluid flow constricting means.

4,006,806

TWO-SPEED CLUTCH AND BRAKE SYSTEM

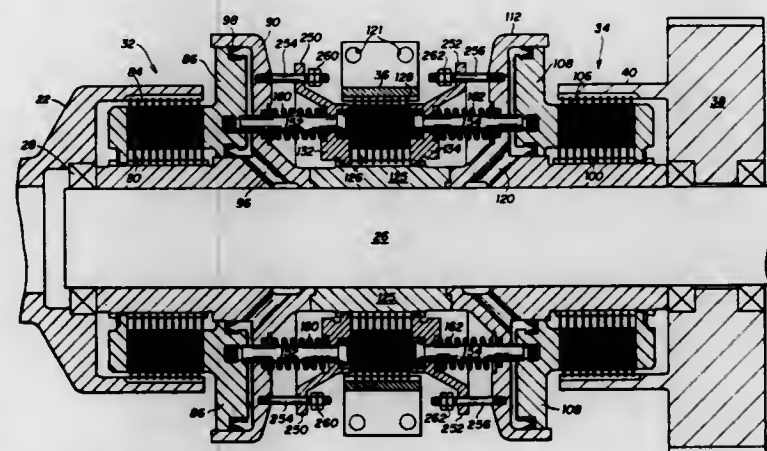
Jene A. Beneke, Parker, Tex., assignor to Verson Allsteel Press Company, Dallas, Tex.

Division of Ser. No. 454,271, March 25, 1974, Pat. No. 3,896,911. This application Dec. 26, 1974, Ser. No. 536,547

Int. Cl.² F16D 67/04

U.S. Cl. 192—18 A

9 Claims



1. A clutch system comprising:
 - a rotatable shaft,
 - a low speed clutch assembly including friction clutch surfaces mounted about said shaft,

a high speed clutch assembly spaced from said low speed clutch assembly and including friction clutch surfaces mounted about said shaft, a brake assembly disposed between said low and high speed clutch assemblies and including a plurality of friction surfaces mounted about said shaft, a stationary housing mounted about said brake assembly, and brake friction surfaces engaging said housing to brake said shaft when said clutch assemblies are disengaged, means for selectively engaging either of said clutch assemblies, means for maintaining the engagement of said brake assembly for a predetermined increment of time during the initial engagement of either of said clutch assemblies, means for disengaging said brake assembly after said predetermined interval of time to enable rotation of said shaft, and a mechanical stop having an adjustable effective length for selectively varying said predetermined increment of time.

4,006,807

POWER TRANSFER MECHANISM

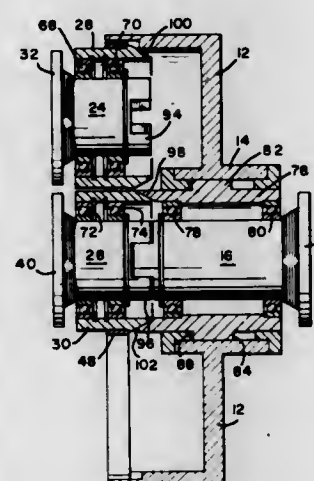
Carl Franklin Back, Orrville, Ohio, assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 18, 1976, Ser. No. 659,134

Int. Cl.² F16D 21/02, 25/10

U.S. Cl. 192—48.9

4 Claims



1. In a power transfer mechanism: a housing; an output shaft support plate mounted to move translationally within the housing; a pair of output shafts mounted in said translationally movable plate for movement therewith; an input shaft mounted in said housing; a rotatable clutch member connected to each output shaft and a rotatable clutch member connected to the input shaft; and means for selectively coupling the clutch member of the input shaft with either of the output shaft clutch members.

4,006,808

CONTROLS FOR A CENTRIFUGAL FLUID CLUTCH

James G. Starling; Jay J. Walt, and Craig W. Riediger, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 27, 1975, Ser. No. 581,007

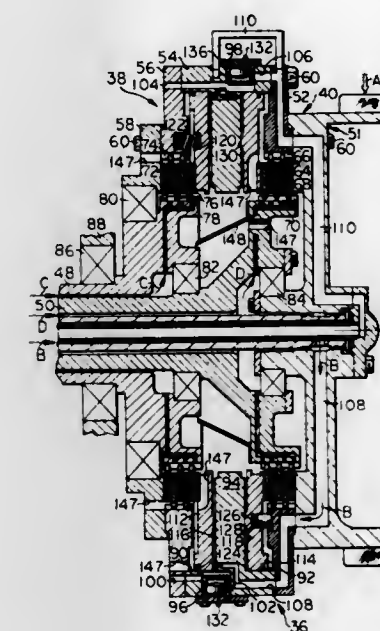
Int. Cl.² F16D 43/284

U.S. Cl. 192—103 FA

8 Claims

1. A control system, for a rotating clutch having a rotating housing with a cavity adapted to axially slidably receive a clutch actuating piston therein and defining a clutch actuating chamber therebetween, comprising: a source of fluid; a control valve for infinitely variably supplying said fluid through a path in the rotating housing to such clutch actuating chamber so that the clutch actuating piston is biased in a direction to engage the clutch; passage means in said rotating housing including a radially

disposed bore of a predetermined cross sectioned area disposed in fluid communication with said clutch actuating chamber and said path, and including a fluid exhaust passage connecting therewith; and differentially sensitive centrifugal valve means including a relief piston slidably mounted in said bore and biased radially outwardly by centrifugal force and by the fluid



pressure in said clutch actuating chamber acting on said cross sectional area for relieving fluid from said clutch actuating chamber to said exhaust passage, and including a reaction slug disposed within said relief piston and providing an effective cross sectional area less than said predetermined area in communication with fluid pressure in said path which biases said piston radially inwardly.

4,006,809

OIL-IMPREGNATED SINTERED CLUTCH HUB

Hiroshi Selno, Yokohama; Norio Yamada, Yokosuka; Shigeo Kimura, Fujisawa; Hildeaki Kosugi, and Koreyuki Yamamoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

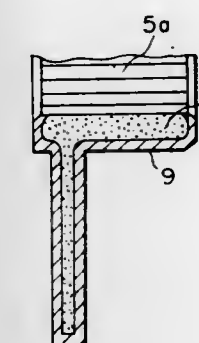
Division of Ser. No. 380,137, July 18, 1973. This application Jan. 8, 1976, Ser. No. 647,635

Claims priority, application Japan, July 19, 1972, 47-71573

Int. Cl.² F16D 13/74

U.S. Cl. 192—106.2

3 Claims



1. A clutch hub of a sintered metal powder, comprising a cylinder with a splined axial bore and a generally disk-shaped extension extending radially from the outer surface of said cylinder, said cylinder having an oil-impregnated layer forming a portion of said cylinder contiguous to the inner surface thereof defining said splined bore and a resin-impregnated layer forming the remaining portion of said cylinder contiguous to the outer surfaces thereof and said oil-impregnated

layer, said extension having a resin-impregnated layer forming a portion of said extension contiguous to the surfaces of extension; whereby a movement of oil, outward and away from said oil-impregnated layer, due to centrifugal forces caused by the rotation of said clutch hub is prevented.

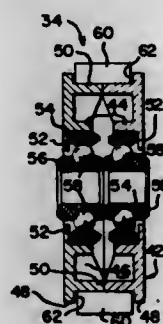
4,006,810

RESILIENT CONVEYOR ROLLERS

Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio
Continuation of Ser. No. 385,502, Aug. 1, 1973, abandoned, which is a continuation of Ser. No. 220,151, Jan. 24, 1971, abandoned. This application Mar. 31, 1976, Ser. No. 672,235
Int. Cl.² B65G 13/00

U.S. Cl. 193—37

3 Claims



1. A gravity undriven roller conveyor, comprising: a stationary inclined rigid conveyor support; a plurality of substantially identical idler conveyor rollers serially arranged in a conveying direction downwardly along said inclined conveyor support; bearing means freely rotatably mounted each of said conveyor rollers on said conveyor support with parallel axes of rotation in a common inclined plane, said axes being perpendicular to said conveying direction down said inclined plane for supporting loads on said conveyor rollers and conveying loads from the top of said inclined conveyor support to the bottom of said inclined support solely by gravity; each of said rollers having a rigid wheel including an outer annular bearing surface concentric with its axis of rotation and a pair of axially spaced flanges integrally extending radially outwardly from axially opposed sides of said outer annular bearing surface; an annular tire of elastomeric material freely mounted on each wheel between said flanges and normally being of less axial width throughout its thickness than the corresponding axial space between said flanges; said tire having an inner annular bearing surface of complementary shape with said wheel outer bearing surface and being mounted on said wheel for free axial and circumferential relative movement between said inner and outer bearing surfaces of said tire and wheel respectively; said tire having a radial thickness greater than the radial depth of said flanges; said elastomeric material of said tire having an elastic limit by which it acquires a permanent deformation when radially compressed; and said flanges being of a radial depth relative to the radial thickness of said tire to completely receive the elastomeric material of the tire and directly engage a load being conveyed before the elastic limit of said elastomeric material is reached under radial compression by the load being conveyed.

4,006,811

REVERSING DEVICE FOR THE LONGITUDINAL ADVANCE OF A RIBBON OF TYPE PRINTERS

Andreas Metachnabl, Nurnberg, and Gottfried Burkhardt, Winkelhaid, both of Germany, assignors to D I E H L datensysteme GmbH, Nurnberg, Germany

Filed Dec. 2, 1975, Ser. No. 636,912

Claims priority, application Germany, Dec. 3, 1974, 2456989

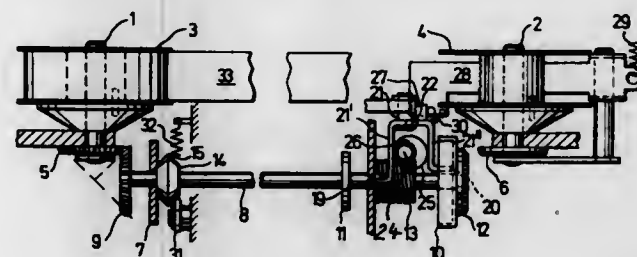
Int. Cl.² B41J 33/512

U.S. Cl. 197—161

2 Claims

1. A reversing device for the longitudinal advance of a

ribbon on type printers for the alternating drive of two reels, which includes: two stationarily journaled shafts adapted to receive and to be coupled to a reel for receiving and supporting a ribbon, two first gears respectively rotatably connected to said shafts, a feed shaft, two second gears fixedly connected to said feed shaft and operable alternately in response to an axial displacement of said feed shaft in one or the other axial direction thereof to drivingly and alternately selectively engage one and the other one of said second gears, a first lever forming a feeler lever and adapted to be controlled by a ribbon on one of said reels, a second lever controllable by said first lever, a first guiding member in the form of a slot defining element, a second guiding member in the form of a pin and extending into said slot, one of said members forming a part of said second lever and the other member being stationarily



arranged, a rotatable shaft journaled stationarily and continuously drivingly connected to said feed shaft, an eccentric keyed to said last mentioned rotatable shaft for rotation therewith, said second lever being displaceable substantially perpendicularly with regard to the longitudinal axis of said feed shaft and substantially parallel to the longitudinal axis of said feed shaft by means of the first and second guiding members and said eccentric so as to form a pendulum lever, said pendulum lever comprising a pin engageable by said feeler lever for bringing about a longitudinal movement of said pendulum lever and also comprising two first spaced abutment means, and said feed shaft being provided with two second abutment means, said first abutment means alternately engaging one of said second abutment means for axially and alternately displacing said feed shaft in one and the opposite direction.

4,006,812

AUTOMATIC FEEDING HOPPER

George Everett, Unionville, and Michael Shapcott, Plainville, both of Conn., assignors to Zapata Industries, Inc., Frackville, Pa.

Continuation-in-part of Ser. No. 319,457, Dec. 29, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 532,186

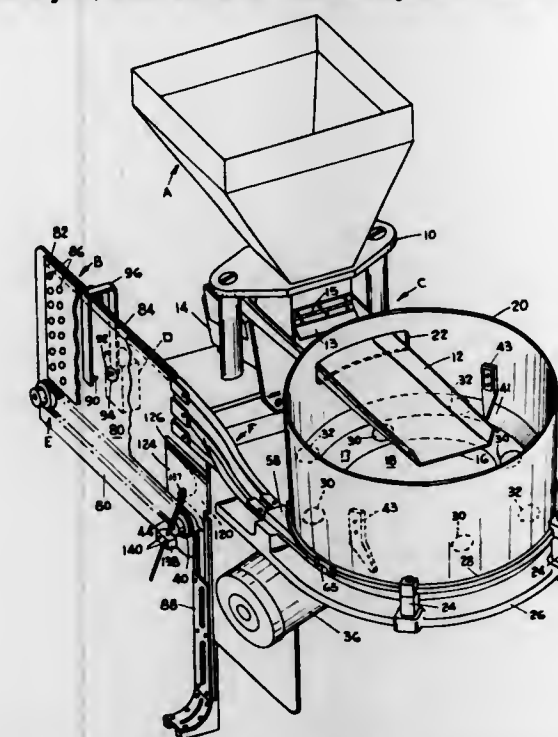
Int. Cl.² B65G 47/24

U.S. Cl. 198—347

16 Claims

1. A hopper for disk-like objects comprising a supply chute, a reservoir for storing the disk-like objects, the reservoir being dimensioned to receive a plurality of substantially horizontal rows of disk-like objects in a substantially vertical plane, feeding means intermediate the supply chute and the reservoir for feeding the disk-like objects to the reservoir, control means responsive to the level of disk-like objects in the reservoir connected to the feeding means to maintain a predetermined level of objects in the reservoir, a conveyor adjoining the reservoir for engagement with a substantial portion of the lowermost row of objects in the reservoir and for removing the disk-like objects from the reservoir, the disk-like objects being

caused by gravity to engage the conveyor, means for driving the conveyor, and an exit chute adjacent the conveyor to



receive the disk-like objects in an aligned row from the conveyor.

4,006,813

ARTICLE SEPARATING AND CONVEYING SYSTEM
Rene Fluck, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

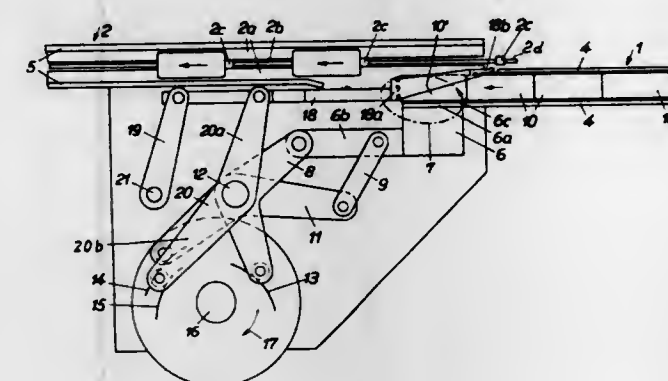
Filed July 9, 1974, Ser. No. 487,210

Claims priority, application Switzerland, July 9, 1973, 9964/73

Int. Cl.² B65G 47/26

U.S. Cl. 198—488

6 Claims



1. In a device for separating and conveying items, which device includes: an input conveyor for carrying a plurality of aligned items in end to end engagement; an output conveyor arranged for conveying items at a speed higher than that of the input conveyor, the output conveyor being disposed so that its item-receiving end is adjacent, and laterally overlaps, the item-delivery end of the input conveyor; a main pusher disposed adjacent the region of overlap of the two conveyors; and operating means connected to the main pusher for moving the main pusher in synchronism with the output conveyor in a manner to cause the main pusher to engage the foremost item on the input conveyor and to transfer the same to the output conveyor, the improvement comprising an additional, synchronizing pusher; means connected for driving said synchronizing pusher independently of the main pusher; said synchronizing pusher being disposed and driven for controlling the movement of that item with that of the main pusher; and means defining a guide piece carried by said synchronizing pusher and located in the region between said conveyors at

the lateral side of said input conveyor which is near said output conveyor; and wherein said synchronizing pusher further comprises a sensor arranged to be actuated whenever said synchronizing pusher comes in contact with the leading end of an item on said input conveyor in order to stop the drive for both said pushers when there is no item on said item-delivery end of said input conveyor.

4,006,814

APPARATUS FOR THE CONTINUOUS FEEDING OF PALLETIZED FIBER MATERIALS

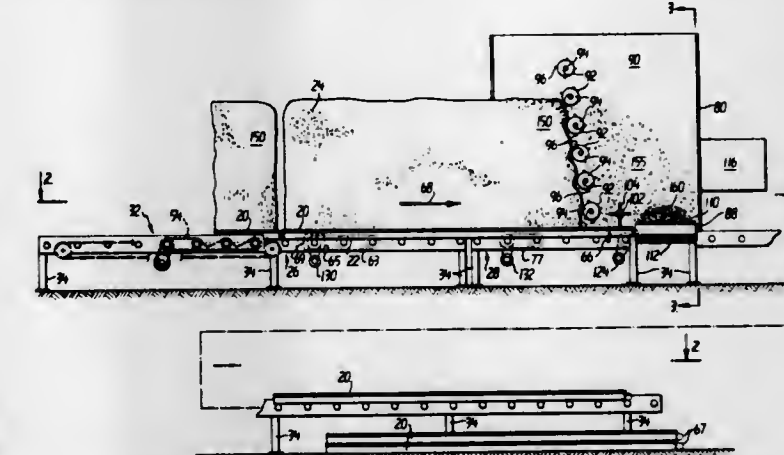
Lambert H. Wilkes; Gary L. Underbrink, both of College Station, Tex., and Joseph K. Jones, Raleigh, N.C., assignors to Cotton, Incorporated, New York, N.Y.

Division of Ser. No. 439,846, Feb. 6, 1974, Pat. No. 3,897,018. This application Apr. 17, 1975, Ser. No. 569,076

Int. Cl.² B65G 47/31

U.S. Cl. 198—577

4 Claims



1. Apparatus for handling fiber-laden pallets comprising: a generally horizontal bed means having a loading zone and a discharge zone and operable to support a pallet from the loading zone to the discharge zone; loading conveyor means positioned at the loading zone for translating a pallet at a first predetermined speed longitudinally along the generally horizontal bed means; means driving said loading conveyor means at said first predetermined speed; feed conveyor means carried by the generally horizontal bed means, and operable at a second predetermined speed, lower than said first predetermined speed, to translate a pallet at said second predetermined speed to the discharge zone; means driving said feed conveyor means at said second predetermined speed; transition conveyor means carried by said generally horizontal bed means between said loading and feed conveyor means for receiving a pallet from said loading conveyor and delivering it to said feed conveyor means; means selectively driving said transition conveyor means: at said first predetermined speed to translate a pallet from said loading conveyor into engagement with a preceding pallet being translated at said lower second predetermined speed by said feed conveyor means; and at said second predetermined speed to maintain said engaged pallets in engaged relationship; and endless chain means disposed longitudinally of said bed means operable to be engaged by a pallet for moving that pallet onto the bed means.

4,006,815

ARTICLE TRANSPORTING CONVEYOR

Charles W. Wertz, Ferguson, Mo., assignor to Alvey Inc., St. Louis, Mo.

Filed Nov. 11, 1974, Ser. No. 522,473

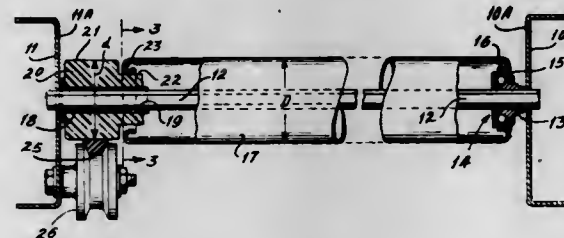
Int. Cl.² B65G 13/04, 13/071, 13/075

U.S. Cl. 198—781

4 Claims

1. An article transporting conveyor comprising spaced side

rails defining the sides of an article transporting path; a plurality of article supporting rollers extending between and of less length than the space between said side rails to make up an article conveying surface along the upper surfaces of said rollers; bearing means engaged in the ends of said rollers positioned adjacent one of said side rails; each of said rollers extending toward the opposite side rail and having an open end spaced from the opposite side rail and formed with an internal circular surface; drive transmission means operatively mounted at said opposite side rail and occupying the space between the open end of each roller and the opposite side rail and in axial alignment with the open ends of said rollers, each of said drive transmission means having a first cylindrical surface exposed in the space between said opposite side rail and the open ends of said adjacent article supporting rollers,



said first cylindrical surface being smaller in diameter than said rollers so as to be out of contact with the articles supported on said rollers which may substantially fill the space between said side rails, and each of said drive transmission means having a second cylindrical surface extending axially into and loosely engaged with said adjacent article supporting roller open end adjacent said internal circular surface, said second cylindrical surface of said drive transmission means being smaller than said internal circular surface; and a source of power frictionally engaged with said first cylindrical surfaces of said drive transmission means, whereby on article stoppage said article supporting rollers slip at said loosely engaged ends on said second cylindrical surface and accumulation of stopped articles causes slippage of said first cylindrical surfaces to limit load on said drive means.

4,006,816

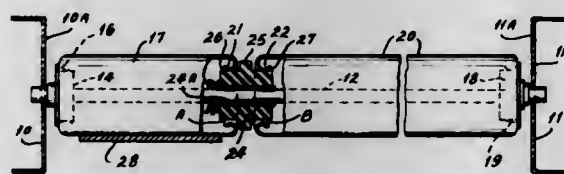
ARTICLE ANTISCAMBLING AND ACCUMULATING ROLLER CONVEYOR

Charles W. Wernitz, Ferguson, Mo., assignor to Alvey Inc., St. Louis, Mo.

Filed May 30, 1975, Ser. No. 582,206
Int. Cl.² B65G 13/07

U.S. Cl. 198—781

6 Claims



1. An article antiscrambling conveyor comprising: side rails in spaced relation; shafts extending between said side rails; an array of rollers carried by said shafts, certain of said array of rollers including first and second roller sections on the same shaft having the same diameter and being in position so that articles are supported by both sections, all of said first roller sections being adjacent one side rail and being of less length than said second roller sections as measured along said shafts, and said first and second roller sections having open ends in spaced facing relation; first drive means engaged with said first roller sections to drive the same and deliver direct inline propulsion to articles supported thereon for movement on the conveyor; and second drive means operatively supported on said shafts and having opposite ends engaging in said open ends of said first and second sections of said rollers simulta-

neously to transmit the propulsion of articles by said first roller sections to said second roller sections through said second drive means, said engagement of said roller sections with said second drive means being eccentric to provide a running clearance.

4,006,817

CONVEYOR CHAIN

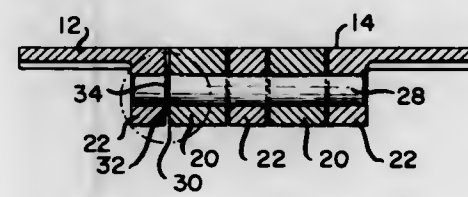
William T. Paul, Holyoke, Mass., assignor to Incom International Inc., Pittsburgh, Pa.

Continuation of Ser. No. 269,898, July 7, 1972, abandoned.
This application May 8, 1974, Ser. No. 467,969

Int. Cl.² B65G 15/30

U.S. Cl. 198—853

10 Claims



1. A conveyor chain comprising at least two pivotally connected links, each of said links comprising a flat body portion having a container carrying supporting face, two sets of at least two apertured ears projecting from an integral width of said flat body portion and on opposite sides thereof, said ears being spaced in side by side relation with respect to each other to interfit and align with the apertured ears of an adjoining link on the respective sides thereof, the apertures of said ears on each side of said flat body portion being in alignment, a grooved pin disposed in said aligned apertures of said interfitting ears, at least two of said ears being axially displaced to define an ear gap, said groove on said pin being in alignment with said ear gap, a holding ring means locked on said pin at said aligned apertures and thereby holding said pivotally connected links in operational position.

4,006,818

PACKAGING SHELL WITH HINGED BOTTOM WALL

Albrecht Leo Pieter Wannyn, Vught, Netherlands, assignor to Hamido B.V., 's-Hertogenbosch, Netherlands

Filed Nov. 21, 1973, Ser. No. 417,885
Claims priority, application Netherlands, Nov. 28, 1972, 7216142; Aug. 22, 1973, 7311587

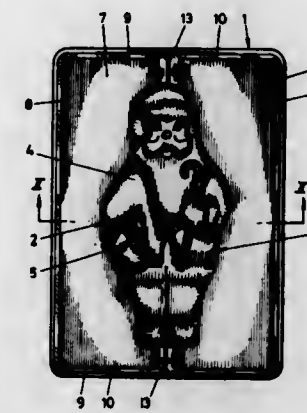
Int. Cl.² B65D 1/34

U.S. Cl. 206—564

12 Claims

1. A package for an article having a peripheral edge in any desired shape, said package comprising a shell formed from a film and including a recess formed in one face of said shell for receiving the article therein, said recess including a bottom wall and a plurality of side walls and having a depth of at least equal to the greatest thickness of the article to be received therein, at least a portion of an opposite pair of said side walls forming an angle less than 90° with said bottom wall whereby said portion retains the article in said recess, a hinge line extending throughout said shell and being formed in said

bottom wall between said pair of said side walls, said bottom wall being bendable about said hinge line to a position wherein



said pair of side walls are spaced apart a distance such that said article can be inserted into said recess.

4,006,819

SAFETY MATCHBOOK HAVING INTERLOCKING COVER PANELS

Benjamin P. Elliott, 11000 Dobbins Drive, Potomac, Md. 20854

Filed May 14, 1975, Ser. No. 577,161
Int. Cl.² A24F 27/00

U.S. Cl. 206—104

4 Claims



1. A matchbook folder with safety interlock, comprising: a casing formed of a strip of sheet material, the major portion of the strip being folded to form front and back cover panels; one end portion of said strip having a first fold forming a first substantially upstanding U-shaped fold into which a base portion of matches can be securably seated and a second fold extending back into the matchbook and forming a substantially inverted U-shaped fold; the opposite end portion of the strip having a single fold which extends outwardly of the matchbook and forms a further upstanding U-shaped fold which mates with said inverted U-shaped fold in interlocking engagement to prevent disengagement of the panels in the longitudinal direction, the panels being disengaged from each other by relative movement of the end portions in opposite lateral directions.

4,006,820

MIXING CONTAINER

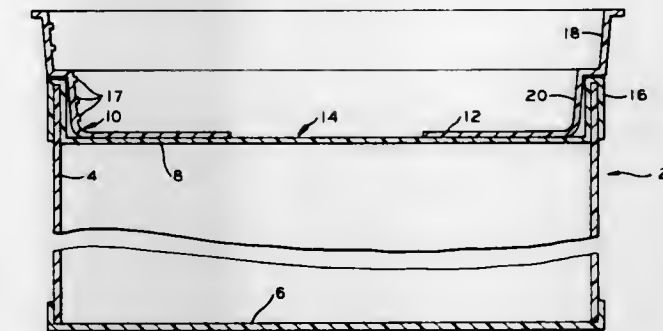
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Del.

Continuation of Ser. No. 364,920, May 29, 1973, abandoned.
This application July 31, 1975, Ser. No. 600,550

Int. Cl.² B65D 25/08

U.S. Cl. 206—219

15 Claims



1. A packaging container for packaging a first material and for subsequently mixing therewith a predetermined volume of a second material, said packaging container comprising: a sealed container having a packaging cavity for packaging said first material, said sealed container having a top member with a recessed portion formed therein, said recessed portion having sidewalls and an uninterrupted bottom member; and a concave measuring vessel removably nested in and extending above the recessed portion of said sealed container, said measuring vessel having a bottom member extending inwardly across said bottom member of said recessed portion of said sealed container, said bottom member of said measuring vessel being sealed to said bottom member of said recessed portion of said sealed container, said bottom member of said measuring vessel having an opening extending therethrough, the portion of said bottom member of said recessed portion of said sealed container below said opening being capable of being readily perforated to permit a volume of said second material contained in said measuring vessel to enter said packaging cavity and mix with the first material contained therein.

4,006,821

MULTI-TRAY CONTAINER FOR STORING ELONGATE OBJECTS

Karl Sautter, Ammerbuch-Reusten, Germany, assignor to Georg Knoblauch Werkzeugkassetten-fabrik, Giengen, Germany

Filed Dec. 29, 1975, Ser. No. 645,013

Claims priority, application Germany, Dec. 28, 1974, 2461766

Int. Cl.² B65D 85/29

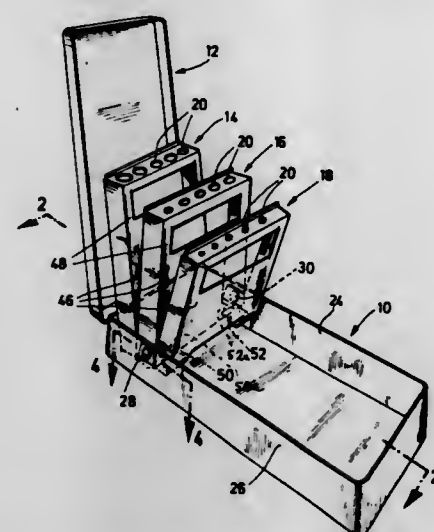
U.S. Cl. 206—379

7 Claims

1. A container for storing a plurality of elongated objects, such as drill bits, screw taps and the like, comprising: a. an open-topped body member (10) having a horizontal bottom wall and vertical side and end walls; b. a lid member (12) pivotally connected with said body member for pivotal movement between closed and open positions relative thereto; c. at least two trays (14, 16, 18); d. pivot means (28) pivotally connecting said trays at one end with said body member for pivotal movement about a common pivot axis parallel with both said body bottom wall and the pivot axis of said lid member, said trays being pivotally displaceable between stacked retracted positions within said body member and extended positions in which the other ends of said trays extend through the top of said body member; e. connecting means (22) connecting said lid with a first one

(14) of said trays to cause said first tray to be displaced toward its extended position when the lid is pivoted toward the open position relative to said body member; and

f. abutment means (38a, 38a; 50a, 52a) adjacent one end of one of said trays for causing the other tray to be displaced toward its extended position when said first tray is dis-



placed by said lid toward its extended position, said trays being returned to their retracted positions when the lid is pivoted to the closed position relative to the body member, said abutment means comprising at least one abutment surface arranged on one of said trays adjacent said common pivot axis for cooperation with a corresponding surface on the other of said trays.

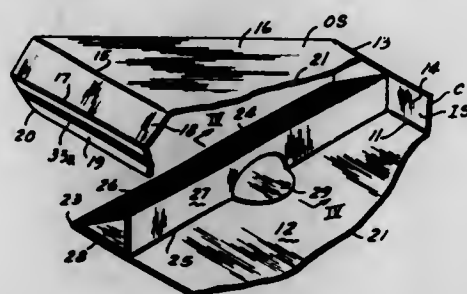
4,006,822 MAILING CARTON

Richard J. McCall, 1515 North Sedgwick St., Chicago, Ill. 60610

Filed Nov. 18, 1975, Ser. No. 632,956
Int. Cl.² B65D 85/30

U.S. Cl. 206-424

1 Claim



1. A mailer carton formed from a one-piece blank, the blank being T-shaped and having substantially parallel first fold lines forming and hingedly connecting bottom, rear, top, and front walls and having parallel second fold lines disposed perpendicularly to said first fold lines to form side members hingedly connected to said bottom wall, the second fold lines forming first, second, and third side flaps, said carton being substantially rectangular, having an enclosed chamber for receiving a heavy article, and comprising:

bottom, rear, top, and front walls enclosing said chamber on four sides; and

a pair of side members enclosing said chamber on opposite ends thereof, each of said members forming a protective air pocket therewithin which is triangular in cross-section, and each of said side members comprising:

a first inclined side flap connected to said bottom wall and extending inwardly and upwardly thereof to engage against said top wall,

a second, vertical side flap extending from said first inclined flap to said bottom wall and from said front to said rear wall,

a third, sidewardly extending side flap connected to said second side flap and extending outwardly from said second side flap, an edge of said third side flap engaging an inside surface of said first, inclined side flap, and a horizontal tab affixed to said third flap and severed from said second flap, said tab being positioned to overlie the bottom wall of the carton to be captured beneath the heavy article; whereby said first and third flaps reinforce said second, vertical side flap independently of the rest of the carton to support the article protectively between the opposite vertical flaps of said side members spaced inwardly of said side edges of said top and bottom walls.

4,006,823

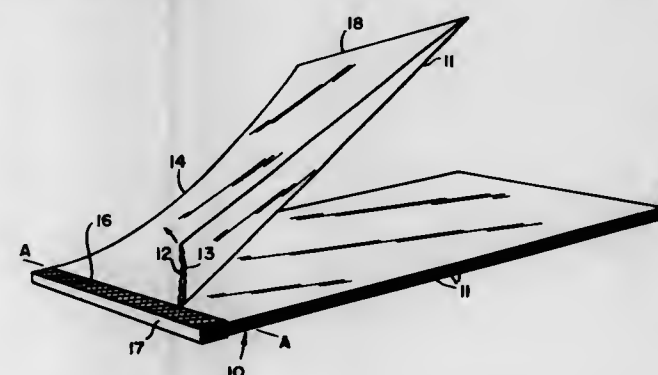
STERILE BAG PAD

Ricardo Hurtado Soto, Apartado 91711, Bogota, Colombia
Filed Feb. 25, 1976, Ser. No. 661,405

Int. Cl.² B65D 31/00, 85/54

U.S. Cl. 206-554

4 Claims



1. An article comprising a plurality of closed, sterile bags of thin, flexible thermoplastic sheet material aligned and arranged in side-by-side relation and bound together along a common marginal edge with a heat-fused thick, stiffened binding whereby all of said bags form a book-like pad, the ends of said bags opposite said binding being free and the edges of said bags adjacent said binding being weakened but continuous adjacent said binding, whereby a bag may be removed from said pad by holding said binding in one hand, grasping the free end in the other hand and tearing along the line of weakness to separate the bag from the binding in an opened condition.

4,006,824

DISPLAY AND DISPENSING STAND

Robert R. Snediker, Winnetka, Ill.; Steve Chalmers, St. Louis, Mo., and Robert E. Drapeau, Berwyn, Ill., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Nov. 11, 1975, Ser. No. 631,130

Int. Cl.² A47F 5/11

U.S. Cl. 211-49 D

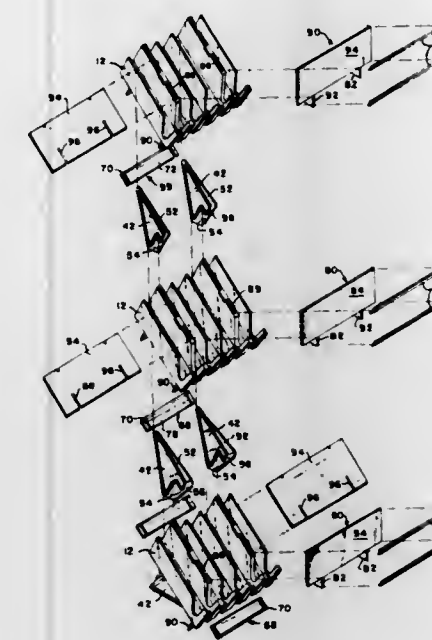
37 Claims

1. A display and dispensing stand comprising:

a. a plurality of unitary trays having at least one channel for containing articles, said channel being formed by a plurality of upstanding sidewalls, said trays including at one extremity of said channels a frontal abutment means, said side walls including two support side walls symmetrically placed with respect to the width of said tray, said support side walls including a plurality of receiving fissures therein, said receiving fissures comprising upper receiving fissures accessible from above said tray and lower receiving fissures accessible from below said tray;

b. at least two planar supporting members spacially separating said trays one above the other, each of said supporting members having at least two connecting blades, an upper connecting blade engaging the lower fissure of the tray above said supporting member and a lower connecting blade engaging the upper fissure of the tray below said

supporting member, said supporting member further including means for detachably affixing said trays to said supporting member to prevent relative movement therebetween; and



c. means for inclining said trays, said inclining means being placed beneath the bottom tray of said display stand.

4,006,825

NOVEL FISHING ROD SUPPORT

Milton Austin, 3 Spielman Road, Fairfield, N.J. 07006, and Arthur G. Kendall, 37 Passaic Ave., Livingston, N.J. 07039
Filed Mar. 17, 1975, Ser. No. 558,961

Int. Cl.² A47F 7/00

U.S. Cl. 211-60 R

10 Claims



1. A fishing rod support comprising a pair of cooperating bracket members adapted for attachment to either a horizontal or a vertical surface to support said fishing rod, said bracket members comprising:

a proximal bracket member adapted to receive the handle portion of said rod;

a distal bracket member possessing a U-shaped channel adapted to receive the tip portion of said rod, the longitudinal dimension of said channel lying in a plane parallel to the plane of said surface, and said channel possessing a mouth defined by a first and a second peripheral edge of said distal bracket member; and

means associated with said channel for retaining said tip portion securely therein comprising a lip extending into said mouth from said first peripheral edge in a plane perpendicular to said longitudinal dimension to partially obstruct said mouth, and a gate located in a plane parallel with the plane of said lip, said gate moveably anchored at one end thereof to said second peripheral edge, and adapted to pivot into position to fully obstruct said mouth and thereby prevent the escape of said tip.

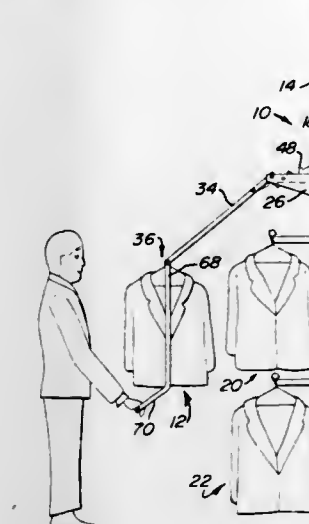
4,006,826 GARMENT HANGER

Walter Rich, 1911 Spruce St., Philadelphia, Pa. 19103
Filed Apr. 2, 1975, Ser. No. 564,236

Int. Cl.² A47F 5/08

U.S. Cl. 211-101

11 Claims



1. A hanger comprising structure attachable to a wall for supporting mounting brackets, a pair of mounting brackets for projecting in spaced parallel cantilever relation from said structure for supporting a hanger device, a hanger device including a hanger rail coupled to said brackets by a pair of arms, each arm having an upper end connected to said hanger rail and a lower end pivotably connected to one of said brackets, a handle pivotably connected to said hanger device between said arms for pivoting said arms about a horizontal axis to thereby lower the elevation of said hanger rail, and spring means having a first end and a second end, means for fixedly attaching said first end of said spring means to a first point which is stationary relative to said brackets, means for attaching said second end of said spring to a second point on one of said arms, the location of the second point with respect to said horizontal axis being such that an imaginary line connecting said first and said second points is disposed above said horizontal axis when said hanger rail is in its upper position and at least a portion of said imaginary line is disposed below said horizontal axis when said hanger rail is in its lower position, whereby said hanger rail is maintained in each of its upper and lower positions.

4,006,827

FILE ORGANIZER

George Henry Wiseman Riches, 170 Roehampton Ave., Toronto, Ontario, Canada (M4P1R2)

Filed Sept. 15, 1975, Ser. No. 613,613

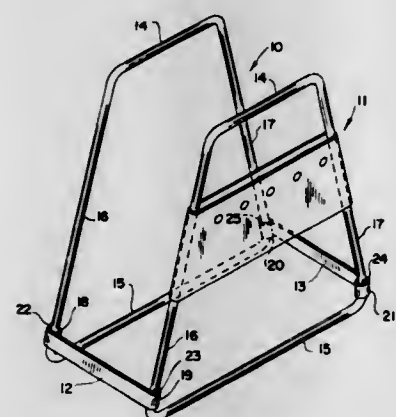
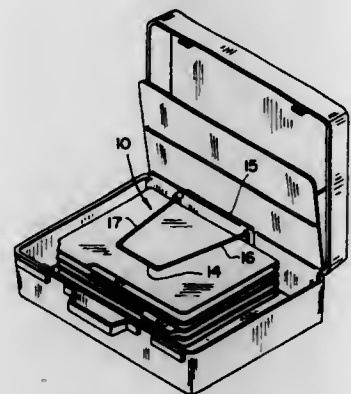
Int. Cl.² A47F 5/10

U.S. Cl. 211-201

5 Claims

1. A portable collapsible file holder and organizer comprising a pair of substantially rigid spaced frames forming a storage space therebetween, each of said frames having lateral side portions, top and bottom portions, said bottom portions forming a base on which the organizer stands when upright, and a pair of connecting members on which files are to be supported, said members adjustably interconnecting the frames adjacent the base only for to-and-fro adjustable movement of the frames relative to each other and to maintain said frames in spaced apart substantially parallel relationship between a fully opened position and a fully collapsed position and at intermediate positions therebetween whereby the frames retain said files in all said positions, the space between

said frames being open and unobstructed above said base for receiving files therein, said files being supported either hori-



zontally when said frames are horizontal or vertical when arranged upright.

4,006,828

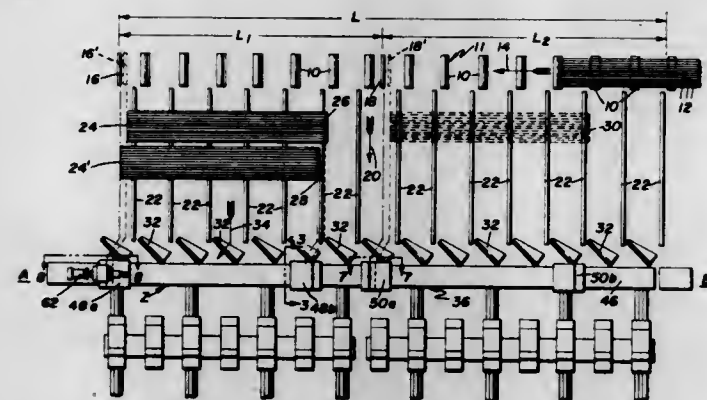
APPARATUS FOR ALIGNING THE ENDS OF PRODUCT LENGTHS

William J. Hill, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Aug. 11, 1975, Ser. No. 603,368
Int. Cl.² B21B 39/20

U.S. Cl. 214-1 P

10 Claims



1. Apparatus for aligning the ends of product lengths delivered laterally into a longitudinally extending alignment zone, said apparatus comprising:

- a stationary support frame located proximate to said alignment zone;
- elongated rail means fixed to said support frame, said rail means extending in a direction parallel to the length of said alignment zone;
- a plurality of pairs of first and second alignment heads carried on said rail means for movement along the length thereof, each of said alignment heads having a product contacting surface extending into said alignment zone;
- two draw bars carried on said support frame;
- drive means for axially reciprocating said draw bars simulta-

neously in opposite directions relative to said support frame;

locking means for connecting said draw bars to said alignment heads, the locking means associated with said first alignment heads being releasably engageable with one of said draw bars and the locking means associated with said second alignment heads being releasably engageable with the other of said draw bars;

and positioning means for adjusting the distance between cooperating pairs of said alignment heads by moving said alignment heads along said rail means relative to said draw bars.

4,006,829

TRANSFER UNIT IN A TRANSFER MACHINE

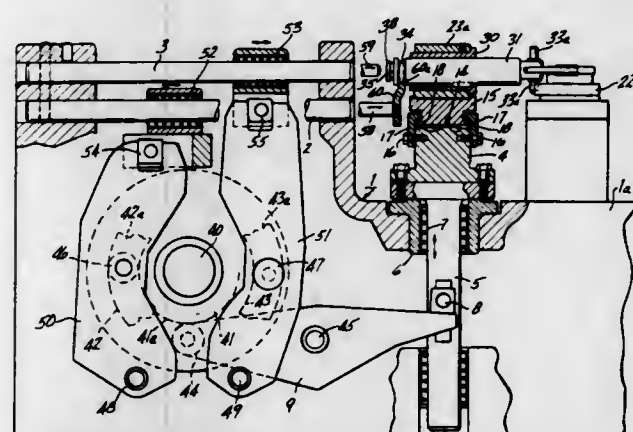
Yoshio Tokunaga, Kurume, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 650,018

Claims priority, application Japan, Apr. 15, 1975, 50-45598
Int. Cl.² B65G 25/04

U.S. Cl. 214-1 BB

7 Claims



1. A transfer unit for a transfer machine provided with a number of working stations which are arranged in tandem at a fixed interval therebetween, said transfer machine being designed for transporting a work piece from one to the next working station for performing a series of operations on said work piece, comprising:

- a mounting table movable intermittently in the work transfer direction and in the opposite direction by a pitch equal to the interval between the adjacent working stations;
- a plurality of mounting blocks arranged on said mounting table at the same interval as that of said working stations and configured for being adjusted slightly in their positions in both vertical and transfer directions;
- a chuck shaft slidably coupled to each of said mounting blocks and movable along longitudinal axis of said chuck shaft, said chuck shaft being mounted transversely to said transfer direction and each said chuck shaft carrying at its front end a pair of chuck jaws;
- guide means provided on said chuck jaws and engageable with guide portions provided in turn on a jig unit mounted on each of said working stations;
- a mounting plate for reciprocally supporting said mounting table; and
- a cam shaft mounted in parallel with said tandem arranged working stations and carrying a plurality of cam plates which are adapted for cooperating with cam levers associated therewith, said cam levers being configured respectively for opening and closing the chuck jaws, longitudinally displacing said chuck shaft, elevating and lowering said mounting table and displacing said mounting table in the transfer direction.

4,006,830

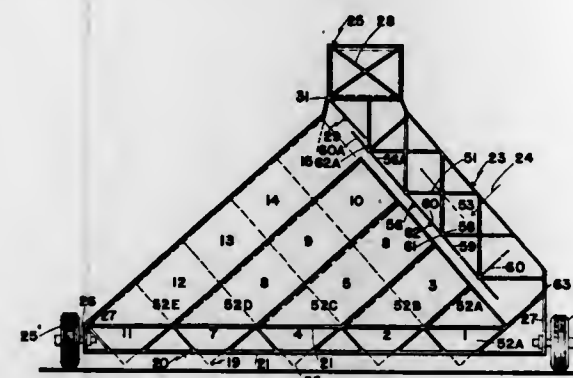
HAY BALE STACKER

Brian Knaggs, General Delivery, Elm Creek, Canada
Filed Dec. 8, 1975, Ser. No. 638,377

Int. Cl.² B65G 57/32

U.S. Cl. 214-6 B

11 Claims



1. A bale stacker for use in conjunction with a baler and a conveyor receiving bales from said baler and transferring same to said bale stacker; said bale stacker comprising in combination supporting framework, ground engaging means on each side of said framework, for facilitating the movement of said stacker along the ground, a bale receiving chamber formed on the upper side of said framework and receiving bales one at a time from the associated conveyor, an outlet gate hingedly mounted in the base of said chamber and forming said base, trip means actuated by the particular bale in said chamber to release said outlet gate, means to return said outlet gate to the closed position after said bale has passed therethrough, an inclined transfer chute extending from below said chamber downwardly and outwardly therefrom, a plurality of bale receiving chutes extending from the base of said transfer chute and being situated in side by side relationship substantially at right angles to the longitudinal axis of said transfer chute, bale receiving forks at the bases of said bale receiving chutes, and automatically opening chute gates forming the base of said transfer chute, said chute gates including spring means normally urging the chute gates to the closed position the weight of a bale thereon opening said chute gates against the pressure of said spring means.

4,006,831

AUTOMATIC TORTILLA COUNTER AND STACKER

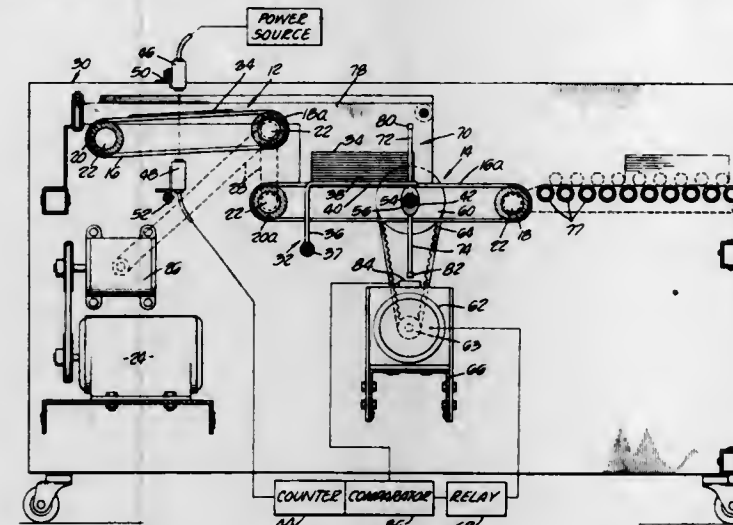
James A. Jimenez, Temple City, Calif., assignor to Electra Food Machinery, Inc., El Monte, Calif.

Continuation-in-part of Ser. No. 448,527, March 6, 1974, abandoned. This application July 28, 1975, Ser. No. 599,649

Int. Cl.² B65G 57/14

U.S. Cl. 214-6 D

3 Claims



1. An apparatus for stacking semi-rigid generally planar shaped articles comprising:

a. first conveyor means for sequentially receiving the arti-

cles to be stacked and moving them forwardly of the apparatus;

- b. a second conveyor means disposed forwardly of and below said first conveyor means for moving the articles forwardly of the apparatus, said second conveyor means comprising a plurality of spaced apart article-carrying belts;
- c. a pivotally mounted rack disposed proximate said second conveyor means and having a plurality of spaced apart fingers defining an article receiving surface, said rack being pivotally movable from a first article receiving position wherein said fingers are substantially horizontal to a second article dispensing position wherein said fingers are inclined and interleaf between said belts of said second conveyor means;
- d. means for moving said rack from a first position to a second position including a rotatable shaft, motor means for rotating said shaft and a cam connected to said shaft, said cam being rotatable through 360° and disposed in operative engagement with at least one finger of said rack and being adapted to pivotally move said rack from the first position to the second position upon rotation of said cam;
- e. first and second oppositely extending locating arms connected to said rotatable shaft and rotatable therewith through 360°, said arms being movable from a first position wherein said arms are substantially normal to the plane of said fingers of said rack in its first position to a second position wherein said arms are substantially parallel to the belts of said second conveyor means;
- f. magnets affixed to the extremities of said first and second locating arms;
- g. sensor means adapted to sense the passage of each article toward said rack and to thereupon generate and transmit a signal;
- h. counter means operatively associated with said sensor means for receiving and counting signals transmitted thereby and for transmitting signals to said motor means upon receipt of a predetermined number of signals from said sensor means to activate said motor means to rotate said shaft; and
- i. magnetically responsive means operably interconnected with said motor for stopping said motor when said magnets move into operable communication with said means.

4,006,832

BUCKET DOOR SNUBBER

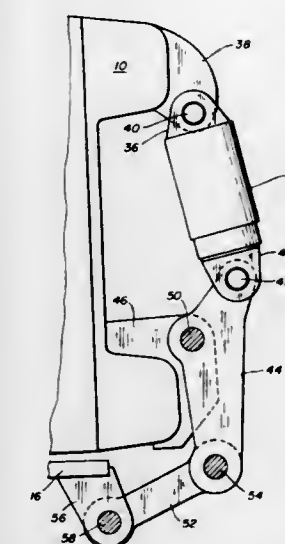
Marvin L. Auxer; Floyd E. McCann, and Gerald D. Shepherd, all of Tulsa, Okla., assignors to Unit Rig & Equipment Co., Tulsa, Okla.

Filed June 18, 1975, Ser. No. 587,951

Int. Cl.² E02F 3/81, 3/84; F16F 7/00

U.S. Cl. 214-146 R

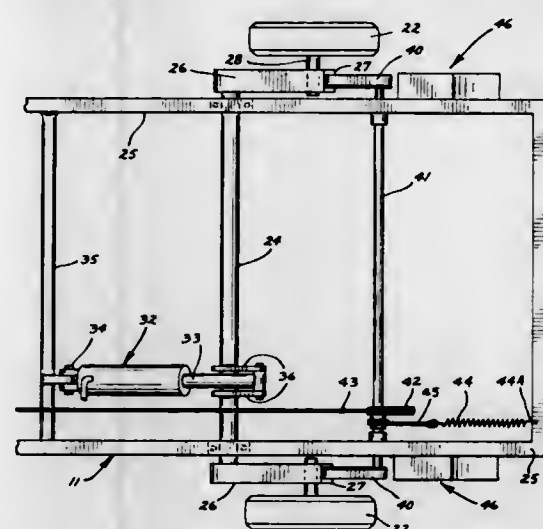
4 Claims



1. Apparatus for dampening the closing of a heavy door of

the type mounted for swinging movement along a hinge axis, said hinge axis being located on a heavy movable member, and wherein the closing of the door is effected by moving the movable member in a direction to cause the door to swing by inertia about its hinge axis towards its closed position with respect to said movable member, wherein the improvement comprises a dampening apparatus including a crank having first and second opposite ends, said crank being pivotally mounted intermediate its ends on said movable member adjacent said hinge axis, linkage means pivotally mounted adjacent one end thereof on said door and pivotally connected adjacent an opposite end thereof to said first end of said crank, a cushioning device having a lower pivotal connection pivotally connected to said second end of said crank and an upper pivotal connection pivotally connecting said cushioning device to said movable member; said cushioning device having an outer housing with a flat portion thereon, an inner housing telescopically received within said outer housing and having a flat end disposed adjacent the flat portion of said outer housing, bolt means connected at one end to the flat portion of said outer housing and extending through and beyond the flat end of said inner housing, rubber pad means mounted on said bolt means between said flat portion and said flat end, a plurality of rubber pad means mounted on said bolt means between said flat end and the end of said bolt opposite from said one end thereof, said opposite end of said bolt means being threaded, washer means mounted on said opposite end of said bolt means adjacent said rubber pad means, and nut means threadedly received on said bolt means adjacent said washer means and on the opposite side thereof from said rubber pad means, said outer housing being integral with one of the pivotal connections for said cushioning device, said inner housing being integral with the other of said pivotal connections for said cushioning device; whereby, as said door moves past a predetermined position towards its closed position, the lower pivotal connection on said cushioning device will move away from said movable member and beyond the line between the upper pivotal connection for said cushioning device and the intermediate pivotal connection for said crank; and whereby, when said door moves further past said predetermined position towards its closed position, said second end of said crank will exert a pulling force on the lower pivotal connection of said cushioning device to compress said plurality of rubber pads between said flat end and said washer means.

mechanical latch means being pivotally mounted to said frame member and positionable to directly mechanically engage said



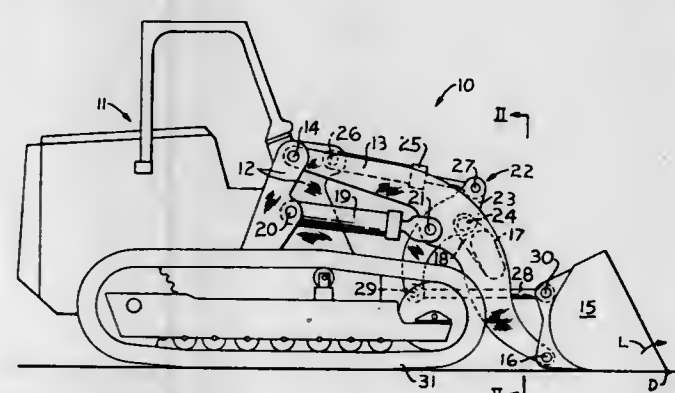
arm means to support said frame relative to said arm means independently of said means to control movement.

4,006,834
TILT LINKAGE FOR LOADER BUCKETS
Reynold M. Anderson, Morton, and Donald E. Tullar, Metamora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 15, 1976, Ser. No. 649,310
Int. Cl.² E02F 3/82

U.S. Cl. 214-776

11 Claims



1. A construction vehicle comprising a tractor having a frame, a pair of laterally spaced lift arms having rearward ends thereof pivotally mounted on said frame and having forward ends thereof extending forwardly of said tractor, a laterally extending cross-brace disposed between the forward and rearward ends of said push arms and secured therebetween, lift cylinder means pivotally interconnected between at least one of said lift arms and said frame for selectively raising or lowering said lift arms vertically, a work tool pivotally mounted on the forward ends of said lift arms, and tilt linkage means pivotally interconnected between said frame, said cross-brace and said work tool for selectively pivoting said work tool on said lift arms, said tilt linkage means comprising bellcrank means pivotally mounted intermediate upper and lower ends thereof rearwardly on said cross-brace at a location disposed between said cross-brace and the rearward ends of said lift arms whereby compressive stress will be imposed on said location and tensile stress will be imposed on an opposite, forward surface on said cross-brace from said location upon pivoting of said work tool on said lift arms during operation thereof.

4,006,833
LOWERING DEVICE FOR UNLOADING OR LOADING HAYSTACKS

Chester G. Neukom, Jamestown, and Ivyl D. Kopecky, Ypsilanti, both of N. Dak., assignors to Haybuster Manufacturing Inc., Jamestown, N. Dak.

Filed June 25, 1975, Ser. No. 590,392
Int. Cl.² B60P 1/04

U.S. Cl. 214-506

7 Claims

1. A haystack forming machine comprising a bed for forming a stack and which is adapted for removing stacks from the bed and replacing stacks onto the bed including a frame, at least one separate wheel on each of the opposite sides of said frame, means to mount said wheels on said frame including a tube member extending transversely of said frame and pivotally mounted thereto, arm means fixed to opposite ends of said tube member, said wheels being attached to outer ends of said arm means, means to control pivotal movement of said tube member and said arm means comprising a hydraulic cylinder, whereby said wheels may be swung in an arc relative to said pivot and said frame to thereby lower portions of said frame relative to the ground or raise said portions upon opposite movement of said hydraulic cylinder, and mechanical latch means engageable with said arm means adjacent to the mounting of at least one of said wheels to said arm means, said

4,006,835
CONVERTIBLE STOPPER FOR A WIDE MOUTH THERMOS

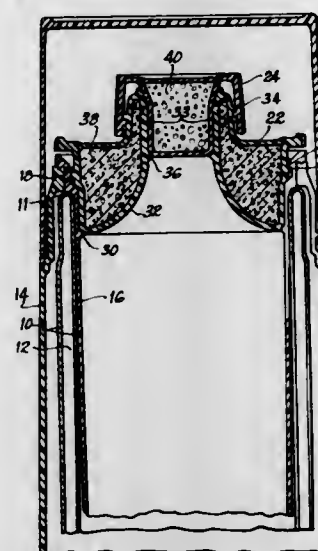
John S. Cummings, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Continuation of Ser. No. 446,694, Feb. 28, 1974, abandoned.
This application Jan. 22, 1976, Ser. No. 651,458

Int. Cl.² A47J 41/00

U.S. Cl. 215-13 R

5 Claims



1. In a wide mouth thermos bottle having a vacuum filler, a protective jacket disposed about said filler and a liner conforming to the interior of said filler, the improvement comprising:

- a compound stopper including a hollow toroidal stopper having a central narrow opening therethrough removably engaging said liner at a top portion thereof for converting the thermos from a wide mouth opening to a relatively narrow opening, said hollow toroidal stopper being filled with insulation, and
- a narrow mouth stopper for sealing said narrow opening.

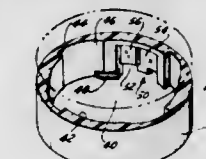
4,006,836
SAFETY CAP

Lewis A. Micallef, Fort Lee, N.J., assignor to Leeds and Micallef, Fort Lee, N.J.

Filed Jan. 8, 1976, Ser. No. 647,328
Int. Cl.² B65D 55/02, 85/56; A61J 1/00

U.S. Cl. 215-218

23 Claims



1. A safety cap for a container comprising; an outer cover having an end wall and a peripheral skirt depending therefrom, a band mounted in the cover, means in the band for

rotatably fastening and unfastening the band and cover on a container, lock means on the band and cover to permit rotating of the band and cover onto the container into the fastened position and to prevent rotating of the band and cover into the unfastened position, and release means on the band and cover adapted to be shifted between an inactive position whereupon it does not affect the operation of the lock means and an active position whereupon it deactivates the lock means and permits the band and cover to rotate into the unfastened position.

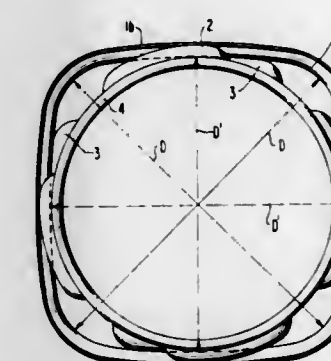
4,006,837
CONTAINER CLOSURE

Gerald G. Gates, Wheeling, W. Va.; Charles J. Hasper, Jr., Bellaire, Ohio; Milton H. McCann, Wheeling, and Richard D. Francis, Moundsville, both of W. Va., assignors to Wheeling Closure Corporation, Wheeling, W. Va.

Filed Oct. 30, 1974, Ser. No. 519,259
Int. Cl.² B65D 41/04

U.S. Cl. 215-340

8 Claims



1. A container closure comprising a top wall, a continuous skirt portion depending from the perimeter of said top wall, a continuous reinforcing bead provided on the lower end of said skirt portion adapted to engage interrupted thread portions on a container, said reinforcing bead being of uniform thickness throughout its extent, a portion of said closure having a radial dimension greater than the corresponding radial dimension of the container thread portions, and another portion of said closure having a radial dimension less than the corresponding radial dimension of the container thread portions, whereby when applying the closure to the container the portion of the closure having the greater radial dimension is aligned with the thread portions to thereby position said portion radially outwardly from said threads, and by rotating said closure, the portion of the bead at the shorter radial dimension of the closure is caused to underlie and engage the container threads thereby tightening the closure on the container.

4,006,838
BRAZING ALLOY AND BRAZING PASTE FOR GAS CONTAINER JOINTS

Richard S. Baumann, Glenbeulah, and Ronald K. Raboin, Green Bay, both of Wis., assignors to Western Industries, Inc., Milwaukee, Wis.

Division of Ser. No. 526,912, Nov. 25, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,275

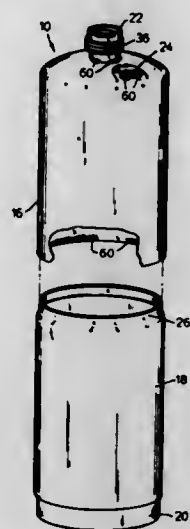
Int. Cl.² F17C 1/14; B32B 1/02

U.S. Cl. 220-3

2 Claims

1. A steel container for pressurized gas which tends to react with an alloy containing more than 67% copper to form an explosive compound; said container consisting of a plurality of components steel in sealed relationship by a brazing alloy of pressurized gas therebetween, being joined and brazing alloy

being exposed to said pressurized gas within said container, said alloy consisting of: about 48% to about 67% by weight of



copper; about 4.5% to about 7% by weight of phosphorous; and the balance nickel.

4,006,839

CONTAINER WITH SNAP COVER HAVING FRANGIBLE PORTIONS

Alfons W. Thiel, Mainz, and Hans Hell, Wiesbaden-Freudenberg, both of Germany, assignors to Bellaplast GmbH, Wiesbaden-Biebrich, Germany

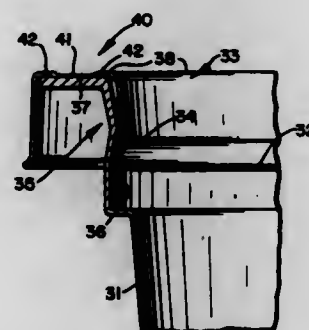
Filed Mar. 10, 1976, Ser. No. 665,409

Claims priority, application Germany, July 28, 1975, 2533631

Int. Cl.² B65D 41/32

U.S. Cl. 220-266

24 Claims



1. A container assembly having a safeguard against undetectable unauthorized or partial opening after a cover is initially applied comprising a container adapted to receive material to be packaged and having an open end, a cover for said open end, said container and said cover having around their outer peripheries generally flat annular edge regions in coextensive adjacent relation, cooperating formations on the cover and container providing a reusable snap fit connection between the cover and container permitting the cover to be reapplied with a snap fit after each removal from the container, and said safeguard being independent of said formations and comprising fastening means fixedly connecting said edge regions closely together after a container has initially been filled and the cover snapped thereupon over the opening, said fastening means being so constructed and arranged that upon rupture of fastening means for separation of said regions for partially or fully opening said container assembly a tear line pattern is formed at least in the cover edge region adjacent said ruptured fastening means, said tear line pattern being such that upon reclosure of the cover the cover and container edge regions cannot be undetectably reassembled in the initial cover closed condition.

4,006,840 BEVERAGE DISPENSER HAVING FLOW-ACTUATED SENSING MEANS

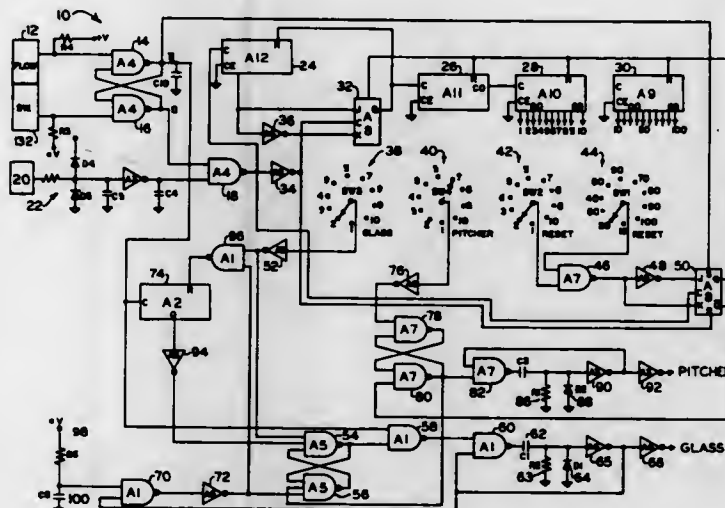
Joseph W. Shannon, Kent, Ohio, assignor to American Beverage Control, Kent, Ohio

Filed July 7, 1975, Ser. No. 593,847

Int. Cl.² B67D 5/54

U.S. Cl. 222-30

9 Claims



1. A beverage dispenser apparatus for monitoring the volume of beverage dispensed from a mass reservoir through a dispensing line and out a pouring head, comprising: valve means for permitting the flow of beverage from the mass reservoir and through the dispensing line; switch means operatively engaged with the dispensing line and actuated by the flow of said beverage; a counting circuit connected to and actuated by said switch means; decode means connected to said counting circuit for producing output signals at selected time intervals after the actuation of said switch means, said time intervals corresponding with preselected volumes dispensed; and recording means connected to said decode means for recording the dispensing of a first preselected volume only after said flow of beverage through the dispensing line has terminated, recording the dispensing of a second preselected volume immediately upon receipt of an output signal from the counting circuit indicating that such second volume has been dispensed and being inhibited from recording the dispensing of third preselected volumes until a fixed number of said third preselected volumes have been dispensed, at which time said recording means records the dispensing of a volume equal said first preselected volume.

4,006,841

PERFUME DISPENSER

Girair Hagop Alticosian, 27 Beaufort Road, Ealing, W.5., England

Filed July 14, 1975, Ser. No. 595,799

Claims priority, application United Kingdom, July 24, 1974, 32752/74

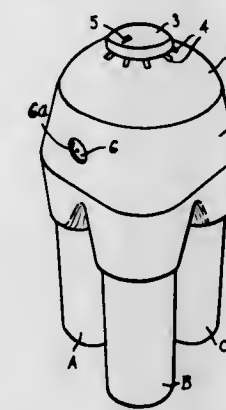
Int. Cl.² B67D 5/22, 5/60

U.S. Cl. 222-42

6 Claims

1. A perfume dispenser comprising: a holder for holding a plurality of perfume containers, each containing a liquid perfume of a different fragrance, a selector device which, when the plurality of containers are located in the holder, enables liquid perfume from any one or from a combination or combinations of the containers to be selected for dispensing through an outlet of the dispenser, and an actuating means operable to cause the release of a quantity of the selected liquid perfume or perfumes into a mixing chamber and from said chamber to said outlet,

wherein said selector device is in the form of a push-button which is rotatable to predetermined angular positions relative to said holder to effect the desired selection and which is provided with a region carrying said actuating means in the form of a series of spaced projections, whereby when the push-button is depressed after the



desired selection has been made, the projections are also depressed so that the projection or projections corresponding to the selection made can engage with the outlet valve or valves of the selected container or containers to cause the selected perfume or perfumes to be fed through said mixing chamber and dispensed at said outlet.

4,006,842

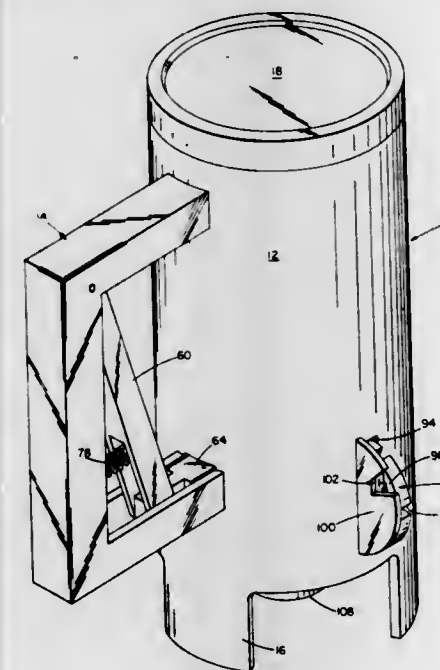
MATERIAL MEASURING AND DISPENSING DEVICE

Anthony L. Bassignani, 17 King St., Norfolk, Mass. 02056
Continuation-in-part of Ser. No. 466,732, May 3, 1974, Pat. No. 3,907,166. This application Sept. 18, 1975, Ser. No. 614,702

Int. Cl.² G01F 11/28

U.S. Cl. 222-43

8 Claims



1. A device for measuring and dispensing granular material which comprises: a container for the material having a material discharge outlet opening at the bottom thereof; dispensing means including a plurality of closely adjacent material receiving compartments open at top and bottom, a barrier member for shielding the tops of said compartments from said outlet opening at one position relative to said compartments, and a closure member for closing the bottoms of said compartments at one position relative to said compartments; mounting means fixedly mounting said compartments at said outlet opening and mounting said members for recip-

location across the tops and bottoms respectively of said compartments; reciprocating means for reciprocating said members between a single dispense position in which all of said compartments are shielded at their tops from said outlet opening by said barrier member and are opened at their bottoms by said closure member, and a plurality of fill positions in which selected different numbers of said compartments have the tops thereof exposed to said outlet opening by said barrier member and the bottoms thereof closed by said closure member; operating means for said reciprocating means accessible from the exterior of the device; and control means adjustable to stop the movement of said members by said operating and reciprocating means at selected fill positions corresponding to said selected numbers, including adjustment means for said control means accessible from the exterior of the device and operable to set said control means to stop said movement at said selected positions, and indicator means showing the compartment capacity to be filled and dispensed at each setting of said adjustment means.

4,006,843

APPARATUS AND METHOD OF WATERING OBJECTS

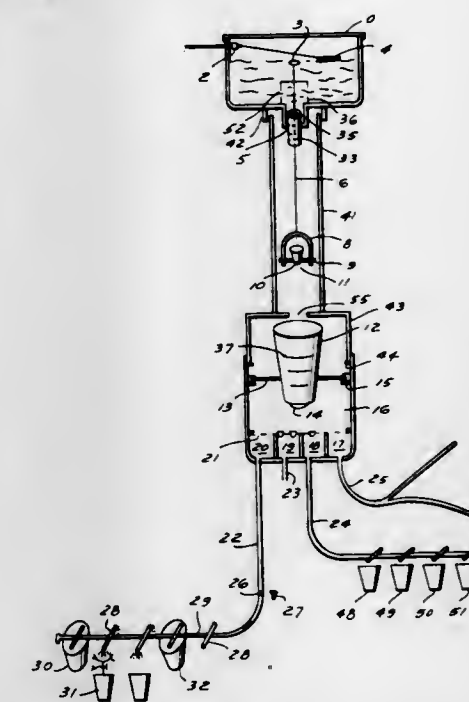
Antonio Martinez Martinez, Avda. del Manzanares No. 148, Madrid, Spain

Filed Apr. 16, 1975, Ser. No. 568,580

Claims priority, application Spain, Apr. 20, 1974, 425543
Int. Cl.² B67D 5/08

U.S. Cl. 222-68

16 Claims



1. A method of watering objects, comprising the steps of receiving water in a tank having a passage formed with an orifice through which the water may flow; metering quantities of the flowing water per unit time by moving an elongated tubular element having a plurality of differently-sized first holes spaced longitudinally along said element and lying in substantially parallel transverse planes with respect to each other, and a plurality of second holes spaced longitudinally along said element and alternatingly between said first holes and operative for communicating each of said first holes with the exterior of said element, said step of moving said element including registering a selected one of said first holes with said orifice so as to selectively vary the amounts of water flowing through said first holes to be expelled from said element; collecting said metered quantities of expelled water; automatically discharging the collected quantities of water whenever they reach a predetermined amount; and conducting the discharged amount of water towards the objects to be watered.

4,006,844

APPARATUS FOR OPERATING AN AEROSOL CONTAINER

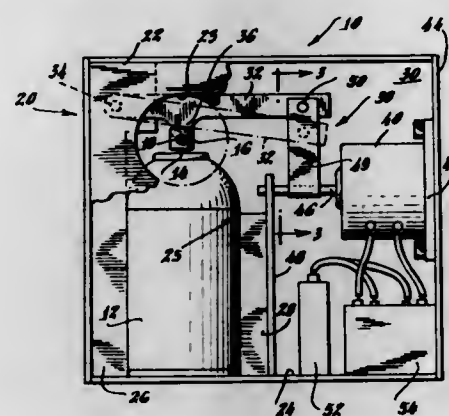
Charles James Corris, Camden, S.C., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Apr. 10, 1975, Ser. No. 566,959

Int. Cl.² B67D 5/28

U.S. Cl. 222-70

5 Claims



1. An apparatus for operating an aerosol container to dispense the contents thereof, the container having a dispenser valve at one end actuated through a valve stem urged outwardly therefrom to a normally closed position away from a depressed open position, said apparatus comprising:

- A. a housing formed to receive at least the valved end of the container;
- B. lever means pivotally mounted in said housing, operatively associated with the valve stem when the valved end of the container is received in said housing; and
- C. means for pivoting said lever means to depress the valve stem including
 - 1. a shaft rotatably mounted in said housing;
 - 2. drive means for rotating said shaft; and
 - 3. a flexible member having one end attached to said lever means and a second end attached to said shaft to be wound thereon; whereby rotation of said shaft by said drive means winds said flexible member thereon to pivot said lever means and depress the valve stem.

4,006,845

MOLTEN ADHESIVE DISPENSING DEVICE

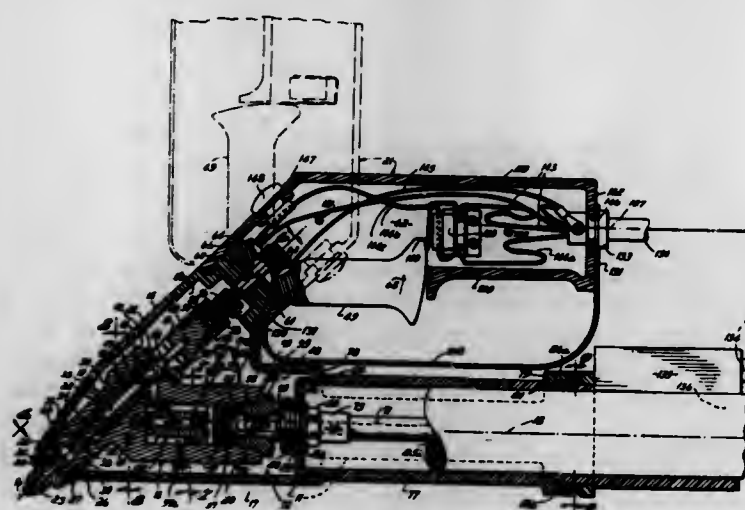
Charles H. Scholl, Vermillion, and Alan B. Reighard, Bay Village, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 7, 1975, Ser. No. 565,733

Int. Cl.² B67D 5/62

U.S. Cl. 222-146 HE

11 Claims



1. A hand gun adapted to discharge molten adhesive feedstock as desired by an operator, said gun comprising a gun housing having a barrel portion and an adhesive feed portion, the longitudinal axes of said barrel and adhesive feed portions being oriented at an acute angle relative one to the other,

a heater body positioned within said gun housing, said heater body including at least one heater cartridge thermostatically controlled to maintain the molten adhesive feedstock within said gun at the desired temperature level,

a discharge valve positioned within said gun housing and connected with said heater body, said discharge valve being operable by an operator to control discharge of said molten adhesive feedstock,

a handle fixed to one of said housing's portions at the aft end thereof and extending rearwardly thereof, said handle being located in one of first and second mount locations as selected by said operator,

connector means that mount said handle to that one of said housing's portions in fixed relation therewith, said connector means being operable to allow swinging of said handle about the longitudinal axis of that one of said housing's portions from said first mount location generally normal to the longitudinal axis of the other of said housing's portions to said second mount location generally parallel to the longitudinal axis of the other of said housing's portions, said second mount location being substantially 180° removed from said first mount location, and said handle's longitudinal axis being oriented at a generally acute angle relative to the longitudinal axis of that one of said housing's portions at both mount locations.

4,006,846

INDEXING POWDER DISPENSING DEVICE

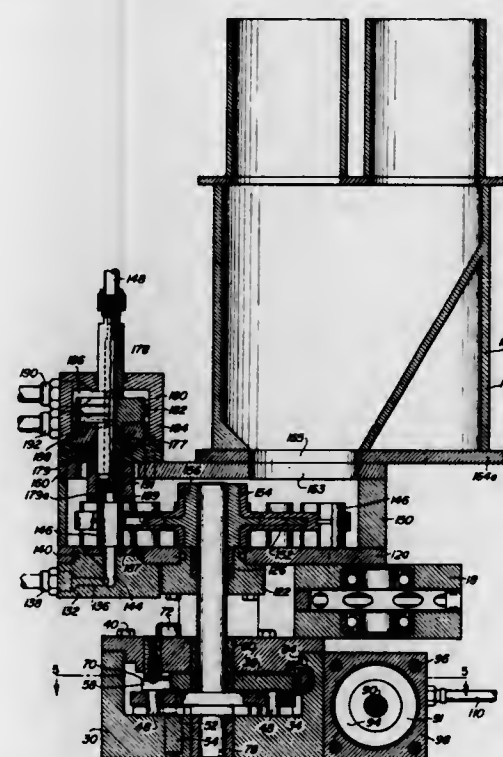
Robert G. Coucher, Salt Lake City, Utah, assignor to EPPCO, Salt Lake City, Utah

Filed Jan. 30, 1976, Ser. No. 653,785

Int. Cl.² B67D 5/54

U.S. Cl. 222-194

18 Claims



1. An indexing motor comprising:

- a housing,
- an elongated shaft journaled for rotation within said housing,
- a wheel member fixed to one end of said elongated shaft, said wheel member having a plurality of spaced apart openings bored annularly about said wheel member,
- a cylindrical pin loosely carried within each of said openings,
- a sectored drive gear loosely held about said shaft,
- a biasing means for sequentially urging each of said cylindrical pins into contact with an edge of said sectored drive gear,
- a means for intermittently moving said sectored drive gear while said cylindrical pin is in contact with said edge and,

4,006,847

DISPENSING APPARATUS

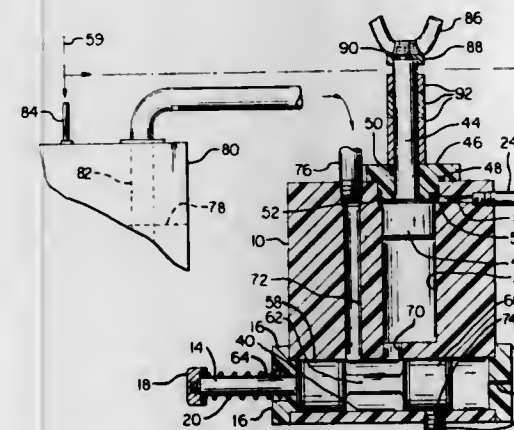
Dan W. Dooley, Lake Oswego, Oreg., assignor to Dooley Dynamics, Inc., Portland, Oreg.

Filed Oct. 23, 1975, Ser. No. 625,081

Int. Cl.² G01F 11/00

U.S. Cl. 222-263

12 Claims



1. Dispensing apparatus comprising:

- a unitary housing block provided with a bore forming a dispensing cylinder, and a dispensing exit port,
- a dispensing piston received in said bore, said piston having major and minor end areas in said bore,
- a second bore in said housing and a spool valve structure received therein continuously communicating with the first mentioned bore adjacent the major end of said dispensing piston,
- passageways in said housing block communicating with said second bore forming ports adapted to be opened and closed by said spool valve and communicating respectively with the source of material to be dispensed and said dispensing exit port,
- and means for applying air under pressure to the minor area of said dispensing piston and the material to be dispensed.

4,006,848

APPARATUS FOR PRODUCING NUCLEAR REACTOR PARTICLES

Josef Cramer, and Willi Hannen, both of Jülich, Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Germany

Filed Mar. 7, 1975, Ser. No. 556,312

Claims priority, application Germany, Mar. 12, 1974, 2411745

Int. Cl.² G01F 11/06

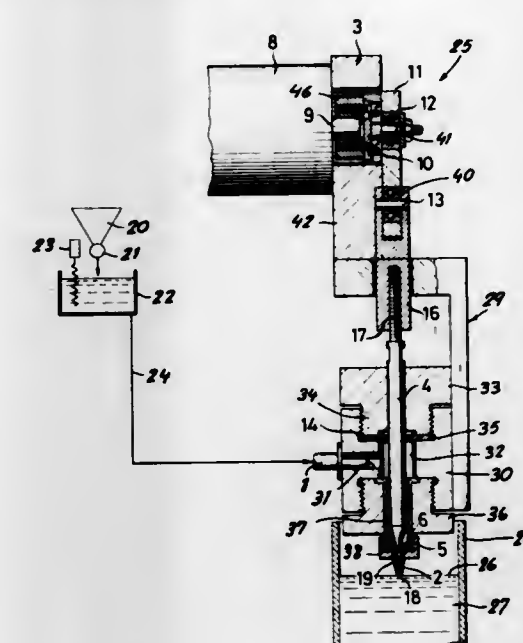
U.S. Cl. 222-309

10 Claims

1. A droplet-forming device for the production of spherical fertile or nuclear fuel particles, comprising:

- housing means forming an inlet for a droplet-forming liquid adapted to congeal to form said particles, a downwardly open droplet-forming nozzle, an axial passage extending from said inlet to said nozzle and coaxial therewith for delivering said liquid thereto, said nozzle having a discharge aperture of a flow cross-section less than that of said passage, and a valve seat along said passage of a flow cross-section in excess of that of said aperture;
- a closure piston axially reciprocable in said passage toward and away from said seat, said piston having a conical tip

receivable in and engageable with said seat; means for periodically actuating said piston; and



means below said nozzle for receiving said droplets and congealing same into said particles.

4,006,849

INJECTION SYRINGE HOLDER HAVING A BLOCKING MEMBER

Petrus Adrianus Wilhelmus Hendrik van Vroenhoven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

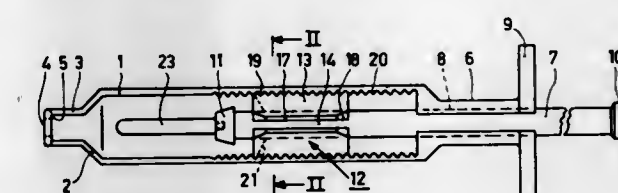
Filed Oct. 2, 1975, Ser. No. 619,071

Claims priority, application Netherlands, Oct. 31, 1974, 7414218

Int. Cl.² A61M 5/315

U.S. Cl. 222-309

5 Claims



1. A holder for an injection syringe, comprising a channel-shaped body having two ends, and at least sidewall portions extending longitudinally between said ends, a guide member at one end having a passage, and a shoulder at the other end, a plunger rod extending through said guide member passage into the channel-shaped body; and a blocking member arranged between and engaging said sidewall portions for longitudinal translational sliding movement, wherein a sidewall portion has teeth along an inner wall surface, and said blocking member comprises teeth engaging the teeth of the sidewall portion.

4,006,850

DISPENSING MECHANISM

John Farina, 5745 N. Washtenaw, Chicago, Ill. 60659

Filed Aug. 25, 1975, Ser. No. 607,291

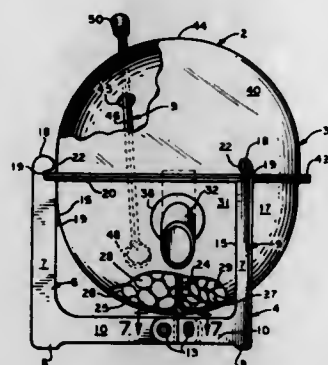
Int. Cl.² G01F 11/10

U.S. Cl. 222-356

9 Claims

1. A dispenser, comprising a container having a bowl for holding dispensable items, a transparent cover mounted over the bowl, a discharge spout extending from the interior of the bowl through an opening therein, a ladle extending through an opening in said cover and adapted to be moved to a position of accessibility to the items by rotating the cover and thereafter manipulated to scoop the items from the bowl and transfer them to the spout for discharge to a recipient, and a support stand mounting said container and comprising means for

rotatably interlocking said cover and bowl with each other and with the stand, at least said cover being formed of plastic material and being deflectible to engage and disengage said cover with respect to said interlocking means, and said stand



having legs positioned about the peripheries of the cover and the bowl, and said cover and bowl each having an outwardly projecting rim, and said interlocking means comprising rim-receiving notches in said legs.

4,006,851

NIGHT STICK HOLDER

Albert J. Kippen, Springfield, Mass., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

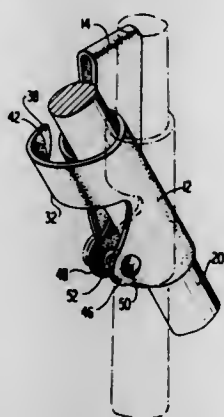
Continuation of Ser. No. 109,252, Jan. 25, 1971, abandoned.

This application Feb. 24, 1976, Ser. No. 660,885

Int. Cl.² F41C 27/00

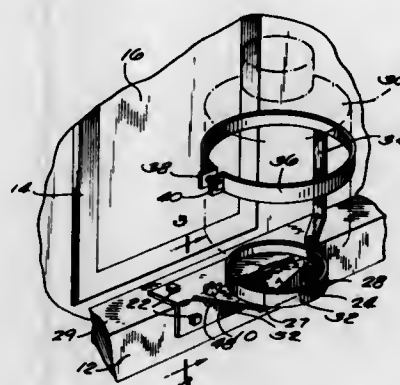
U.S. Cl. 224-3

10 Claims



1. A holder for a night stick having a generally cylindrical handle and an enlarged diameter portion directly below the handle comprising: a sleeve formed of flexible material for receiving the body of the night stick, just below the enlarged diameter portion of the handle, said sleeve being split substantially lengthwise therealong and having generally opposed edge portions, first and second fasteners spaced axially along said sleeve with each fastener having cooperating parts carried by said opposed edge portions for releasably securing the latter one to the other thereby to selectively open and close said sleeve about the body of the stick, said first fastener being adapted to close an upper portion of said sleeve about the body of the night stick and form a sleeve diameter less than the diameter of the enlarged portion of the night stick directly below its handle thereby to substantially constrain the night stick from endwise movement axially through the sleeve in one direction, said second fastener being adapted to close a lower portion of said sleeve about the body of the night stick, said second fastener being releasable in response to an enlargement of the diameter of the lower portion of said sleeve thereby permitting quick release of the night stick from said holder after said first fastener is released, means connected to said sleeve for supporting said holder.

4,006,852
GAS TANK CARRIER FOR CAMPER OR TRAILER
Victor F. Pilsner, Rte. 1, and Merrill M. Helmer, 219 Main St., both of Horicon, Wis. 53032
Filed Apr. 14, 1975, Ser. No. 567,903
Int. Cl.² B60R 11/00
U.S. Cl. 224-42.03 2 Claims



1. A liquified gas tank carrier comprising a first bracket which is adapted to be attached to the rear bumper of a vehicle below a rear door on the vehicle, a second bracket pivotally connected at one end to one end of said first bracket and swingable about a vertical axis between a central position below said door and a position to one side of said door, means attached to said second bracket for supporting a liquified gas tank thereon, and means for releasably latching said first bracket and second bracket together when said second bracket is in its central position below said door, whereby said liquified gas tank can be supported in a central position in front of said door while said vehicle is in motion and can be swung away from said door when said vehicle is at rest to permit said door to be opened, and said first bracket comprising an angle iron having a top plate and a depending flange and wherein said second bracket has a top plate and a depending flange which tapers toward the connection with said first bracket wherein the means for supporting the tank is attached to said top plate of said second bracket and the means includes a ring for supporting the bottom of a gas tank and wherein said depending flange on said second bracket extends beneath said ring proximate a diametral line through said ring to rigidly support said ring and the tank.

4,006,853

CRESCENT RESET SYSTEM FOR FAST FORWARD 8-TRACK CARTRIDGE PLAYER

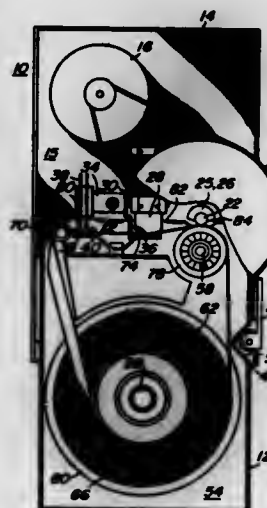
Edwin Stanley Bara, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 30, 1975, Ser. No. 591,674

Int. Cl.² B65H 17/22

U.S. Cl. 226-178

6 Claims



1. A drive mechanism for a cartridge tape player comprising a cylindrical capstan rotatably driven about its longitudinal

axis by a motor actuated flywheel, the longitudinal axis being located in a vertical plane and predeterminedly positioned to forcibly engage the pressure roller of a tape cartridge to be played, a plurality of crescents vertically stacked on, and rotatable about, the capstan, each crescent having an inner face, an outer face and a vertical dimension, the inner face encircling greater than 180° of the capstan circumference while revealing a substantial arc on the capstan surface, the outer face of predetermined curvature, the vertical height predeterminedly fixed, first means coupling the uppermost crescent to the capstan for rotation therewith in a first mode, means coupling each crescent to the crescent beneath it in the first mode, including means aligning the crescents such that the outer faces form a substantially circular configuration as viewed from a point above the axis of the capstan, means decoupling the uppermost crescent from the capstan in a second mode and indexing the uppermost crescent such that it reveals the capstan to the pressure roller, and second means coupling rotational drive of the capstan to the lowermost crescent actively driving it to index at a position such that it exposes the capstan to the pressure roller when the player is activated from the first to the second mode.

4,006,854

WIRE DISPENSER CONTAINER

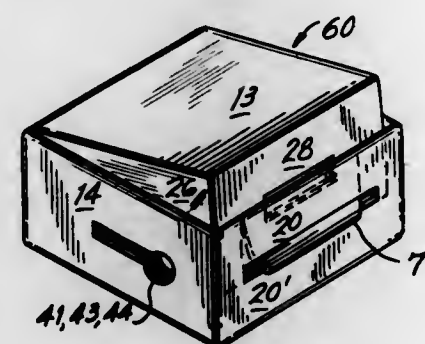
Obediah Daniel Gibson, Duxbury, Mass., and Daniel Philip Kazes, Putnam, Conn., assignors to International Paper Company, New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,290

Int. Cl.² B65D 5/72, 5/46

U.S. Cl. 229-17 S

39 Claims



1. A cut and scored, paperboard blank (10) for a hexahedral container, having bottom, top and end walls reinforced by at least one additional layer of paperboard material, which comprises:

- a bottom panel (11);
- a first side panel (12) and a second side panel (13) connected to opposite sides of the bottom panel (11);
- a first end panel (14) and a second end panel (15) connected to opposite sides of the first side panel (12);
- a first, first end panel reinforcing flap (16) connected to a side of the first end panel (14) remote from the first side panel (12);
- a first, second end panel reinforcing flap (17) connected to a side of the second end panel (15) remote from the first side panel (12);
- a second, first end panel reinforcing flap (18) and a second, second end panel reinforcing flap (19) connected to the other opposite sides of the bottom panel (11);
- a top panel (20) connected to a side of the first side panel (12) remote from the bottom panel (11);
- a third, first end panel reinforcing flap (21) and a third, second end panel reinforcing flap (22) connected to opposite sides of the top panel (20);
- a first top panel reinforcing flap (23) connected to a side of

the top panel (20) remote from the the first side panel (12);

- a first bottom panel reinforcing flap (24) connected to a side of the first, first end panel reinforcing flap (16) remote from the third, first end panel reinforcing flap (21);
- a second bottom panel reinforcing flap (25) connected to a side of the first, second end panel reinforcing flap (17) remote from the third, second end panel reinforcing flap (22);
- a fourth, first end panel reinforcing flap (26) and a fourth, second end panel reinforcing flap (27) connected to opposite sides of the second side panel (13);
- a second top panel reinforcing flap (28) connected to a side of the second side panel (13) remote from the bottom panel (11);
- a third top panel reinforcing flap (29) connected to a side of the second top panel reinforcing flap (28) remotod from the second side panel (13);
- a fourth top panel reinforcing flap (30) connected to a side of the fourth, first end panel reinforcing flap (26) remote from the first end panel (14); and
- a fifth top panel reinforcing flap (31) connected to a side of the fourth, second end panel reinforcing flap (27) remote from the second end panel (15);
- the first end panel (14), the first end panel reinforcing flaps (16, 18, 21, and 26) and the fourth top panel reinforcing flap (30) being adjacent to one another; and
- the second end panel (15), the second end panel reinforcing flaps (17, 19, 22 and 27) and the fifth top panel reinforcing flap (31) being adjacent to one another.

4,006,855

SEPARATOR WORM FEED AUGER AND WEAR PLATES

Konrad Merzenich, Hoffnungsthal, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

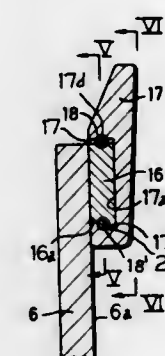
Filed Oct. 23, 1975, Ser. No. 625,032

Claims priority, application Germany, Oct. 23, 1975, 2450337

Int. Cl.² B04B 3/04

U.S. Cl. 233-7

11 Claims



1. In a centrifugal separator having a rotating chamber, a material advancing structure within the chamber comprising: a spirally shaped carrier vane arranged coaxially within the chamber supported on a rotatable driving shaft; a spirally shaped wear plate supported on the vane with an edge radially outwardly of the vane and a mounting face extending radially alongside of a radial face of the carrier vane; a mounting piece secured to said mounting face of the carrier vane; and mechanically releasable means securing said wear plate to the mounting piece so that the wear plate will not tilt on the carrier vane; said securing means including a first locking surface on one of said carrier vane and mounting piece and a second locking surface on said wear plate, and a removable locking element between said surfaces with said locking element being removable for replacement of the wear plate.

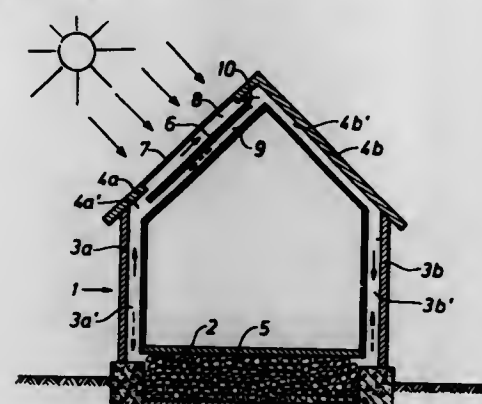
4,006,856 **ARRANGEMENT FOR UTILIZING SOLAR ENERGY FOR HEATING BUILDINGS**

Karl N. A. Nilsson, Stockholm, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden
Filed Mar. 14, 1975, Ser. No. 558,207
Claims priority, application Sweden, Mar. 27, 1974, 7404085

Int. Cl.² F24J 3/02

U.S. Cl. 237-1 A

6 Claims



1. In a building structure provided with solar heating means, comprising a solar heat-exchange chamber and air-circulating channel means extending between opposite ends of said heat-exchange chamber and communicating therewith to form a closed air-circulation loop about at least a portion of said building structure, said solar heat-exchange chamber comprising a light-pervious front panel exposed to solar light and solar light-absorbing means positioned to receive solar light by way of said front panel and to convert a substantial portion of said light to heat, the improvement comprising:

means mounting said light-absorbing means to divide said heat-exchange chamber into a front channel extending between said light-absorbing means and said light-pervious front panel, and a rear by-pass channel extending between said light-absorbing means and a rear wall of said heat-exchange chamber; and
air-flow responsive check valve means associated with said front channel for automatically reducing the air flow through said front channel when the solar heat-producing radiations reaching said solar light absorbing means are strongly reduced or absent, and for permitting said air flow to increase when said radiation increases.

4,006,857 **METHOD FOR TRANSPORTATION AND UTILIZATION OF WASTE HEAT OF LARGE CONDENSER POWER PLANTS**

Fritz Adrian, Ratingen, Germany, assignor to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany
Filed Sept. 2, 1975, Ser. No. 609,400
Claims priority, application Germany, Dec. 21, 1974, 2460829

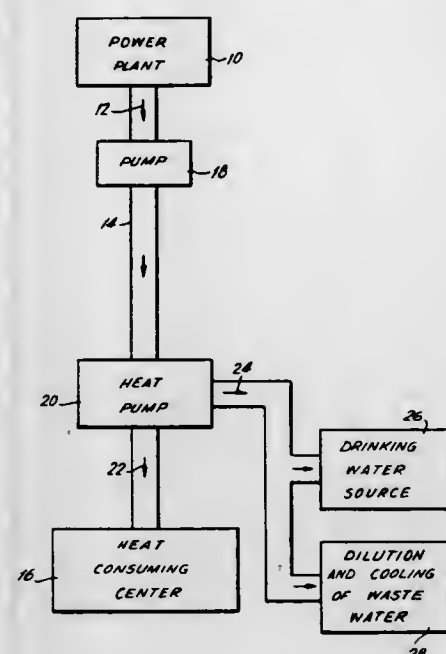
Int. Cl.² F24D 9/00, 11/02

U.S. Cl. 237-2 B

6 Claims

1. A method for transporting heat over long distances, utilizing the waste heat of thermal power plants comprising the steps of: increasing the condenser back-pressure at a power plant to a level at which the condenser cooling water attains a temperature within the range of 25°-50° C; the temperature of said cooling water being limited within the range of 25°-50° C; pumping the cooling water through substantially large pipelines to a location remote and at a substantially far distance from said power plant for using the heat in the cooling water for consumer purposes; the temperature of said cooling water being limited within the range of 25°-50° C for substantially minimizing loss of heat from said pipelines while said cooling water is pumped through said pipelines; applying the condenser water to a heat pump and raising the tempera-

ture of a heating medium by the heat content in said condenser water, the temperature of said heating medium being



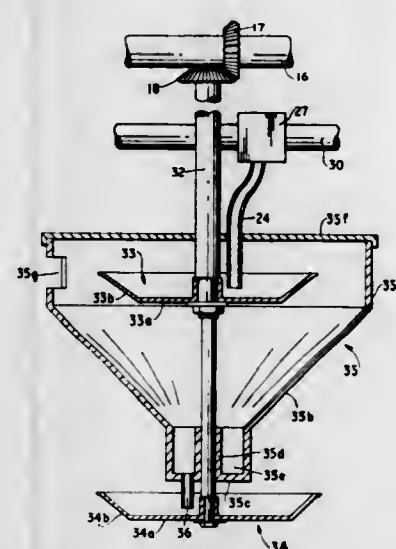
4,006,858 **SPRAY APPARATUS**

Horstine Farmery, North Newbald, England, assignor to Horstine Farmery Limited, North Newbald, England
Filed Feb. 17, 1976, Ser. No. 658,841
Claims priority, application United Kingdom, Feb. 27, 1975, 8300/75

Int. Cl.² B05B 1/28

U.S. Cl. 239-7

15 Claims



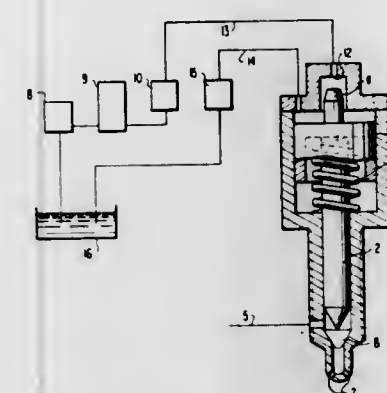
1. A method for distributing a flowable material over a base surface comprising the steps of rotating two rotary members in vertically spaced relationship about a common vertical axis, centrifuging flowable material from the upper one of said rotary members to obtain a substantially annular spray pattern from said upper rotary member, interrupting the annular spray pattern from the upper one of said rotary members at two locations spaced apart but concentric with the rotational axis of the said rotary members whereby to reduce the said annular spray pattern to two separated arcuate spray patterns, directing the interrupted material from the annular spray pattern to the lower one of said rotary members and centrifuging said material from said lower rotary member to obtain an annular spray pattern therefrom, and whereby the two arcuate spray patterns produced from the upper one of said rotary member is superimposed on the annular spray pattern from the lower one of said rotary members.

4,006,859 **FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES** Frank Thoma, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany Filed Aug. 27, 1975, Ser. No. 608,345 Claims priority, application Germany, Aug. 31, 1974, 2441841

Int. Cl.² B05B 1/30

U.S. Cl. 239-89

11 Claims



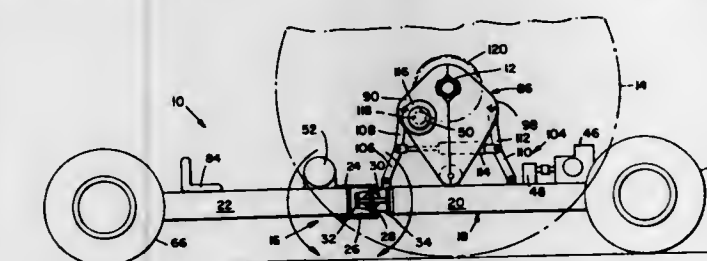
1. A fuel injection nozzle for internal combustion engines which comprises a nozzle needle means displaceably guided in a nozzle body means, the nozzle needle means being operable to feed fuel, metered by a metering means, under pressure to a combustion space by way of at least one injection bore means, the nozzle means being displaceably guided from a first position spaced from the bore means to a second position sealing the bore means and terminating the injection, characterized in that a pressure space means communicating with the metering means is provided for accommodating the fuel to be injected, said pressure space means is defined between the injection bore means and the nozzle needle means when said nozzle needle means is in the first position, the nozzle needle means includes on its actuating side a servo-piston means which is guided intermittently actuatable and displaceable against the force of a spring in the injection direction by a pressure medium.

4,006,860 **METHOD AND APPARATUS FOR TRANSPORTING AN IRRIGATION LINE**

Gail Cornelius, Portland, and Lloyd C. Olson, Beaverton, both of Oreg., assignors to R. M. Wade & Co., Portland, Oreg.
Filed June 12, 1975, Ser. No. 586,419
Int. Cl.² B05B 3/02

U.S. Cl. 239-212

47 Claims



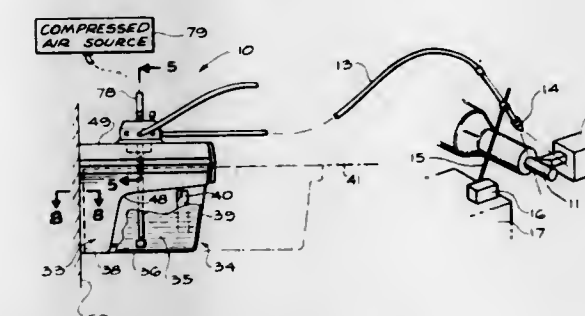
1. Apparatus for transporting an irrigation line supported by and having fixed relative thereto a plurality of wheel means and transportable upon rotation thereof about the longitudinal axis thereof comprising:

a transport assembly movable to adjacent a continuous irrigation line inwardly of a wheel means most adjacent an end of an irrigation line;
readily attachable means associated with said transport assembly for selectively applying rotational torque to a continuous irrigation line at an area inwardly of a wheel means most adjacent an end of that irrigation line, with

the transport assembly adjacent the irrigation line, to rotate the adjacent irrigation line about the longitudinal axis thereof; and
means associated with the transport assembly for allowing removal of the transport assembly from a transported irrigation line.

4,006,861 **MACHINE TOOL COOLANT APPARATUS** Shirl R. Alger, Rowland Heights; Ronald S. Arnold, Brea, and Manfred Schuler, Newport Beach, all of Calif., assignors to All-Power Manufacturing Co., Montebello, Calif. Filed Feb. 12, 1976, Ser. No. 657,448 Int. Cl.² B05B 1/30, 7/24 U.S. Cl. 239-311

23 Claims



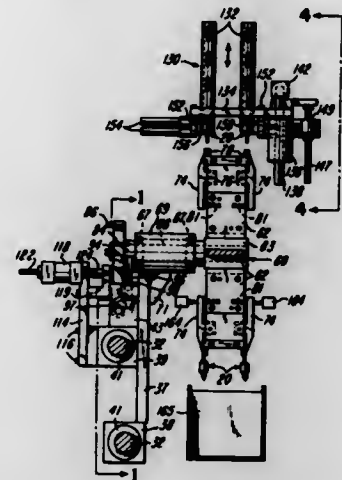
1. Mist coolant apparatus comprising:
a container for holding a quantity of coolant liquid;
at least one flexible hose through which liquid from said container and a compressed gas flow and having a discharge nozzle for emitting a spray of said coolant onto a work piece; and
a liquid distribution unit for delivering the liquid to said hose;
said liquid distribution unit including a centerpost containing passages into which liquid from said container and said compressed gas flow in isolation from one another, a body structure disposed about said centerpost and having a plurality of outlet openings at different locations spaced apart circularly about the centerpost and adapted for connection to a plurality of said hoses to deliver liquid and gas thereto, with said body structure containing passages leading liquid and compressed gas from the centerpost separately to said outlets, and valve means for controlling the flow of compressed gas from the centerpost to at least one of said outlets.

4,006,862 **ARMATURE WINDING APPARATUS WITH IMPROVED ARMATURE LOADING AND UNLOADING MECHANISM** Lawrence A. Shively, Dayton; Robert C. Gray, Tipp City, and Robert P. Hoy, Springfield, all of Ohio, assignors to Mechaner, Inc., Dayton, Ohio Filed Dec. 20, 1974, Ser. No. 534,911 Int. Cl.² B65G 29/00; H02K 15/09 U.S. Cl. 242-7.05 B

15 Claims

1. Apparatus for successively winding armatures each having an armature core and a commutator mounted on an armature shaft, comprising a set of opposing chucks positioned at an armature winding station and having means for gripping the core of each armature, means including a rotatable flyer for winding wire coils on said armature core at said winding station, a turret having a plurality of angularly disposed armature shaft gripping members, means supporting said turret for rotary indexing on a generally horizontal axis in a step-by-step manner, each of said shaft gripping members having means for releasably gripping an end portion of each armature shaft with the armature projecting in a cantilever manner outwardly from said gripping member, means for moving said turret for successively transferring each said gripping member and the corresponding armature from an armature receiving station to

a circumferentially spaced armature unloading station through said armature winding station, means for successively supplying unwound armatures and their corresponding shafts



to said shaft gripping members at said receiving station, and means for successively removing the armature shafts of wound armatures from said gripping members at said unloading station.

4,006,863

STRAND SCATTERING WINDING MACHINE

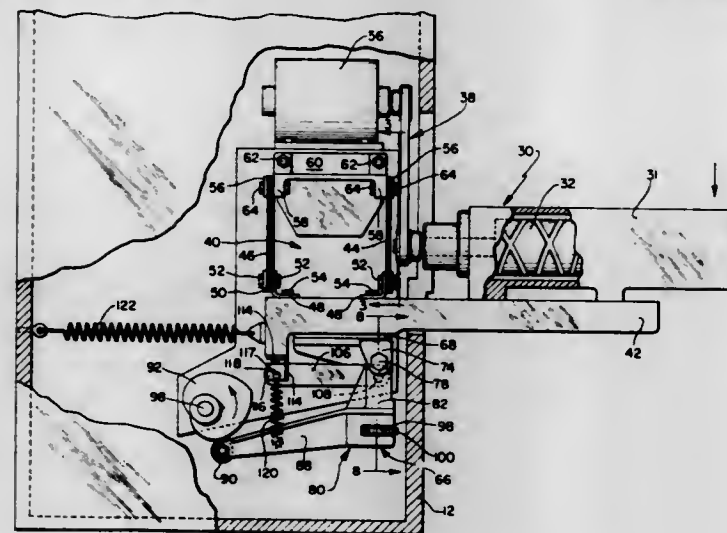
William Malcolm Bense, Barrington, R.I., assignor to Leeson Corporation, Warwick, R.I.

Filed Oct. 6, 1975, Ser. No. 620,172

Int. Cl.² B65H 54/38

U.S. Cl. 242—18.1

8 Claims



1. Apparatus for winding a strand onto a rotating member to form a package comprising a frame member, a beam, means mounted on said beam for traversing said strand axially of said member to form a plurality of overlying layers of said strand, a pair of spaced leaf springs respectively interconnected at opposed ends thereof to said frame and said beam to mount said beam to said frame, said mounting means permitting transverse flexure of said beam relative to said frame, and means for oscillating said beam to vary the relative axial position of the traversal strokes of said strand.

4,006,864
METHOD AND APPARATUS FOR CARRYING OUT
DOFFING AND DONNING OPERATION

Takuzo Tooka, Toyooka, Japan, assignor to Daiwa Boseki Kabushiki Kaisha, Osaka and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of, Japan

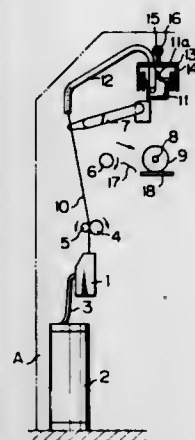
Filed Nov. 21, 1974, Ser. No. 525,848

Claims priority, application Japan, Nov. 27, 1973, 48-133770; Nov. 27, 1973, 48-133771

Int. Cl.² B65H 67/04

U.S. Cl. 242—35.5 R

3 Claims



1. In an apparatus for carrying out doffing and donning operations at each unit of a spinning machine, means for continuously delivering a yarn from said spinning unit, and a take-up mechanism provided with a friction roller and a cradle for rotatably supporting a fresh bobbin or a yarn package formed on said bobbin in contacting relationship with said friction roller, said cradle being pivotally supported on a shaft mounted on a bracket secured to a frame of said units, means for releasably and rotatably holding a bobbin on said cradle, said holding means being disposed on said cradle, suction means disposed at a position on the opposite side of said delivery means with respect to said friction roller for temporarily forming a yarn passage by a yarn continuously being delivered from said delivery means at a position in front of the part of the peripheral surface of said friction roller where said yarn passes over during a normal taking up operation, the improvement comprising means for displacing said suction means in a direction lengthwise of said spinning machine to a position outside and above said take-up mechanism of each spinning unit at the time of doffing and donning operations, and means for creating suction force in said suction means, said displacing means comprising means for temporarily stopping said suction means at any point lengthwise of said spinning units, said suction means comprising a suction nozzle provided with a mouth opened at a position outside and above any of said take-up mechanisms and a connecting pipe connected to said suction force creating means, said suction force creating means comprising a suction blower disposed at a gear end frame or an outer frame of said spinning machine and a horizontal suction duct extending in a lengthwise direction of said spinning machine at a position above said take-up mechanisms, said suction duct being connected to said suction blower and having an elongated aperture extending in the lengthwise direction of said machine and covered with a flexible plate, said connecting pipe of said suction nozzle displaceably extending into said duct through said aperture, in a condition such that said flexible cover plate seals said aperture of said suction duct other than at the portion of said aperture through which said connecting pipe of said suction nozzle extends, said displacing means comprising an endless belt extending lengthwise of said spinning machine at a position above said take-up mechanisms, and driving pulley and a guide pulley respectively disposed at the end frames of said spinning machine, and a motor for driving said driving pulley, said endless belt being held by said pulleys, a guide rail means disposed along said suction duct, a carrying member displace-

ably mounted on said guide rail, and an engaging member for detachably engaging said endless belt with said carrying member, said connecting pipe being held by said carrying member for movement lengthwise of said machine.

4,006,865

ADJUSTABLE WIRE DISPENSING REELS AND BASE FOR
USE IN DISPENSING BOX WIRE

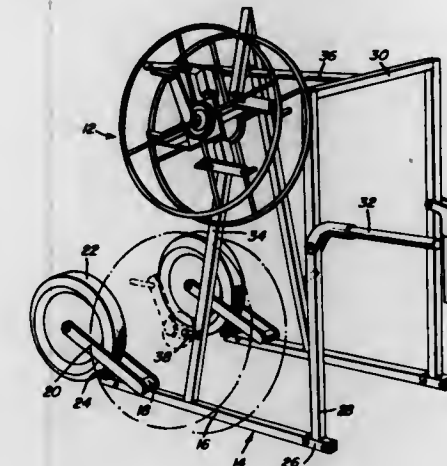
Ansel W. Howard, 1301 W. Tenth, Coffeyville, Kans. 67337

Filed Oct. 7, 1975, Ser. No. 620,361

Int. Cl.² B65H 17/46

U.S. Cl. 242—86.5 R

9 Claims



1. A wire dispensing device, comprising a mobile carrier and a plurality of reel assemblies, each of said reel assemblies including a pair of wheels each having radially inner and outer rims interconnected by radial spokes, an adjustable hub assembly rotatably mounted on the carrier and interconnecting the pair of wheels in axially adjusted relation to each other, handle means connected to the hub assembly for holding the wheels assembled on the hub assembly and imparting rotation to the reel assembly, and releasable locking means for holding the hub assembly in a radially adjusted position relative to the wheels.

4,006,866

ACRYLIC MODIFIED URETHANE BOBBIN FINISH

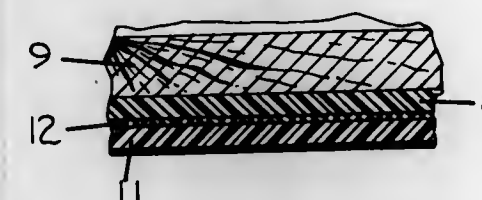
Walter C. Webster, III, Northbridge, and Frank L. Allen, Jr., Hopedale, both of Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 573,863, May 2, 1975. This application Jan. 29, 1976, Ser. No. 653,558

Int. Cl.² B65H 75/12; B32B 27/40

U.S. Cl. 242—118.32

6 Claims



1. A wood textile bobbin the wood of which has been dried to less than about 9% by weight of moisture, said bobbin comprising:
a. a wood bobbin body;
b. a first protective layer adherent directly to and penetrating the exposed surface of said bobbin body said first coating consisting essentially of ricinoleate diphenyl methane diisocyanate prepolymer and trifunctional polyether polyol;
c. a second protective layer adherent directly to said first protective layer, said second protective coating consisting essentially of ricinoleate diphenyl methane diisocyanate prepolymer and trifunctional polyether polyol modified with 30% to 50% thermoplastic acrylic copolymer.

4,006,867

MOTORIZED FISHING REEL WITH CLUTCHES

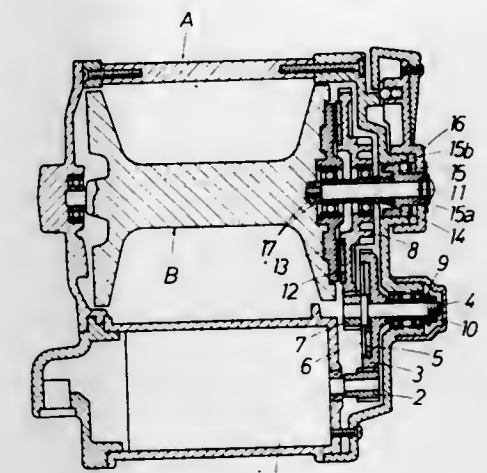
Toshiaki Miyamae, 2-16, 2-chome, Nishi-Iwata, Higashi-Osaka, Osaka, Japan

Filed Aug. 20, 1975, Ser. No. 606,216

Int. Cl.² A01K 89/017, 89/02

U.S. Cl. 242—217

1 Claim



1. A motorized fishing reel comprising
a reel frame;
a torque motor housed in said frame;
a power transmission means including a pinion connected to said motor for transmitting rotary power from said motor;
a first shaft held by said frame;
reduction gear means freely rotatable about said first shaft and engageable with said pinion;
a first lining attached to one side of said reduction gear;
first clutch means including first clutch plate frictionally contactable with said first lining of said reduction gear;
reduction pinion means freely rotatable about one end of said first shaft and attached to said first clutch plate;
dished head spring held by said first shaft exerting pressure from the other side of said reduction gear;
nut means held by first shaft for manually adjusting the frictional engagement of said reduction gear with said first clutch plate by regulating the pressure of said dished head spring acting against said reduction gear;
a second shaft held by said frame;
main gear means freely rotatable about said second shaft and engageable with said reduction pinion;
a second lining attached to one side of said main gear;
a second clutch plate freely rotatable about said second shaft and mounted adjacent said second lining and frictionally contactable therewith;
second dished head spring mounted on said second shaft and contactable with the other side of said main gear;
cam means mounted on said second shaft, including a cylindrical cam member having a convex surface and a cylindrical cam member having a concave surface slidably engageable with one another;
manual control lever for slidably engaging said convex member with said concave member thereby to forcibly press said second dished head spring against said main gear thereby frictionally engaging said second lining with said main gear;
a third shaft held by said frame; and
spool means supported at end end by said second shaft and at the other end by said third shaft.

4,006,868

CARRIER FOR PNEUMATIC TUBE SYSTEM

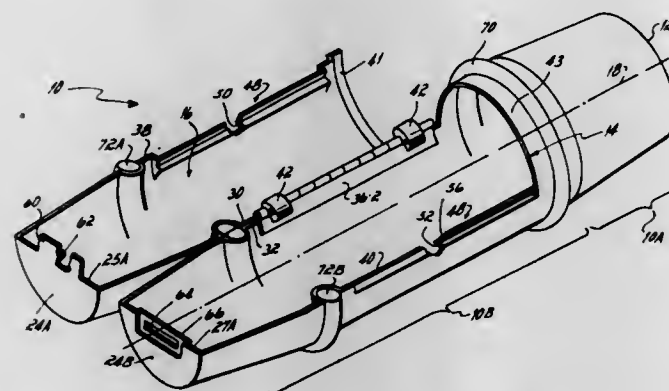
Ernest Hochradel, Sparta; Werner Hauer, Nutley, and Victor J. Vogel, Oak Ridge, all of N.J., assignors to The Mosler Safe Company, Hamilton, Ohio

Filed July 28, 1975, Ser. No. 599,368

Int. Cl.² B65G 51/06

U.S. Cl. 243-34

13 Claims



1. A carrier for transporting articles through a pneumatic tube comprising:

- a major body member including,
 - a tubular section having a completely closed outer end and a completely open inner end,
 - a first semi-tubular section having a completely open inner end integrally connected to said tubular section inner end, an outer end, and a pair of side edges,
 - a minor body member having a second semi-tubular section with a completely open inner end, an outer end, and a pair of side edges,
 - a connector pivotally interconnecting one of said side edges of said first semi-tubular section and one of said side edges of said second semi-tubular section for facilitating movement of said semi-tubular sections between a) a closed position in which both said semi-tubular sections cooperate to define an enclosed tubular region, and b) an open position in which said semi-tubular sections are juxtaposed,

end closure means integrally connected to at least one of said outer ends of said semi-tubular sections to seal said outer ends of said semi-tubular sections when positioned in said closed position, at least part of said end closure means being connected for movement with said outer end of said second semi-tubular section to provide endwise access to the interior of said tubular section when said semi-tubular sections are positioned in said open position.

4,006,869

CARGO HANDLING SYSTEM

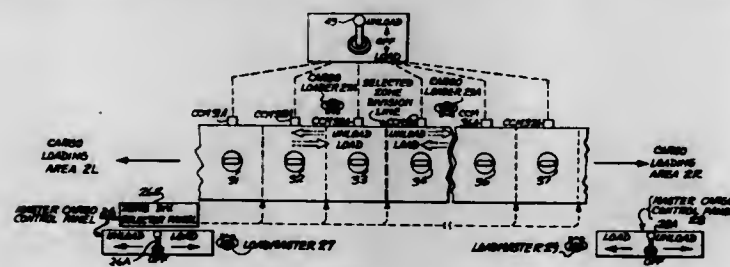
Bruno Joseph Voegel, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 30, 1975, Ser. No. 591,785

Int. Cl.² B64D 9/00; B64C 1/20

U.S. Cl. 244-137 R

7 Claims



1. A cargo handling control system, for permitting simultaneous loading and unloading of cargo through two entryways of a single cargo compartment, comprising: a first master controller for controlling cargo through a first entryway; a

second master controller for controlling cargo through a second entryway remotely located with respect to the first entryway; a multiplicity of power drive units on the floor of the cargo compartment for moving cargo between the entryways; a cargo control module directly associated with each of the individuals power drive units; a zone division logic operatively interconnected between said cargo control module and the master controllers for permitting the arbitrary selection of a zone division line between any adjacent pair of power drive units to automatically set up two cargo control zones, one on either side of the arbitrarily selected zone division line, with each of said zones being controllable independently of each other by only one of the master controllers; said zone division logic in conjunction with said cargo control module, delegating the operating control of the power drive units in each of the two independently controllable zones to the respective master controller associated with the entryway in that zone, for controlling the direction of rotation of the power drive units.

4,006,870

SELF-ALIGNING ROLL OUT GUIDANCE SYSTEM

Jimmie H. Boone, and Robert D. Simpson, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

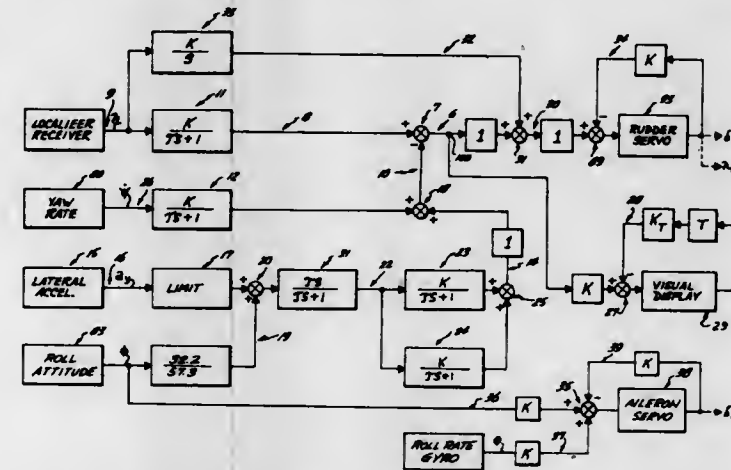
Continuation of Ser. No. 428,515, Dec. 26, 1973, abandoned.

This application July 10, 1975, Ser. No. 594,833

Int. Cl.² G05D 1/12

U.S. Cl. 244-184

7 Claims



1. In combination in an aircraft control system for controlling the path of the aircraft along the surface of a runway; first means comprising lateral velocity signal generating means; second means comprising yaw rate signal generating means; third means comprising adder circuit means for combining said signal representative of lateral velocity and said signal representative of yaw rate thereby providing a further signal representative of combined skid and lateral movement of the aircraft.

4,006,871

AUTOMATIC PITCH AXIS CONTROL SYSTEM FOR AIRCRAFT

Robert D. Simpson, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 264,119, June 19, 1972, abandoned.

This application Jan. 18, 1974, Ser. No. 434,538

Int. Cl.² G05D 1/12

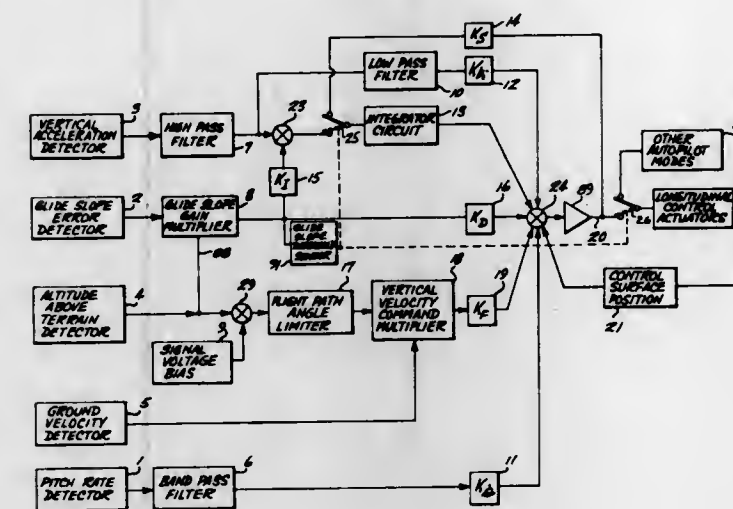
U.S. Cl. 244-186

10 Claims

1. In combination in a pitch axis control system, means for achieving short term stability of an aircraft comprising:

- first means for generating a first signal representative of the change in vertical velocity of said aircraft;
- second means for generating a second signal representative of vertical acceleration of said aircraft;
- third means for generating a third signal representative of pitch rate of said aircraft;

fourth means for combining said first, second, and third signals; and



fifth means including longitudinal control actuator means coupled between said fourth means and the control surfaces of said aircraft.

4,006,872

ELECTRICAL CONNECTOR ASSEMBLY

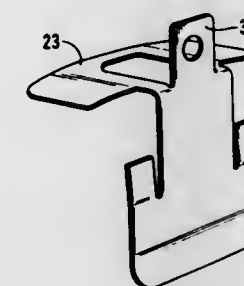
Robert Ivins Tanner, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 23, 1976, Ser. No. 660,417

Int. Cl.² G12B 9/08; H02B 104

U.S. Cl. 248-27.1

1 Claim



1. A locking clip for removably securing a housing in an opening in a supporting mounting plate comprising a neck portion having a pair of mutually perpendicular legs, a flange extending from one leg of said pair of legs having a first pair of spring ends extending outwardly from respective sides of said one leg, each of said first pair of spring ends being deflected from the plane of said flange in the direction of the other leg of said pair of legs, and a blade portion extending from said other leg, said blade portion being formed to present a pair of shoulders extending at right angles outwardly from respective sides of said other leg, said shoulders being disjoined from said other leg for a partial length of said blade portion to present a second pair of spring ends, each of said second pair of spring ends being deflected from the plane of said blade portion in the direction of said one leg of said pair of legs, the ends of said first pair of spring ends and the ends of said second pair of spring ends being spaced apart a predetermined dimension, said first and second pairs of spring ends being flexible to grip therebetween a mounting plate having a thickness greater than said predetermined dimension.

4,006,873

SPRING SUPPORT

Peter Berger, Pforzheim, Germany, assignor to Metallschlauch-Fabrik Pforzheim (vorm. Hch. Witzmann) Gesellschaft mit beschränkter Haftung, Pforzheim, Germany

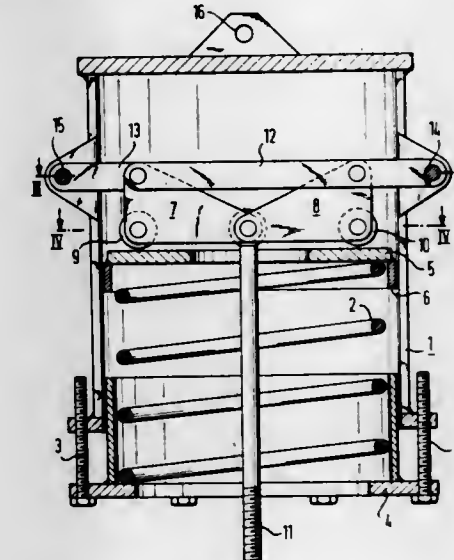
Filed Apr. 11, 1975, Ser. No. 567,085

Claims priority, application Germany, Apr. 11, 1974, 2417728

Int. Cl.² F16L 3/00

U.S. Cl. 248-54 CS

14 Claims



1. In a spring support device including a coil spring having a longitudinal axis, one end supported by a stationary abutment and another end carrying a spring disc; at least two bell crank levers arranged on the spring disc symmetrically to the coil spring; fulcrum means slidably and pivotally supporting each bell crank lever on the spring disc; each bell crank lever having a first arm extending from the fulcrum means generally towards the axis of the coil spring; each bell crank lever having a second arm extending from the fulcrum means at an angle to the first arm; the first and second arms having an end remote from the fulcrum means; a longitudinally movable pull rod having a first end adapted to carry a load and a second end at least indirectly articulated to the end of each first arm; the improvement comprising guiding means for guiding said end of each said second arm in a stationary, arcuate path oriented generally along a line parallel to said axis.

4,006,874

TUBE CLAMP

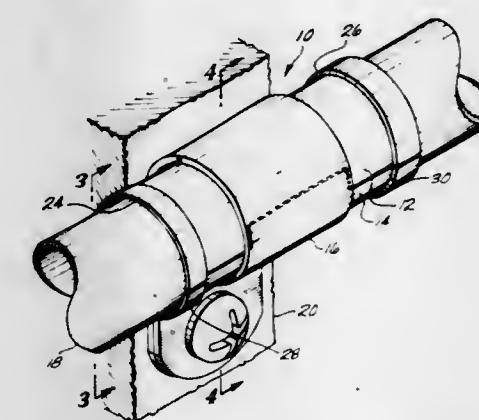
James Monroe McGee, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 29, 1975, Ser. No. 617,925

Int. Cl.² F16L 3/08

U.S. Cl. 248-74 R

2 Claims



1. Clamping apparatus for supporting a metal tube from fixed structure, the apparatus comprising a split sleeve surrounding the tube, said sleeve having identical, interlocking halves, interlocking tongues and slots and raised shoulders at

their ends, and a loop clamp surrounding the split sleeve between the end shoulders and attached to the fixed structure, the improvement comprising having the interlocking tongues extending cylindrically from the interlocking halves and cylindrically surrounding more than 180° of the tube circumference so that the sleeve halves must be snapped into place to be installed onto the tube and so that axial displacement of said sleeve along said tube is frictionally resisted by the spring clamp action of each part of said split sleeve said improvement further comprising the width of said strap of said loop clamp being less than the distance between said end shoulders of said split sleeve, so that said sleeve can be displaced axially in said surrounding clamp, and the inside diameter of said loop clamp being such that it must be snapped into place to fit around the outside diameter of said sleeve so that said axial displacement between said sleeve and said loop clamp is frictionally resisted, the frictional resistance between said loop clamp and said sleeve being less than the frictional resistance between said sleeve and the metal tube.

4,006,875

PROTECTION EQUIPMENT FOR FLEXIBLE ELONGATED MEMBERS

Job Frederick Smith, and Owen O'Neill, both of Derby, England, assignors to Coal Industry (Patents) Limited, London, England

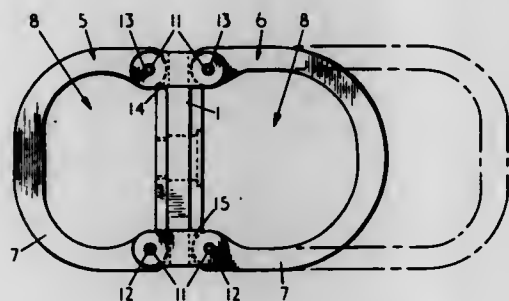
Filed Dec. 23, 1975, Ser. No. 643,916

Claims priority, application United Kingdom, Jan. 3, 1975, 262/75

Int. Cl.² A62C 23/04; A41B 21/00; F16G 13/00

U.S. Cl. 248—75

4 Claims



1. Protection equipment for a plurality of flexible elongated members, comprising a link having a support component adapted to be pivotally connected adjacent its ends to two other support components of adjacent links, respectively, and two retaining components securable to opposed sides of the support component, respectively, to define two closed-sided passages extendable around the flexible elongated members which in use pass through the passages.

4,006,876

ACTUATOR CONTROLLED INSTRUMENT SUPPORT STAND

Chadwell O'Connor, 2024 Galaxy Drive, Newport Beach, Calif. 92660

Continuation-in-part of Ser. No. 406,542, Oct. 15, 1973, Pat. No. 3,850,395. This application Oct. 15, 1974, Ser. No. 514,298

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

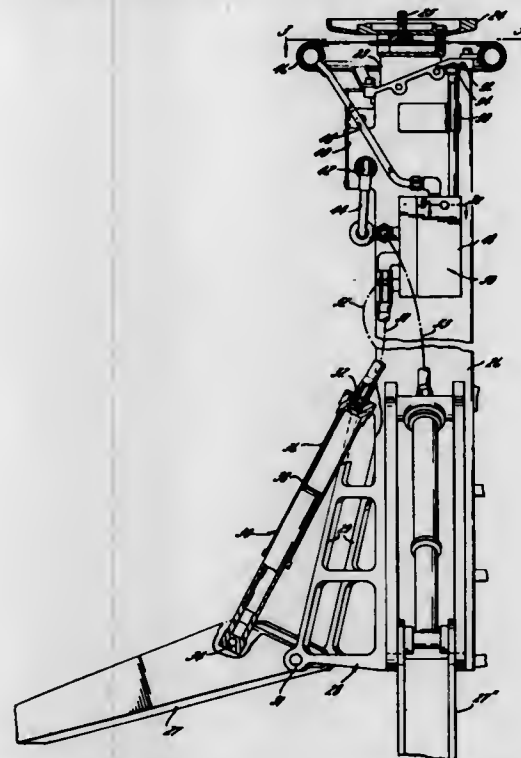
Int. Cl.² F16M 11/38

U.S. Cl. 248—171

2 Claims

1. In an instrument support structure including, in combination, a column, a plurality of legs pivoted at the lower end of said column for swinging movement between positions adjacent the column to positions extending from the column to define a base for supporting the column upright, a plurality of struts including double-acting fluid actuators each connected between said column and one of said legs so as to define one

extendible strut for each of the legs, a reservoir mounted on said column and containing fluid, and means including a valve for selectively (1) opening said reservoir to all of said actuators so that, when so opened, the struts extend and the legs pivot to their base defining positions, (2) shutting off said



4,006,877

BICYCLE REFLECTOR CLIP

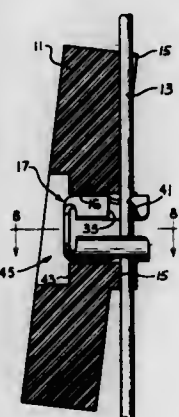
Clarence R. Van Niel, North Olmsted, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 27, 1976, Ser. No. 690,349

Int. Cl.² F16M 13/00

U.S. Cl. 248—466

12 Claims



1. A one-piece spring clip for mounting a first member fixed relative to an elongated second member, the first member having an aperture extending therethrough defining an axis, the axis intersecting the elongated second member and being generally perpendicular thereto, said spring clip comprising:

- a generally tubular body portion having a head end and an opposite end and adapted to be disposed within the aperture of the first member;
- said body portion defining first and second oppositely-disposed slots extending axially from said opposite end;
- said body portion defining first and second oppositely-disposed slots extending circumferentially from said first and second axial slots, respectively, each of said circumferential slots having a terminal portion contiguous therewith and adapted to receive said elongated member extending therethrough;

d. said tubular body portion defining a distance X from said circumferential slot to said head end and a distance Y from said terminal portion to said head end, both of said distances X and Y being less than the thickness of the first member adjacent the aperture.

4,006,878

CONCRETE FORM ASSEMBLY

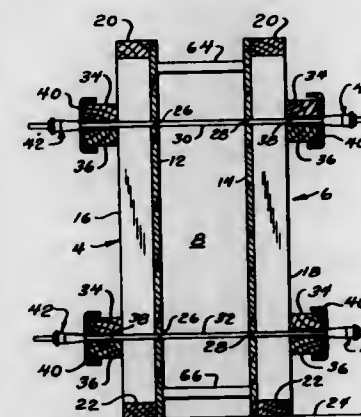
Robert H. Dawson, Lake Bluff, and James L. McGrath, Medinah, both of Ill., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed July 16, 1973, Ser. No. 379,791

Int. Cl.² E04G 11/08, 17/08

U.S. Cl. 249—43

5 Claims



1. A concrete form assembly comprising spaced apart forms, spacers spanning the space between said forms and establishing a preselected distance therebetween, said forms having holes positioned such that holes in one form are aligned with holes in the other form, plastic tie rods spanning the space between said forms and projecting through pairs of said aligned holes, and anchors on the outsides of said forms and receiving said rods, said anchors each including a tapered shell having a smaller end presented toward the adjacent form and abutting an appurtenant portion thereof; a plurality of arcuate tapered jaws in each shell that are longitudinally juxtaposed to define a tapered jaw cluster with a bore that receives the rods, said jaws having teeth presented to said bore for gripping the rod, each of said shells having spring means therein that urges said jaw cluster therein toward the adjacent form and into gripping engagement with the rod such that forces tending to move the forms further apart upon pouring concrete between said forms act on said shells at the respective smaller ends thereof to increase the grip on said rod by said jaw teeth and thereby maintain said preselected distance despite said forces, said tie rods being of such size, cross-section and composition as to be manually breakable, and said anchors being exposed for manual gripping and movement with the smaller ends thereof fulcruming on the appurtenant portions of the forms to break off the tie rods adjacent to and exteriorly of said forms.

4,006,879

DEGATING

Peter J. Morroni, P.O. Box 1102, Marco Island, Fla. 33937

Filed Apr. 22, 1976, Ser. No. 679,478

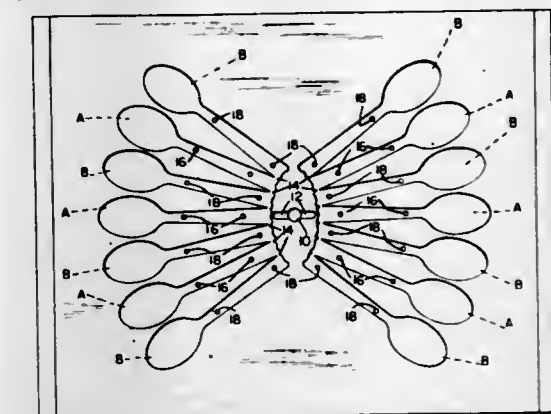
Int. Cl.² B29F 11/4

U.S. Cl. 249—68

8 Claims

1. In a die for molding articles, cavities arranged with communication between contiguous cavities forming means for the running of molten plastic material so that when cooled a variety of parts are connected together into a single shot,

means for ejecting alternate articles from the die, thereby disrupting all the articles from each other and thereby degating.



4,006,880

SIDE BOARD SECURING DEVICE

Raymond Snowden, Long Acre Nechells, Birmingham, B7 5JR, England

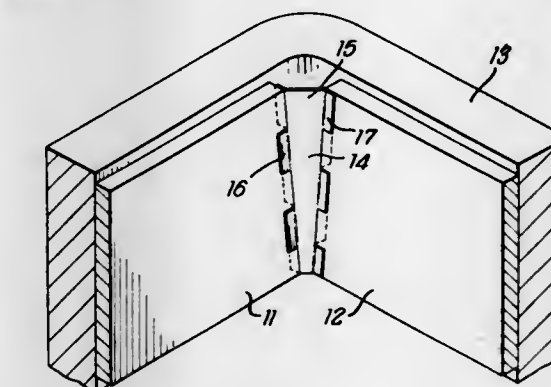
Filed Feb. 13, 1976, Ser. No. 657,902

Claims priority, application United Kingdom, Feb. 18, 1975, 6803/75

Int. Cl.² B22D 7/10

U.S. Cl. 249—106

8 Claims



1. In a securing device for use in securing two side boards together in a hot top assembly for an ingot mould, each side board having an inner surface and an end surface, the securing device constituted by a single plate which tapers in width along its length, the improvement which comprises at each of the longitudinal edges of the plate an integral marginal portion which is divided transversely to provide at least a first and a second flange, each flange extending over only part of the length of the plate, one of said flanges projecting at an acute angle forwardly from the plate, and the other of said flanges projecting at an acute angle rearwardly from the plate, the flanges at each longitudinal edge of the plate lying at such an angle to one another that when the securing device is inserted into the gap left at a corner of the mould between two of the side boards of the hot top assembly, the said flanges will respectively engage the inner surface and the end surface of one of the said two side boards.

4,006,881

FLUID-TIGHT PACKING FOR CLOSURE DEVICES AND DEVICES FITTED WITH SAID PACKING

Georges Gaillard, Montmorency, France, assignor to Gachot S.A., Saisy-sous-Montmorency, France

Filed Dec. 9, 1974, Ser. No. 530,556

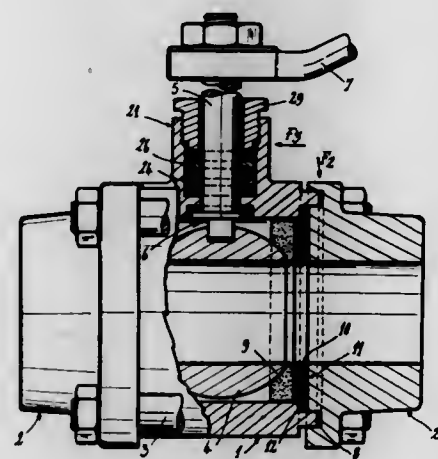
Int. Cl.² F16K 41/00

U.S. Cl. 251—214

4 Claims

1. A closure device such as a valve or cock which is primar-

ily intended to withstand high temperatures, comprising a plug actuated by a rod moving across a stuffing-box packing, wherein said packing comprises at least one washer of carbonaceous sheet material formed by the association of carbon fibers with expanded graphite, said washer being cut out from a sheet and having a structure which is substantially laminated



in a direction parallel to the plane of the sheet from which the washer is cut out, said washer being clamped by a gland nut of said stuffing-box between two metallic washers each having a convex bearing surface and said washer being compacted as a result of the compression applied transversely to the plane of the sheet material.

4,006,882

BUTTERFLY VALVE OF LARGE DIAMETER

Maurice Bonafous, Gurmencon, France, assignor to Applications Mecaniques et Robinetterie Industrielle A.M.R.I., Paris, France

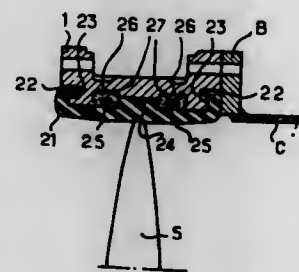
Filed Jan. 31, 1975, Ser. No. 546,188

Claims priority, application France, Feb. 6, 1974, 74.03970

Int. Cl.² F16K 1/18

U.S. Cl. 251-306

3 Claims



1. A butterfly valve of large diameter, comprising: a cylindrical body having a substantially cylindrical inner bore defined at its outer ends by spaced-apart parallel side walls and being lined in its interior with an elastic seat in the form of a ring that terminates at said parallel side walls of said valve body; said ring having a substantially U-shaped cross-section that conforms to the configuration of said bore; a butterfly pivotally mounted in said body by means of valve spindles that pass through said body and said ring; wherein said body includes at least two annular grooves, each of which having an opening at its innermost end into said bore, and being closed at its outermost end; said grooves being coaxial with respect to said bore, opening thereinto, and being narrower at said innermost ends than at said outermost ends; said ring being constructed of a plurality of sections that are disposed in an end-to-end relationship, said sections including two sections having a curvilinear outer shape for the passage of said valve spindles and of the valve, and a plurality of rectilinear sections; the ends of said sections being formed and vulcanized to shape after having been aligned with each other; said ring further including, on its side adjacent said body, at least two

annular tenons that have heads which respectively engage said grooves; said tenons being smaller than said openings of the grooves; and wherein an empty space is provided between said tenons and said grooves, said empty space being filled with a plastic material that hardens by polymerization, to retain said ring in said body.

4,006,883

ADJUSTABLE SEAT FOR BUTTERFLY VALVES

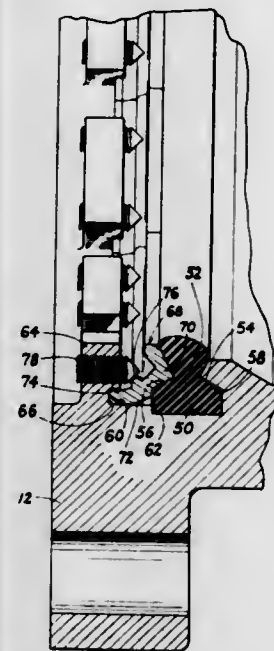
George W. Hilsheimer, P.O. Box 1647, Tulsa, Okla. 74101

Filed Jan. 8, 1973, Ser. No. 321,994

Int. Cl.² F16K 1/22

U.S. Cl. 251-307

6 Claims



1. A valve seat for a butterfly valve having a valve body and a valve disc rotatable to alternate open and closed positions, comprising a first annular groove provided in the valve body in substantial alignment with the closed position of the valve disc, a resilient valve seat disposed within said annular groove and having the outer periphery thereof in sealing engagement with the groove and the inner periphery thereof in sealing engagement with the outer periphery of the valve disc in the closed position thereof, said valve seat being provided with oppositely disposed annular recesses, one sidewall of said annular groove being provided with recess means complementary to the recess means of the valve seat disposed adjacent thereto, a second annular groove provided in the valve body and in open communication with the first annular groove, inwardly directed flange means provided on the body conterminous with the second annular groove and spaced from the first annular groove, a plurality of arcuate retaining segments disposed in end to end relation within said second annular groove between the flange means and valve seat means, said arcuate retaining segments being provided with longitudinally extending ridge means along one side thereof of a configuration complementary to the recess of the valve seat disposed thereagainst, a longitudinally extending curved sidewall provided on each retaining segment conterminous with the ridge and engagable with the second annular groove whereby said retaining segments are pivotally disposed therein, projection means provided on each retaining segment oppositely disposed with respect to the curved sidewall, and adjusting means provided on said lug means and engagable with the projection means for selectively rocking the retaining segments in a direction toward the valve seat, said ridge of each retaining segment cooperating with the recess of the sidewall of the first annular groove for selectively adjusting the sealing pressure of the valve seat against the outer periphery of the valve disc upon rocking of the segments by said adjusting means.

4,006,884

METHOD AND APPARATUS FOR AERIAL WIRE STRINGING THROUGH AREAS WITHOUT VERTICAL ACCESS

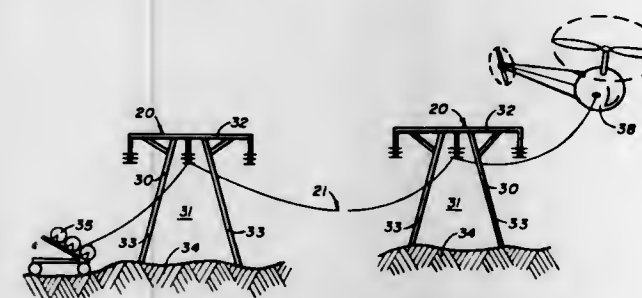
Donald A. Lederhos, Rte. 1, Box 498, Bonners Ferry, Idaho 83805, and L. E. Lindsey, 222 Vista Ave., Pasadena, Calif. 91107

Filed Sept. 22, 1975, Ser. No. 615,480

Int. Cl.² B66D 1/36

U.S. Cl. 254-134.3 PA

8 Claims



1. A method of aerially stringing a cable through an area of a support having no free access from above, comprising, in combination:

the placement of a loop cable in a simple loop through the area of the support having no access from above with the ends of the loop cable extending to a releasable support in an area having free access from vertically above; the transport of a stringing cable to the point of releasable support of the ends of the loop cable; the interconnection of the loop cable in the pulling cable to form a compound unitary pulling cable; and the release of the ends of the loop cable from their releasable support.

4,006,885

MODULAR FENCE AND HAND RAIL

Jose Unterberger, 2562 Runyon, Anaheim, Calif. 92804

Filed Dec. 5, 1975, Ser. No. 638,145

Int. Cl.² E04H 17/14

U.S. Cl. 256-59

2 Claims



1. A modular fence and hand rail comprising: a first upper, elongated, tubular rail member having a plurality of equally-spaced, threaded holes juxtapositioned along one side thereof; a second, lower, support rail positioned in parallel relationship to said first rail, said second rail being an elongated tubular member having a plurality of oppositely aligned threaded holes disposed therein in a juxtaposed relation; a plurality of vertical, tubular bar members, wherein each bar includes: a threaded screw secured to the upper end of said bar wherein said screw is arranged to be received in said threaded holes of said first rail member; a threaded plug being removably attached to the lower end of said bar;

955 O.G.-20

a mounting bolt adapted to pass through said aligned holes of said second rail, and threadably engage said threaded plug in said vertical bar; a pair of anchor posts removably mounted to each end of said rails; a base plate secured to said anchor post; attached means comprising an angular bracket interconnecting said rails and anchor post for removably mounting thereto; and a cap member arranged to be secured to adjacent terminating open ends of said first upper rail and said anchor post, whereby said ends are closed thereby.

4,006,886

SOIL COMPACTING DEVICES

Roger Michael Elliott, Ipswich, England, assignor to B S P International Foundations Limited, Ipswich, England

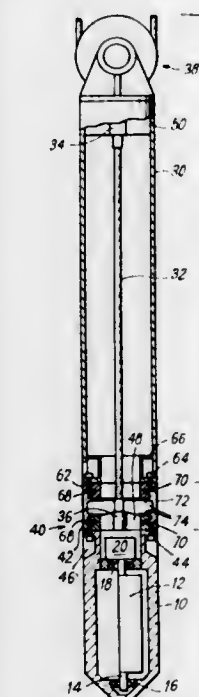
Filed Jan. 13, 1976, Ser. No. 648,630

Claims priority, application United Kingdom, Jan. 15, 1975, 1769/75

Int. Cl.² B01F 11/00; E02D 3/06

U.S. Cl. 259-1 R

9 Claims



1. A soil compacting device comprising, in combination a vibrator body and a follower disposed substantially in line and forming an elongate assembly with the body below the follower, a vibratory mechanism within the body for generating oscillations transverse to the longitudinal axis of the assembly, means suspending the body from the follower, said suspension means comprising at least one flexible tension element, respective end portions of the body and follower being adjacent but spaced from each other and flexible sealing means extending between and enclosing said end portions, said sealing means comprising a resilient member that is precompressed by the tension in said at least one flexible element.

4,006,887

DEVICE FOR CONTINUOUS COATING OF FIBERS

Kaspar Engels, Mannheim, Germany, assignor to Draiswerke GmbH, Mannheim, Germany

Filed Aug. 11, 1975, Ser. No. 603,271

Claims priority, application Germany, Aug. 13, 1974, 2438818; Feb. 18, 1975, 2506784

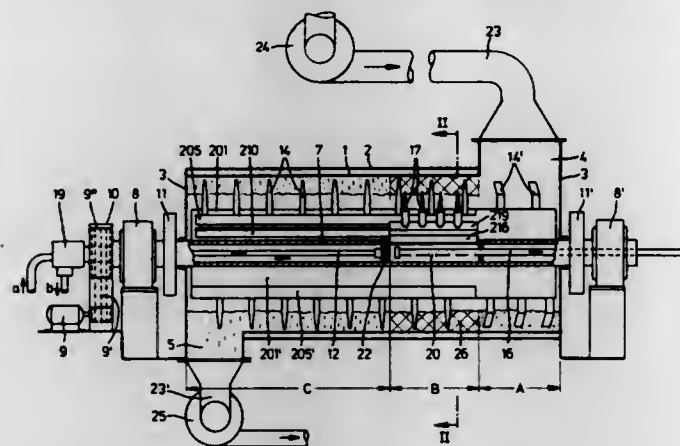
Int. Cl.² B01F 7/02, 15/00; B05B 17/00

U.S. Cl. 259-9

18 Claims

1. A device for continuous coating of fibers, comprising: a horizontally mounted cylindrical mixing container; an inlet funnel entering into one end of said container; an outlet funnel connected to the other end of said container;

a mixing shaft mounted coaxially within said container, said shaft being at least partially hollow;
drive means connected to said mixing shaft for driving said shaft at considerably supercritical speeds;
glue feed means for feeding glue into at least a portion of the interior of said shaft;
mixing tools connected to said shaft at least on an axial portion thereof;
glue agitating elements connected to said shaft on an axial portion thereof and extending into the ring of material formed on the inside wall of the cylindrical mixing con-



tainer when said shaft is operated at a considerably supercritical speed, said elements being in the form of mixing rods extending into the ring of material, each of said rods being provided with at least one groove extending in the lengthwise direction, each of said grooves being open outwardly along its entire length and each of said grooves communicating with the interior of said mixer shaft for allowing dispensing of glue into the ring of material; and means for ensuring air vorticity in said cylinder; whereby fibers may be substantially homogeneously coated while avoiding substantial jamming and lumping of the fibers in the mixing container.

4,006,888

DRY GRANULAR FEEDER

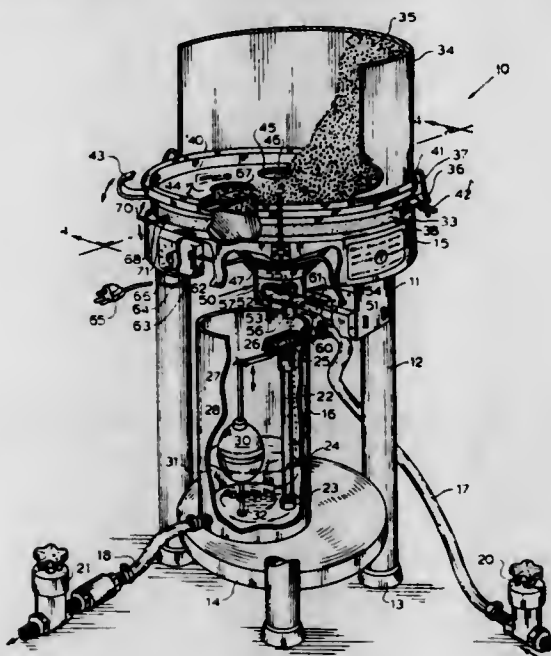
Donald R. Emmons, 2909 Trentwood Blvd., Orlando, Fla. 32809

Filed Sept. 2, 1975, Ser. No. 609,288

Int. Cl.² B01F 5/00; G01F 11/06

U.S. Cl. 259-18

12 Claims



1. A granular material feeder comprising in combination;
a frame;
a hopper mounted to said frame;

a receiving tank mounted to said frame and located to receive granular material;
a movable flag rotatably attached to the top portion of said hopper by a shaft extending from said frame whereby rotating of the said shaft will indicate whether said flag is rotating in a granular material; and
feeding means for feeding granular material from said hopper to said receiving tank and being operatively connected to said hopper, said feeder means having an opening from said hopper therethrough and having a plunger slidably mounted therein and said feeding means including a path for granular material to move from the opening from said hopper therethrough to said receiving tank responsive to the sliding of said plunger whereby granular material is fed from said hopper to said receiving tank by the sliding of said plunger.

4,006,889

ASPHALT SEALER MIXER

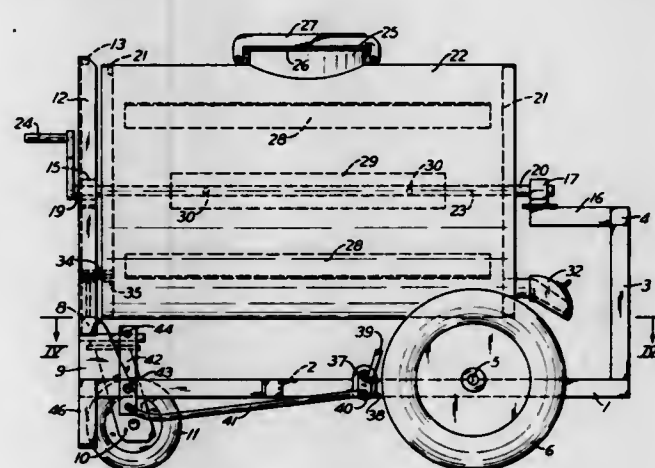
Richard A. Perrott, Sr., P.O. Box 51, Hillsville, Pa. 16132

Filed July 18, 1975, Ser. No. 597,034

Int. Cl.² B28C 7/16

U.S. Cl. 259-176

5 Claims



1. An asphalt sealer mixer comprising a pair of substantially horizontal side frame bars having front and rear ends, an axle secured to said bars near their front ends, wheels mounted on said axle, a pair of upright members rigidly connected at their lower ends to the front ends of the side frame bars, a cross bar secured to the upper ends of the upright members, a support bar connected at one end to the center of the cross bar and extending therefrom toward the opposite end of the mixer, a first bearing mounted on the free end of the support bar, a cross member supported by the side frame bars above their rear ends, a single rear swivel wheel between the rear ends of the side frame bars, means pivotally connecting the swivel wheel with the central portion of said cross member, a post mounted on the central portion of said cross member, a second bearing mounted on the upper end of said post in alignment with said first bearing, a mixing drum having spaced front and rear end walls connected by an encircling side wall, trunnions projecting from the centers of said end walls and rotatably mounted in said bearings, mixing vanes secured to the inside of the drum, the drum being provided in said side wall with a filling opening, a removable cover normally sealing said opening, the front end wall of the drum having a discharge opening located at the bottom of the drum when said filling opening is at the top, a discharge valve connected with said outlet opening and projecting forward from the end of the drum, the space between the front ends of said side frame bars being unobstructed to permit a pail to be inserted between them and moved back beneath said valve, and a crank secured to the trunnion in said second bearing for rotating the drum, said support bar being long enough for said valve to be carried around it by the rotating drum.

4,006,890

GAS-CUTTING TORCH ARRANGEMENT

Shimon Abramovich Vainer, ulitsa Logovskaya, 43, kv. 21; Anatoly Fedorovich Temerev, ulitsa Tsimlyanskaya, 34, kv. 46; Saveli Abramovich Vainer, ulitsa Krasnopiterskaya, 23, kv. 46; Sergei Sergeevich Nikulin, ulitsa Bakhturova, 1, kv. 26; Matvei Evseevich Kheifets, ulitsa Dotsenko, 37, kv. 11; Vadim Anatolevich Usoltsev, ulitsa Panfilovskaya, 3, kv. 3; Evgeny Fedorovich Matveev, ulitsa Astrovskaia, 13; Georgy Petrovich Kazakov, ulitsa Petrogradskaya, 16, kv. 2; Vladimir Alexandrovich Salkov, ulitsa Krasnopresnenskaya, 31, kv. 33, and Anatoly Isidorovich Malinin, ulitsa Dotsenko, 74, kv. 21, all of Volgograd, U.S.S.R.

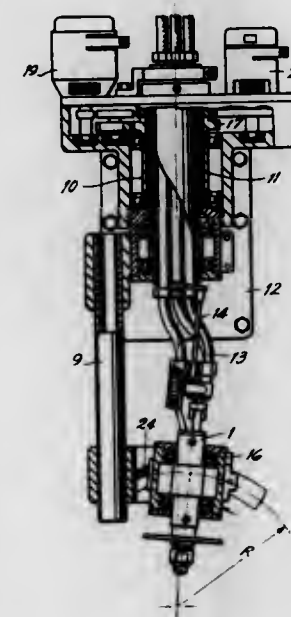
Division of Ser. No. 463,063, May 22, 1974, Pat. No.

3,944,441. This application May 28, 1975, Ser. No. 581,681

Int. Cl.² B23K 7/02

U.S. Cl. 266-77

1 Claim



1. An arrangement for orientating a torch for gas cutting machine, in making parts from sheet metal by means of oxygen cutting, the arrangement comprising a carriage in the cutting machine for mounting a cutting torch and two coaxial cylinders, the inner cylinder being fixedly mounted on said carriage while the outer cylinder is rotatably mounted in relation to said inner cylinder, which is connected through flexible means to said torch; the axis of the latter intersecting that of said cylinders at a point that lies on the surface of the sheet metal; said torch being fitted in a bearing which has an outer race linked to said outer cylinder; means to impart an angular motion to said torch in a vertical plane, at a predetermined small angle from the vertical, the angle of the oxygen jet to the cutting path remaining substantially constant irrespective of changes in the direction of the cut; gas-supply hoses, passing to said torch through said inner cylinder; and means for eliminating twisting of said hoses, constituted by said fixed inner cylinder, said flexible means and said bearing.

4,006,891

CRUCIBLE FOR MELTING SUPER-ALLOYS

David Alan Ford, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

Filed July 9, 1976, Ser. No. 703,818

Claims priority, application United Kingdom, July 25, 1975, 31095/75

Int. Cl.² F27B 14/10

U.S. Cl. 266-284

4 Claims

1. A crucible for melting a nickel-based superalloy containing one or more of the elements of the group consisting of aluminum, titanium and hafnium, wherein the crucible is made of a material consisting by weight of 90-99% magnesia grains and 1-10% of an oxide being a bonding medium for the magnesia grains and being one of the group consisting of

titania, hafnia and yttria, and wherein the purity of the magnesia is not less than 97%.

4,006,892

COMPRESSION MOUNTING

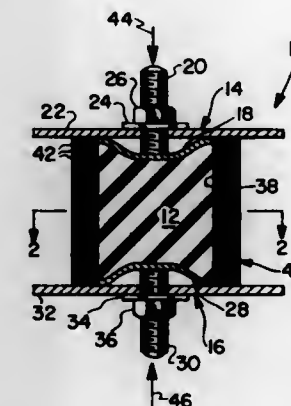
James B. Koeneman, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 15, 1975, Ser. No. 640,359

Int. Cl.² F16F 1/36

U.S. Cl. 267-153

13 Claims



1. A compression mounting comprising
a body of elastomer,
first load-transmitting means for engaging and covering at least part of a first surface of the body of elastomer,
second load-transmitting means for engaging and covering at least part of a second surface of the body of elastomer opposite and spaced from said first surface, the first and second load-transmitting means being disposed and configured to expose a circumferential surface of the body of elastomer, and
shell means for completely covering and enclosing at least a circumferential portion of the exposed circumferential surface of the body of elastomer, said shell means including (a) filamentary means providing a plurality of substantially parallel and juxtaposed filament portions oriented to circumscribe the exposed circumferential surface, the filament portions being less extensible than said elastomer, and (b) matrix means encasing the filament portions of the filamentary means and flexibly bonding adjacent filament portions to one another in substantially parallel relationship, the shell means snugly fitting the exposed circumferential surface and the filamentary means causing the shell means to be more resistant to circumferential expansion than the body of elastomer so as at least to impede circumferential expansion of said portion of the exposed surface of the body of elastomer in response to compressive loads applied to the body through the load-transmitting means, adjacent filament portions in the shell means being movable in parallel planes relative to each other so that the shell means can deflect in response to torsional loads on the mounting.

4,006,893

SPRINGS

William Wilfred Spencer, 5 Tottenham Road, Baysville, East London, Cape Province, South Africa

Filed Apr. 15, 1976, Ser. No. 677,118

Claims priority, application South Africa, Apr. 17, 1975, 75/2463

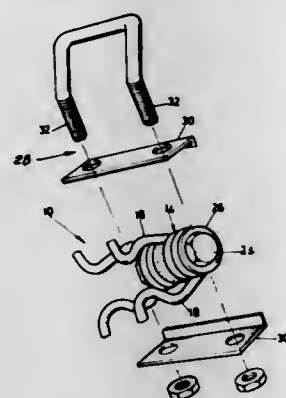
Int. Cl.² F16F 1/12

U.S. Cl. 267-61 S

4 Claims

1. A device for strengthening a coil spring comprising a torsion spring having a helical formation with an arm extending generally tangentially from each end of the formation, each of the arms having a hook for engaging a coil of a coil spring, and a deformable body accommodated within the

helical formation resistively to oppose a reduction of the diameter of the helical formation, the deformable body being



in the form of a sleeve, and a stiff incompressible rod being snugly received inside the sleeve.

4,006,894

SHEET DISTRIBUTING DEVICE

Hermann Raible, St. Georgen; Wilfried Dorer, Donaueschingen, and Werner Lehmann, Gutach, all of Germany, assignors to Mathias Bauerle GmbH, Firma, St. Georgen, Germany

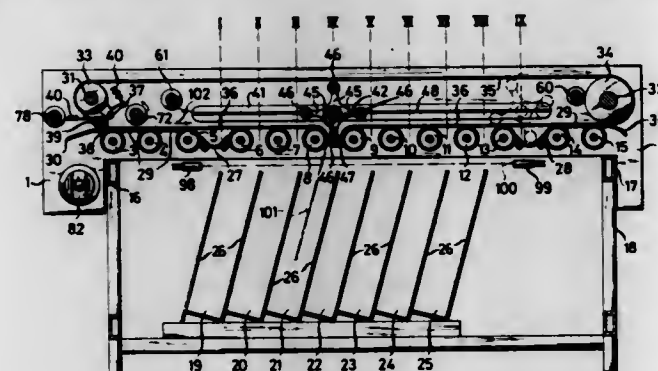
Filed Mar. 3, 1975, Ser. No. 554,821

Claims priority, application Germany, Mar. 22, 1974, 2413908

Int. Cl.² B65H 29/58

U.S. Cl. 271-173

20 Claims



1. A sheet distributing apparatus, comprising: a plurality of pockets having in-feed openings for receiving sheets in a predetermined sequence; sheet transport means for conveying sheets in feeding relation to the in-feed openings, said sheet transport means comprising guide rolls positioned in spaced apart parallel relation adjacent the in-feed openings and flexible conveyor belt means for capturing the sheets between the conveyor belt means and the guide rolls, whereby the sheets move in a transport plane; and deflector means moveable relative to the conveyor belt means and in timed relation with the sheets, said deflector means including a shaft provided with a plurality of radially extending arms adapted to move between adjacent ones of said guide rolls to form a loop in a conveyor belt means by partially wrapping said conveyor belt means around the guide rolls and the deflector means, thereby changing the direction of the sheet movement from the transport plane to the in-feed opening.

4,006,895

REVOLVING EXERCISING DEVICE

Anthony DiLaurenzio, 4832 Merten Ave., Cypress, Calif. 90630

Filed June 2, 1975, Ser. No. 582,588

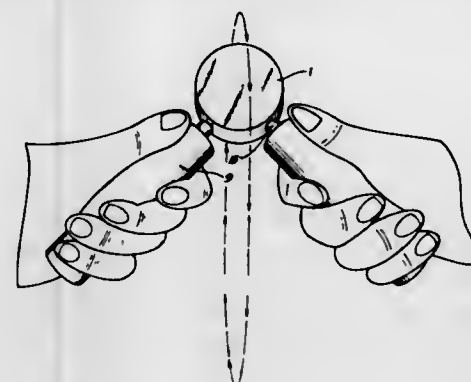
Int. Cl.² A63B 23/00

U.S. Cl. 272-67

1 Claim

1. A wrist exercising device comprising, in combination, a

solid member, two bars imbedded into said member at an angle of generally 90° to each other, a stock freely rotatably mounted on and surrounding the axis of each bar, an outer



handle surrounding each stock, said member, bars, stock and handles in communication with each other and combined with each other so that when the two handles are grasped by the user, the user can rotate said member by wrist action.

4,006,896

TENNIS RACKET

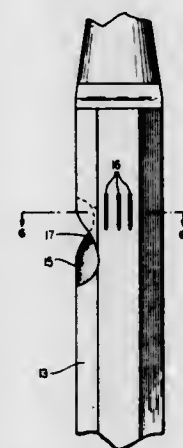
Alfred C. Soldavini, Fairmount Road, East Pottersville, N.J. 07979

Filed July 10, 1975, Ser. No. 594,794

Int. Cl.² A63B 49/08

U.S. Cl. 273-73 J

6 Claims



1. A tennis racket having a string matrix disposed in a common plane and held in position by a frame to form a surface for striking a tennis ball, an extended handle linking said strings to a player's hand and indexing means on said handle for positioning the junction point between the player's thumb and forefinger with respect to said common plane characterized in that said indexing means includes at least one raised surface irregularity and a set of lines parallel to the long axis of said handle, said parallel lines being disposed on the surface of said handle in a predetermined position with respect to said common plane so as to cooperate with the point of junction between a holder's thumb and forefinger and said surface irregularity being disposed on said handle to engage at least one gripping finger of a holder's hand.

4,006,897

SIMULATED TENNIS GAME

Eliseo Ordinaga Llorens, Valencia, Spain, assignor to Cremeal S.A., Valencia, Spain

Filed Feb. 28, 1975, Ser. No. 554,325

Claims priority, application Spain, Mar. 1, 1974, 201078[U]; July 12, 1974, 204600[U]; July 12, 1974, 204601[U]

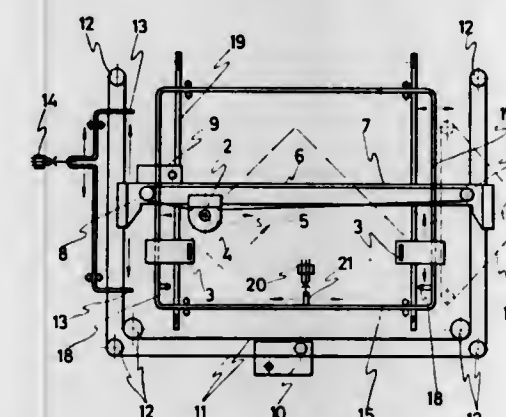
Int. Cl.² A63F 9/14

U.S. Cl. 273-85 R

11 Claims

1. A skilled game of simulated tennis or table tennis type, said game comprising:

a frame;
a translucent screen supported by said frame and representing a playing court, said screen having opposite side edges representing lateral boundaries of said court and opposite end edges representing end lines of said court;
a luminous point representing a ball supported for zig-zag type movement beneath said screen, each said zig-zag type movement being the resultant vector from simultaneous movement of said point between said lateral boundaries and between said end lines;
a pair of segments representing raquets or players, one each slidably mounted on a transverse bar support adjacent a respective one of said end lines for transverse movement therealong between said lateral boundaries;
a pair of segment movement means, one each operatively connected to a respective one of said segments, for selectively and manually moving said segments along said



respective transverse bar supports between said lateral boundaries;

a first reversible motor;
first point movement means, operable by said first motor, for moving said point between said lateral boundaries;
first switch means, connected to said first motor, for reversing the direction of said first motor and said first point movement means upon movement of said point to one of said lateral boundaries;
a second reversible motor;
second point movement means, operable by said second motor, for moving said point between said end lines; and
second switch means, connected to said second motor, for reversing the direction of said second motor and said second point movement means upon movement of said point to one of said end lines when the respective said segment has been manually moved to a position to block the path of movement of said point.

4,006,898

VIDEO GAME TARGET RESET APPARATUS

Clarence Groat, and William R. Price, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Oct. 28, 1975, Ser. No. 626,166

Int. Cl.² A63F 9/00

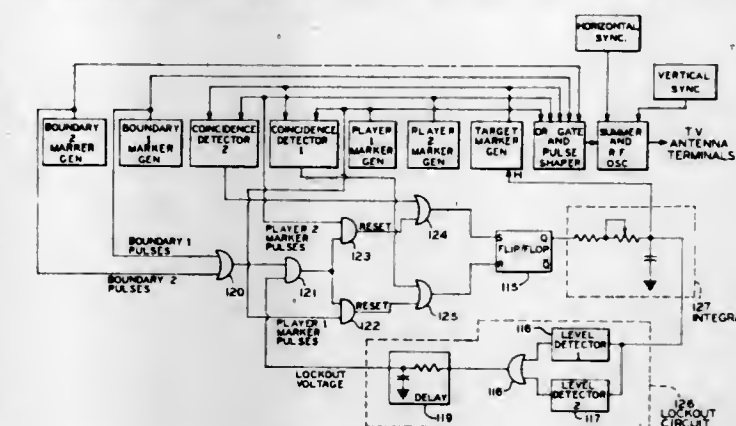
U.S. Cl. 273-85 R

9 Claims

1. In an electronic video game having means for generating a signal representing a target marker, means for generating a plurality of signals representing a plurality of game player position markers including 1st and 2nd game player position markers, means for generating a signal representing a boundary marker, and a flip flop for changing the direction of travel of said target marker, an improved target marker reset comprising:

a. coincident detection circuit means for receiving said signal for representing a boundary marker and said plurality of signals representing a plurality of game player position markers, said coincident detection circuit means having an output signal when a player position marker is coincident with a boundary;

b. lockout circuit means connected to said flip flop output terminal for providing a signal when a target marker is in an out of bounds region; and
c. means for changing the state of said flip flop, said means



being operatively connected to said lockout circuit means and said coincident detection circuit means whereby the state of said flip flop will change when said coincident detection circuit output signal occurs simultaneously with said lockout circuit means output signal.

4,006,899

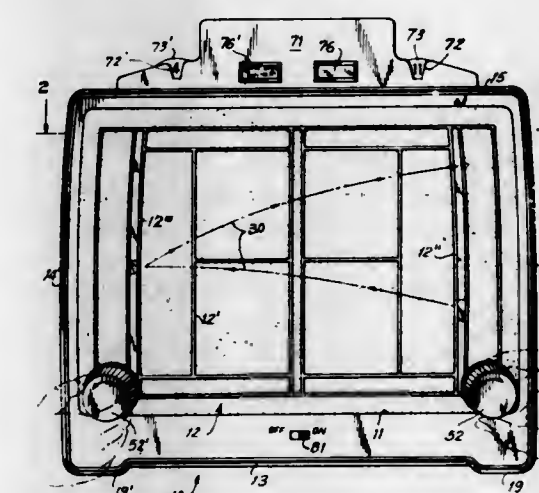
DEVICE SIMULATING PLAY ACTION GAME

Raymond J. Lohr; Richard N. Carver; Charles M. Kienholz; Calvin S. Cook, and Maxmillian P. Rogers, all of Erie, Pa., assignors to Louis Marx & Co., Inc., Glen Dale, W. Va. Continuation-in-part of Ser. No. 544,545, Jan. 27, 1975, abandoned. This application Mar. 3, 1976, Ser. No. 663,375

Int. Cl.² A63F 9/14

U.S. Cl. 273-85 R

18 Claims



1. A game device comprising a housing, a screen associated with said housing, indicia on the screen simulating a playing field, a boom having opposed ends, means mounting said boom for universal movement of an end thereof within said housing in a plane substantially parallel to the screen, actuable signal means mounted in said end of said boom for projecting a signal on said screen simulating a game piece in play on the simulated field, drive means mounted in said housing for reciprocating the signal end of said boom across said screen, a pair of movable deflectors movably mounted in said housing for buffeting the signal end of said boom across said screen at random verticals to the reciprocal horizontal, and means for independently moving each said deflector along a corresponding scoring position of the simulated playing field provided on the screen for thereby striking and returning the simulated game piece across the playing field in the manner corresponding to game play, as observed on the screen, each cross buffet of the signal end of the boom by a respective deflector corresponding to a successful game piece return, and each concomitant misregistration of a deflector and the signal end of the boom corresponding to a missed game piece which concludes a match play point.

4,006,900

MAGNETIC BASEBALL, BAT AND GLOVE

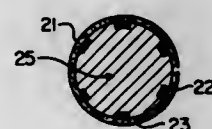
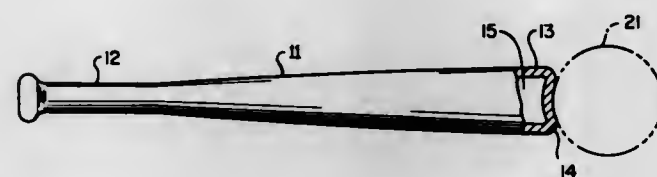
Joseph A. DiVito, 10 Alden Ave., Hull, Mass. 02045

Filed Feb. 5, 1975, Ser. No. 547,111

Int. Cl.² A63B 71/02

U.S. Cl. 273—95 R

1 Claim



1. A magnetic baseball game comprising in combination: a hollow plastic ball having iron filings dispersed throughout the shell of said ball, magnetic attracting baseball glove means having a magnet within the ball receiving pouch of said glove for receiving and catching said ball, a plurality of plastic bats having ball receiving pouches at one end of each bat with a magnet therein for attracting and holding said ball, such that a player may hold said bat with both hands, place a ball within the pouch, raise the bat into position, jerk it, strike the ball when released and catch the ball when thrown or struck back to him.

4,006,901

ARROWHEAD

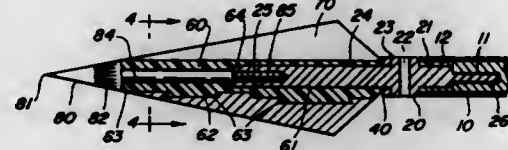
Miroslav Andrew Simo, Riverside, Ill., assignor to New Archery Products Corporation, Riverside, Ill.

Filed Oct. 6, 1975, Ser. No. 619,824

Int. Cl.² F41B 5/02

U.S. Cl. 273—106.5 B

15 Claims



1. An arrowhead assembly for attachment to the head end of an arrow shaft comprising: an adapter shaft having a head end and an other end, said other end having fastening means for securement to said head end of an arrow shaft and means for fastening a nosepiece at said adapter shaft head end; an arrowhead body forming a hollow cylinder, said hollow cylinder having a diameter greater than said adapter shaft

providing freely rotatable movement when said adapter shaft is inserted in said hollow cylinder, multiple blades firmly mounted within said body and having a shape exterior to said arrowhead body adapted for good aerodynamic flight characteristics and keep target penetration; and

a conical nosepiece having a fastening means at its tail end for mating with said fastening means in the head end of the adapter shaft fastening said nosepiece in fixed relation to said adapter shaft and said arrow shaft while allowing freely rotatable movement of said arrowhead body and blades.

4,006,902

AMUSEMENT DEVICE WITH A BUBBLE MOVABLE IN A LIQUID HAVING MEANS FOR CONTROLLING THE SIZE AND MOVEMENT OF THE BUBBLE

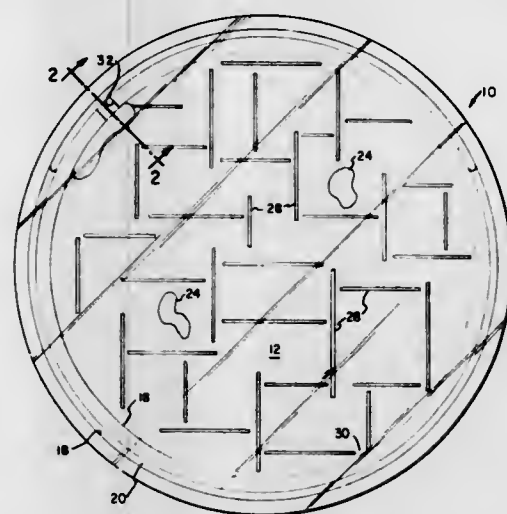
Antoine B. Khawand, New York, N.Y., assignor to Dynavision Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 495,682, Aug. 8, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,909

Int. Cl.² A63F 7/04

U.S. Cl. 273—113

12 Claims



1. An amusement device comprising upper and lower plates and a side wall forming a closed container having a hollow space with a fluid therein, a bubble of material different from said fluid which moves therein, means forming a channel surrounding said hollow space of said closed container, said channel forming means including said side wall, and a passage-way through said side wall for selectively admitting a part of the bubble from the hollow space into the channel for controlling the size of the bubble.

4,006,903

ELECTRICAL TICK-TACK-TOE GAME

Benjamin J. Barish, 36 Yehuda Hanassi, Tel Aviv, Israel

Filed July 7, 1975, Ser. No. 593,730

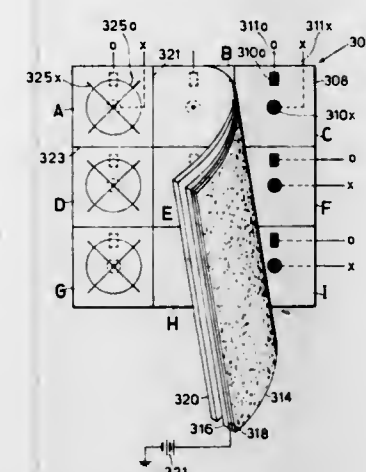
Int. Cl.² A63F 3/00

U.S. Cl. 273—130 AB

10 Claims

1. An electrical Tick-Tack-Toe game comprising an electrical switching device having a face divided into a rectangular matrix of nine boxes arranged in three horizontal rows of three boxes in each row, and three vertical columns of three boxes in each column; a first and a second electrical switch in each box; a first electrically-actuatable indicator located outside said rectangular matrix; a second electrically-actuatable indicator located outside said rectangular matrix; and electrical circuit means including a first electrical circuit effective to actuate said first indicator to provide a first indication whenever said first electrical switches of the three boxes in any horizontal row, vertical column, or diagonal are all closed, and

a second electrical circuit effective to actuate said second indicator to provide a second indication whenever said second



electrical switches of the three boxes in any horizontal row, vertical column, or diagonal are all closed.

4,006,904

DISPLAY DEVICE FOR PROJECTING SCENES, WIN SIGNALS, AND PROPORTION OF WIN SIGNALS

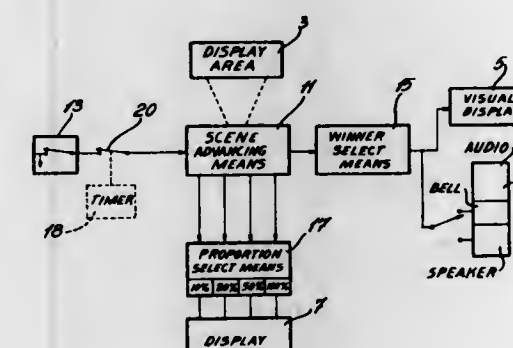
Edward M. Felsher, 5650 Hudson Ave., Montreal, Quebec, Canada

Filed Feb. 10, 1975, Ser. No. 548,777

Int. Cl.² A63B 71/06

U.S. Cl. 273—138 A

1 Claim



1. A display device for displaying one of a plurality of scenes, and comprising: a slide projector for containing representations of said plurality of scenes on slides mounted in said slide projector, a display area comprising said projector screen, means for projecting one of said slides at a time on said projector screen, and, means for advancing said slides into the project position on receipt of a scene advancing signal from a signal means; means associated with preselected scenes for activating a win signal; means associated with preselected ones of said preselected scenes for activating a proportion of win signal; display means for displaying a win signal and a plurality of further display means for displaying respective proportions of win signals; wherein, each slide comprises a plurality of markings on an end thereof; a conductive bar on each slide connecting all of said markings, said conductive bar being connected to ground potential; a plurality of spring contacts mounted in said slide projector such that each spring contact is adjacent a respective marking when the slide is in the project position; each of said contacts being connected to one end of a respective relay, the other end of the relay being connected to a source of potential; and conductive clips for mounting on selective ones of said markings of said preselected slides;

said spring contacts being adapted to contact the clip on its respective marking when the slide, carrying the marking, is in its project position;

whereby, when a contact is grounded through a conductive clip by said conductive bar, its respective relay will be energized;

the movable contacts of each said relay being in a conductive path between a source of potential and an associated win or respective proportion of win display means;

whereby, when a respective relay is energized, power will be supplied to its associated display means to energize said associated display means;

and further comprising:

conductive means connecting said signal means with said means for advancing;

switch means inserted in said conductive means;

timer means connected to said switch means and adapted to open said switch means when said timer means is activated whereby to prevent said means for advancing from receiving said signal, said switch means being closed when said timer is not activated;

whereby to introduce an element of time randomness in the advancement of said representations.

4,006,905

SOLITAIRE GAME LAP BOARD

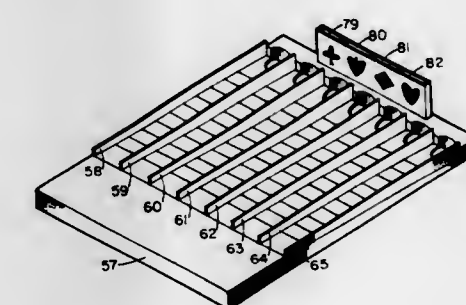
Thomas Kingston Marbury, 227 Harrill St., Forest City, N.C. 28043

Filed Apr. 21, 1975, Ser. No. 569,808

Int. Cl.² A63F 1/10

U.S. Cl. 273—148 A

4 Claims



1. A solitaire game board comprising a rigid main body, flat surface areas at the forward and rearward portions of the body, the rearward portion being of a size suitable to shuffle a deck of cards thereon, a receptacle having four open compartments each of a size to accommodate a plurality of conventionally sized playing cards, means for removably attaching said receptacle to said forward portion with the compartments opening upwardly, the body portion between the forward and rearward portions comprising a surface having at least seven equally spaced steps descending from the rearward portion to the forward portion, vertically and longitudinally extending dividers disposed on said stepped surface and dividing said surface into seven equal sized areas each extending between the rearward and forward portions, each area being of a size to accommodate at least seven conventionally sized playing cards in longitudinally extending overlapped relation with the edges of successive cards abutting successive steps, and a finger recess disposed at the forward end of each area.

4,006,906

CARD GAME

Jeffrey S. Gruber, Ile-Ife, Nigeria, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 27, 1976, Ser. No. 662,115

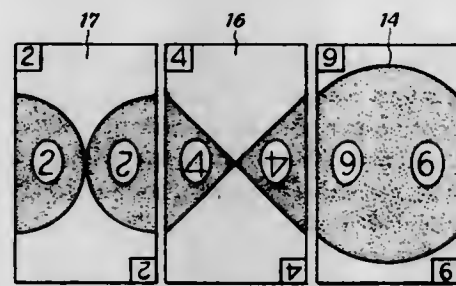
Int. Cl.² A63F 1/00

U.S. Cl. 273—152 R

2 Claims

1. A card game, comprising a creator's card; and

120 cards, said cards being divided into 12 groups each having 10 cards numbered zero to 9, said cards being divided into 4 groups each having 30 cards of the same



pattern of one of a bar, an arc, a point and a semicircle, and said cards being divided into 3 groups each having 40 cards of the same color of one of three colors.

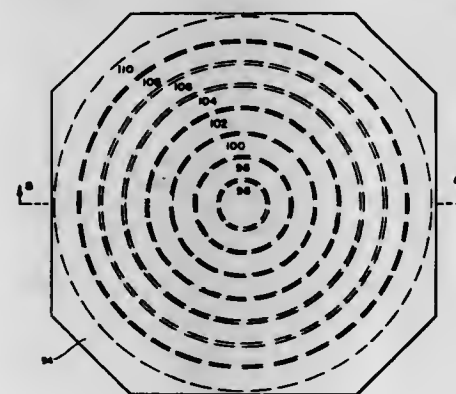
4,006,907 GAME APPARATUS

Russell H. Heffley, Jr., 1533 Lochinvar Drive, Fort Wayne, Ind. 46825

Division of Ser. No. 405,575, Oct. 11, 1973, Pat. No. 3,897,947. This application Dec. 9, 1974, Ser. No. 530,741
Int. Cl.² A63B 69/36

U.S. Cl. 273—185 A

6 Claims



1. A game apparatus of the type which includes a target connected to a scoreboard comprising a target having a plurality of target zones, a plurality of impact responsive signal generators, each of said target zones having at least one of said signal generators operatively connected to said zone, whereby an object impacting on each of said target zones will create a signal, a signal selector circuit operatively connected to said signal generators, and a plurality of scoreboard drivers operatively connected to said selector circuit and each of said target zones.

4,006,908 PRACTICE GOLF BALL

Tieko Minami, Tokyo, Japan, assignor to Yoichi Kawamura, Yokohama, Japan

Filed Apr. 13, 1976, Ser. No. 676,654

Claims priority, application Japan, Apr. 17, 1975, 49-52540

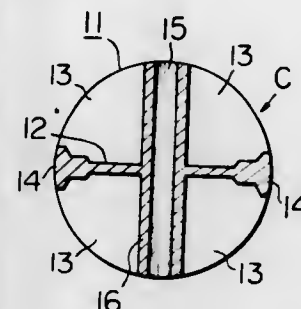
Int. Cl.² A63B 69/36

U.S. Cl. 273—183 C

5 Claims

1. A golf ball for practice constituted by a spherical structure having a polar axis and made of an elastic tough material, said spherical structure comprising, in integrally formed state: a circular equatorial vane lying in an equatorial plane perpendicular to the polar axis; a hub part disposed coaxially relative to the polar axis and extending between opposite outer sides of the spherical structure; a plurality of meridian vanes of substantially semicircular planar shape lying in respective meridian planes spaced at equal angular intervals and mutually intersecting at the polar axis, the meridian vanes being integrally joined at their chordal parts to the hub part; and a

middle band of a specific width engirdling the spherical structure around the circumference of the equatorial vane, the

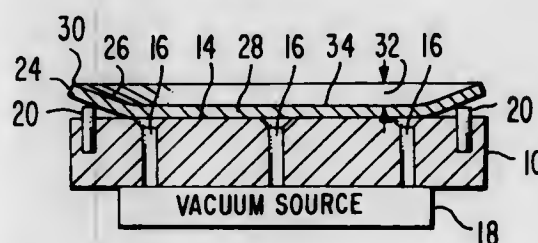


**4,006,909
SEMICONDUCTOR WAFER CHUCK WITH BUILT-IN STANDOFF FOR CONTACTLESS PHOTOLITHOGRAPHY**
Joel Ollendorf, West Orange, and Frank J. Cestone, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,716
Int. Cl.² B23B 31/00

U.S. Cl. 279—3

5 Claims



1. A semiconductor wafer vacuum chuck for providing a controlled separation between a surface of a semiconductor wafer having a small degree of flexibility and a photographic mask overlying said surface upon the application of a vacuum to said chuck comprising:

an element including at least one substantially planar surface for receiving said wafer thereon, said element having means to allow a vacuum to be applied to said planar surface, and means disposed on said surface of said element for mechanically maintaining a fixed distance between a peripheral portion of said wafer supported on said means and said surface of said element, said means being made of non-resilient material and extending no more than about 0.1 millimeters above said surface, and positioned in a pattern to allow a central portion of said wafer spaced inwardly from said means to be drawn towards said surface of said element upon the application of said vacuum to said surface of said element.

4,006,910 FOLDING SEAT

Charles R. Beckley, 2708 Woodley Place, Washington, D.C. 20008

Filed Sept. 16, 1975, Ser. No. 613,918
Int. Cl.² A47C 4/32

U.S. Cl. 297—16

16 Claims

1. A seat which is foldable to assume either an erect sitable condition or a collapsed storable condition, comprising:
A. A pair of frame members which define sides of the seat wherein each frame member comprises:
an arm having front and rear ends and extending generally in a horizontal direction when the seat is in the erect condition;

a rear leg having a certain width and pivoted adjacent to the rear end of the arm to extend therefrom when the seat is erect and to extend therealong when the seat is collapsed, said rear leg having a projecting portion extending above the arm when the seat is erect, said rear leg forming an acute angle with the top surface of the arm; and
a front leg having a link fixed rigidly thereto and extending at an angle therefrom;
a sliding pivot connection between the link and the front end of the arm to pivot the link and the front leg adjacent to the front end of the arm, said link being longer than the width of said rear leg so that when the link and front leg are pivoted to collapse the seat, the front leg

and snow from within by pushing the lower end of a ski pole into the receptacle's axial aperture, and comprising a series of longitudinal internal ridges extending from the receptacle's substantially conical inner wall inwardly in such a way as to align the receptacle's longitudinal inner ridge's crests substantially parallel to each other, so that if the lower end of a conventional ski pole is inserted into the receptacle's axial aperture each of the longitudinal ridge's crests will make a full longitudinal contact with the outer wall of the inserted ski pole to establish a rigid mechanical connection between the ski and the ski pole, and wherein the receptacle's inner spaces increase from the receptacle's upper end downward to the receptacle's lower opening.

4,006,912

SKI PROTECTOR

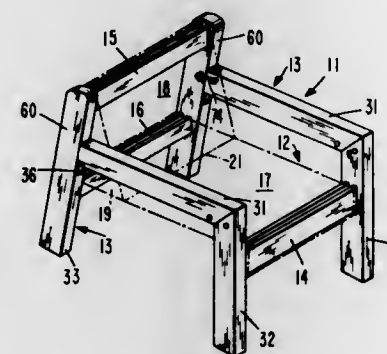
Frank J. Perlch, Excelsior, Minn.; Frank J. Perlch, Jr., Big Sky, Mont.; Jon R. Perlch, Tucson, Ariz., and Timothy C. McLaughlin, Mound, Minn., assignors to Frank J. Perlch, Excelsior, Minn.

Filed Sept. 24, 1975, Ser. No. 616,259

Int. Cl.² A63C 11/20

U.S. Cl. 280—11.38

14 Claims



overlies the rear leg, wherein the sliding pivot connection allows the link and the front leg to pivot when the link is slid to a first position and prevents the front leg from pivoting when slid to a second position;

B. a system of rungs which combine with the pair of frame members to define a top, a front and a back of the seat, wherein one rung extends between the projecting portions of the rear legs, one rung extends between the rear legs of the frame below the arm and one rung extends between the front legs of the frame; and
C. a web supported by the rungs to form a sling for seating a person, wherein said web applies torque to said rear leg in the direction of said front rung when the person sits in the web in order to help keep the rear leg erect when a person sits in the seat.

1. A ski protector comprising an elongated body portion having inwardly facing U-shaped grooves at the sides thereof for receiving therein only the marginal sides of a ski and having a height corresponding substantially to the thickness of said sides, a first portion at one end of said elongated body portion having top, bottom and side walls forming a recess or cavity for enclosing the toe of the ski, and a second portion at the other end of said elongated body portion having top, bottom and side walls forming a recess or cavity for enclosing the heel of the ski, said body portion and the grooves therein extending from said first portion to said second portion and at least a longitudinal section of said body portion being resilient so that, when said first portion is placed over the ski's toe, said second portion can be pulled rearwardly and then released to fit over the heel.

4,006,911

RIGID SKI-MOUNTING STABILIZER

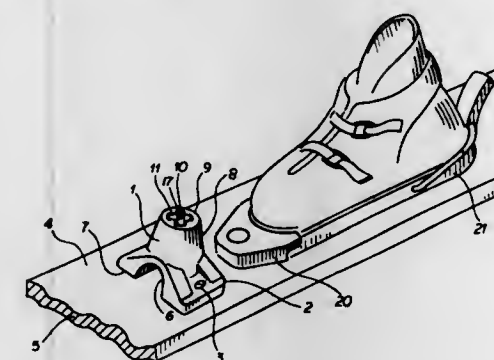
Robert A. Kraus, and Edmund J. Kraus, both of 14160 Redhill, Tustin, Calif. 92680

Filed Aug. 19, 1975, Ser. No. 605,931

Int. Cl.² A63C 5/06

U.S. Cl. 280—11.37 E

6 Claims



1. A device for the rigid reception of a conventional ski pole to stabilize and align a snow ski during the mounting operation to its corresponding ski boot, comprising a substantially conical receptacle having at least one flange on its lower portion for the purpose of fastening the receptacle to the upper side of a snow ski, and having at least one opening on its lower portion for the purpose of ejecting a possible accumulation of ice

4,006,913

LOW HEIGHT SEMI-TRAILER

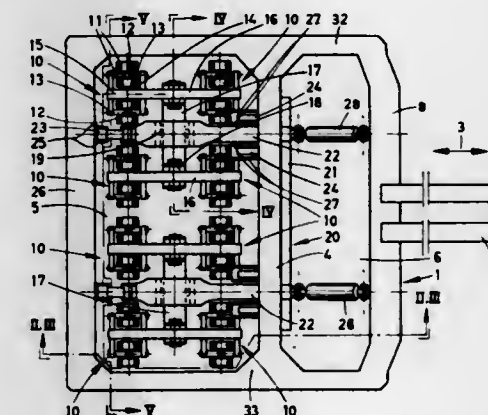
Bengt Ingemar Rimhagen, Linköping, Sweden, assignor to Linköpings Transportindustri AB, Linköping, Sweden

Filed July 14, 1975, Ser. No. 595,375

Int. Cl.² B62D 21/02

U.S. Cl. 280—43.13

7 Claims



1. An undercarriage which supports the body of a vehicle such as a trailer and which has numerous wheels that share equally in the support of the body and any load thereon not-

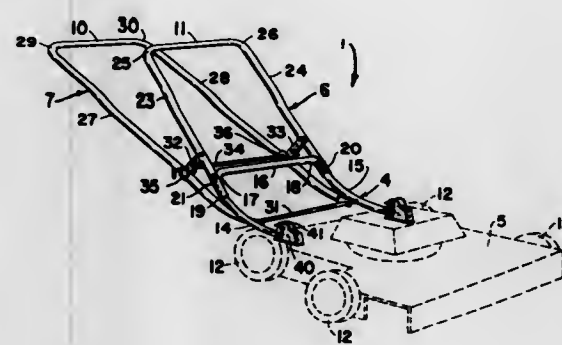
withstanding irregularities in the surface over which the vehicle may be moving, said undercarriage comprising a pair of undercarriage assemblies symmetrically disposed at opposite sides of a longitudinal centerline of the vehicle and each characterized by:

- A. a laterally extending first beam;
 - B. first trunnion means medially pivotally connecting said first beam with the vehicle body and enabling the opposite ends of the first beam to be swingable up and down about a longitudinally extending tilting axis;
 - C. a pair of second beams which extend longitudinally;
 - D. second trunnion means medially pivotally connecting said second beams, respectively, with opposite end portions of the first beam so that the second beams are carried bodily up and down by tilting motion of the first beam but the opposite end portions of said second beams are swingable up and down about the first beam and around a common laterally extending second tilting axis;
 - E. two pairs of laterally extending bogie beams for each of said second beams;
 - F. third trunnion means medially pivotally connecting each bogie beam with its second beam and disposing one bogie beam of each pair near an end of its second beam and the other bogie beam of the pair between said one bogie beam and said second tilting axis, said third trunnion means confining all of the bogie beams for each second beam to tilting about a longitudinally extending third tilting axis;
 - G. two pairs of wheels for each pair of bogie beams;
 - H. an axle for each pair of wheels by which the wheels of the pair are constrained to rotate about a common axis and are maintained axially spaced apart by a fixed distance; and
 - I. means providing a connection between each axle and a pair of adjacent end portions of its pair of bogie beams, whereby the axle is carried by said bogie beams between their said end portions, the pair of bogie beams is constrained to swing in unison about said third tilting axis, and the axle is confined to an orientation in which its axis extends laterally and is tiltable about an axis intermediate its ends, the last mentioned means comprising a rigid longitudinally extending member connected at its ends with said end portions of said pair of bogie beams and which has a medial connection with said medial portion of said axle.
3. The undercarriage of claim 1, further characterized by means connecting said undercarriage assemblies with one another and with the vehicle body in a manner that provides for raising and lowering the vehicle body relative to the wheels, the last mentioned means comprising:
1. a substantially rigid frame having substantial longitudinal extent and having substantial lateral extent symmetrically to the longitudinal centerline of the body, said first trunnion means providing a connection between each of said first beams and said frame;
 2. a plurality of links, each having one end pivotally connected to the vehicle body and its other end pivotally connected to said rigid frame,
 - a. certain of said links being disposed near the front of the vehicle body,
 - b. others being disposed near the rear thereof, and
 - c. said links being disposed substantially symmetrically to opposite sides of the longitudinal centerline of the vehicle,
 3. each of said links being swingable in a vertical fore-and-aft extending plane between a near-horizontal position in which the vehicle body is lowered relative to the wheels, through and slightly beyond a vertical position to a defined body-raised position; and
 4. extendable and retractable actuator means connected between the vehicle body and said rigid frame for so moving the body relative to the frame as to swing the links between their said near-horizontal positions and their said body-raised positions.

4,006,914
LAWNMOWER HANDLE FOR MOWING TERRACES
 Edward G. Koch, 716 Benton Blvd., Kansas City, Mo. 64124
 Filed Oct. 15, 1975, Ser. No. 622,771
 Int. Cl.² B62B 5/06

U.S. Cl. 280—47.37 R

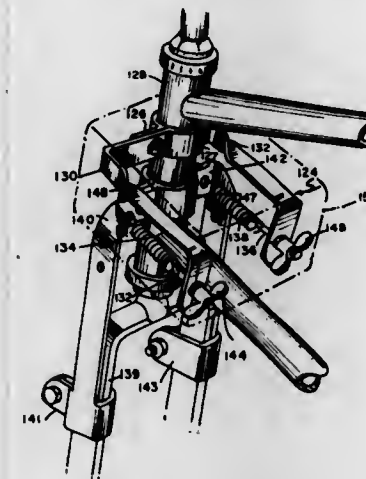
3 Claims



1. A lawnmower and handle therefor comprising:
 - a. a lawnmower having a housing with wheels mounted thereon to permit movement along a ground surface;
 - b. a pair of handle mounting members on said lawnmower housing and each comprising:
 1. a first bracket and a second bracket positioned in spaced relation;
 2. means in said first bracket and said second bracket defining generally C-shaped apertures each having laterally aligned first and second vertically spaced pockets and a passage therebetween; and
 3. a support member extending between said first bracket and said second bracket and having respective end portions thereof positioned in said respective apertures, said support member being removably received in a selected one of said first and second pockets and selectively movable therebetween;
 - c. a handle member having spaced end portions each positioned between said respective first and second bracket and pivotally mounted thereon, said handle member end portions each being above and engageable with said respective support member;
 - d. means on each of said handle mounting members for retaining said respective handle member end portion therebetween and each comprising:
 1. means in said first bracket and said second bracket defining second generally C-shaped apertures each having laterally aligned first and second vertically spaced pockets and a passage therebetween; and
 2. a retainer member extending between said first bracket and said second bracket and having respective end portions thereof positioned in said respective apertures therein, said retainer member being removably received in a selected one of said first and second pockets and selectively movable therebetween, said retaining members each being above and engageable by said respective handle member end portion;
 - e. an upper handle portion having spaced end portions connected to said handle member and extending upwardly therefrom, said upper handle portion having a gripping portion at an upper end thereof;
 - f. an auxiliary handle member having spaced end portions pivotally mounted on said handle member adjacent the spaced end portions thereof and having a gripping portion positioned rearwardly of and substantially level with the gripping portion of said upper handle portion; and
 - g. means mounted on said upper handle portion and engageable by said auxiliary handle member for adjustably retaining same in a selected positioned relative to said upper handle portion.

4,006,915
CYCLE STEERING STABILIZER
 C. William Parker, 53 Cedar St., Lynn, Mass. 01905
 Continuation-in-part of Ser. No. 364,627, May 29, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 547,871
 Int. Cl.² B62K 21/10
 U.S. Cl. 280—271

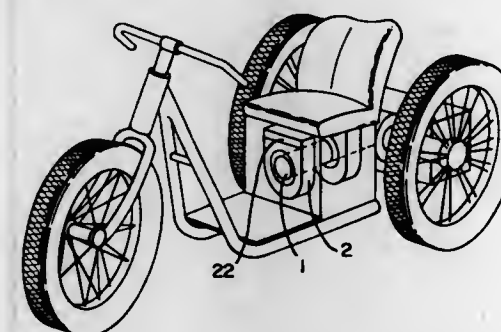
4 Claims



1. A cycle steering stabilizer comprising a column clamp mountable on a fixed portion of the steering column frame of said cycle, said clamp having a pair of arms which extend rearwardly with respect to the long axis of said cycle on each side thereof, a pair of fork clamps, each clamp mountable on a separate branch of the front wheel steering means of said cycle and tensable resilient means connecting respectively each fork clamp with its opposed arm of said column clamp to restrain excessive turning and jackknifing of the steering wheel of said cycle.

4,006,916
LOCKABLE ARTICULATION
 Pierre Patin, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France
 Filed July 1, 1975, Ser. No. 592,177
 Claims priority, application France, July 5, 1974, 74.23406
 Int. Cl.² B62K 5/04; F16D 51/60
 U.S. Cl. 280—282

15 Claims

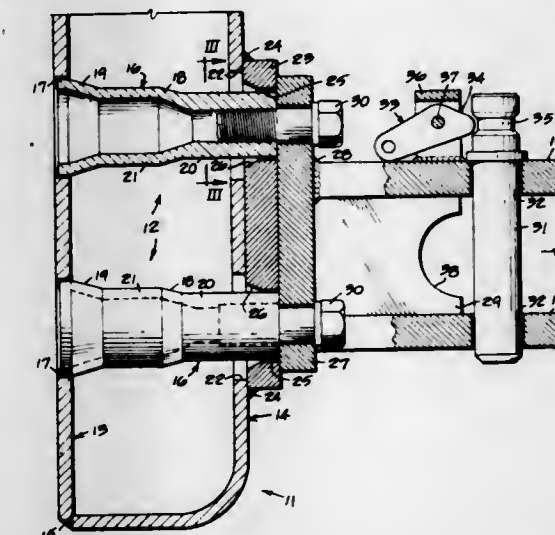


1. A lockable articulation arranged between a first part and a second part mounted for relative rotation about a first axis and comprising:
 - a hollow cylindrical drum centred on said axis and fast with said first part;
 - two jaws arranged inside said drum, each jaw having the form of a cylindrical sector and provided with a friction surface for bearing against the inner surface of the wall of said drum, said jaws being arranged with one end of each said jaw adjacent one end of said other jaw and said other ends of said jaws spaced apart and defining dihedral bearing surfaces, the angle between said dihedral bearing surfaces opening outwardly to said drum; and
 - means for locking said first and second parts against relative rotation and operable to spread said jaws apart, said locking means comprising:

at least one roller interposed between said inner surface of said wall of said drum and said dihedral surfaces of said jaws for spreading said jaws apart; means for moving said roller including at least one hinged lever means forming a knee and comprising a first and a second link, said first link being pivoted on said second part and on said second link and said second link bearing said roller; wherein said dihedral bearing surfaces, said pivotal axis of said lever means and the axis of said roller are parallel with said axis of relative rotation of said first and second parts.

4,006,917
ENERGY ABSORBING PULL HOOK FOR CONSTRUCTION VEHICLES
 Douglas P. Liehr, and Erich E. Drochner, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
 Filed July 14, 1975, Ser. No. 595,909
 Int. Cl.² B60D 1/00
 U.S. Cl. 280—451

25 Claims



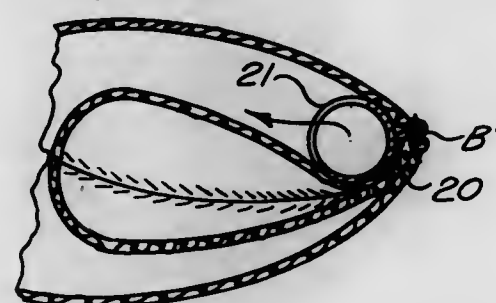
1. An energy absorbing and safety pull hook arrangement in combination with a construction vehicle having a frame defining an aperture thereon comprising a pull hook, and energy absorbing means normally secured between said frame and said pull hook and disposed in alignment with said aperture for being sequentially detached from said frame when pulling forces imposed on said pull hook to pull it away from said frame exceed a predetermined magnitude and for thereafter progressively absorbing said pulling forces when they exceed said predetermined magnitude by being drawn through said aperture.

4,006,918
INFLATABLE CONFINEMENT FOR VEHICLE OCCUPANT RESTRAINT SYSTEM AND METHOD OF MAKING SAME
 Robert W. MacFarland, Grosse Pointe Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio
 Filed Feb. 28, 1973, Ser. No. 336,859
 Int. Cl.² B60R 21/08
 U.S. Cl. 280—729

15 Claims

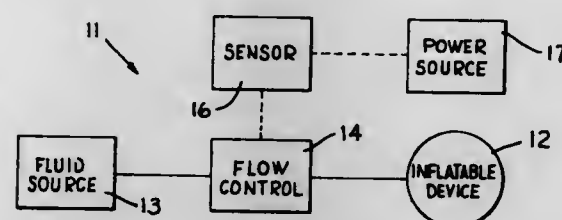
1. In combination an inflatable confinement for a vehicle occupant restraint system and port means for communicating inflating fluid thereto, wherein
 - a. said inflatable confinement is formed of a single layer of material with the margins thereof joined in fluid pressure sealing arrangement and with portions thereof disposed to form an inner fluid chamber and an outer fluid chamber with an aperture formed in the wall of each of said chambers with said port means received therethrough, and
 - b. said port means has a longitudinal portion thereof com-

communicating only with said inner chamber and a portion thereof communicating only with said outer chamber for



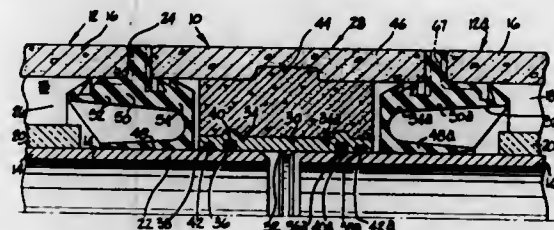
permitting introduction of inflating fluid simultaneously thereto.

4,006,919
INFLATOR ASSEMBLY AND FLOW CONTROL VALVE FOR SAME
Richard F. Neuman, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed May 16, 1974, Ser. No. 470,337
Int. Cl.² B60R 21/08
U.S. Cl. 280-736 32 Claims



1. In a vehicular safety system having an inflatable occupant restraint, reservoir means operatively connected to said restraint and containing a supply of pressurized gas therein, and valve means for controlling the flow of gas from said reservoir means into said restraint, comprising the improvement wherein said valve means includes a valve housing operatively interconnected to the outlet opening of said reservoir means, said valve housing having a flow passage therethrough, and a valve member disposed within said passage and supported on said housing member for movement relative thereto between a first position wherein said restraint is normally maintained in a collapsed condition and a second position wherein said restraint is at least partially inflated, said valve housing and said valve member including cooperating wall means defining a flow control orifice which is of progressively increasing area as said valve member moves from said first position toward said second position, said valve member being disposed such that flow from said outlet opening impinges thereupon in a direction substantially transverse to the direction of movement of said valve member urging said cooperating wall means together to create a predetermined frictional force resisting movement of said valve member, said wall means including means cooperating with certain surfaces of said valve member to form a chamber, and said wall means includes means defining a second passage communicating said source of fluid pressure with said chamber thereby permitting fluid source pressure to be applied to the said certain surfaces of said valve member for moving same.

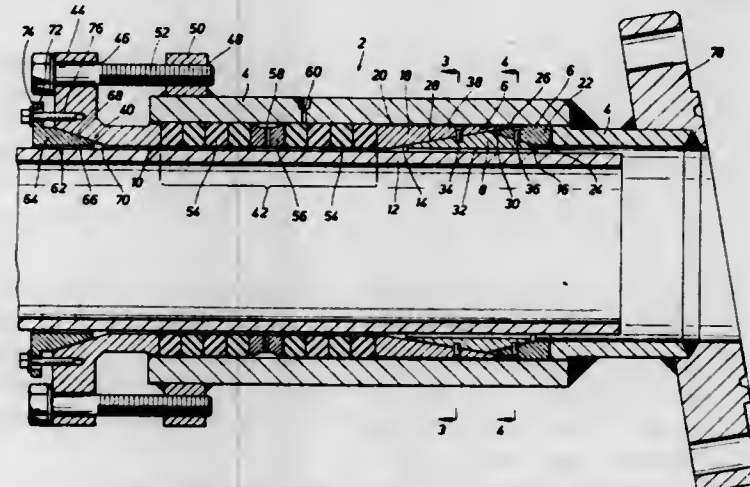
4,006,920
JOINT ASSEMBLY FOR INSULATING HIGH TEMPERATURE FLUID CARRYING CONDUITS
Thomas Harry Sadler, Morrison, and Ronald Neal Cerny, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.
Filed Mar. 12, 1975, Ser. No. 557,704
Int. Cl.² F16L 11/12
U.S. Cl. 285-14 13 Claims



1. A joint assembly connected with one end of heat insulated conduit which includes an outer casing, a concentric inner core and a concentric layer of insulation material therebetween, said core including a circumferential end section extending longitudinally beyond adjacent ends of said casing and layer of insulation material, said assembly comprising:

- a coupling arrangement at least including a coupling having a first longitudinal portion which is located concentrically around a first portion of said core end section and which is spaced from the adjacent ends of said casing and insulation material and a second portion which is adapted to connect said one end of said conduit to an adjacent end of a second conduit;
- a circumferential end seal located concentrically around and against a second portion of said core end section between said adjacent ends and said coupling, one circumferential side of said end seal engaging against the adjacent ends of casing and insulation material and its opposite circumferential side facing said coupling; and
- said coupling and end seal together defining a passage, said passage extending therebetween from said core outwardly to the outer surface of said coupling arrangement and ambient surroundings of said joint assembly, said passage being such that fluid therein and under a predetermined amount of pressure in the direction towards the outer surface of said coupling arrangement will move out of said passage in the direction of said pressure to the ambient surroundings, said end seal preventing said fluid from passing into said layer of insulation material.

4,006,921
PIPE COUPLING
Harvey O. Mohr, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.
Filed June 10, 1975, Ser. No. 585,504
Int. Cl.² F16L 35/00
U.S. Cl. 285-18 12 Claims



1. In apparatus for locking together two mutually telescoping rigid tubular members against relative axial movement, the

combination comprising:

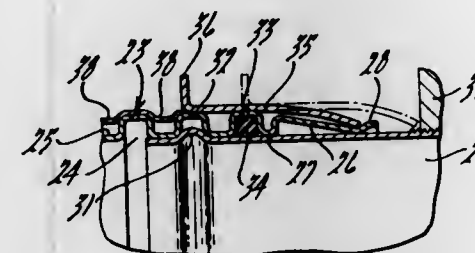
annular bowl means locked within one of said rigid tubular members and including a pair of axially and oppositely tapered annular surfaces;

annular gripping means comprising a plurality of gripping elements disposed within said annular bowl means, said annular gripping means including a pair of oppositely tapered surfaces mateably engaged with respective tapered surfaces of said bowl means;

said bowl means including said pair of annular bowl surfaces and said gripping means being movable between a retracted position in which said rigid tubular members are freely assemblable in the mutually telescoping relationship aforesaid and an extended and locked position in which said bowl means including said pair of annular bowl surfaces applies opposing forces against both tapered surfaces of said gripping means to squeeze the latter into tight gripping and locking engagement with the other rigid tubular member whereby both tubular members are locked against relative axial movement while said bowl means is at least partially engaged with said one rigid tubular member;

and means for moving said bowl means and said gripping means towards said extended positions.

4,006,922
NON-THREADED TUBING CONNECTOR
Donald D. Bartholomew, Utica, Mich., assignor to Merit Plastics, Inc., East Canton, Ohio
Division of Ser. No. 358,916, May 10, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,092
Int. Cl.² F16L 35/00
U.S. Cl. 285-39 3 Claims

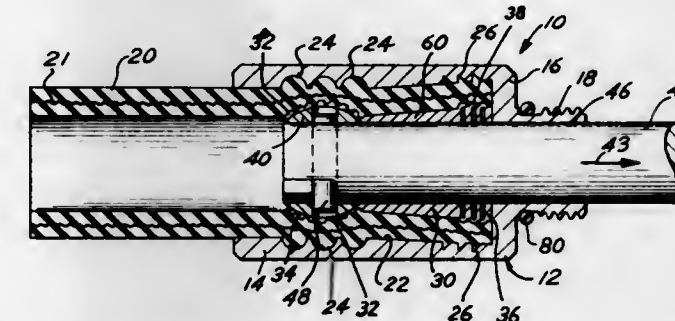


1. In a tube for a fluid, a tube body having an end section insertable over a tubular element which extends therewithin, the wall of said tube body is corrugated having alternate inwardly and outwardly presenting continuous annular sections, an inwardly presenting continuous annular bead near the end of the tubular element received by an inwardly presenting corrugation into which the bead extends, and means comprising a locking sleeve for securing the inwardly presenting corrugation over said bead, and a sealing element provided in a second inwardly presenting continuous corrugation which is maintained in engagement with said tubular element by said locking sleeve, said tube body having an inclined plane means converging toward the end and having thereat means comprising a locking lip for securing the end of the locking sleeve when passed thereover and moved to locking position.

4,006,923
COUPLING CONSTRUCTION
John B. Wagner, 33-9th St., Racine, Wis. 53233
Filed Oct. 29, 1975, Ser. No. 626,969
Int. Cl.² F16L 33/20
U.S. Cl. 285-39 9 Claims

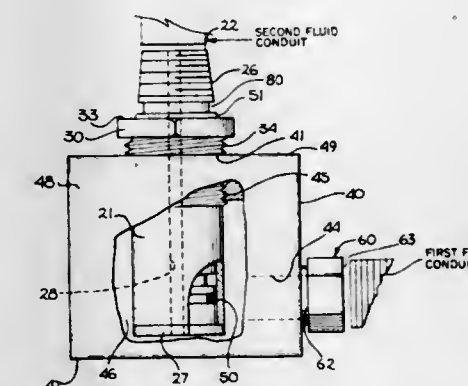
1. In a hose coupling comprising a body having a cylindrical chamber with an open end for telescoping over an end of a hose and an end wall at the other end of said chamber, and a tubular pressure element in said chamber having an inner end

portion of deformable material, said deformable end portion being deformed so as to cause the aligned portion of the hose to be firmly squeezed and displaced against the cylindrical wall of the chamber of said body to firmly secure the body, the hose, and the pressure element in fixed relation to each other, the inner cylindrical wall of said chamber and the external surface of said pressure element, outwardly of the deformable inner end portion, being dimensionally related to provide an axially tapering annular space, converging toward the end wall of the body, which is less than the thickness of the wall of the hose to which the hose coupling is supplied, a portion of the pressure element outwardly of said deformable inner end portion being tapered and having a surface increasing in diameter toward the end wall of said body, and the maximum diameter of said tapered portion being greater than the nor-



mal internal diameter of the hose to which the coupling is applied, the inner cylindrical wall of said chamber being provided with a first plurality of grooves spaced from the end wall and located in transaxial registration with said deformable inner end portion of said pressure element, into which the material of the hose is caused to flow incident to affixing the pressure element within the body, the outer surface of the deformable inner end portion being provided with a plurality of first grooves remote from the end wall, the improvement comprising a collapsible wall portion on the tapered portion of the pressure element adjacent the end wall of the body and a second plurality of grooves in the inner cylindrical wall adjacent the end wall of the body, the collapsible wall portion defining ridges when collapsed to cause hose material to flow into the second grooves and thereby provide secondary means for securing and sealing the hose relative to the body.

4,006,924
SWIVEL OR ROTATING COUPLING
Audley V. Spencer, 5001 S. "C", Oxnard, Calif. 93030
Filed Oct. 14, 1975, Ser. No. 621,871
Int. Cl.² F16L 5/00, 27/00, 41/00
U.S. Cl. 285-190 4 Claims



1. A coupling means coupled to at least a first fluid conduit and having a cavity therein in fluid communication with said first fluid conduit, said coupling means comprising:

- a first member having a tubular body and a first and second end, said first end coupled to said coupling means and said second end disposed within said cavity and forming a sealing surface;

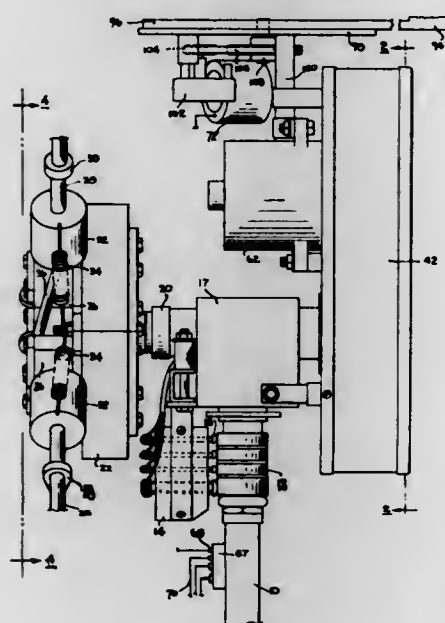
b. a second member having an elongated cylindrical body with a longitudinal bore extending therethrough, said second member having a first and second end, said first end being larger in diameter than said body, such that an annular collar is formed at the point of change in diameters, the side of the collar adjacent the body of the second member comprising a second sealing surface, said body of said second member having an outer diameter slightly smaller than the inner diameter of said body of said first member, said second member disposed within said first member, such that said first end is disposed near said second end of said first member, said second end of said second member coupled to a second fluid conduit, said second fluid conduit capable of being rotated in relation to said first fluid conduit, said longitudinal bore being in fluid communication with said cavity and said second fluid conduit, such that fluid will pass between said first and second fluid conduits and will fill said cavity creating fluid pressure against said first end of said second member such that said annular collar is urged against said second end of first member thereby forming a seal between said first and second member.

4,006,925

WIND POWER ENERGY GENERATING SYSTEM
Peter Scherer, 554 Hargrave Ave., Inglewood, Calif. 90302
Filed Aug. 15, 1974, Ser. No. 497,696
Int. Cl.² F03D 9/00

U.S. Cl. 290—55

24 Claims



1. A wind driven electric energy generating apparatus comprising:

- a. support means,
- b. a main shaft carried by said support means,
- c. a plurality of vane shafts angularly located with respect to said main shaft,
- d. means operatively connecting said vane shafts to said main shaft so that said main shaft rotates with rotation of said vane shafts,
- e. a plurality of vanes secured to and extending outwardly from respective ones of said vane shafts to cause rotation of said main shaft when the vanes are driven by a wind,
- f. electric energy generating means operatively connected to said main shaft and being operable thereby to generate electric energy pursuant to rotation of said shaft, said electric energy generating means comprising a field winding and a flux operable shaft cooperating therewith,
- g. first speed control means operatively mechanically associated with said vane shafts and coupling each of said vane shafts to one another to prevent rotation of said

vanes and said vane shafts and main shaft beyond a maximum threshold velocity of rotation, and

h. second speed control means operatively associated with said main shaft and having a rotatable member operatively rotatable thereby, said second speed control means operatively connected to said field winding of said electric energy generating means to prevent energy generation of said field winding and thereby prevent operation of said generating means if said main shaft and said vanes do not meet a minimum threshold velocity of rotation.

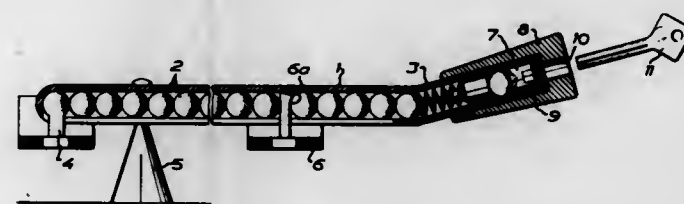
4,006,926

FASTENING DEVICE FOR WINGS, SPECIALLY FOR WINDOWS OR DOORS

Stig Bertil Burebäck, S-24013 Genarp, Sweden
Filed June 18, 1975, Ser. No. 587,999
Int. Cl.² E05C 17/04

U.S. Cl. 292—262

4 Claims



1. A fastening device for a wing, to permit lockable closure and lockable holding of said wing in at least one opened position relative to a stationary part, which device comprises an arm having a profile which forms a channel and at the underside has a longitudinal slot in communication with the channel; means for pivotally connecting one end of said arm to said wing; a plurality of locking members placed in a row in the channel of said arm and movable in the channel longitudinally of said arm; a screw spindle axially screwed into the other end of said arm; a key for turning said screw spindle; a compression spring placed in the channel of said arm between said locking members and said screw spindle and acting in the longitudinal direction of said arm; two latches one of which is adapted for mounting on said stationary part and the other on said wing; and a portion formed on each of said latches and introducible through said slot upwardly into said channel between two adjacent locking members, to move said two adjacent locking members apart against the action of said compression spring, and having an engagement surface which, upon introduction of said portion between said two adjacent locking members, is adapted to engage at least one of said two adjacent locking members, said portion being arrestable in the portion in which said engagement surface engages said locking members, by such turning movement of the screw spindle with the aid of the key that the spring action is abolished.

4,006,927

DOOR HANDLE ATTACHMENT

Thomas A. Recupero, 31 Marron Ave., Stoughton, Mass. 02072

Filed Dec. 10, 1975, Ser. No. 639,462
Int. Cl.² E05C 13/00

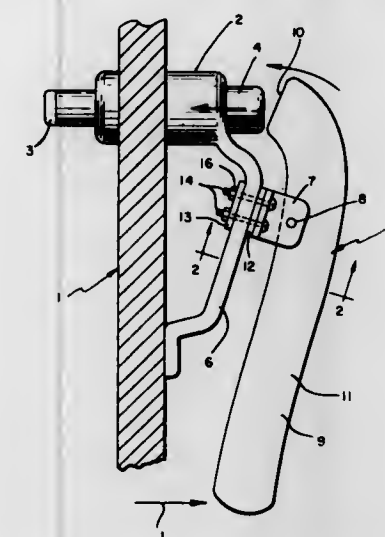
U.S. Cl. 292—336.3

4 Claims

1. An attachment for a door latch housing having a hand grip and an external latch actuator comprising

- a bracket,
- a lever pivotally mounted on the bracket, and means on the bracket for clamping the bracket to the hand grip with one end of the lever opposed to the plunger and the other

end extending below the hand grip so that pulling on the other end engages said one end with the actuator so as to



unlatch and open the door, wherein the lever pivots in a plane common to the door handle and latch actuator.

4,006,928

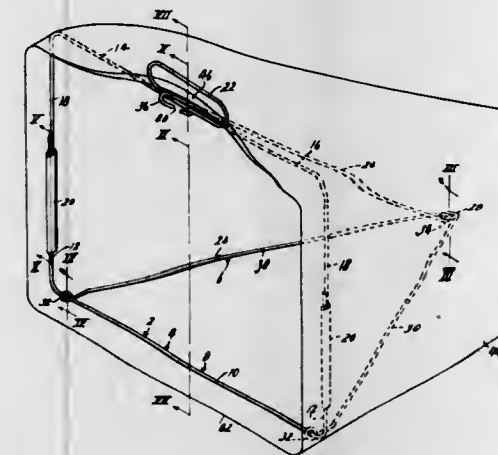
LAWN BAG CADDY

Louis E. Beugin, 2910 S. Hawthorne, Independence, Mo. 64052

Filed Dec. 10, 1975, Ser. No. 639,234
Int. Cl.² B65B 67/12; B65F 1/04

U.S. Cl. 294—1 R

6 Claims



1. A lawn bag caddy comprising:

- a. an open, generally rectangular frame adapted to be inserted snugly into the mouth of a lawn bag, adjacent and with its plane generally parallel to the plane of the bag mouth opening, said frame when disposed in a vertical plane having generally parallel upper and lower legs and generally parallel side legs, and
- b. supporting means connected to said frame and operable, when supported on the ground, to support said frame in an approximately vertical plane with its lower leg at ground level, said supporting means constituting a stand comprising a generally planar base member secured at one edge to lower leg of said frame and extending from said frame at approximately right angles to the plane thereof, and a diagonal strut secured at one end to the extended end of said base member and at its opposite end to the upper leg of said frame.

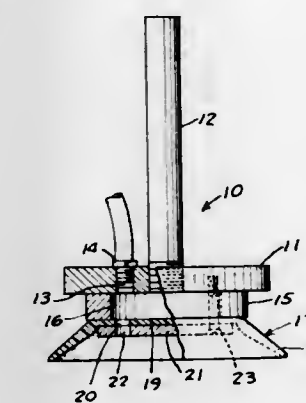
4,006,929

VACUUM PAD

Loren B. Barker, Salem, Ill., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.
Filed Dec. 17, 1975, Ser. No. 641,498
Int. Cl.² B66C 1/02

U.S. Cl. 294—64 R

3 Claims



1. In a vacuum pad, the combination comprising a body, said body having an opening therethrough, one end of said opening being adapted to be attached to a source of vacuum, an annular member associated with said body and defining a water trap chamber communicating with said opening, and a cup of flexible material having a peripheral lip and a central portion mounted on said chamber defining means and having a plurality of circumferentially spaced openings through said central portion providing communication between the interior of said water trap chamber and the space surrounded by said lip.

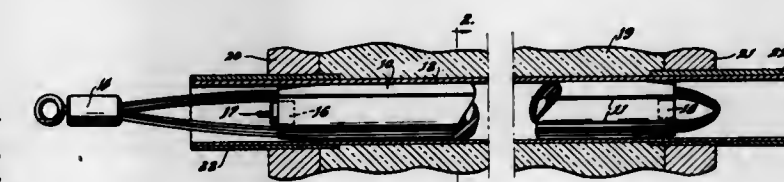
4,006,930

MANIPULATOR FOR HOLLOW OBJECTS

William E. Cawley, and Charles E. Frantz, both of Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Mar. 15, 1961, Ser. No. 96,051
Int. Cl.² A25B 11/00

U.S. Cl. 294—93

3 Claims



1. A device comprising a rubber tube closed at one end and having means at the other end for admitting pressure fluid to expand the rubber tube, and a plurality of parallel cables lodged in the exterior of the tube so as to protrude slightly therefrom, extending longitudinally of the rubber tube throughout the length thereof, and being equally spaced from one another about the exterior of the rubber tube so as to define substantial circumferential spaces between said cables for the full length of said tube, said cables being flexible to permit substantial flexure of said device.

4,006,931

DEVICE FOR REDUCING WIND RESISTANCE OF A VEHICLE

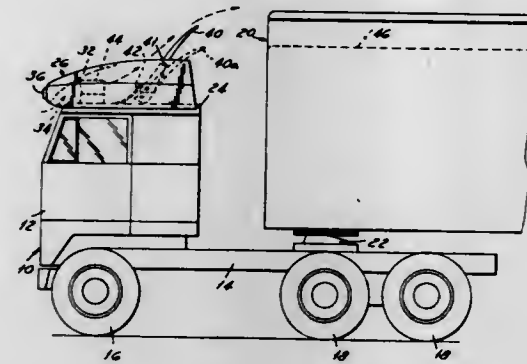
Donald W. Groves, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 11, 1974, Ser. No. 505,121

Int. Cl.² B62D 39/00

U.S. Cl. 296-1 S

1 Claim



1. A device for reducing the wind resistance of a vehicle having a forward vehicle roof and a vertical body portion situated rearwardly and above said roof, a false roof having a transverse portion and depending side portions, said side portions having a greater longitudinal length than said transverse portion, said side portions of said false roof being joined to said vehicle roof adjacent the lateral edges of said vehicle roof, the leading edge of said transverse portion being spaced forwardly and upwardly of the leading edge of said vehicle roof, said transverse portion of said false roof being spaced apart from said vehicle roof and cooperating therewith to define an air-flow channel, an adjustable air deflector vane extending transversely between said side portions of said false roof, said adjustable vane extending upwardly and rearwardly and constructed to direct air flowing through said channel in a direction over the top of said vertical body portion, adjustment means supporting said adjustable vane relative to said false roof and constructed to provide means for adjusting the angle of inclination of said adjustable vane, said adjustable vane having an upper portion that extends upwardly above said transverse portion of said false roof whereby said adjustable vane deflects air flowing over said transverse portion as well as through said channel, an air conditioning unit supported on said vehicle roof in said air flow channel, said false roof being constructed to direct the flow of air around said air conditioning unit, a fixed air deflector vane extending transversely between said side portions of said false roof, the leading edge of said adjustable vane being disposed adjacent to and rearwardly of said fixed vane.

4,006,932

INFLATABLE DRAG REDUCER FOR LAND VEHICLES

Alan T. McDonald, West Lafayette, Ind., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed July 21, 1975, Ser. No. 597,557

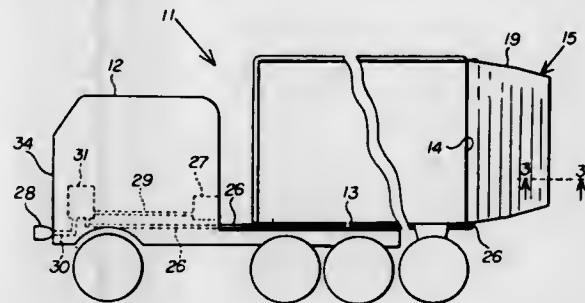
Int. Cl.² B62D 35/00

U.S. Cl. 296-1 S

7 Claims

1. A vehicle comprising:
a front end that leads said vehicle during normal movement thereof;
a rear end with a substantially planar surface that trails said vehicle during normal movement thereof;
an inflatable enclosure secured to said rear end, said enclosure

sure when inflated having convergent contoured surfaces extending from the edges of said planar surface and further comprises a substantially flat rear surface spaced from said planar surface and connected to said contoured



surfaces; wherein said contoured surfaces comprise cusp portions that project rearwardly from the periphery of said flat rear surface;
inflation means for inflating said enclosure; and
deflation means for deflating said enclosure.

4,006,933

UNITARY SUNSHIELD FOR AN AUTOMOBILE

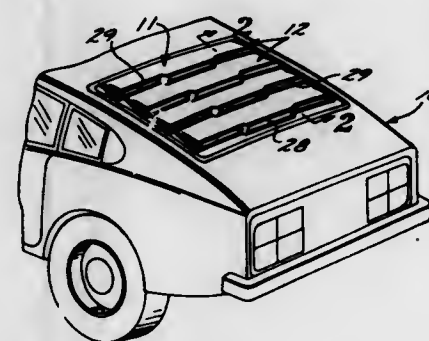
Elwood J. Simpson, 29075 Clevis, Rancho Palos Verdes, Calif. 90274

Filed May 17, 1976, Ser. No. 687,362

Int. Cl.² B60J 1/20

U.S. Cl. 296-95 R

8 Claims



1. A sunshield for the rear window of an automotive vehicle formed from a single laminar sheet of deformable material to provide a border extending about the periphery thereof and having opposing longitudinal edges sloping up to a forward transverse edge and downward to a rear transverse edge; and wherein there are formed a plurality of transverse louvers of generally planar configuration oriented in mutually parallel horizontal alignment and extending between said opposing longitudinal edges of said border with each louver having a central portion and adjoining lateral portions wherein each central portion extends rearward from adjoining lateral portions to define demarkations between adjacent portions and longitudinally aligned stiffening ribs extend vertically downward from each louver at said demarkations to join with the remaining structure of said sheet to define a plurality of transverse apertures in said sheet in association with each portion of each louver below and to the rear thereof.

4,006,934

SEAT FOR AUTOMOBILE

Hisakazu Murakami, and Yasuhiko Fujiwara, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 447,367, March 1, 1974, abandoned. This application July 2, 1975, Ser. No. 592,798

Claims priority, application Japan, Mar. 2, 1973, 48-25496

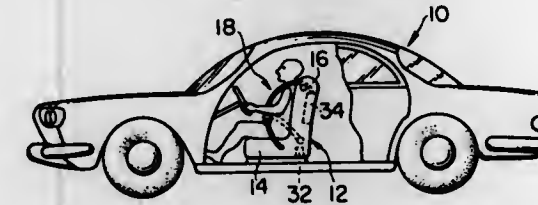
Int. Cl.² A47C 31/00

U.S. Cl. 297-386

7 Claims

1. In a motor vehicle having a seat including a generally horizontal portion and a back supporting portion, said seat

being mounted to the motor vehicle so that it will slide adjustably in the longitudinal direction thereof, the combination with said seat, of a harness and a means for tightening said harness on the seat occupant, said tightening means being mounted fixedly to and within said seat and said harness being fixed to said seat and operatively connected to said tightening means, said harness having first, second, and third terminal ends said first terminal end being secured to said horizontal



portion, said tightening means including a first means mounted within said horizontal portion and so constructed as to normally hold the second terminal end stationary relative to the seat; and a second means mounted within said back supporting portion and so constructed as to normally hold the third terminal end stationary relative to the seat, each of said first and second means being adapted to tighten said harness on the seat occupant.

4,006,935

MINING MACHINES

Terence John Gapper, Duffield; George Thomas Addison, and David Arthur Tate, both of Burton-on-Trent, all of England, assignors to Coal Industry (Patents) Limited, London, England

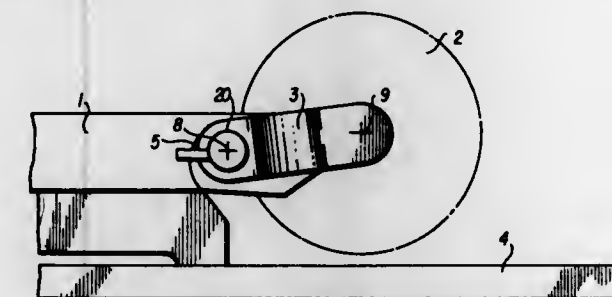
Filed May 19, 1975, Ser. No. 578,868

Claims priority, application United Kingdom, May 17, 1974, 22036/74

Int. Cl.² E21C 25/10

U.S. Cl. 299-1

5 Claims



1. A mining machine, comprising: a body; an arm mounted to said body for pivotal movement relative to said body about a first substantially horizontal axis; a rotary cutter drum carried by said arm and mounted for rotation about a second substantially horizontal axis; sensing means, including a rotary sine-cosine potentiometer means coupled to said arm for sensing a displacement of said arm corresponding to the height of said second axis relative to a plane containing said first axis, said potentiometer means generating a signal directly related to the sensed relative height; a first member secured to said arm and having an annular bearing surface; a second member engaging said annular bearing surface of said first member, said first member being rotatable relative to said second member; said potentiometer having a rotating spindle, said potentiometer being mounted to said second member such that said spindle is co-axial with said first axis; and a further arm secured to said spindle and engaging said first member to rotate said spindle through an angle substantially equal to angular movement of said arm.

4,006,936

ROTARY CUTTER FOR A ROAD PLANER

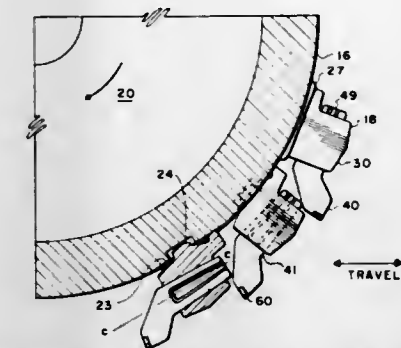
Wesley Irving Crabiel, Gallon, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 6, 1975, Ser. No. 629,341

Int. Cl.² E21C 47/00, 35/18

U.S. Cl. 299-39

25 Claims



1. An improved rotary cutter for a road planing machine suitable for cutting a path in hardened paving materials such as asphalt, concrete, or the like, comprising:
a cylindrical drum adapted to be suspended from a surface engaging vehicle on a generally horizontal axis of rotation;
a plurality of bit holders attached to the periphery of the drum, each of the holders having a tapered socket extending through the holder along an axis spaced from and generally tangential to the drum surface; and
a plurality of cutter bits, each having a body portion including a cutting tip and shoulderless shank extending along an axis generally perpendicular to the cutting face of the cutting tip, wherein said bit shank is tapered along its axis corresponding to the taper in the socket of the bit holders and is sized such that when the bit is inserted in its respective bit holder it will seat snugly on its tapered shank in the socket of the holder,
whereby the cutting forces imposed on said bits when the rotary cutter is cutting a paved surface act tangential to the drum surface and generally along the axis of the bit shank to hold it in snug engagement with the bit holder without the need for any positive locking means to hold the bit in place.

4,006,937

CARRIAGE ESPECIALLY FOR USE IN MINES

Brian Matthew Curtis, Scarciff, England, assignor to Perard Engineering Ltd., England

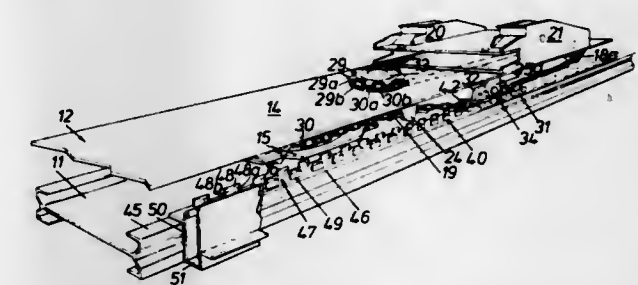
Filed Jan. 31, 1975, Ser. No. 546,041

Claims priority, application United Kingdom, Feb. 2, 1974, 4927/74

Int. Cl.² E21C 29/04

U.S. Cl. 299-43

7 Claims



1. A frame for a mineral winning machine, the frame having a drive mechanism for mounting and driving a continuous chain engageable with a rack for driving the machine along the rack, the drive mechanism comprising drive means mounted for rotation about a vertical axis, the drive means being adapted for engagement with a continuous link chain having adjacent links in relatively perpendicular planes by

provision of teeth which engage the outer perimeters of the links, guide members for the chain and arranged so as to deflect the chain perpendicularly to the plane of the drive sprocket, a pair of the guide members being spaced lengthwise of the frame, and deflection means between the guide members of the pair and arranged to deflect the chain downwardly below the guide members to engage the rack.

4,006,938

METHOD AND APPARATUS FOR SEPARATING AND DISTRIBUTING FIBROUS MATERIALS

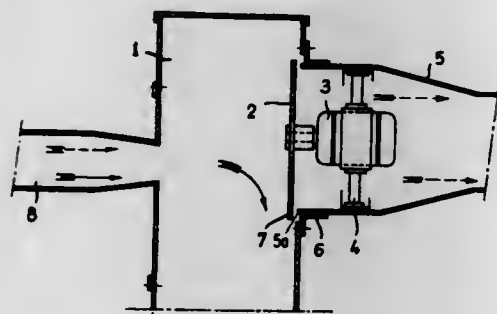
Ferdinand Relterer, Lille, France, assignor to Societe Anonyme des Etablissements Neu, Lille, France

Continuation of Ser. No. 450,801, March 13, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,203 Claims priority, application France, Mar. 19, 1973, 73.10223

Int. Cl.² B65G 53/60

U.S. Cl. 302-59

6 Claims



1. Apparatus for separating and collecting fibrous material from a pneumatically conveyed air-fibrous material mixture, comprising, in combination, storage means having a side wall defining an interior for storing fibrous material, said storage means being provided with an inlet and an outlet in said side wall, a flat disc mounted for rotation on a horizontal axis in said storage means interior adjacent said outlet, said disc having a perforated portion provided with a plurality of perforations extending radially outward from said axis and terminating radially inward of the outer periphery of said disc and an imperforate, annular edge portion on said disc extending circumferentially between said perforated portion and said disc outer periphery, means for rotating said disc, conduit means connected to said storage means inlet for conducting the pneumatically conveyed air-fibrous material mixture into said storage means interior along a path normal to said disc for impingement of said air-fibrous material mixture on said rotating disc, a suction conduit connected at one end to said storage means outlet and to said side wall, said conduit one end edge projecting into said storage means interior and being at an end edge disposed in closely spaced relationship with said imperforate portion inwardly of the outer periphery of said disc and to provide during the rotation of said disc an aerodynamic seal formed in an annular duct defined between said annular imperforate portion of the rotary disc, the inner surface of said side wall and the outer surface near the edge of said suction conduit, pneumatic suction means associated with said suction conduit for drawing the air from said air-fibrous material mixture impinging on said rotating disc through said disc perforated portion and to permit the fibrous material in the mixture from which said air is drawn to be deposited in said storage means with the passage of air between said rotating disc and said edge of said suction conduit one end being prevented by said aerodynamic seal.

4,006,939
AIR PRESSURE MODULATED BRAKE VALVE SYSTEM
Lawrence Francis Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

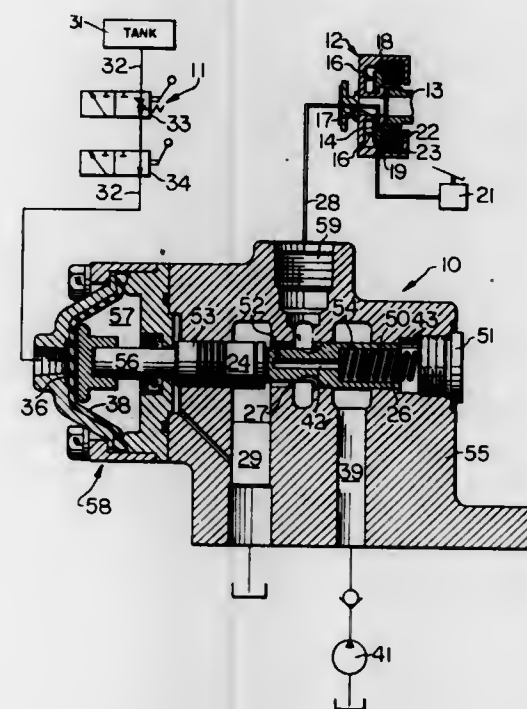
Filed Jan. 31, 1975, Ser. No. 545,856

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B60T 13/22

U.S. Cl. 303-71

9 Claims



1. Modulating valve means for modulating the pressure of the operating fluid of a fluid pressure operated brake mechanism, said valve means including; a housing block, said housing block including first bore means and second, third, and fourth bore means in direct fluid communication with said first bore means, valve spool means at least partially disposed movably within said first bore means for selectively blocking and permitting fluid flow communication between said fourth bore means and said second bore means and between said fourth bore means and said third bore means, said spool means being a unitary member including a rod extension portion at one of two opposite ends thereof, said extension portion extending without said first bore means and without said housing block into a chamber housing means adjacent said housing block, said chamber housing means including first and second chambers separated by resilient diaphragm means, said resilient diaphragm means being in direct engagement with said extension portion of said unitary member, said chamber housing means including inlet passage means for communicating said first chamber with a regulatable source of secondary fluid under pressure, said modulating valve means performing the function of modulating the pressure of said operating fluid in response to the pressure of said secondary fluid in said first chamber, said modulating valve spool means unitary member having first and second opposite end portions, said first end portion being contiguous with said rod extension portion and said second end portion being disposed within a spring-pressure chamber at one end of said first bore means, said valve spool means unitary member including passageway means for constantly communicating said spring-pressure chamber with said fourth bore means, said spool means unitary member being urged in a first direction by the pressure extent in said spring-pressure chamber and being urged in a second opposite direction by said secondary fluid pressure extant in said first chamber.

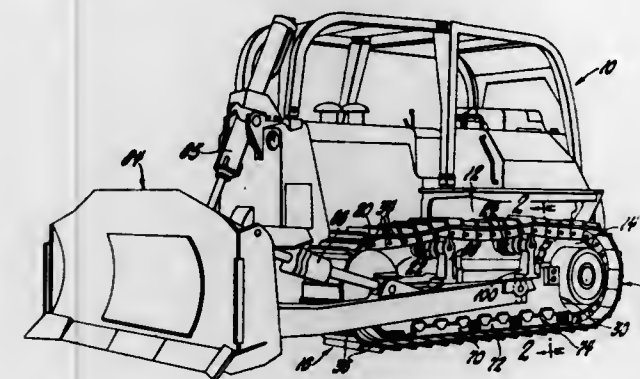
4,006,940
ROLLER FRAME FOR CRAWLER TRACTOR
Francis J. Halterman, Jr., Ravenna, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 8, 1976, Ser. No. 647,358

Int. Cl.² B62D 25/16

U.S. Cl. 305-12

3 Claims



1. A roller frame for a crawler tractor having a body portion each side of which is provided with a drive sprocket and an endless track composed of a plurality of track shoes interconnected by pivot pins, said roller frame adapted to support said body portion on the lower run of said endless track and comprising a pair of laterally spaced side plate members rigidly interconnected to form an elongated unitary member having a front end and a rear end, an idler wheel rotatably supported by the front end of the roller frame between the side plate members, pivot means for connecting the rear end of the roller frame to said body portion, each of said side plate members having an upper edge and a lower edge, said lower edge having at least two cut-out portions formed therein so as to provide said each of said side plate members with a front support surface and an intermediate support surface and a rear support surface, said front, intermediate and rear support surfaces being located in a common vertical plane, a plurality of rollers rotatably supported in each of said cut-out portions, a shield extending between each adjacent pair of support surfaces and being L-shaped in crosssection so as to provide a pair of legs located in mutually perpendicular planes, and fastener means fixedly attaching one leg of said shield directly to said adjacent pair of support surfaces whereby the other leg extends horizontally towards the pins of the endless track so as to enclose said rollers and prevent rocks and the like from gaining access into the roller frame.

4,006,941
AIRCRAFT BRAKE CONTROL SYSTEM HAVING HYDROPLANING PROTECTION
Garrett H. DeVlieg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

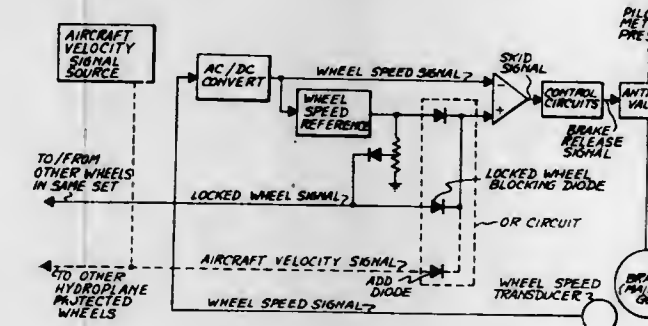
Continuation of Ser. No. 535,010, Dec. 20, 1974, abandoned.

This application Jan. 8, 1976, Ser. No. 647,387

Int. Cl.² B60T 8/10

U.S. Cl. 303-103

3 Claims



3. In combination in an aircraft having brakes for at least two groups of wheels:
hydraulic circuit means for applying brake pressure to said brakes of said at least two groups of wheels, each group including at least two wheels;

antiskid circuit means for controlling brake pressure at said wheels in said at least two groups in response to a skidding condition of said wheels in said at least two groups; said antiskid circuit means in each of said at least two groups of wheels including locked wheel protection circuit means; said locked wheel protection circuit means providing a locked wheel protection signal to a first wheel upon rotation of a further wheel; and means responsive to the velocity of said aircraft during lock up of all braked wheels of said aircraft for releasing brake pressure to at least one but not more than half of the wheels in each of said at least two groups of wheels.

4,006,942

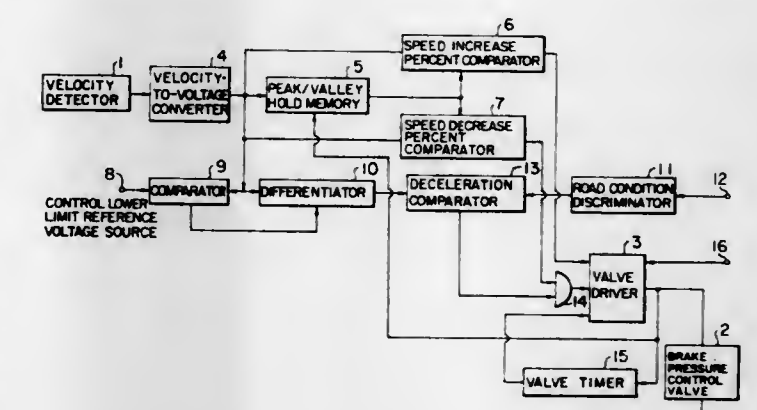
ANTILOCK SYSTEM FOR WHEELED VEHICLES
Masashi Saito, No. 11-1, 3-chome, Kasugadai, Aikawa, Aiko, Kanagawa, Japan
Continuation of Ser. No. 500,087, Aug. 23, 1974, abandoned.

This application Nov. 17, 1975, Ser. No. 632,820
Claims priority, application Japan, Sept. 14, 1973, 48-104085; Apr. 25, 1974, 49-46835; May 28, 1974, 49-59985

Int. Cl.² B60T 8/10, 8/08

U.S. Cl. 303-109

10 Claims



1. A brake control system for an automotive vehicle for preventing skids resulting from early locking of the vehicle's wheels comprising:

- a first means for generating a first signal voltage representing the vehicle's wheel velocity;
 - a second means for continuously generating a second signal, said second signal representing an extremum of said first signal;
 - a driving means for generating a signal for controlling a brake pressure control valve to release and reapply brake pressure;
 - a connecting means in circuit with said second means and said driving means for causing said second means to switch said second signal between values corresponding to maximum and minimum values of said first signal responsive to said driving means signal; and
 - a comparing means for comparing said first and second signals and for providing a signal for operating said driving means.
4. A method for preventing skidding of automotive vehicles due to premature locking of brakes comprising of the steps of:
- providing a first signal proportional to a vehicle's wheel velocity;
 - providing a brake-relief signal in response to said first signal dropping more than a first fixed percentage from a peak value thereof;
 - removing said brake relief signal in response to said first signal increasing more than a second fixed percentage from a minimal value thereof;
 - generating the minimal value of said first signal in response to the application of said brake relief signal; and
 - generating the peak value of said first signal in response to the removal of said brake-relief signal.

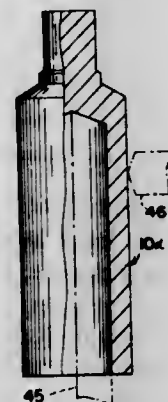
4,006,943

FORMED ONE-PIECE HOLLOW ROLLER SHAFT

Lawrence W. Gible, and Dennis Lee Keese, both of York, Pa., assignors to Caterpillar Tractor Co., Peoria, Ill.
Division of Ser. No. 421,120, Dec. 3, 1973, Pat. No. 3,927,449.
This application Sept. 8, 1975, Ser. No. 611,194
Int. Cl.² F16C 1/24

U.S. Cl. 308—103

4 Claims



1. A formed, hollow roller shaft of integral, one-piece construction comprising an elongated member having a cylindrical central body portion defining a first diameter and cylindrical journal portions extending from opposite ends of said central body portion, said journal portions each defining a diameter which is less than that of the central body portion, the diameters defined by each journal portion being substantially equal to each other, a transition portion between each of said journal portions and said central body portion, and a generally cylindrical, centrally disposed internal cavity for receiving lubricant formed entirely within said central body portion so as to define a closed chamber, whereby reduced residual stresses and increased wear and resistance to load failure are provided, and further including a formed lubricant fill passage centrally disposed within one of said journal portions intercommunicating said closed chamber with the shaft exterior in order to facilitate filling of said cavity with lubricant, and the other of said journal portions being free from cavities.

4,006,944

SPINDLE DEVICE HAVING BEARINGS LUBRICATED WITH OIL JET

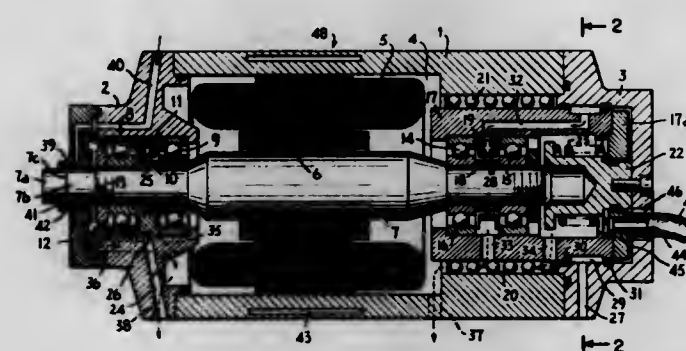
Shigenori Ando; Masato Ota, and Tadashi Kawashima, all of Narashino, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 4, 1975, Ser. No. 601,428
Claims priority, application Japan, Aug. 2, 1974, 49-92444[U]

Int. Cl.² F16C 1/24

U.S. Cl. 308—187

8 Claims



1. A spindle device with oil jet lubrication comprising: a housing having front and rear portions; a spindle disposed within said housing and having a nose portion protruding through a spindle opening in the housing front portion; bearings rotatably supporting said spindle in said housing; oil jet

lubricating means for effecting oil jet lubrication of said bearings with pressurized lubricating oil, said means comprising an oil inlet in said housing for receiving pressurized lubricating oil, oil jet nozzles connected to said oil inlet and facing said bearings to jet oil thereon, and an oil outlet in a lower portion of said housing for enabling the drawing off of the jetted oil; air circulating means for circulating pressurized air past said spindle opening in said housing to seal said opening to prevent dust from entering therethrough into said housing; and means including an air outlet in an upper portion of said housing to effect exhaustion of pressurized air accumulated in said housing together with any oil mingled therein to thereby prevent undue pressurization of the air within said housing which would otherwise force oil out said spindle opening.

4,006,945

ROLLER BEARING ASSEMBLY

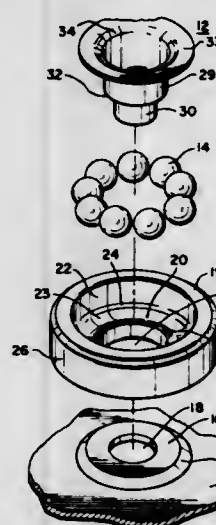
Michael Sekerich, Spring Valley, N.Y., assignor to Buildex Incorporated, West Nyack, N.Y.

Filed Mar. 6, 1975, Ser. No. 555,793

Int. Cl.² F16C 33/00

U.S. Cl. 308—191

7 Claims



1. A roller assembly comprising a base member, a roller defining tubular outer race member having a centrally apertured proximal end wall proximate said base member and being open at its distal end and having an outer race defining inside peripheral face, an inner race member coaxial with said outer race member and having an inner race defining peripheral outside face confronting and spaced from said outer race and provided with an outwardly directed peripheral flange at its distal end registering with the distal end opening of said outer race member and locking means extending through said proximal end wall opening of said outer race and secured to said base member to lock the roller assembly, and a plurality of bearing balls entrapped between said inner and outer races and said flange and end wall, said base member comprising a plate having an opening coaxial with said end wall aperture and said inner race member being of tubular configuration and including a cylindrical distal section terminating in said flange at its distal end and projecting into said end wall aperture and a cylindrical proximal section of a diameter less than that of said distal section and joined to said distal section by a peripheral shoulder engaging the forward peripheral border of said base member opening, the end of said proximal section being upset into engagement with the rear peripheral border of said base member.

4,006,946

SWING MOUNTING FOR CEMENT MIXER AND THE LIKE

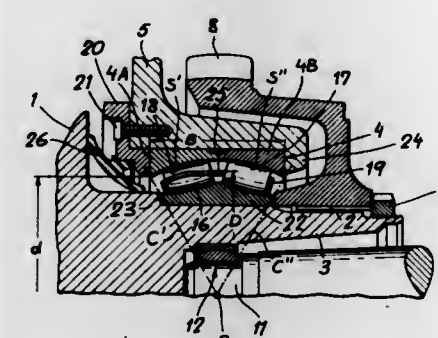
Egon Mann, and Manfred Fischer, both of Friedrichshafen, Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Aug. 22, 1975, Ser. No. 606,945

Int. Cl.² F16C 21/00

U.S. Cl. 308—194

8 Claims



1. A mounting for a load shaft driven from a prime mover through a transmission in a housing with freedom of limited nutation about a predetermined reference point on the shaft axis, comprising an annular inner race with two concave raceways secured to said load shaft, an annular outer race fixedly secured to said housing and axially split into two halves each having a toroidal inner surface with arcuate generatrices curved about said reference point, and two sets of barrel-shaped rollers respectively interposed between the guide surfaces of said halves and the raceways of said inner race, said outer race being of substantially greater axial width than said inner race for keeping said rollers confined upon a relative swing of said races to either side of a mid-position.

4,006,947

LINER AND INSULATION STRUCTURE FOR REFRIGERATION APPARATUS

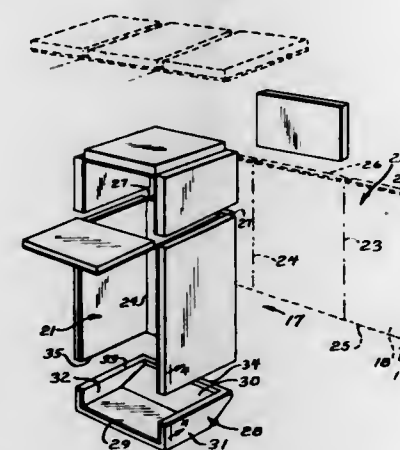
Charles Walter Haag, and Samuel Joseph Pearson, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 7, 1975, Ser. No. 629,874

Int. Cl.² F25D 17/04; B65D 25/14

U.S. Cl. 312—214

16 Claims



1. In a refrigeration apparatus having an exterior cabinet, an improved liner and insulation structure comprising: a base having a formed bottom, and side and rear portions defining a generally upward facing abutment surface; and an upright wall structure formed of a folded laminate of an inner sheet-like liner and an outer insulation, said wall structure having a lower edge portion resting on said base abutment surface to define therewith within said cabinet at least a portion of the interior refrigerated space of said refrigeration apparatus.

4,006,948

FIRE HOSE CABINET

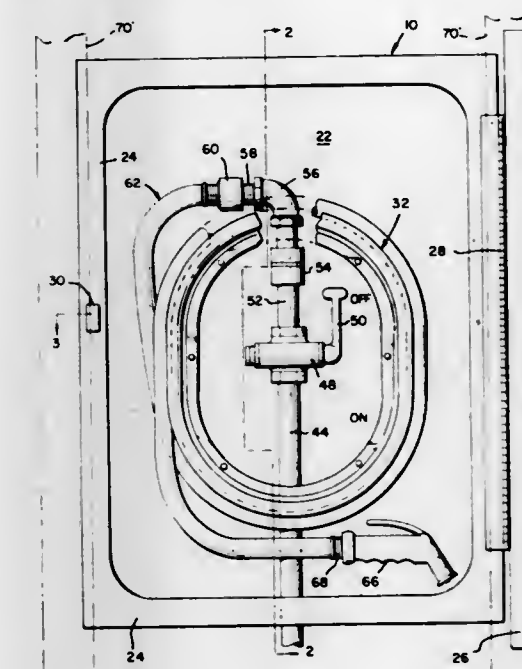
William B. Kessinger, Box 156, Beech Creek, Pa. 16822

Filed Jan. 23, 1976, Ser. No. 651,826

Int. Cl.² A47B 67/02; B05B 75/36

U.S. Cl. 312—242

2 Claims



1. A cabinet for mounting a fire hose or the like comprising a cabinet body having side walls and a rear wall; a door attached to a side wall by a hinge for closing the front of the cabinet; a hose-receiving spool mounted on the rear wall within the body and including an interior opening, a rounded wrapping portion having a smooth exterior surface extending from the rear wall toward the door, opposed sections of the exterior surface diverging from each other away from the rear wall, inwardly directed mounting means on the edge of the wrapping portion adjacent the rear wall and secured thereto, and an outwardly directed hose-retaining flange on the edge of the wrapping portion away from the rear wall; an on-off valve mounted within the interior opening adapted to be connected to a water line; an outlet water line extending from said valve through an opening in the spool to an elbow located outwardly of the exterior surface of the wrapping portion; a swivel in the outlet line between the valve and elbow; and a hose, one end of the hose being secured to the elbow, a nozzle secured to the other end of the hose, hose loops wrapped around the exterior surface of the wrapping portion, said flange extending a distance from exterior surface equal to approximately one half the diameter of the hose and including a rounded edge facing the rear wall to facilitate rapid removal of the hose from the spool.

4,006,949

CABINET FOR MOUNTING ELECTRONIC EQUIPMENT

Roman Keller, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 22, 1973, Ser. No. 343,955

Claims priority, application Germany, Mar. 24, 1972, 2214538

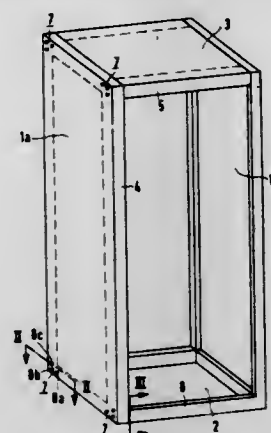
Int. Cl.² A47B 48/00

U.S. Cl. 312—263

1 Claim

1. A cabinet for mounting electronic equipment comprising:
a. side walls;
b. a bottom end part;
c. a top end part, the side walls and the end parts of an assembled cabinet conjointly defining respective cabinet corners;
d. a plurality of joints located at said corners each of said joints comprising three bushing pairs arranged to define the respective corners of a triangle, each bushing pair consisting of a first pair body and a second pair body, the

first pair body fixedly mounted in the side wall corresponding to the joint and the second pair body fixedly mounted in the end part of the cabinet corresponding to the same joint, one of the pair bodies of each of said bushing pairs having a bushing bore formed therein, the other one of said paired bodies of each of said bushing



pairs having a projection for engaging the bushing bore of the corresponding pair body, a threaded bore formed in at least one pair body of each of said bushing pairs and three screws threadably engaging corresponding ones of said threaded bores to join the side wall and the corresponding one of said end parts together.

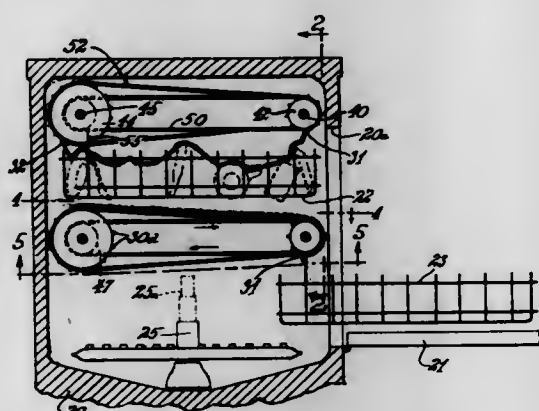
4,006,950

DISH-STABILIZERS FOR DISH WASHING MACHINES
James M. Murray, 9129 S. Crescent Court, Oak Lawn, Ill. 60453

Filed Feb. 14, 1975, Ser. No. 550,004
Int. Cl.² B08B 11/00; A47L 15/00, 15/50

U.S. Cl. 312-270

3 Claims



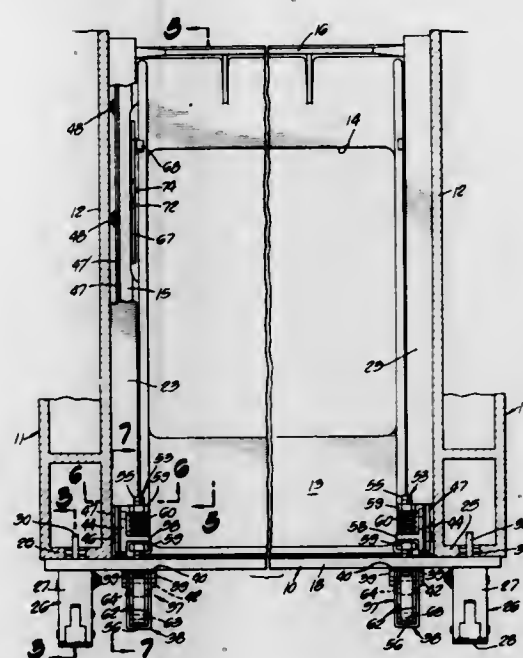
1. A stabilizer for dishes contained in a workbasket of a dishwashing machine to maintain them therein as deposited and apart from each other comprising a limp mesh having a length greater than that of the work basket and adapted to be lowered into the work basket when same is inserted into said machine and to be lifted from and supported above said work basket when same is removed from said machine and conveyor means to support and to move the mesh into and out of said work basket, said conveyor means comprising a pair of co-operating differentially-driven conveyors and drive means between the work basket and one of said conveyors to advance one end of the mesh at the speed of the work basket movement and the opposite end of the mesh at a faster speed to impose a gradual draping of the mesh into said work basket upon its insertion and to quickly lift said mesh from said work basket upon its withdrawal.

4,006,951
LOCKING MECHANISM FOR A SLIDE DRAWER
Larry A. Geer, Upland, and Ralph L. Sheffer, Arcadia, both of Calif., assignors to Adams Rite Products, Inc., Glendale, Calif.

Filed June 12, 1975, Ser. No. 586,291
Int. Cl.² A47B 88/16

U.S. Cl. 312-320

17 Claims



1. In the combination of a cabinet and a drawer supported for movement between an open extended position projecting from a side of the cabinet and a closed retracted position within the cabinet, the improvement comprising:

- means supporting the drawer on said cabinet for guided movements between said open and closed positions, and said supporting means comprises side rails carried by said drawer, and guide rails carried by said cabinet respectively operatively associated with each of said drawer side rails; and
- lever actuated means operable in open, closed, and an infinite number of intermediate positions of said drawer of retaining and holding the drawer against vibrational movements said retaining and holding means including means engageable between a drawer side rail and an associated cabinet rail for releasably anchoring said rails against relative movements.

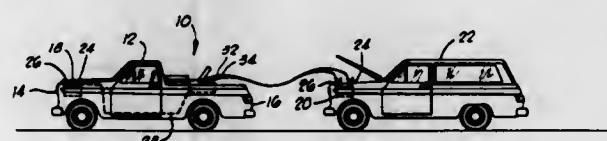
4,006,952

BATTERY JUMP CABLE APPARATUS
William E. Puckett, 105 W. Charlotte Drive, Oklahoma City, Okla. 73159

Filed May 10, 1976, Ser. No. 684,652
Int. Cl.² H01R 39/00

U.S. Cl. 339-5 RL

10 Claims



1. Apparatus for transferring power from the battery, having positive and negative terminals, of a service vehicle to the battery, having positive and negative terminals, of a second vehicle where the negative terminal of the service vehicle battery is connected to the frame of the service vehicle, comprising:

- a housing secured to the service vehicle;
- a reel rotatably supported in the housing;
- a first cable wound on the reel having one end thereof secured to the reel and an opposite free end;

means electrically connecting the end of the first cable connected to the reel to the frame of the service vehicle; a clamp connected to the free end of the first cable for connection with the negative terminal of the battery of the second vehicle; a second cable wound on the reel having one end thereof connected to the reel and an opposite free end; means electrically connecting the end of the second cable connected to the reel to the positive terminal of the service vehicle battery; and a clamp on the free end of the second cable for connection with the positive terminal of the battery of the second vehicle

4,006,953

SPINDLE ASSEMBLY HAVING AN ELECTRODE SPINDLE

Sadao Moritomo, Ichikawa; Shinichi Kikuchi, and Shigenori Ando, both of Narashino, all of Japan, assignors to Seiki Kabushiki Kaisha, Japan

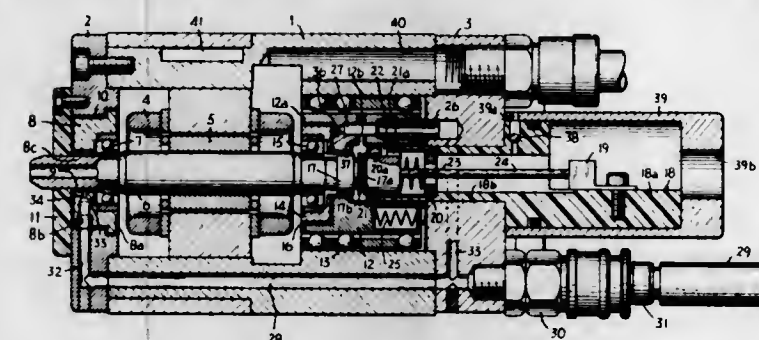
Filed May 7, 1975, Ser. No. 575,130

Claims priority, application Japan, May 7, 1974, 49-51389[U]; May 10, 1974, 49-52081

Int. Cl.² H01R 39/00

U.S. Cl. 339-6 R

11 Claims



1. A spindle assembly for electrolytic grinders and others which use electric current through rotating spindles, comprising an electrode spindle supported rotatably in a housing, said spindle being insulated from the housing, an electric current collector securely fixed on the rear end of said spindle, a slipping brush member spaced behind said electric current collector and being in contact with the collector, said brush member being also insulated from the housing and connected to an electric supply during use of the spindle assembly, and means including air circulating paths formed in the combination of said electric current collector and said slipping brush member for sucking air from outside to circulate through the paths returning to the outside, so that wear material from the brush member is ejected out together with the circulating air.

4,006,954

ELECTRICAL CONTACTING DEVICE
Kazuo Ikawa, Tokyo, and Naoki Ogawa, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sept. 17, 1975, Ser. No. 614,161

Claims priority, application Japan, Oct. 28, 1974, 49-124749

Int. Cl.² H01R 39/00

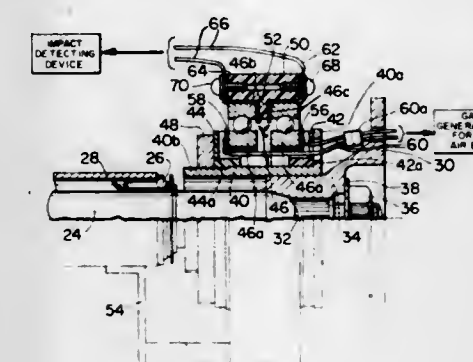
U.S. Cl. 339-8 R

8 Claims

1. An electrical contacting device for providing continuous electrical connection between a first electrical device mounted on a rotatable shaft and a second electrical device mounted on a relatively stationary member, comprising:

- a cylindrical base member coaxially and securely mounted on said rotatable shaft, said base member being formed with at one end thereof a flange portion outwardly extending therefrom and at the other end thereof a threaded portion;
- a pair of annular inner holders concentrically mounted

around said cylindrical base member and positioned to be spaced from each other, said annular inner holders being respectively formed with step portions facing each other; at least one inner race member concentrically mounted on said step portions, said inner race member being connected with said first electrical device; a lock ring engageable with said threaded portion of said cylindrical base member for locking said inner race member and said pair of annular inner holders against said flange portion of said cylindrical base member;



at least one outer race member concentrically positioned around and radially spaced apart from said inner race member for forming a substantially cylindrical gap between said inner and outer race members, said outer race member being securely connected to said relatively stationary member through outer race members securing means and electrically connected to said second electrical device; and

a plurality of rolling elements located in said cylindrical gap for providing electrical connection between said inner and outer race members.

4,006,955

CARD RETAINER

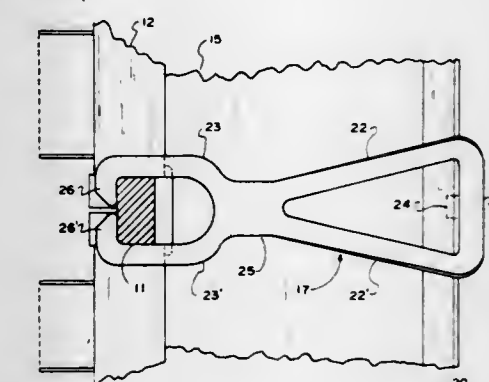
Melvin L. Johnson, Lombard, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 22, 1975, Ser. No. 642,967

Int. Cl.² H01R 13/54

U.S. Cl. 339-91 R

1 Claim



1. A retainer for locking a printed circuit card into its associated connector in a file wherein said file includes cross-bars onto which are mounted said connectors, comprising: an elongated planar ring having a tongue extending inwardly from the periphery of said ring, the tongue and associated portion of said ring being flexible enough to be displaced for hooking over the edge of a printed circuit card in said file, and a pair of hooked tines at the opposite end of said ring projecting outwardly, the hook portions of said tines facing each other, said tines being flexible enough to permit the hooked portions to be displaced out of the plane of said ring for passage of said hooked portions past said cross-bar and to return to their original position to hook around said cross-bar, to thereby lock said printed circuit card in its associated connector.

4,006,956

STRAIN RELIEF DEVICE

Werner Allgaier, Sauerlach, Germany, assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 371,676, June 20, 1973, abandoned.

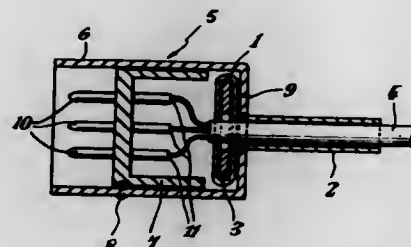
This application July 14, 1975, Ser. No. 595,785

Claims priority, application United Kingdom, June 22, 1972, 29275/72

Int. Cl.² H01R 13/58

U.S. Cl. 339—103 M

14 Claims



9. A strain relief device comprising:
- a plug member having a rear wall with a first aperture formed therein;
 - a heat shrinkable sleeve having a first and second portion, said first portion being in a recovered state and said second portion being in an expanded state and forming a pathway capable of receiving an electrical cable, said second portion of said heat shrinkable sleeve positioned in said first aperture of said plug, and
 - a disk having a diameter larger than said first aperture and having annular faces defining one centrally located second aperture, said first portion of said sleeve being recovered onto said faces, said second aperture being in alignment with said pathway thereby forming a further part of the pathway capable of receiving an electrical cable.

4,006,957

CONNECTOR

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

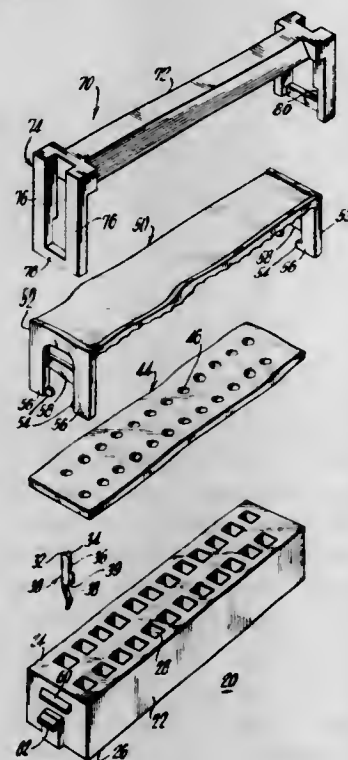
Continuation of Ser. No. 509,236, Sept. 25, 1974, abandoned.

This application Feb. 23, 1976, Ser. No. 660,537

Int. Cl.² H01R 13/58

U.S. Cl. 339—103 M

7 Claims



1. A connector for connecting each of the conductors of a multi-conductor flat cable to a termination point comprising: a base member having a first surface and a second surface and

a plurality of apertures therein extending from said first surface to said second surface, the number of said apertures being equal to the maximum number of conductors which can be present in said multi-conductor flat cable; a plurality of elongate contacts, one for each of said apertures, said contacts having a circular, dual slotted conductor contact portion, said two slots dividing said contact into two radial arms, at one end of said contact, a post contact portion at its other end and a tab, having a first edge and a second edge, intermediate the two ends of said contact, said contacts being inserted in said apertures to position said conductor contact portion adjacent said first surface of said base member with the first edge of said tab aligned with said first surface of said base member and said post contact portion adjacent said second surface of said base member; keeper means having a plurality of additional apertures equal in number to the number of apertures in said base member and of a size which permits said arms to freely deflect in a first direction radially outwardly from the longitudinal axis of said contact as a conductor of such multiconductor flat cable is forced into said two slots of said conductor contact portions; said keeper means having a predetermined thickness less than the height of said conductor contact portions to permit said arms to freely deflect in a second direction obliquely away from the longitudinal axis of said contact, said keeper means being permanently coupled to said base member in such manner as to align said additional apertures with said apertures in said base member; cover means having an inner surface and an outer surface, and a plurality of recesses in said cover means extending from said inner surface towards said outer surface and terminating intermediate said inner and outer surface, one recess for each of said contacts and aligned with said additional apertures of said keeper means, each recess arranged to receive the free ends of said arms of its associated contact after said arms have pierced the insulation and extended through the thickness of such multi-conductor flat cable; and latch means for selectively coupling said base member to said cover means; the application of a force to said outer surface of said cover means, when a multi-conductor flat cable is inserted between said inner surface of said cover means and the free ends of said arms of said contacts, causing each conductor of said multiconductor flat cable to enter its associated one of said contacts and the free ends of said arms to enter its associated recesses in said cover means as said latch means operates to hold said inner surface of said cover means and the exposed surface of said keeper means in intimate contact with said multi-conductor flat cable.

4,006,958

RIGHT ANGLE ELECTRICAL PLUG

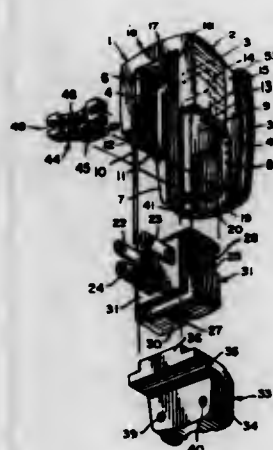
David E. Kramer, and Russell F. Stoll, both of Northbrook, Ill., assignors to Daniel Woodhead, Inc., Northbrook, Ill.

Filed Feb. 21, 1975, Ser. No. 551,785

Int. Cl.² H01R 13/58

U.S. Cl. 339—110 P

10 Claims



1. A right angle electrical plug comprising:
- a. a housing having first and second leg portions forming a

4,006,960

MEMBER FOR CONNECTING THE END OF A CONDUCTOR TO A PIN

Guy Lacan, Carrieres sous Bois, France, assignor to La Telemecanique Electrique, France

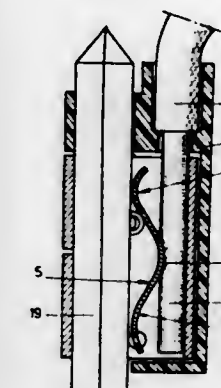
Filed May 6, 1975, Ser. No. 575,116

Claims priority, application France, May 15, 1974, 74.16811

Int. Cl.² H01R 9/12

U.S. Cl. 339—274

6 Claims



- generally right angle configuration,
- b. a first insert member having electrical contact blades thereon adapted to have electrical conductors connected thereto and removably received within that portion of the housing forming the first leg portion thereof so that said blades thereon extend outwardly therefrom to be inserted into an electrical receptacle,
- c. a second insert member removably received in that portion of the housing forming the second leg portion thereof,
- d. cooperating interengaging parts on said first and second insert members so arranged that said first insert member cannot be removed while said second insert member is in place, said first insert member being otherwise readily removable,
- e. means to secure said second insert member in said housing to prevent removal of both of said inserts, and
- f. an opening between the second leg portion of said housing and said second insert member for receiving a cable having electrical conductors therein for connection with said contact blades.

4,006,959
INTRINSIC CERTIFICATION ASSEMBLY TECHNIQUE
FOR WIRING COMPONENTS INTO AN ELECTRICAL
APPARATUS

John Root Hopkins, Belleair, Fla.; Robert Maurice Renn, and Robert Keith Southard, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

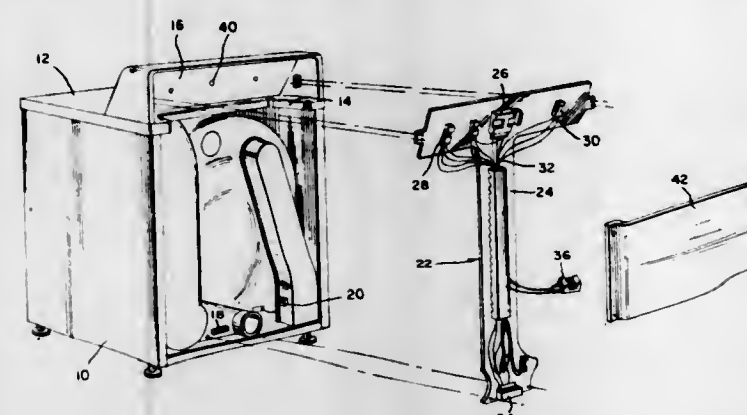
Division of Ser. No. 520,399, Nov. 4, 1974, Pat. No. 3,970,354.

This application Jan. 14, 1976, Ser. No. 649,009

Int. Cl.² H01R 3/00

U.S. Cl. 339—113 R

9 Claims



1. A system for wiring electrically powered or controlled apparatus such as appliances, computers, copy machines, vehicles and craft, and the like, comprising:
- a frame adapted to be mounted proximate said apparatus in a single position;
 - mounting means on said frame adapted to receive a plurality of components and connectors each in a single position only, said mounting means on said frame preventing assembly of the respective connectors, components and their respective subassemblies on said frame unless said connectors and components are fully mated; and
 - conductor securing means on said frame for holding in place conductors interconnecting said connectors.

4,006,961

CONTACT RETENTION ASSEMBLY

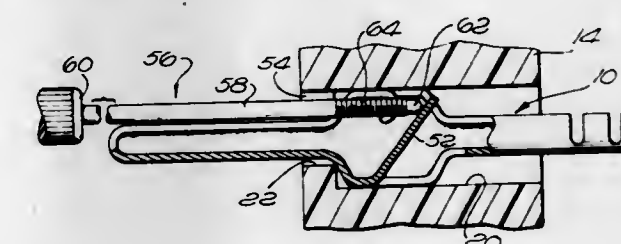
Jack E. Langenbach, Newport Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,179

Int. Cl.² H01R 13/42, 43/00

U.S. Cl. 339—217 S

3 Claims



1. An electrical connector and extraction tool combination comprising:
- an insulator having a front face and a rear face with a contact cavity therein extending from said front face to said rear face;

an electrical contact mounted in said cavity, said contact comprising an electrically conductive body having a forward contacting section and a retention section behind said contacting section;
a spring retention line on said retention section extending rearwardly at an angle across said cavity to frictionally engage the wall of said cavity, the section of said cavity between said line and said rear face having a uniform cross-section;
means on said retention section providing a relatively stationary tool-receiving aperture in front of said line; and an extraction tool insertable from said front face into said aperture to engage said line whereby said line will be rearwardly deflected to release its engagement with said cavity wall, said tool embodying means for positively gripping said contact while deflecting said line so that said line will remain disengaged from said cavity wall when said contact is withdrawn rearwardly from said cavity.

4,006,962

COMMUNICATION SYSTEM HAVING LOW DISPERSION GLASS OPTICAL WAVEGUIDE

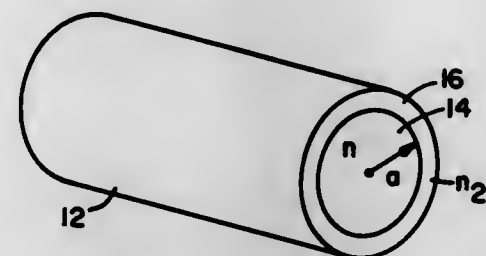
Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 27, 1975, Ser. No. 581,281

Int. Cl.² G02B 5/14

U.S. Cl. 350-96 WG

4 Claims



1. An optical communication system comprising a light source having a mean wavelength λ_0 , a cylindrical, multimode, optical waveguide having input and output ends, said input end being disposed in light receiving relationship with respect to said source, said waveguide having a core of radius a surrounded by a layer of cladding material having a refractive index n_2 , the on-axis refractive index n_1 of said core being greater than n_2 , and the index distribution in said core as a function of the radius r being defined by the equation

$$n(r) = n_1 [1 - 2\Delta(r/a)^\alpha]^{1/2} \text{ for } r < a$$

where $\Delta = (n_1 - n_2)/n_1$ and α is a parameter between 1 and infinity, but not equal to about 2, means for causing mode coupling in said waveguide, said mode coupling means, said mean source wavelength and said optical waveguide being such that the quantity $\lambda_0^2 n_1''$, which determines the mode independent material dispersion that is dependent upon the spectral width of said source, is substantially equal to the quantity $2n_1 \Delta C(\alpha) M_{11}(\alpha)$, which determines the mode dependent waveguide dispersion that is dependent upon the spectral width of said source, where

$$C(\alpha) = \frac{\alpha-2}{\alpha+2} + \frac{\alpha}{\alpha+2} + \frac{4\alpha}{(\alpha+2)^2} + \frac{\lambda_0 \Delta'}{\Delta} + \frac{1}{\alpha+2} + \frac{2\lambda_0 \Delta''}{\Delta}$$

and wherein the matrix element M_{11} is a number between 0.1 and 1.0, depending upon the index gradient α and the nature of the perturbation caused by said mode coupling means, and means for detecting light radiating from the output end of said waveguide.

4,006,963
CONTROLLABLE, ELECTRO-OPTICAL GRATING COUPLER

Peter Baues, Krailling; Hans Mahlein, Munich; Achim Reichelt, Munich, and Gerhard Winzer, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

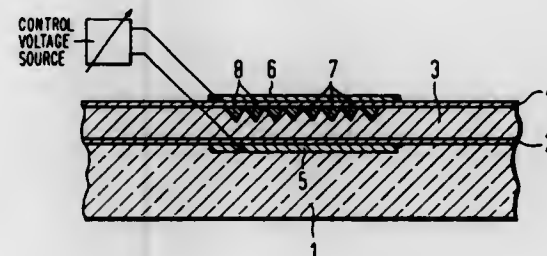
Filed July 21, 1975, Ser. No. 597,663

Claims priority, application Germany, Sept. 6, 1974, 2442723

Int. Cl.² G02B 5/14, 5/18

U.S. Cl. 350-96 C

8 Claims



1. A controllable, electro-optical grating coupler for optional switch-over or modulation of optical waves in waveguides, comprising:
a substrate;
a first areal electrode carried on said substrate;
a first dielectric layer carried on said first areal electrode;
a waveguide carried on said first dielectric layer for the propagation of light in a predetermined direction, including a periodic grating structure transversely of the direction of propagation, said waveguide including electro-optical material in the region of the grating structure;
a second dielectric layer carried on said waveguide; and
a second areal electrode arranged on said second dielectric layer.

4,006,964
INTEGRATED OPTICAL WAVEGUIDE HAVING A FILTER

Hans Mahlein, and Gerhard Winzer, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

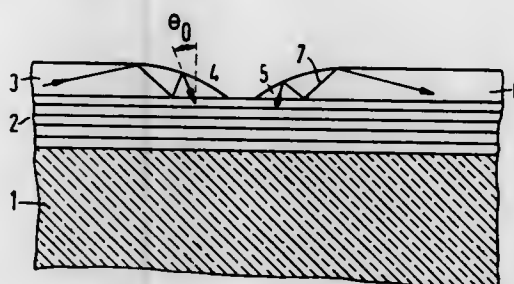
Filed Aug. 15, 1975, Ser. No. 605,182

Claims priority, application Germany, Sept. 6, 1974, 2442724

Int. Cl.² G02b 5/14; G02B 5/30

U.S. Cl. 350-96 C

5 Claims



1. An integrated optical waveguide with a filter, characterized in that a multilayer filter system having alternating high-refractive and low-refractive layers applied onto a substrate has arranged upon a first layer thereof opposite the substrate first and second waveguide portions having closely spaced, adjacent tapered ends,
the effective indices of refraction for light in the two waveguides being greater than the index of refraction of said first layer of the filter.

4,006,965
PROJECTION SCREEN

Ryosaku Takada, 5-54, 4-chome, Ayazono, Takashi, Osaka, and Akemi Joma, 25-21, 3-chome, Shindo, Ibaraki, Osaka, both of Japan

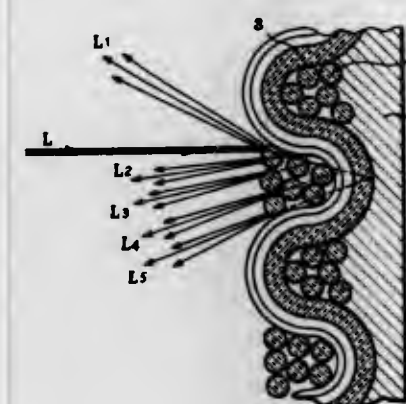
Filed Dec. 23, 1974, Ser. No. 535,306

Claims priority, application Japan, Apr. 18, 1974, 49-44540[U]; May 8, 1974, 49-51532

Int. Cl.² G03B 21/60

U.S. Cl. 350-117

4 Claims



1. A screen comprising a woven transparent fabric layer made of clear glass yarn with a transparency more than 90 percent and having a front exposed surface of uniformly and minutely rough textile weave, and a layer of highly reflecting aluminum joined to said transparent fabric layer at a rear surface thereof, said transparent fabric layer having an optically dense structure for providing a highly diffused reflection of light beam projected thereto in combination with said layer of highly reflecting aluminum.

4,006,967
DIRECTING OPTICAL BEAM

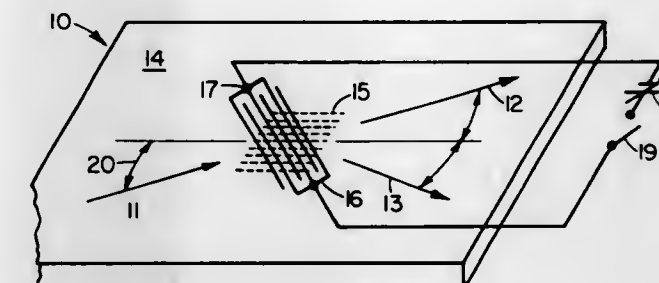
Richard P. Kenan; Carl M. Verber, both of Columbus, and Van E. Wood, Delaware, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Apr. 23, 1975, Ser. No. 570,836

Int. Cl.² G02F 1/16

U.S. Cl. 350-160 R

23 Claims



1. A method of directing a beam of optical radiation toward a selected location, and modulating the intensity thereof at the location, comprising
directing the beam over a path that includes a Bragg grating, and
selectively modifying the angle between the direction at which the beam enters the Bragg grating and a direction of Bragg incidence of the grating.

4,006,968

LIQUID CRYSTAL DOT COLOR DISPLAY

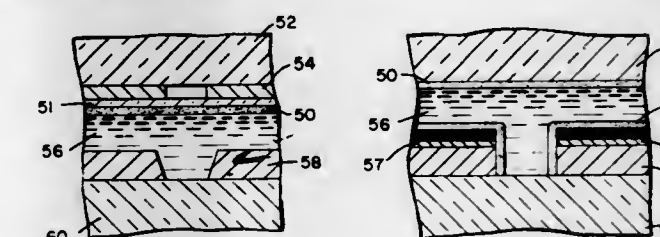
Michael N. Ernstoff, Los Angeles; William C. Hoffman, Torrance, and Richard N. Winner, Palos Verdes Peninsula, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 2, 1975, Ser. No. 574,150

Int. Cl.² G02F 1/13

U.S. Cl. 350-160 LC

5 Claims



1. A display system comprising in combination:
a first electrode structure formed on one surface of a flat bulk silicon substrate wafer;
a thin transparent plate, one side of which covers said first electrode structure;
a second electrode structure formed on said one side of the thin transparent plate;
a plurality of color selective interference filters deposited on another side of said thin transparent plate forming columnar strips selective of different adjacent colors;
an insulating structure providing electrical insulation between said first electrode structure and said second electrode structure and creating interstices therebetween;
liquid crystal material positioned between said first electrode structure and said second electrode structure so as to fill said interstices created by said insulating structure; arrangement of said interstices positioned with said columnar strips to form color triads therefrom;
a transparent cover plate positioned to protect said display system and retain said liquid crystal material between the first and second electrode structures; and
means coupled to said first and second electrode structures for applying electric current thereto, thereby creating electric fields in selected ones of said interstices.

4,006,966
PROCESS FOR PREPARATION OF AN ELECTRODE STRUCTURE CONTAINING WO₃ USE OF THE STRUCTURE IN AN ELECTROCHROMIC CELL

Marion Douglas Meyers, Stamford, Conn., and Henry Patrick Landl, Yorktown Heights, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 392,165, Aug. 27, 1973, abandoned, which is a division of Ser. No. 105,882, Jan. 12, 1971, abandoned. This application Apr. 4, 1975, Ser. No. 565,307

Int. Cl.² G02F 1/36

U.S. Cl. 350-160 R

6 Claims



1. In a variable light modulating device comprising a layer of persistent electrochromic material as a light modulating material, a counter-electrode, an electrolyte material in contact with said light modulating material and said counter-electrode, the improvement being a counter-electrode comprising a sheet of an admixture of a persistent electrochromic material, a fibrillated plastic binder and an electrically conductive material pressed onto a planar electrically conductive support.

4,006,969

ELECTRO-CHROMIC DISPLAY DEVICE

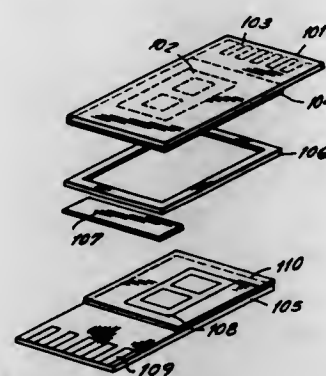
Akihiko Kouchi; Kunihiro Inoue; Hiroshi Takeshita; Kunihiro Yamada, and Tsutomu Otake, all of Sawa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Dec. 8, 1975, Ser. No. 638,579

Claims priority, application Japan, Dec. 9, 1974, 49-141360
Int. Cl.² G02F 1/23

U.S. Cl. 350-160 R

10 Claims



1. An electro-chromic display device, comprising first and second opposed plates, at least said first plate being transparent, electrodes in the form of indicia on the inner surface of each of said opposed plates, the electrode on at least said first plate being transparent, a transparent electrolyte disposed between said plates, a common electrode, an electro-chromic material making contact with said indicia on each of said plates and said common electrode, said common electrode and said indicia on each plate being selectively connectable to an external source of voltage in a selected polarization direction, said common electrode and said indicia forming electrodes being so positioned in non-registry with each other for selectively actuating the indicia on either plate for display so that two sets of indicia may be available in the space normally available for only one set.

4,006,970

LASER LIGHT IMAGE GENERATOR

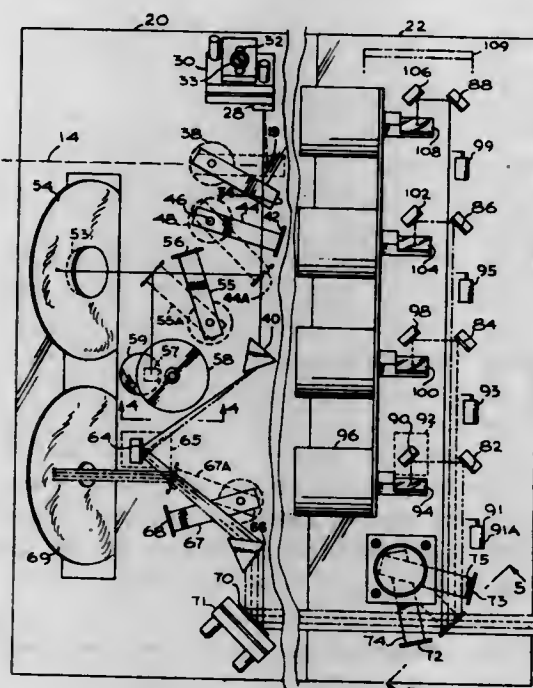
Dan Slater, Folkerton; Ivan M. Dryer, Canoga Park, and Charles W. McDonald, La Canada, all of Calif., assignors to Laser Images Inc., Van Nuys, Calif.

Filed July 14, 1975, Ser. No. 595,516

Int. Cl.² G05D 25/00; A63J 17/00

U.S. Cl. 350-285

10 Claims



1. A system for generating light images of various colors comprising

laser means for generating a single light beam capable of being separated into a plurality of different color light beams,

first prism means for producing as an output a plurality of different color light beams from said single light beam,

first mirror means for directing said single light beam on said first prism means,

second prism means for collimating the output of said first prism means to produce as output a plurality of different color light beams having spaced parallel paths,

a plurality of spaced aligned moveable x-y mirror means each respectively moving a light beam thereon in a manner to describe a desired pattern,

second mirror means positioned for directing said output of said second prism means along a path parallel to a line defined by said spaced, aligned, moveable x-y mirror means,

a plurality of third mirror means respectively positioned in said path adjacent said plurality of moveable x-y mirror means for directing a different one of said collimated different color light beams onto a different one of said moveable x-y mirror means, and

beam torquer means for reciprocally moving the light beams directed at said second mirror means whereby each of the patterns described by said moveable x-y mirror means is made to change color.

4,006,971

REFLECTIVE IMAGING APPARATUS

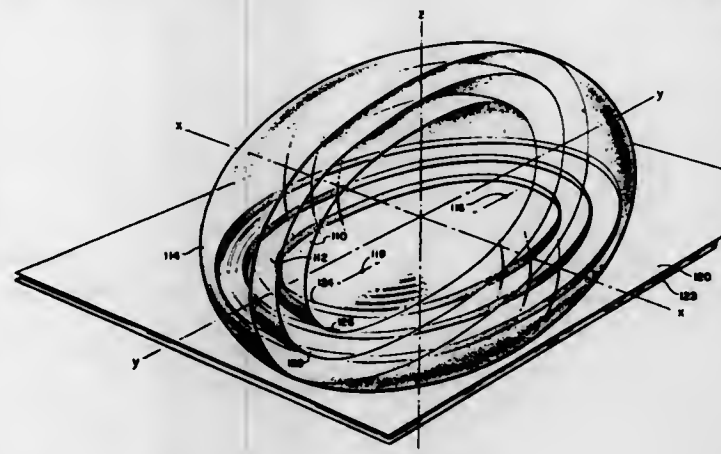
William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 333,188, Feb. 16, 1973, abandoned, which is a division of Ser. No. 141,253, May 7, 1971, Pat. No. 3,735,685. This application Jan. 28, 1975, Ser. No. 544,713

Int. Cl.² G02B 5/10, 3/08

U.S. Cl. 350-293

19 Claims



8. Generally planar reflecting means, comprising:

a first face;

a second face disposed in back-to-back relation with said first face; and

a plurality of echelon arranged surfaces disposed along said first face, each having a cross-sectional pitch relative to said first face that varies over a path along the surface and equidistant from said first face.

4,006,972

LASER MIRROR COOLANT PRESSURE BALANCE MEANS

Russell L. Nachtman, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 12, 1975, Ser. No. 576,492

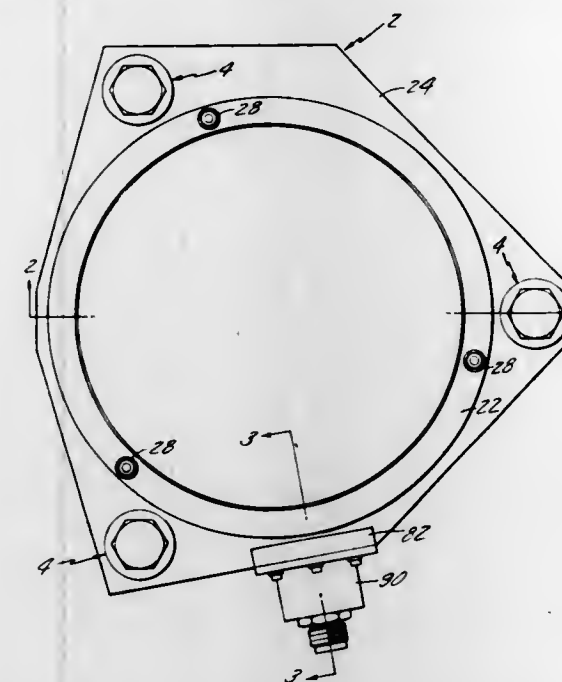
Int. Cl.² G02B 5/08

U.S. Cl. 350-310

7 Claims

1. In combination, a mirror, means for mounting said mirror, said mirror containing coolant passages, said mirror having a cylindrical hole therein extending inwardly from an

opening in the side of the mirror, said cylindrical hole having a bottom surface, opposite said opening first passage means connecting said cylindrical hole to said coolant passages, said first passage means entering said cylindrical hole at a location between its opening and bottom surface, a first cylindrical section of said cylindrical hole being located between said location and said bottom surface, a second cylindrical section



of said cylindrical hole being located between said location and said opening, a first piston in the first cylindrical section, means connecting said first piston to said mounting means for preventing said piston from engaging said bottom surface, tubular means extending into said second cylindrical section, said tubular means providing a passageway between the exterior of said mirror and said first passage means for directing a coolant therebetween.

4,006,973

LASER MIRROR COOLANT PRESSURE BALANCE MEANS WITH SEPARATE INLET AND OUTLET MANIFOLDS

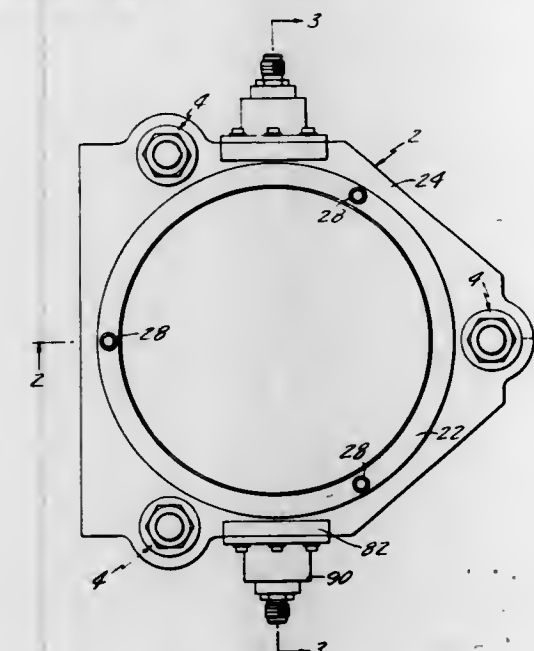
Arthur L. Zanotti, and Robert K. Stalcup, both of Lake Park, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 12, 1975, Ser. No. 576,493

Int. Cl.² G02B 5/08

U.S. Cl. 350-310

1 Claim



1. In combination, a mirror, means for mounting said mirror, said mirror containing coolant passages, said mirror hav-

ing a first opening therein and a second opening therein, said first opening being connected to one end of said coolant passages and said second opening being connected to the other end of said coolant passages, first means for directing a coolant fluid to said coolant passages including a first transfer tube assembly, second means for directing a coolant fluid from said coolant passages including a second transfer tube assembly, said first transfer tube assembly having one end positioned in said first opening, said second transfer tube assembly having one end positioned in said second opening, a first manifold means fixed with respect to said mounting means, a second manifold means fixed with respect to said mounting means, the other end of said first transfer tube assembly being connected to said first manifold means, the other end of said second transfer tube assembly being connected to said second manifold means, each transfer tube assembly comprises a tubular member, each tubular member having an enlarged head on each end, each head having a spherical surface thereon, each spherical surface on one end extending into its cooperating opening in said mirror, the spherical surface on the other end of each tubular member being connected to its manifold means to limit its movements into its cooperating opening, each enlarged head being connected to its manifold means by being confined between an inner seat and an outer stop means in its manifold means, the end of each tubular member connected to its manifold means having a seat in the end thereof, a rod member positioned in each tubular member, each rod member having a cylindrical member fixed on one end contacting its cooperating opening in said mirror and a cap member fixed on the other end, each cap member having a spherical surface for engaging its seat in the end of its tubular member for limiting the movement of its cylindrical member so that it does not contact the bottom of its cooperating opening, each cap member being retained between the end of its tubular member and its outer stop means, each cap member having opening means therethrough for the flow of a coolant, said first manifold means includes a first outer member fixed to said mounting means aligned with said first opening, said second manifold means includes a second outer member fixed to said mounting means aligned with said second opening, each outer member having an insert fixed therein and an adapter connected to said insert, each insert having an inner seat, each adapter forming an outer stop means for its cap member, each adapter having an opening therein to provide a passage connected to the cap member.

4,006,974

EYEGLASS STRUCTURE

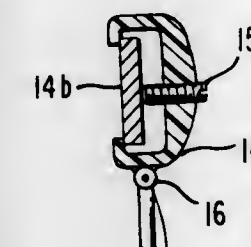
Sam L. Resnick, 15-43 200th St., Bayside, N.Y. 11360

Filed Sept. 26, 1975, Ser. No. 617,047

Int. Cl.² G02C 9/02

U.S. Cl. 351-59

10 Claims



1. A spectacle apparatus adapted to be supported and worn by a user comprising first and second lens assemblies, a bar located between said lens assemblies and having a back surface including an adhesive for direct coupling of the bar to the forehead area of a user, said bar as located causing said lens assemblies to be positioned each in front of a respective eye of the user.

4,006,975

FADE-OVER APPARATUS FOR A MOTION PICTURE CAMERA

Eduard Wagenonner, Aschheim, and Alfred Winkler, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

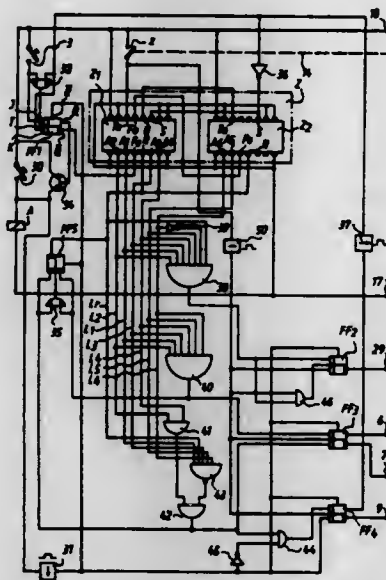
Filed July 23, 1975, Ser. No. 598,386

Claims priority, application Germany, July 26, 1974, 2436019

Int. Cl.² G03B 21/36

U.S. Cl. 352-91 C

12 Claims



1. In a motion picture camera having film including a plurality of frames, film transport means for transporting said film along a predetermined path, an aperture and aperture control means including a light-sensitive element and adjustment means for adjusting the size of said aperture to a normal or a fade-out size in response to a first or second control signal respectively, a fader arrangement, comprising, in combination, externally operable start signal furnishing means for furnishing a start signal initiating a fade-out; counting means connected to said start signal furnishing means for counting the number of frames transported along said predetermined path following receipt of said start signal and furnishing counting signals corresponding to the number of so-counted frames; first circuit means connected between said counting means and said aperture control means for furnishing said second control signal to said adjustment means in response to a first predetermined one of said counting signals, thereby initiating said fade-out; and second circuit means connected between said counting means and said film transport means for furnishing a stop signal stopping said film transport means in response to a second predetermined one of said counting signals following said first predetermined one of said counting signals by a predetermined time interval at least sufficient for completion of said fade-out.

4,006,976

FADE-IN AND FADE-OUT DEVICE OF A CINECAMERA

Yasuo Ishiguro, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed July 16, 1975, Ser. No. 596,415

Claims priority, application Japan, July 19, 1974, 49-82265; July 19, 1974, 49-82266; July 19, 1974, 49-82267

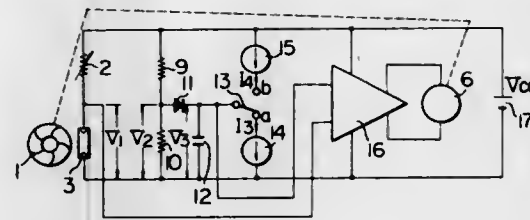
Int. Cl.² G03B 21/36

U.S. Cl. 352-91 C

9 Claims

1. An improved fade-in and fade-out device of a cinecamera having an automatic exposure control circuit including an electric source (17), a photoelectric element (3) having an output and being arranged behind one of two variable diaphragms (1, 100), namely that of a lens of the cinecamera and that coupled with a diaphragm of the lens, for receiving light from a scene therethrough so as to generate an output voltage indicative of scene brightness, a reference-voltage circuit

having a capacitor (12) charged by said electric source so that the output voltage thereof is used as the reference voltage, a servo-amplifier (16) connected with its inputs to said output of the photoelectric element and the output of said capacitor, respectively, so as to continue to generate an output until the output voltages of said photoelectric element and said capacitor are made equal, the polarity of said output of the servo-amplifier being determined depending upon which of said outputs is greater than the other, namely that of said photoelectric element and of said capacitor, and actuating means 6 connected to said output of the servoamplifier and operatively coupled with said variable diaphragm, thereby adjusting the latter of the lens for proper exposure, wherein the improve-



ment comprises a constant-current charging circuit 15 connected to the plus terminal of said electric source and selectively connectable to said capacitor for additionally charging the same with a constant current in excess of said reference voltage so as to increase said output voltage thereof linearly, a constant-current discharging circuit (14) connected to the minus terminal of said electric source and selectively connectable to said capacitor for discharging the same with a constant current so as to decrease said output voltage thereof linearly to said reference voltage, and switching means (13) for alternately connecting said capacitor to one of said charging circuit and said discharging circuit, thereby permitting the fade-in and the fade-out to be effected by said variable diaphragm of the lens.

4,006,977

PHASE CONTROL SYSTEM FOR POLARIZED SYNCHRONOUS MOTORS

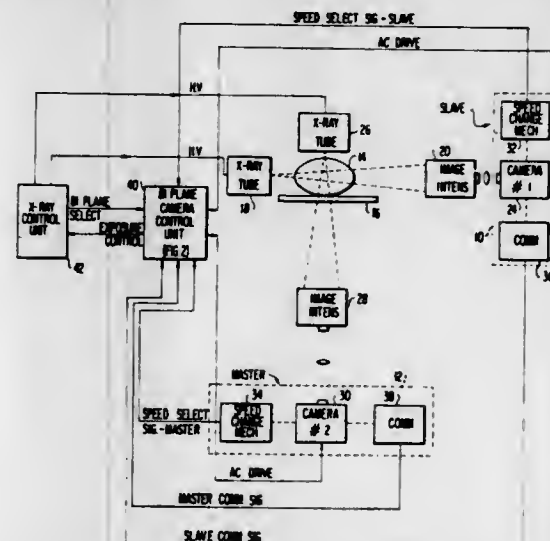
Charles Lawrence Harrow, Baltimore; Jean Claude Bonnac, Kensington, and Gunter Gerd Wilkens, Baltimore, all of Md., assignors to CGR Medical Corporation, Baltimore, Md.

Filed Jan. 22, 1976, Ser. No. 651,258

Int. Cl.² G03B 19/18

U.S. Cl. 352-133

14 Claims



1. A system for phase locking the shutters of two cinefluorographic cameras arranged along two mutually perpendicular axes and having selective multiple frame speeds, and which are adapted to be operated singly in a mono-plane mode or in combination in a biplane mode, alternately or simultaneously, said cameras being driven by respective synchronous drive motors, the improvement comprising in combination:

respective circuit means applying an AC potential of a predetermined frequency to each of said synchronous drive motors;

means coupled to said shutters providing respective electrical output signals in response to the open and closed state of said shutters;

circuit means coupled to said respective electrical output signals and being operative to compare the phase of said electrical signals for a common frame speed of said cameras to provide a pulse output signal for a predetermined phase difference between said electrical output signals; signal generator means coupled to said pulse output signal and being triggered thereby to provide a pulse output signal of a predetermined different pulse width for each frame speed of said cameras; and

circuit means phase locking said pulse output signal of predetermined pulse width to said AC potential and applying said phase locked pulse output signal to said respective circuit means applying said AC potential to one of said synchronous drive motors whereby said AC potential is removed from said one synchronous drive motor for a time period substantially equal to the pulse width of said pulse output signal of predetermined pulse width causing said one synchronous drive motor to slip relative to the other synchronous drive motor to achieve proper phasing therebetween.

4,006,978

MOTION PICTURE CAMERA WITH MOTOR CONTROL CIRCUIT HAVING DECREASED POWER CONSUMPTION

Franz Bien; Karel Pustka, both of Munich, and Eduard Wagenonner, Aschheim, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

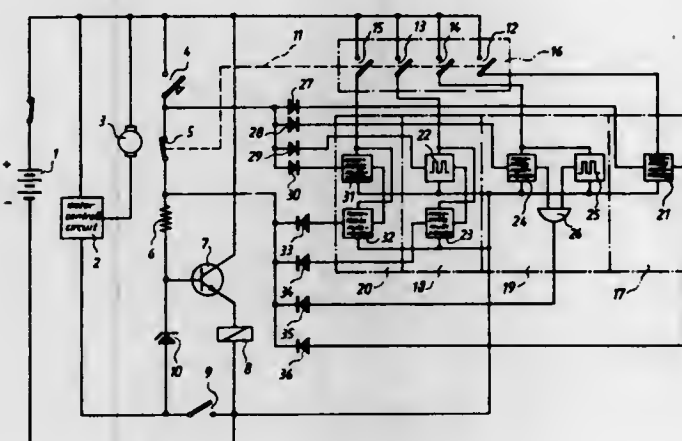
Filed Aug. 22, 1975, Ser. No. 607,055

Claims priority, application Germany, Aug. 30, 1974, 2441544

Int. Cl.² G03B 1/00

U.S. Cl. 352-174

10 Claims



1. In a motion picture camera having film, a source of electrical energy, film drive means for advancing said film, relay means having contact means connected to said film drive means and said source of electrical energy and a coil for operating said contact means to a state energizing said film drive means in response to a pull-in current flowing through said coil said relay means requiring a holding current substantially less than said pull-in current to maintain said contact means in said state, and energizing circuit means connected to said coil for furnishing said pull-in current to said coil upon external activation, the improvement comprising additional circuit means connected to said contact means and said energizing circuit means, for reducing the current through said coil to said holding current when said contact means are in said state energizing said film drive means, wherein said energizing circuit means comprise connecting means for connecting said energizing circuit means to said source of electrical energy upon external activation, and variable impedance means having a controlled impedance circuit connected in series with

4,006,979

ELECTROMAGNETIC RELEASE DEVICE FOR A MOTION PICTURE CAMERA

Teiji Hashimoto, Kawasaki; Tomoshi Takigawa, Machida, and Toshikazu Ichinaga, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

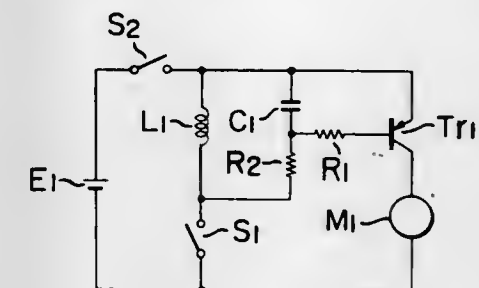
Filed Jan. 10, 1974, Ser. No. 432,247

Claims priority, application Japan, Jan. 17, 1973, 48-7670

Int. Cl.² G03B 1/00

U.S. Cl. 352-176

12 Claims



1. A release arrangement for a photographic camera operable by means of an electric current source, comprising: a motor for operating said camera; a shutter means operated by the driving force of the motor; a release means blocking the operation of said shutter means, and including:

1. blocking means, a part of which is capable of selectively shifting into and out of a movable region of said shutter means; and
2. an electromagnet means for controlling and shifting of said blocking means; and
delay means for delaying the timing of current flow through said motor for a predetermined time relative to the timing of the operation of the electromagnet means, said delay means comprising:

1. an electronic switching circuit for controlling the starting and stopping of said motor, said circuit having a transistor circuit including an output circuit arranged for connecting and disconnecting said motor to said electric current source; and
2. an RC time constant circuit electrically connected to an input circuit of said transistor circuit, said time constant circuit being so arranged as to electrically charge electric current in a predetermined time immediately after cur-

rent from said source is imparted to said electromagnet means, to cause said transistor output circuit to connect said motor to said source when the electric charging is completed, to discharge said charged current likewise in a predetermined time, immediately after the provision of the current from said source to said electromagnet means is interrupted, and to cause said transistor output circuit to disconnect said motor from said source after completion of the electric discharge.

4,006,980

MICROFICHE CARRIER

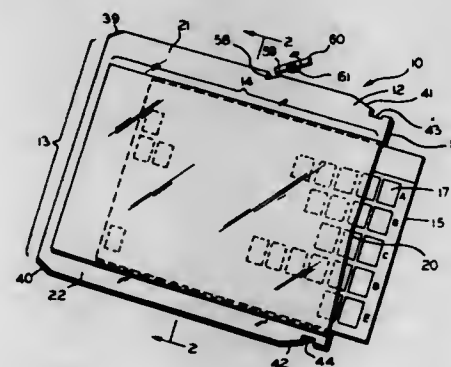
Thomas R. Wells, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 532,798

Int. Cl.² G03B 23/00

U.S. Cl. 353—118

4 Claims



1. A microfiche film carrier for use in a library file which supports a plurality of microfiche carriers in a spaced parallel side-by-side relationship, with a latch for normally securing the carriers in the file, said carrier comprising: a pair of transparent film sheets, one of said sheets being embossed in a window area having dimensions substantially corresponding to dimensions of a microfiche film, means for adhesively securing said pair of film sheets along three edges in face-to-face relationship with said embossed window area forming a relief area for receiving a microfiche film, the edges of said embossed sheet forming a relief area to prevent thickness binding between said carrier and its adjacent supporting structure in a library file, hooks formed on at least one side of said carrier for enabling an extraction of a selected microfiche carrier from a library file, and a latch receiving keeper notch along at least one side of said carrier, whereby a library file latch engages the latch receiving keeper notch to hold the microfiche carrier in a library file.

4,006,981

HALF TONE DEVELOPMENT FOR TOUCHDOWN SYSTEM

Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 481,079, June 20, 1974, abandoned, which is a division of Ser. No. 351,221, April 16, 1973, Pat. No. 3,881,927. This application Oct. 2, 1975, Ser. No. 619,101

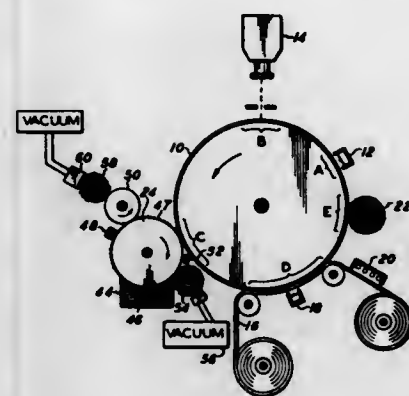
Int. Cl.² G03G 15/08

U.S. Cl. 355—3 DD

12 Claims

3. Apparatus for developing latent electrostatic images carried by a substrate comprising a donor member, means for loading said donor member with a layer of toner, charging means for imparting a uniform electrical charge of predetermined polarity to said donor layer, means for subjecting said charged toner layer to an electrostatic field having an intensity varying in accordance with a grid-like pattern to create a corresponding pattern of hills and valleys in said toner layer, and

means for presenting said patterned toner layer to said



substrate for developing said images, whereby the grey scale content of said images tend to be preserved.

4,006,982

PHOTOELECTROPHORETIC CONCURRENT PROCESS CYCLING

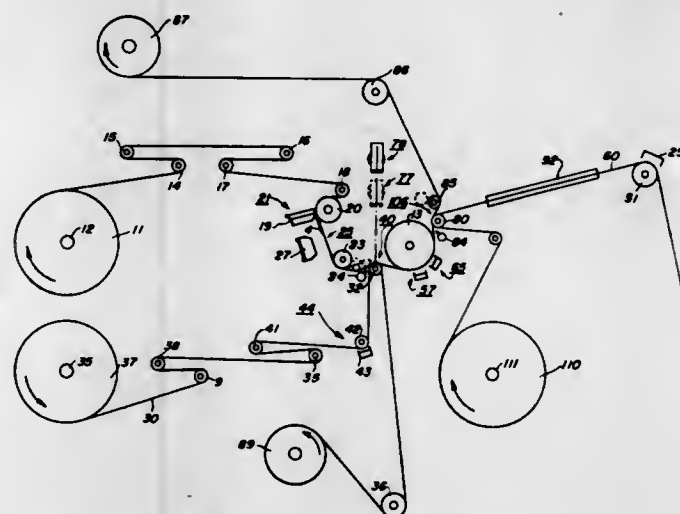
Gino F. Squassoni, Pittsford, and Earl V. Jackson, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,326

Int. Cl.² G03G 15/00

U.S. Cl. 355—3 P

10 Claims



1. Photoelectrophoretic imaging apparatus comprising:
a. means for supporting a first transparent web electrode for travel;
b. first drive means cooperating with said means for supporting a first transparent web electrode to advance a first transparent web electrode through a predetermined path passing an ink coating means and an imaging station;
c. ink coating means for applying a thin film of photoelectrophoretic ink to the first transparent web electrode;
d. means for supporting a second web electrode for travel;
e. second drive means cooperating with said means for supporting a second web electrode to advance the second web electrode through a predetermined path passing the imaging station;
f. an imaging roller mounted at the imaging station, the second web electrode advanced into contact therewith; and whereat the ink carrying surface of the advancing first transparent web electrode is advanced by (a) and (b) into contact with the advancing second web electrode while it is contacting said imaging roller, thereby forming an ink-web sandwich and an imaging zone nip at said imaging roller, the two webs having ink sandwiched between them, supported at the imaging zone nip by said imaging roller on the second web electrode side of the sandwich without a support member contacting the imaging zone area on the first transparent web electrode side of the sandwich at the imaging zone nip;

g. means for coupling a voltage source to the imaging roller to establish an electric field across the ink-web sandwich at the imaging zone nip;
h. exposure means for projecting an image pattern of activating electromagnetic radiation through the first transparent web electrode onto the ink-web sandwich at said imaging roller;
i. means for separating the two webs from contact after the two webs have been advanced past the imaging station and said imaging roller to form an image pattern corresponding to the activating electromagnetic radiation on at least one of the webs; and
k. cycling means for timing application of a next successive film of photoelectrophoretic ink onto the first transparent web electrode concurrently with completion of image formation in (i) above.

4,006,983

ELECTROSTATIC COLOR PRINTING SYSTEMS USING MODULATED ION STREAMS

Gerald L. Pressman, San Jose, and Kenneth W. Gardiner, Odenthal-Hahnenberg, both of Calif., assignors to Electroprint, Inc., Cupertino, Calif.

Filed Oct. 29, 1973, Ser. No. 410,743

Int. Cl.² G03G 15/01

U.S. Cl. 355—4

21 Claims

1. In a system for electrostatic multicolor printing, the combination of:
means for separating a multicolor original pattern to be reproduced into a plurality of substantially single color separation patterns;
means for generating a stream of ions including an ion source and an ion accelerating electrode spaced from said ion source;
means for producing ion patterns by modulating the ion stream including a multilayer apertured element positioned between the ion source and the accelerating electrode and having at least a conductive layer and an insulative layer capable of supporting bipolar charge potentials of differing magnitude for establishing electrostatic lines of force within the apertures of the element for controlling passage of ions in accordance with each given single color separation pattern;
means for developing each of said ion patterns with marking material substantially corresponding in color to one of said single color separations;
means for neutralizing undeveloped charges subsequent to development of a single color separation pattern;
and means for supporting said developed ion patterns in registry to provide a multicolor copy of the original multicolor pattern to be reproduced.

4,006,984

METHOD AND APPARATUS FOR THE MANUFACTURE OF PRINTING PLATES

Ferdinand Friese, Walldorf, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 5, 1975, Ser. No. 629,107

Claims priority, application Germany, Nov. 8, 1974, 2452979

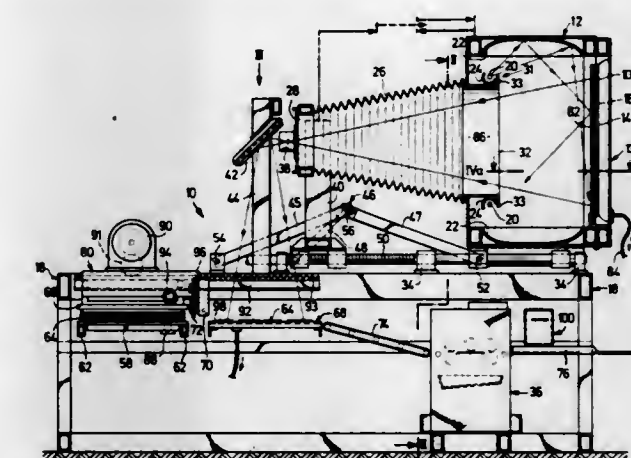
Int. Cl.² G03G 15/00, 13/00; G03B 27/60

U.S. Cl. 355—11

24 Claims

1. An apparatus for the manufacture of printing masters by electrophotographic means comprising:
a frame supporting an unexposed printing master holder and carriage means for removal of unexposed printing master from said holder by reduced pressure of a vacuum plate;
an exposure platform communicating with said frame to receive said unexposed printing master from said carriage means and securely retain said printing master during charging and exposure thereof;

charging means communicating with said frame for electrostatic charging of said printing master retained to said exposure platform;
means communicating with said frame for holding an image containing original for illumination and projection onto said printing master;
means communicating with said frame for illumination of



said original by radiation sources capable of only indirect illumination of said original;
means communicating with said illumination means for projection of image of said original onto said charged printing master; and
means communicating with said frame for transportation, developing and drying of said printing master after exposure of said printing master to said projected image.

4,006,985

XEROGRAPHIC APPARATUS HAVING TIME CONTROLLED FUSING

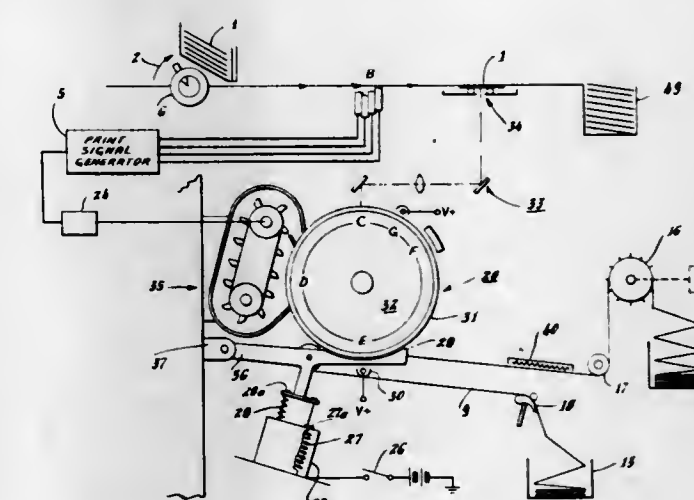
Mark A. Hutner, Glenview, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 5, 1975, Ser. No. 610,725

Int. Cl.² G03G 15/00

U.S. Cl. 355—14

11 Claims



1. Apparatus comprising:
a. a source generating light images and print signals associated with at least some of the images, any one of the print signals being associated with only one of the images;
b. a support base;
c. toner;
d. means for providing toner images corresponding to light images associated with print signals, on successive sections of the support base;
e. a fuser assembly;
f. means, responsive to said print signals, for turning the fuser on for periods of time related to periodic intervals of time occurring between successive print signals, each of

said periods of time occurring during an interval of time immediately prior to the presentation of a toner image, related to the first of the successive print signals, to the fuser assembly;

- g. means for turning the fuser on upon presentation of a toner image to the fuser assembly; and
h. means responsive to the temperature in the fuser for inhibiting means (f) and (g) to turn the fuser off after specific time periods within said intervals of time.

4,006,986

IMAGE RECORDING APPARATUS FOR ELECTROPHOTOGRAPHIC FILM

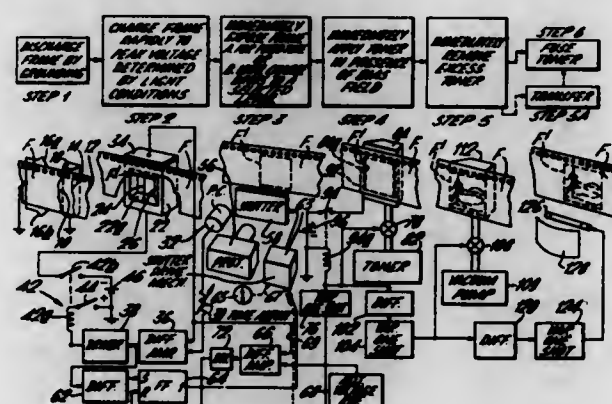
Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Division of Ser. No. 389,124, Aug. 17, 1973, and a continuation-in-part of Ser. No. 361,951, May 21, 1973, abandoned, which is a division of Ser. No. 260,782, June 8, 1972. This application Jan. 20, 1975, Ser. No. 542,179

Int. Cl.² G03G 15/00

U.S. Cl. 355-14

8 Claims



1. Apparatus for recording images of a projected scene or the like on a photoconductive coating of an electrophotographic member which comprises:

- A. means for projecting the image onto the member and including controllable light passing means to enable timed exposure of the said coating;
B. means for charging the coating in darkness at a rapid rate;
C. control means for operating the light passing means to expose the photoconductive coating to the projected image;
D. means for applying toner to the coating to render a latent charge image visible;
E. means for timing variably the periods of charging, exposure and toning, including means coupled thereto for detecting the completion of each of said periods;
F. first and second signal producing means connected with said timing means to produce a first signal when the charging period is completed and a second signal when the exposure period is completed;
G. the signal producing means being coupled to the charging means, control means and toner applying means and the latter three means being responsive to said signals such that the three means are set into operation sequentially, the completion of the charging period starting the exposure period and the completion of the exposure period starting the toning period.

4,006,987

APPARATUS FOR CLEANING A RESIDUAL TONER ON AN ELECTROSTATIC RECORDING MEDIUM

Makoto Tomono; Ken Nakamura, and Koichi Yamakawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

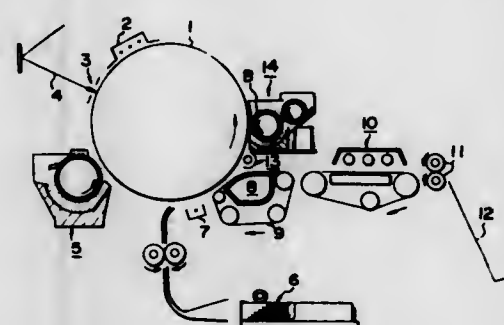
Filed Nov. 6, 1974, Ser. No. 521,396

Claims priority, application Japan, Nov. 12, 1973, 48-126220

Int. Cl.² G03G 21/00

U.S. Cl. 355-15

9 Claims



1. An apparatus for cleaning residual toner from an electrostatic recording medium comprising:
a. a plurality of magnetic particles;
b. carrier means for carrying said magnetic particles thereon, said carrier means being spaced a selected distance from said electrostatic recording medium, said selected distance being small enough to permit contact of said magnetic particles with said electrostatic recording medium;
c. means for applying a bias potential between said electrostatic recording medium and said carrier means for attracting residual toner particles to said magnetic particles;
d. a toner seizer adjacent to and spaced from said carrier means and spaced from said electrostatic recording medium for removing toner from said magnetic particles, said toner seizer being of insulating material and positioned to be contacted by said magnetic particles carried by said carrier means;
e. a plurality of magnet means within said carrier means, said carrier means and said magnet means being relatively movable with respect to each other, at least one of said magnet means being positioned adjacent said electrostatic recording medium and another of said magnet means being positioned adjacent said toner seizer.

4,006,988

PHOTO-ELECTRIC DEPTH OR TURBIDITY METER FOR FLUID SUSPENSIONS

Per-Henric Sebastian Tamm, Lilljeborgsvägen 12, S-752 36 Uppsala, Sweden

Filed Mar. 26, 1975, Ser. No. 562,183

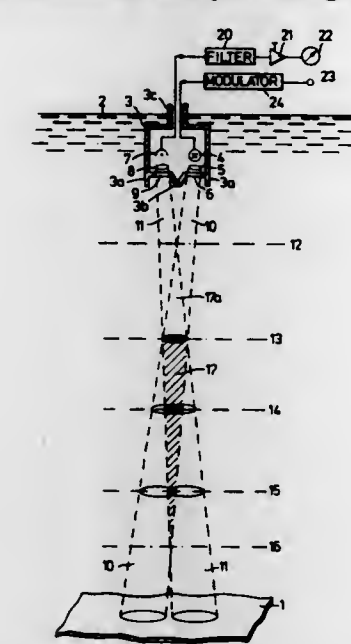
Int. Cl.² G01C 3/08; G01N 21/26

U.S. Cl. 356-4

6 Claims

1. An apparatus for measuring the level of turbidity in a fluid comprising:
a. a fluidtight housing for placement in said fluid and having an optical window;
b. a light source mounted in said housing for producing a beam of light which is directed via said window into said fluid and which diverges about an axis at an angle of between 3 and 10°;
c. photosensitive means mounted in said housing separated from said light source and having a field of view into said fluid which diverges about an axis at an angle of between 3 and 10° and which intersects said divergent beam of light in said fluid, the area of intersection being symmetrically disposed about an axis extending away from said light source and the angle between the axes of said beam and field being no greater than 25° for measuring the light

in said field scattered or reflected by particles causing said turbidity condition and producing an electrical tur-



bidity signal which varies as a function of the cross-sectional area of said intersection at the level of said particles and, hence, the level of turbidity.

4,006,989

LASER GYROSCOPE

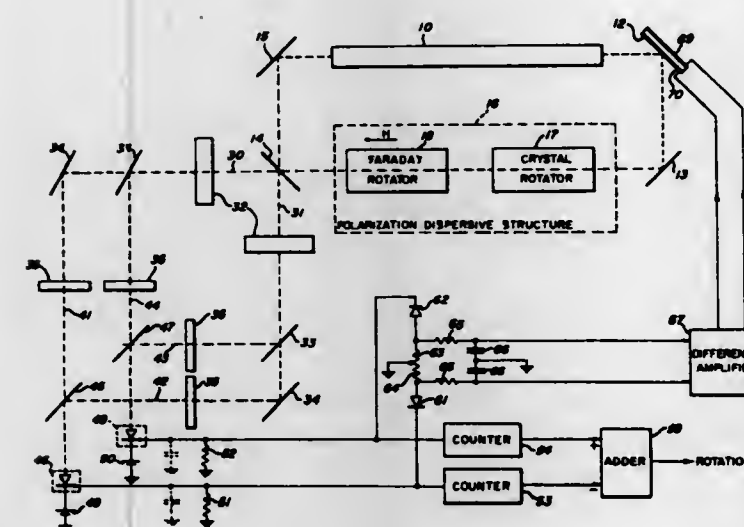
Kelme Andrings, Sherborn, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 294,394, Oct. 2, 1972, Pat. No. 3,854,819, which is a continuation-in-part of Ser. No. 120,581, March 3, 1971, Pat. No. 3,741,657. This application Dec. 11, 1974, Ser. No. 531,836

Int. Cl.² G01B 9/02

U.S. Cl. 356-106 LR

10 Claims



1. The method comprising the steps of:
simultaneously directing a plurality of radiant energy waves having at least a plurality of substantially coherent frequencies in opposite directions through a polarization dispersive medium;
amplifying said waves in an amplifying medium which is common to at least a portion of the path of each of said waves;
deflecting said waves at a plurality of points in said path with reflecting filter means; and
varying the frequencies of said waves by moving said mediums and said reflecting filter means as a unit.

4,006,990

CONVERGENT LIGHT ILLUMINATED FLOW CELL FOR LIQUID CHROMATOGRAPHY

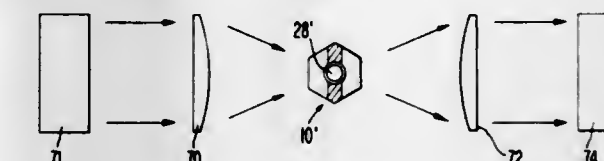
Miner N. Munk, Walnut Creek, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 490,548, July 22, 1974, Pat. No. 3,975,104. This application Mar. 22, 1976, Ser. No. 669,136

Int. Cl.² G01N 1/10

U.S. Cl. 356-246

4 Claims



1. For use in liquid chromatography, a detector comprising:
a flow cell, said flow cell comprising a union connectable at one end to a column of a liquid chromatography apparatus, said union having a flow passage from said one end thereof to the other end thereof for effluent from said column, entrance and exit windows disposed in said union on diametrically opposite sides of said effluent flow passage, each of said windows being in the form of a cylinder segment providing a light acceptance angle of at least 45°;
a light source emitting a collimated beam of light rays and having a light emitting area larger than the cross-sectional area of said passage;
a lens for focusing all rays from said light source to said passage through said entrance window in paths normal to the cylindrical surface of said entrance window; and
means for detecting light rays that emerge from said exit window.

4,006,991

PAINT LOADING APPLICATOR FOR A PAINTING PAD OR BRUSH

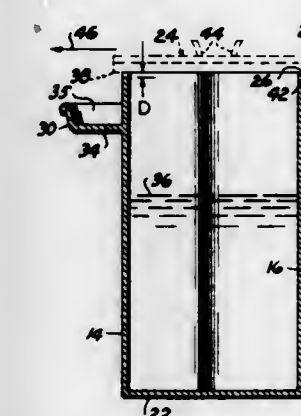
Joseph J. Whalen, 1220 SW. 24, Oklahoma City, Okla. 73109

Continuation-in-part of Ser. No. 618,309, Sept. 29, 1975, abandoned. This application Oct. 16, 1975, Ser. No. 622,927

Int. Cl.² A45D 39/16

U.S. Cl. 401-121

2 Claims



1. A rectangular paint containing painting pad paint applicator, comprising:
an upwardly open container having front, back and end walls;
a horizontal ledge secured to the upper limit of said back wall; and
an upstanding flange secured to the rearward limit of said ledge and forming a back stop adapted for contacting and supporting a longitudinal marginal edge of a painting pad when superposed on said applicator,
whereby a painting pad, while overlying the open end of said applicator against said stop, is coated with paint in an area equal to the open end area of the applicator when the applicator and painting pad are simultaneously temporarily inverted.

4,006,992
FILE

Sven-Olof Ingemar Persson, Fredmans Grand 6, 644 00 Torshälla, Sweden

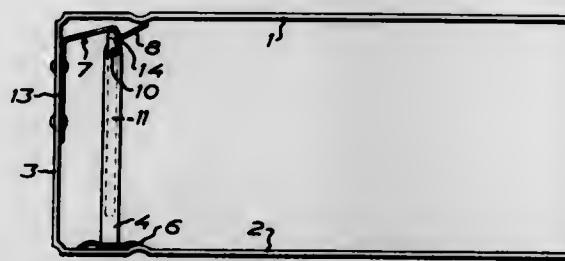
Filed Mar. 5, 1976, Ser. No. 664,354

Claims priority, application Sweden, Mar. 7, 1975, 7502566

Int. Cl.² B42F 13/32

U.S. Cl. 402-47

5 Claims



1. A file for holding perforated sheets, which file is provided adjacent its spine with a pair of spaced apart tubular prongs for cooperation with the sheet perforations and at its spine with a leaf spring of which a portion protruding from the inner side of the spine, in the position of use of the file, abuts against the web of a substantially U-shaped wire member, the arms of which engage the tubular prongs to retain the sheets to the tubular prongs, wherein the leaf spring portion protruding from the spine to cooperate with the web of the U-shaped wire member, has a tongue integral with the protruding leaf spring portion and directed towards the spine of the file, which tongue, when the protruding leaf spring portion is caused to abut against the web of the U-shaped wire member, is adapted to snap home under the wire in order to lock the leaf spring to the U-shaped wire member.

4,006,993

SHAFT MOUNTING ARRANGEMENT

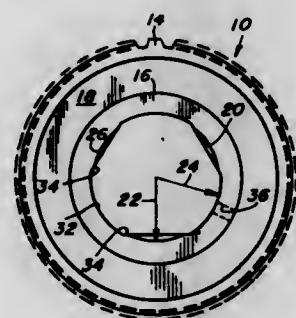
Constantijn L. Woerlee, Zwijndrecht, Netherlands, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 25, 1975, Ser. No. 635,196

Int. Cl.² F16D 1/06

U.S. Cl. 403-359

4 Claims



1. A connecting arrangement comprising:
a cylindrical member having a plurality of flat surfaces spaced around at least a portion of its periphery, each flat surface being spaced from an adjacent flat surface by an arcuate surface, the radius of which equals the radius of the cylindrical member, said flat surfaces being chordal surfaces of said cylindrical member;
an annular member having a bore with a plurality of arcuate surfaces of at least two different radii and a plurality of flat surfaces;
the radius of one group of arcuate surfaces of said annular member being substantially equal to the radius of the arcuate surfaces of said cylindrical member and being in engagement therewith, the flat surfaces of said annular member contacting juxtapositioned flat surfaces of said shaft, and said other arcuate surfaces of said annular member having a smaller radius than that of said one

group and each such other arcuate surface being flanked by a flat surface of said bore.

4,006,994

TAP CHUCKING MEANS

Taizo Kato, 3007-104, Obatahigashijima, Moriyamaku, Nagoya, Japan

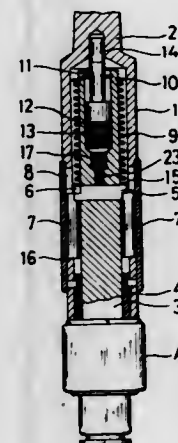
Filed Apr. 28, 1976, Ser. No. 681,002

Claims priority, application Japan, May 1, 1975, 50-53476

Int. Cl.² B23Q 5/22

U.S. Cl. 408-142

2 Claims



1. A tap chucking means adapted to mount a tapping chuck comprising:
a cylindrical body having a shank at one end and an opening at the other end;
a socket shaft, having one end adapted to mount the tapping chuck, rotatably and slidably mounted in said cylindrical body and resiliently biased toward the shank end of said body;
a clutch cross pin, secured transversely through said socket shaft, having partially beveled inner faces on both ends of said clutch pin; and
drive pins diametrically disposed along said socket shaft, said drive pins being axially slidable in axial grooves formed in the mid-portion of said cylindrical body, said drive pins being resiliently biased toward said opening of said cylindrical body,
whereby rotational motion of either of said cylindrical body and said socket shaft is transmitted to the other by engagement of said cross pin with said drive pins, said engagement being released when said cross pin reaches the bottom of said drive pins, and said cross and drive pins are reengaged by reverse rotation of either of said cylindrical body and socket shaft.

4,006,995

DRILL FOR USE IN A BORING MACHINE

Hans Gruner, Hausen (Fils), Germany

Filed Mar. 10, 1975, Ser. No. 556,883

Claims priority, application Germany, Mar. 9, 1974, 2411394

Int. Cl.² B23B 51/00

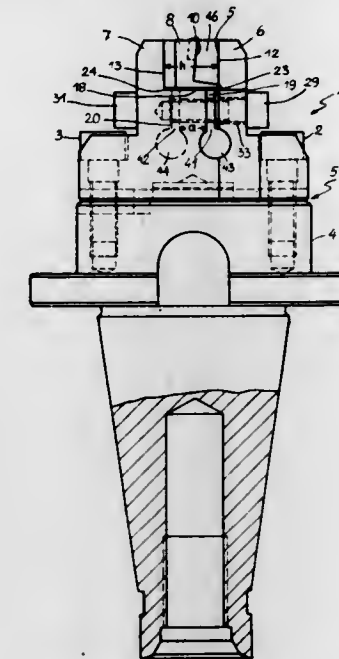
U.S. Cl. 408-157

8 Claims

1. A drill for use in a boring machine comprising a tool holder having a base with spaced walls projecting therefrom having a recess therebetween extending transversely of the axis of the holder, a pair of cutter bars mounted in the recess in end-to-end relation and each having a width substantially equal to the width of the recess and having cutters thereon arranged for radial projection from the periphery of the holder, the base having two noncommunicating slots therein communicating with the recess and extending therefrom in a direction parallel to such axis, and in the same diametrical direction as the recess, and two means located on opposite sides of said central plane each operatively connected with the

parts of the base on opposite sides of each of one of said slots to deform said walls to clamp the cutter bars therebetween the

the bore of said spindle, said o-ring being of such resiliency to be expanded by centrifugal force against said spindle when the latter is rotating.



slots extending from opposite sides of the tool holder approximately to the central plane thereof.

4,006,996

POSITIVELY DRIVEN TOOL HOLDER FOR A HIGH SPEED ROTATABLE SPINDLE

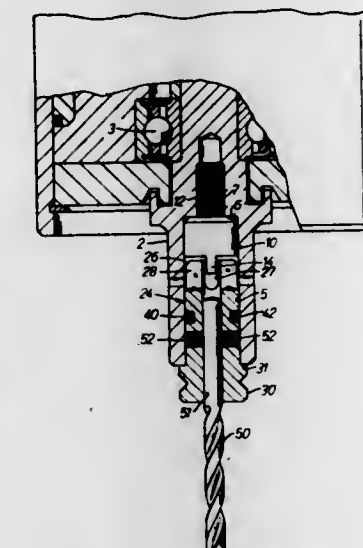
Jack Kasabian, Franksville, Wis., assignor to The Precise Corporation, Racine, Wis.

Filed Dec. 1, 1975, Ser. No. 636,579

Int. Cl.² B23B 31/08, 33/00

U.S. Cl. 408-239 A

4 Claims



1. A tool holder for insertion in a smooth, uninterrupted bore of a rotatable spindle and having a free end extending therefrom and for securing a tool therein, said tool holder also having an end for insertion in said rotatable spindle for rotation by said spindle, said tool holder end which is inserted in said spindle having a drive clutch element, said element having drive surfaces circumferentially spaced apart so as to be concentrically balanced, said free end of said tool holder having a diametrically enlarged end which defines an integral shoulder for abutment with an end of said spindle to position said tool holder in said bore, said tool holder also having an axial hole therein for the reception of a tool, means carried by said tool holder for releasably locking said tool in said tool holder, said tool holder having an annular groove around its periphery, and a flexible o-ring in said groove and is of such size and resiliency so as to project slightly outwardly of the periphery of said tool holder and frictionally abut lightly against said spindle bore when said tool holder is inserted in

4,006,997

SUPERSONIC CENTRIFUGAL COMPRESSORS

Jean Friberg, Bourg La Reine, and Jean-Marie Merigoux, Palaiseau, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

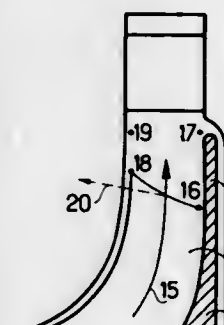
Filed Nov. 6, 1973, Ser. No. 413,224

Claims priority, application France, Nov. 6, 1972, 72.39210 The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.

Int. Cl.² F04D 21/00

U.S. Cl. 415-181

5 Claims



1. In a supersonic centrifugal compressor for handling fluids at supersonic speed including a drive shaft, a circular mobile flange chocked on said drive shaft and extending radially outwardly, a set of radial blades fixed on said mobile flange along one longitudinal edge thereof in circumferentially spaced relationship and having free edges spaced from said mobile flange, a housing disposed about said flange and said blades in proximity thereto, and a flat ring provided as an extension of said mobile flange beyond said blades defining with said housing a fluid slowing down space, the improvement being comprised in providing the radially outward edge of said radial blades with a configuration such that the distance between the axis of said drive shaft and said radially outward edge of the radial blades is greater in the vicinity of said housing than it is in the vicinity of said mobile flange.

4,006,998

RING COMPRESSOR

Siegfried Schonwald, Bad Neustadt, Saale, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

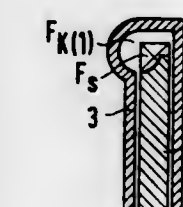
Filed July 7, 1975, Ser. No. 593,384

Claims priority, application Germany, July 23, 1974, 2435432

Int. Cl.² F04D 7/00

U.S. Cl. 415-213 T

1 Claim



1. A ring compressor having a housing with a side channel impeller for use with said ring compressor, said impeller comprising:

a number of blades, said blades each having a lateral end area whose ratio relative to the axial cross section area of said side channel is equal to or less than 0.72 and each said blade being spaced relative to the next adjacent blade by an amount whose ratio relative to the width dimension of said cross section area is equal to or less than 0.72.

4,006,999

LEADING EDGE PROTECTION FOR COMPOSITE BLADES

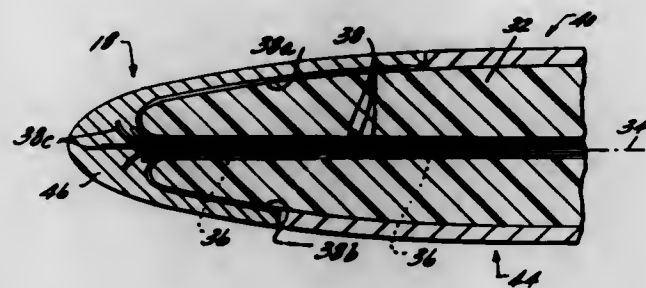
James W. Brantley, Cincinnati, and Thomas P. Irwin, Fairfield, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 17, 1975, Ser. No. 596,905

Int. Cl.² F01D 5/28

U.S. Cl. 416-224

15 Claims



1. A turbomachinery blade comprising: a primary structure including small diameter, high strength filaments composited in a lightweight matrix; and a leading edge protective device partially surrounding said primary structure, a portion of which is anchored within said primary structure along a neutral bending axis thereof, wherein the filaments adjacent the anchored portion are aligned substantially radially within said primary structure.

4,007,000

COMPRESSED OIL BURNER STARTING MECHANISM

Johan Holger Graffman, Danderyd, Sweden, assignor to Clean Air Company, Inc., Panama

Filed Nov. 2, 1973, Ser. No. 412,124

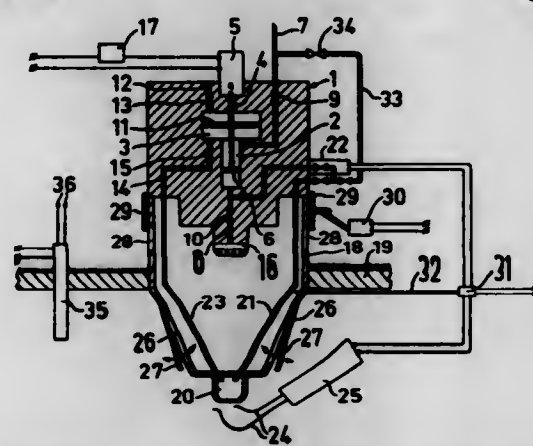
Claims priority, application Sweden, Nov. 3, 1972, 14262/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² F23C 3/02

U.S. Cl. 431-1

6 Claims



1. In a compressed oil burner, having an operating nozzle comprising a valve body, which is yieldingly loaded against a valve seat in a direction contrary to the flow direction of the fuel, said fuel being supplied at a pulsating pressure, the improvement comprising a separate starting nozzle means arranged in front of said operating nozzle, said starting nozzle means being comprised of an air-fuel mixing chamber with outflow apertures and fuel and combustion air introduction means so that fuel and combustion air are supplied to said chamber while the fuel supply to said operating nozzle is closed.

4,007,001

COMBUSTORS AND METHODS OF OPERATING SAME

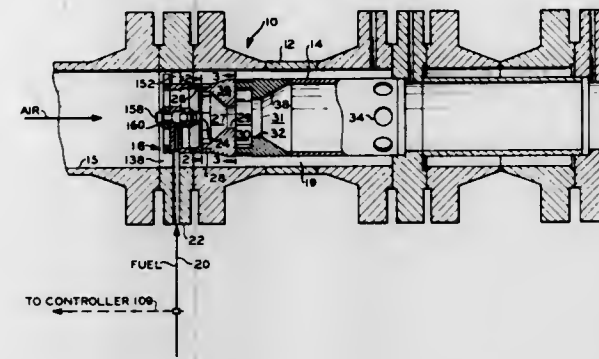
Robert M. Schirmer; John W. Vanderveen, and Paul J. Cheng, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1975, Ser. No. 567,829

Int. Cl.² F02C 7/26

U.S. Cl. 431-10

25 Claims



1. A combustor, comprising, in combination: a flame tube; a dome member disposed at the upstream end of said flame tube; a fuel inlet means disposed in said dome member for introducing a stream of fuel into an upstream first combustion section of said flame tube; a variable first air inlet means provided in said dome member for admitting a variable volume of a first stream of air through said dome member, around said fuel inlet means, and into said first combustion section of said flame tube; a second air inlet means disposed in the wall of said flame tube for admitting a second stream of air into said first combustion section in a circumferential direction and tangential to the wall thereof; a third air inlet means disposed in the wall of said flame tube downstream from said second air inlet means for admitting a third stream of air into a second combustion section in a circumferential direction and tangential to the wall thereof, said second combustion section being located in said flame tube downstream from and in communication with said first combustion section; and means for controlling the volume of said first stream of air in accordance with the rate of introduction of said fuel.

4,007,002

COMBUSTORS AND METHODS OF OPERATING SAME

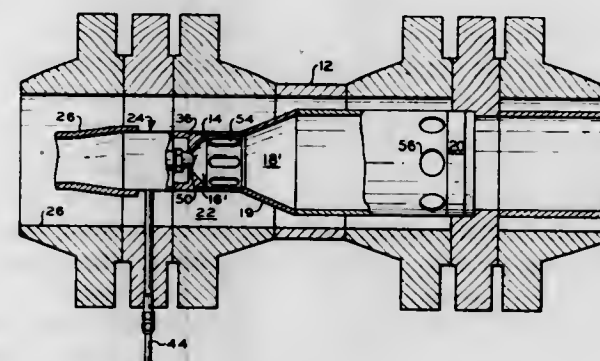
Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1975, Ser. No. 567,830

Int. Cl.² F23D 11/44

U.S. Cl. 431-10

37 Claims



1. A combustor comprising, in combination: an outer casing; a flame tube disposed within said casing and spaced apart therefrom to form a first annular chamber between said flame tube and said casing;

said flame tube having an upstream first combustion section, and a second combustion section located downstream from and adjoining said first combustion section, wherein the volume of said first combustion section is within the range of from 0.7 to 4 percent of the total volume of said first combustion section and said second combustion section;

a first air inlet means for introducing a first stream of swirling air into the upstream end portion of said flame tube;

a fuel inlet means for introducing fuel into the upstream end portion of said flame tube; and a plurality of openings provided in the wall of said flame tube at a first station located between said first combustion section and said second combustion section for admitting a segmented second stream of air from said annular chamber into the interior of said flame tube.

CHEMICAL

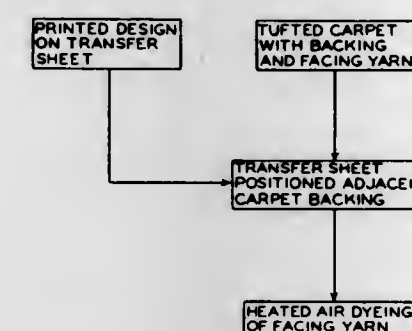
4,007,003 PRODUCT AND METHOD OF PRINTING CARPET WITH A TRANSFER PAPER- II

Walter T. Bulson; George R. Hartranft, and Leonard N. Ray, Jr., all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sept. 12, 1975, Ser. No. 612,773

Int. Cl.² D06P 5/20

U.S. Cl. 8-2.5 A



1. A process for making a decorative carpet through the use of sublimable dyes comprising the steps of:

- printing sublimable dyes on a porous transfer sheet,
- preparing a carpet product which has on one side thereof carpet yarn forming the face fiber yarns with an irregular surface to form a sculptured pile
- placing the transfer sheet adjacent the back of the carpet product on the side of the carpet product opposite from the side of the carpet product having the face fiber yarns so that the transfer sheet with the sublimable dyes printed thereon will be adjacent the back of the carpet product, and
- transferring the sublimable dyes from the transfer sheet to the carpet face yarn through the application only of a directional flow, heated gaseous medium passing through the transfer sheet and the carpet product in the direction from the transfer sheet towards the back of the carpet product and out the face fiber yarn side of the carpet product.

4,007,005 HAIR SETTING COMPOSITIONS WHICH DISPLAY HIGH RESISTANCE TO HIGH HUMIDITY

Kanu I. Patel, Chatsworth, Calif., assignor to Redken Laboratories, Inc., Van Nuys, Calif.

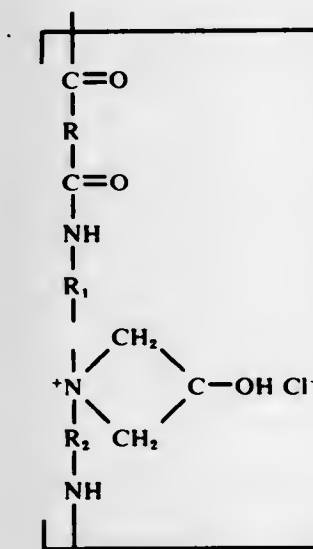
Filed June 19, 1975, Ser. No. 588,383

Int. Cl.² A61K 7/11

U.S. Cl. 8-127.51

14 Claims

1. A sprayable temporary curl setting composition comprising at least one water soluble, reactive polyamide-epichlorohydrin resin having the formula:



wherein R is an alkyl group containing from 1 to about 6 carbon atoms, R₁ and R₂ are independently alkyl groups containing at least 2 carbon atoms, and n is the number of repeating units in the water soluble molecule and at least one water soluble vinylpyrrolidone polymer dissolved in a solvent-carrier for said resin and polymer, wherein the resin and polymer concentration of said composition are independently from about 0.5 to about 8 percent by weight based on the weight of resin, polymer and solvent-carrier and wherein the weight ratio of resin to polymer is from about 1:2 to about 2:1.

4,007,004 DYESTUFF FILLER DERIVED FROM KRAFT BLACK LIQUOR

Carl W. Bailey, III, Isle of Palms, and Peter Dilling, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 485,787

Int. Cl.² C09B 67/00; C07G 1/08

U.S. Cl. 8-83

9 Claims

- A material made from the process comprising:
 - acidifying kraft black liquor to pH between 9 and 10 to form a precipitate and a filtrate,
 - separating said filtrate from said precipitate,
 - treating said filtrate with a lignin solubilizing agent to solubilize the remaining lignin,
 - stabilizing said filtrate with a member selected from the group consisting of oxidizing agents and blocking agents, and
 - evaporating water to obtain a filtrate having a solids content of 40 to 65%.
- A dyestuff composition comprising, a water-dispersible solid dyestuff, a dyestuff dispersant, and the filler material of claim 1.

4,007,006 MODIFICATION OF WOOL

Mendel Friedman, Moraga, and Nathan H. Koenig, Albany, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 4, 1975, Ser. No. 610,473

Int. Cl.² D06M 13/20

U.S. Cl. 8-128 R

6 Claims

- A process for chemically modifying wool, which comprises
 - providing a reaction system by immersing dry wool in a mixture containing a wool-modifying reagent, a reaction promoter, and an inert volatile solvent which has a boiling point of about 30° to 60° C., and
 - exposing the reaction system to an ambient temperature of about 100° to 120° C. for about 15 to 60 minutes under conditions which permit evaporation of the inert volatile solvent during the course of the reaction, wherein the wool-modifying reagent is selected from the group consisting of organic acid anhydrides, organic acid chlorides, organic isocyanates, haloketones, benzyl halides, and epoxides, and wherein the reaction promoter is selected from the group consisting of dimethylformamide, dimethyl sulfoxide, cresol, methylpyrrolidone, gamma-butyrolactone, and acetic acid.

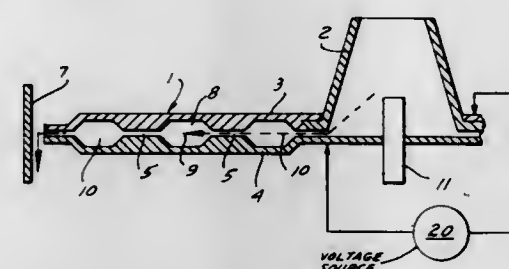
4,007,007

APPARATUS FOR DECONTAMINATING LIQUIDS OF BACTERIA

Hans Otto Ernst Gazda, Anton Krieger, 155, A 1238 Vienna, Austria

Filed Feb. 22, 1974, Ser. No. 444,803
Int. Cl.² A61L 3/00

U.S. Cl. 21-102 R



1. An apparatus for decontaminating bacteria-containing liquid comprising:
- a rotary disk formed by a pair of vertically spaced horizontal plates having juxtaposed faces formed with registering radially spaced relatively wide recesses and defining relatively narrow passages between said recesses for communicating between them, said recesses and passages being radially aligned;
 - an inlet opening into an inner one of said passages for delivering said liquid to the interior of said disk;
 - an outlet along the periphery of said disk for said liquid;
 - means for rotating said disk at a peripheral speed sufficient to centrifugally displace said liquid at high velocity between said plates, said passages being sufficiently narrow and said recesses being sufficiently wide that said high velocity causes substantial changes in acceleration of said liquid at junctions of said passages with said recesses to destroy bacteria present in the liquid; and
 - means for applying a voltage of approximately 70 volts to said plates.

4,007,008

PREPARATION OF REFERENCE SERUM FROM ANIMAL BLOOD

Milton J. Becker, 2925 W. Jerome, Chicago, Ill. 60645, and William F. Line, 829 Lathrop, River Forest, Ill. 60305
Filed July 30, 1975, Ser. No. 600,394Int. Cl.² G01N 33/16; C09K 3/00

U.S. Cl. 23-230 B

27 Claims

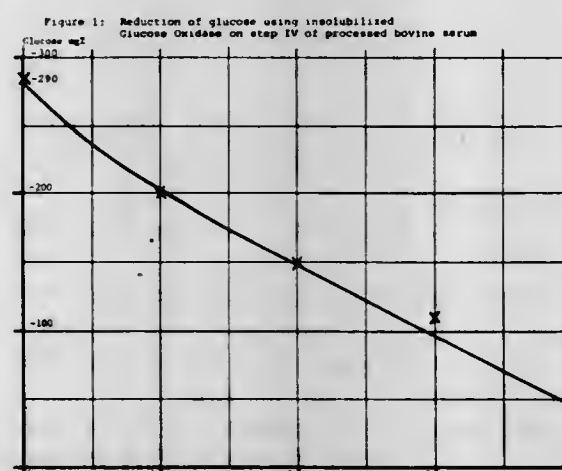


Figure 1: Reduction of glucose using uncalibrated glucose oxidase on step IV of processed bovine serum.

1. A method for reducing enzyme activities in animal serum or plasma comprising the steps of raising the pH of the serum or plasma to a level above normal serum pH by the addition with mixing of a base, and then terminating the reaction for reduction of enzyme activities by neutralizing the serum or plasma with an acidic medium.

4,007,009

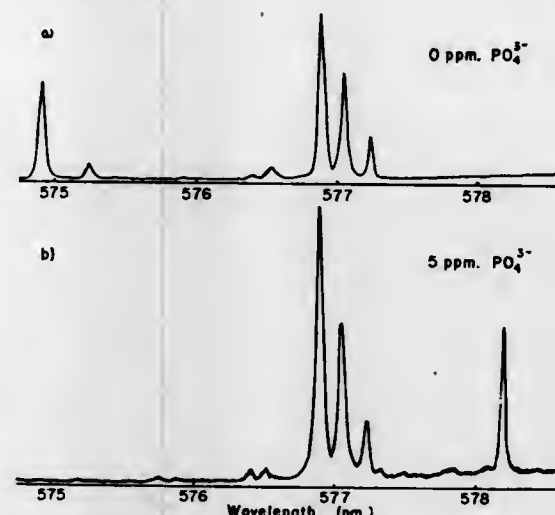
CHEMICAL ANALYSIS OF IONS INCORPORATED IN LATTICES USING COHERENT EXCITATION SOURCES

John C. Wright, Oregon, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 11, 1976, Ser. No. 657,252
Int. Cl.² G01J 1/58; G01N 33/18

U.S. Cl. 23-230 R

15 Claims



1. A method for analysis of cations and anions comprising incorporating said ions in a crystalline lattice containing ions of a probe which fluoresces upon excitation and which experiences a modification in energy level when said ions to be analyzed differ from that of the probe, exciting the probe ion with a tuneable narrow-band source of coherent light, and monitoring the fluorescence from the excited probe ion to analyze for sites in the spectrum to determine presence of the unknown cations or anions and the intensity of fluorescence thereof for determining the amount of said unknown anions or cations.

4,007,010

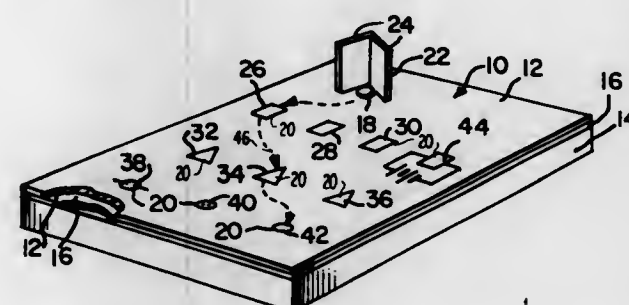
BLISTER PLANE APPARATUS FOR TESTING SAMPLES OF FLUID

Richard G. Woodbridge, III, 40 North Road, Princeton, N.J. 08540

Continuation-in-part of Ser. No. 485,548, July 3, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 672,916
Int. Cl.² G01N 27/00, 31/00, 33/00

U.S. Cl. 23-253 R

30 Claims



1. A blister processing apparatus for testing a sample of fluid, said apparatus comprising:
- a blister processing card having an upper level and a lower layer, said layers defining a two dimensional activity plane therebetween through which said sample may pass, at least one of said layers having pliable characteristics;
 - a blister forming means for introducing a blister sample into said activity plane;
 - a plurality of process station means located in said activity plane;
 - an exterior pusher means for propelling said sample through said activity plane; and

an inert liquid medium located within said activity plane, said medium being strong enough to prevent the movement of said blister sample in said activity plane solely under the influence of gravity but weak enough to allow said blister sample to pass through said activity plane under the influence of said pusher, there being sufficient medium in said plane so as to substantially exclude contaminants from said plurality of station means, wherein said sample is introduced into said activity plane by said blister forming means and then moved selectively around said two dimensional activity plane under the influence of said pusher acting through said pliable layer from outside of said apparatus thereby causing said blister sample to pass through said plurality of process station means substantially without contamination.

29. A blister processing card for testing a sample of liquid in the shape of a blister, said card comprising:
- an upper layer and a lower layer, said layer defining a two dimensional activity plane therebetween through which said sample may pass, at least one of said layers having pliable characteristics;
 - a plurality of process station means located in said activity plane; and
 - an inert liquid medium located within said activity plane, said medium being strong enough to prevent the movement of said blister sample in said activity plane solely under the influence of gravity, but weak enough to allow said blister sample to pass through said activity plane under the influence of an external force, there being sufficient medium in said plane so as to substantially exclude contaminants from said plurality of station means, wherein said sample is introduced into said activity plane and then moved from outside of said card selectively around said two dimensional activity plane thereby causing said blister sample to pass through said plurality of process station means located in said activity plane substantially without contamination.

4,007,011

SPECIMEN TREATMENT APPARATUS

Geoffrey Stuart Greaves, and Roger Abraham Bunce, both of Birmingham, England, assignors to The Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

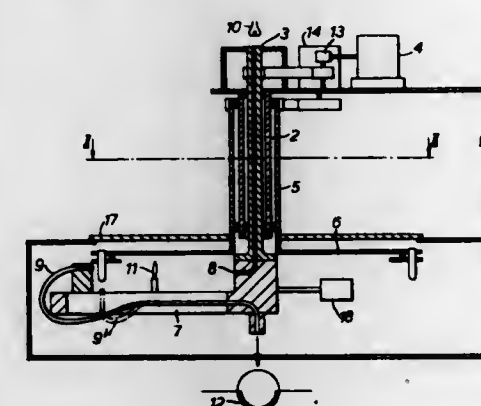
Filed Apr. 29, 1975, Ser. No. 572,716

Claims priority, application United Kingdom, May 8, 1974, 20389/74

Int. Cl.² B01F 11/00; G01N 21/00

U.S. Cl. 23-259

10 Claims



1. Specimen agitation apparatus comprising a substantially horizontal turntable having a relatively high moment of inertia and mounted to rotate about an upright central axis and formed to carry in fixed relation thereto in use, at respective positions substantially equally spaced from the said central axis and distributed substantially uniformly about the said central axis, a plurality of vessels for receiving liquid specimens to be agitated, and stepping drive means connected by

means of a belt to the turntable to bring about stepwise rotation thereof about the said central axis, the stepping drive means being arranged to apply driving impulses to the turntable to bring about rotation thereof, and the stepping drive means and the turntable being so arranged that when the turntable is in a first rotational position about the said central axis and a driving impulse is applied to the turntable by the stepping drive means the turntable rotates to a second rotational position about the said central axis whereby the inertia of said turntable and the belt cause said turntable, before coming to rest at the second rotational position, to oscillate about the said central axis and thereby agitate specimens in vessels carried by the turntable.

4,007,012

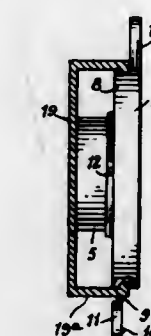
FECAL EXAMINATION DEVICE

Robert J. Greenwald, 4771 N. Federal Highway, Pompano Beach, Fla. 33064

Continuation of Ser. No. 455,017, March 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 150,357, June 7, 1971, abandoned, and Ser. No. 255,857, May 22, 1972, Pat. No. 3,819,045, which is a continuation-in-part of Ser. No. 150,357, June 7, 1971, abandoned. This application Aug. 4, 1975, Ser. No. 601,723
Int. Cl.² B01L 3/00

U.S. Cl. 23-259

7 Claims



1. A fecal sample container for collecting and transporting a sample of feces and for serving as a base, for an open-ended tube subsequently fitted thereto, during the analysis of said sample by a method in which the sample of feces is mixed with flotation liquid in a receptacle formed by said tube and said base and ova in said sample are caused to rise upward through said liquid in said receptacle, said container consisting of two unitary bodies, both of molded plastic, one of which is a unitary cup body including an empty open-top cup adapted to receive and transport the sample of feces to be examined, said cup being adapted to be slid into and received in an open lower end of said tube to form said receptacle by closing the lower end of said tube with a liquid-tight press fit with the outer walls of said cup in close contact with the inner walls of said tube, said cup having an interior volume of about one half to 5 cc for receiving and retaining a corresponding volume of feces and a width of about 1 to 2 cm and said cup having an integral extension in the form of a flat-bottomed tray having an upstanding outer rim, said tray being constructed and arranged to serve as a supporting base for said tube when the latter is fitted to said cup and said rim being constructed and arranged to retain liquid overflowing from said tube, the top of said rim being below the top of said cup, the other of said unitary bodies being a closure cap for fitment over the open top of the cup, said closure cap engaging and spanning said spaced portions and extending over the top of said cup to confine fecal matter therein during the transport of said sample prior to the fitting of said receptacle on said cup, said closure cap having a downwardly extending circumferential wall surrounding said rim and having means for engaging said rim with a snap fit to hold said cap on said body with said cap fitting over the entire top of said tray, closing said cup and covering the space between said well and said rim, said cup body having an extension outwardly of said rim serving as a finger piece for use in separating said cup body and said clo-

sure cap prior to the fitting of said receptacle on said cup, one of said unitary bodies having integral therewith a feces sample-collecting paddle whose width is at least one fifth of, but less than, the inner diameter of said cup, said paddle being connected to said cup or closure cap by a narrower readily frangible zone and thereby being easily removed for use in collecting said sample.

4,007,013

HOLDER DEVICE FOR SAMPLE VIALS OR THE LIKE FOR AN ANALYSIS APPARATUS

Karl Kotacka, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed July 9, 1976, Ser. No. 703,844

Claims priority, application Switzerland, Sept. 22, 1975, 12276/75

Int. Cl.² G01N 33/16; B01L 9/06

U.S. Cl. 23—259

7 Claims



1. A holder device for sample vials for an analysis apparatus, especially a blood cell counter, equipped with a suction tube which can be immersed in a sample vial filled with a liquid sample for removing the sample therefrom, comprising a holder body having means defining a recess for receiving and holding a sample vial, said means defining said recess comprising a rear wall extending approximately parallel to the central axis of the recess and two side walls extending from a lower edge to an upper edge of the holder body, said two side walls upwardly tapering with regard to the rear wall from the lower edge to the upper edge, and a standing surface for the sample vial arranged transversely with respect to the rear wall.

4,007,014

ACTIVATED CARBON REVIVIFICATION EQUIPMENT

Zenji Matsumoto, Osaka; Kiyoshi Adachi; Toyohisa Fujimoto, both of Shizuoka, and Nobutaka Ninomiya, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 432,312, Jan. 10, 1974, abandoned.

This application Nov. 21, 1975, Ser. No. 634,442

Claims priority, application Japan, Jan. 16, 1973, 48-7484

Int. Cl.² B01J 8/12, 21/18; C10B 47/20

U.S. Cl. 23—277 R

4 Claims

1. An apparatus for revivification of activated carbon by direct and indirect heating comprising:

- a first cylindrical compartment having a vertical central axis;
- at least one heating means directed into said first compartment for heating said first compartment;
- a first reactor gas supply means directed into said first compartment for supplying reactor gas thereto during direct revivification of the activated carbon, said first reactor gas supply means stopping the supplying of reactor gas during indirect revivification of the activated carbon;
- a first gas exhaust means connected to said first compartment means for removing exhaust reactor gases and vapors therefrom;
- a first damper means provided into said first gas exhaust

means for closing said first gas exhaust means during direct revivification of the activated carbon and opening said first gas exhaust means during indirect revivification of the activated carbon;

a second cylindrical compartment concentrically within and extending through said first compartment;

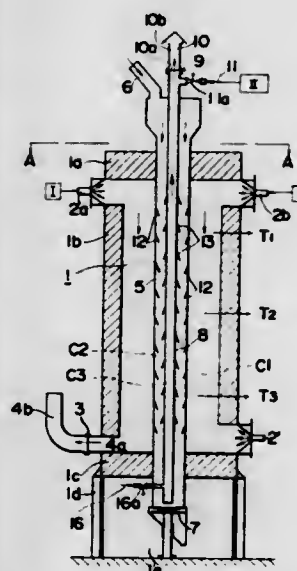
activated carbon supply means for supplying activated carbon to be revivified connected to the top of said second compartment;

carbon removal means at the bottom of said second compartment for removing the revivified activated carbon therefrom;

a third cylindrical compartment concentrically within said second compartment;

guide means within said second compartment for guiding said activated carbon being revivified through said second compartment, said guide means comprised of a plurality of baffles staggered with respect to each other on the inside wall of said second compartment and the outside wall of said third compartment downwardly inclined at an angle to the central axis sufficient to prevent the activated carbon supplied to the second compartment from being retained thereby as it collides with said baffles while falling through said second compartment and positioned so that the carbon is directed essentially vertically through the second compartment;

a second reactor gas supply means operatively connected to



said third compartment for supplying reactor gas to said third compartment during indirect revivification of said activated carbon, said second reactor gas supply means stopping the supplying of reactor gas during direct revivification of the activated carbon;

a second gas exhaust means connected to said third compartment for removing exhaust reactor gases and vapors therefrom;

a second damper means within said second gas exhaust means for closing said second gas exhaust means during indirect revivification of the activated carbon and opening said second gas exhaust means during direct revivification of the activated carbon;

a first gas communication means through the wall of said second compartment for communicating gas and vapor between said first compartment and said second compartment, said first gas communication means being comprised of a plurality of ducts through said second compartment wall;

a second gas communication means within the wall of said third compartment for communicating gas and vapor between said third compartment and said second compartment, said second gas communication means being comprised of a plurality of ducts through said third compartment wall, whereby during direct revivification of said activated carbon, reactor gas from said first reactor gas supply means enters said first compartment, flows

through said first gas communication means to said second compartment, wherein said reactor gas reacts with the activated carbon, and flows through said second gas communication means to said third compartment where it is removed therefrom through said second gas exhaust means, and whereby during said indirect revivification process said reactor gas from said second reactor gas supply means enters said third compartment, flows through said second gas communication means to said second compartment where it reacts with said activated carbon, and then flows through said first gas communication means to said first compartment where it is removed therefrom through said first gas exhaust means.

4,007,015

APPARATUS USEFUL FOR THE PRODUCTION OF HYDROGEN

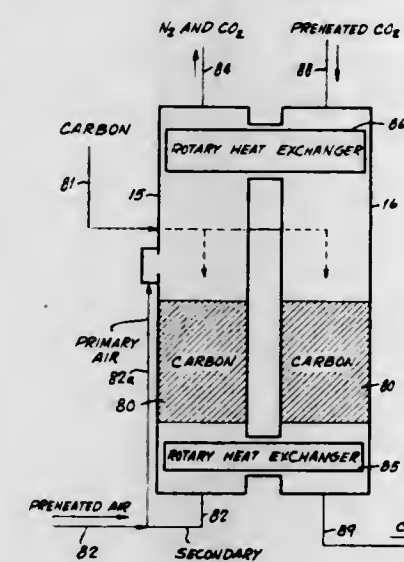
Everett M. Barber, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 532,338, Dec. 13, 1974. This application Dec. 17, 1975, Ser. No. 641,854

Int. Cl.² B01J 7/00; C01B 1/02, 31/18

U.S. Cl. 23—281

1 Claim



1. A combination reactor useful for the combustion of carbon with air to produce a combustion gas effluent containing carbon dioxide and nitrogen and useful for reacting carbon dioxide with carbon to produce carbon monoxide comprising in a unitary structure, first and second zones, said first zone being adapted to contain a first bed of particle-form carbonaceous material, first air supply means associated with said first zone for the introduction of air into the lower portion thereof, second air supply means for the introduction of air into said first zone into the upper portion thereof, first means for supplying particle-form carbonaceous material into said first zone into the upper portion thereof to form said first bed of carbonaceous material therein, combustion gas effluent conduit means associated with the upper portion of said first zone for the withdrawal of combustion gas effluent therefrom, said second zone being adapted to contain a second bed of particle-form carbonaceous material therein, carbon dioxide supply means associated with said second zone for the introduction of gaseous carbon dioxide into the upper portion thereof, second means for supplying particle-form carbonaceous material into said second zone into the upper portion thereof to form said second bed of carbonaceous material therein, carbon monoxide-containing reaction gas effluent conduit means associated with the lower portion of said second zone for the withdrawal of carbon monoxide-containing gaseous effluent from said second zone, first and second rotatable heat exchangers associated with said first and second zones, said first rotatable heat exchanger being located in the upper portion of each of said first and second zones for movement therein above said beds of particle-form carbonaceous material

therein and above said first and second means for supplying particle-form carbonaceous material to said first and second zones, respectively, and said second rotatable heat exchanger being located in the lower portion of each of said first and second zones for movement therein below said beds of particle-form carbonaceous material therein and above said first air supplying means associated with said first zone for the introduction of air into the lower portion thereof and above said reaction gas effluent conduit means associated with said second zone for the withdrawal of carbon monoxide-containing gaseous effluent therefrom.

4,007,016

CONTINUOUS-FLOW REACTOR FOR HIGH VISCOSITY MATERIALS

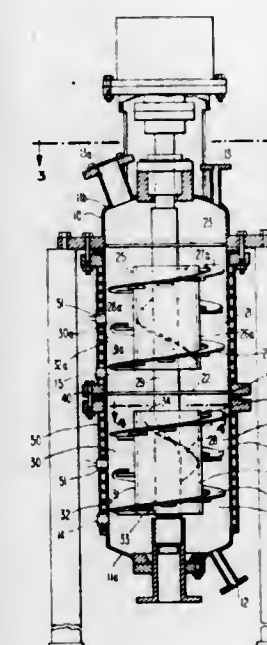
Arthur P. Weber, New York, N.Y., assignor to The Bethlehem Corporation, Bethlehem, Pa.

Filed Mar. 6, 1975, Ser. No. 555,807

Int. Cl.² B01F 7/16, 7/24; B01J 3/04

U.S. Cl. 23—285

4 Claims



1. A reactor for continuous processing of high viscosity materials comprising:

- an elongated hollow vessel having a longitudinal axis, longitudinal side wall means, transverse end wall means, an inlet at one end, an outlet at the opposite end for the introduction and discharge of the process material under pressure, and a rotary drive shaft extending through said vessel along said longitudinal axis;
- a plurality of flat imperforate transverse barrier plates within said vessel and forming, in conjunction with the vessel wall means, at least two reaction stages, the first stage disposed adjacent said inlet and a second stage adjacent the outlet, one of said barrier plates having clearance between its outer periphery and the longitudinal vessel side wall to constitute an end orifice providing a restricted passage for uniform egression of a first portion of the material from the first stage in a direction away from said inlet and into said second stage at a predetermined fixed rate, another of said barrier plates having clearance between its outer periphery and the longitudinal vessel side wall to constitute an end orifice providing a restricted passage adjacent to said outlet for the uniform egression of a predetermined portion of the process material from the second stage in a direction away from said inlet and towards said outlet;
- mixing means mounted within each reaction stage on said elongated drive shaft, said shaft driving said mixing means at a given speed for homogeneously agitating and recirculating a second portion of the process material which

remains in each stage after egression of said first portion from said stage, said mixing means comprising:

- a longitudinal draft tube mounted concentrically on said shaft, said draft tube being spaced from the wall means forming said stage and defining a continuous recirculating flow path for process material within the stage, said path including an advancing annular passage between said tube and the longitudinal side wall means of the vessel and a return annular passage within said tube;
- a helical screw having a pitch in one direction with its axis longitudinal mounted concentrically on said drive shaft and extending between the drive shaft and the draft tube; and
- helical agitator means having a pitch opposite to that of the helical screw mounted with its axis longitudinal and mounted concentrically on said drive shaft in the space between the draft tube and vessel longitudinal side wall means,

whereby in each stage upon driving said drive shaft, said agitator advances the first and second portions of the process material in said advancing passage of said path exteriorly of the tube and said helical screw returns said second portion of the process material in said return passage of said path interiorly of the tube,

the width of said shaft tube, the pitch of said helical screw, the speed of said drive shaft, the size of the orifice and the viscosity and pressure of the material introduced through said inlet cooperating to control the flow in said path and determine the ratio between said first and second portions of said material and thereby the residence time of the material in each stage of said reactor.

4,007,017

PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS
William L. Slater; George N. Richter; William B. Crouch, and Lawrence E. Estabrook, all of c/o Texaco Inc. P.O. Box 400, Montebello, Calif. 90640

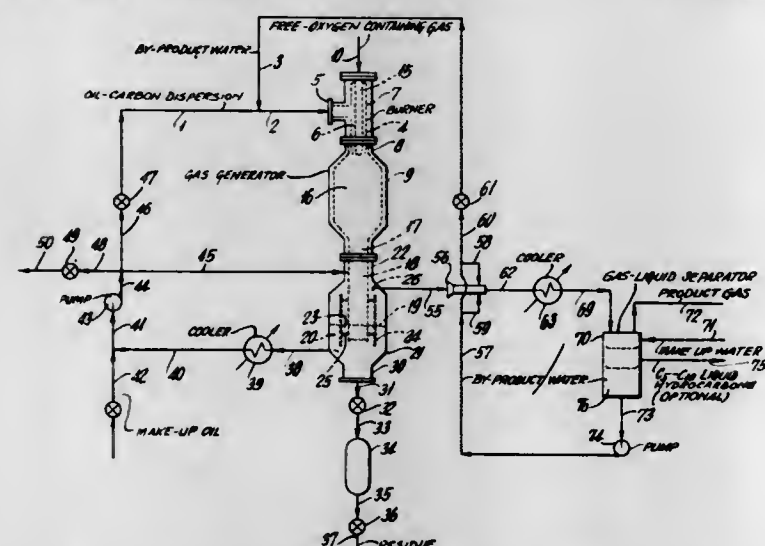
Filed Dec. 22, 1975, Ser. No. 643,069

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.² C10J 3/00; C10K 1/08

U.S. Cl. 48—197 R

11 Claims



1. A continuous process for producing clean gaseous mixtures comprising H₂, CO, CO₂, H₂O, and optionally at least one gas from the group H₂S, COS, N₂, A, and C₁-C₄ hydrocarbons, while simultaneously disposing of by-product water produced by the process comprising:

1. reacting in the reaction zone of a free-flow, unpacked gas generator as feed a dispersion of particulate carbon and liquid hydrocarbonaceous fuel, a stream of free-oxygen-containing gas selected from the group consisting of air, oxygen-enriched air i.e. at least 22 mole % oxygen, and substantially pure oxygen i.e. at least 95 mole % oxygen, wherein the ratio of free-oxygen in the free-oxygen containing gas to carbon in the feedstock (O/C atom/atom) is

in the range of about 0.6 to 1.5; and a temperature moderator comprising at least a portion of the by-product water produced subsequently in step (3) (a), by partial oxidation at a temperature in the range of about 1300° to 3000° F and a pressure in the range of about 1 to 250 atmospheres thereby producing an effluent gas stream containing H₂, CO, CO₂, H₂O, particulate carbon, and optionally at least one gas from the group H₂S, COS, N₂, A, and CH₄;

2. cooling the effluent gas stream from (1) to a temperature in the range of about 300° to 900° F but above the dew point of the water in the gas and simultaneously removing said particulate carbon by discharging said effluent gas stream directly into a body of hot immersion fluid contained in a quench zone and comprising a dispersion of liquid hydrocarbonaceous fuel and particulate carbon, wherein said quench zone contains 30 to 60 gallons of immersion fluid maintained at a temperature in the range of about 300° to 850° F for each 1000 Standard Cubic Feet of effluent gas from the gas generator that is quenched therein, and removing from said quench zone a clean gaseous stream comprising H₂, CO, CO₂, H₂O, particulate carbon and optionally at least one material from the group H₂S, COS, N₂, A, and C₁-C₁₀ hydrocarbons;

3. contacting the process gas stream leaving the quench zone in (2) in a gas-liquid contacting zone with a portion of by-product water and optionally cooling the gas stream in a cooling zone to condense out any entrained normally liquid C₃-C₁₀ hydrocarbons and water, and separating the following streams in a gas-liquid separation zone: (a) by-product water, (b) any light liquid C₃-C₁₀ hydrocarbons, and (c) clean product gas comprising H₂, CO, CO₂, and optionally at least one material from the group H₂S, COS, N₂, A, and C₁-C₄ hydrocarbons;

4. recycling separate portions of the by-product water (3) (a) optionally in admixture with make-up water, to the reaction zone of the gas generator in (1) and to the gas-liquid contacting zone in (3);

5. cooling at least a portion of the hot immersion fluid from (2) to a temperature in the range of about 300° to 850° F in an external cooler, recycling at least a portion of said cooled immersion fluid to said quench zone; and

6. introducing a portion of said hot immersion fluid from (2) or a portion of said cooled immersion fluid from (5) into the reaction zone in (1) as at least a portion of said dispersion of particulate carbon in liquid hydrocarbonaceous fuel.

4,007,018

PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS
William L. Slater, La Habra; George N. Richter, San Marino; William B. Crouch, Whittier, and Lawrence E. Estabrook, Long Beach, all of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,458

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.² C10J 3/00; C10K 1/08

U.S. Cl. 48—197 R

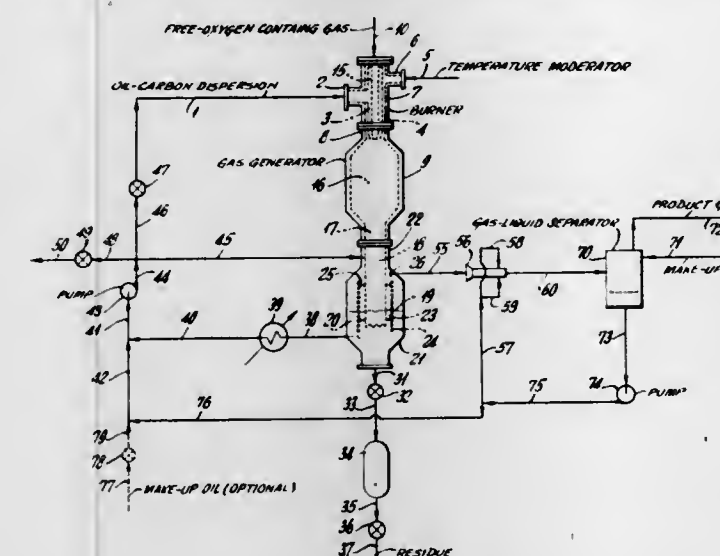
13 Claims

1. A continuous process for producing clean synthesis or fuel gas comprising:

1. Introducing into the reaction zone of a free-flow, unpacked gas generation zone as feed materials a dispersion of particulate carbon in liquid hydrocarbonaceous fuel, a stream of free-oxygen-containing gas selected from the group consisting of air, oxygen-enriched air i.e. at least 22 mole % oxygen, and substantially pure oxygen i.e. at least 95 mole % oxygen, wherein the ratio of free-oxygen in the free-oxygen containing gas to carbon in the feedstock (O/C atom/atom) is in the range of about 0.6 to 1.5, and optionally a temperature moderator selected from the group consisting of H₂O, CO₂, flue gas, a portion of

cooled and recycled effluent gas from the gas generator, and mixtures thereof, and reacting said feed materials by partial oxidation at a temperature in the range of about 1300° to 3000° F and a pressure in the range of about 1 to 250 atmospheres, thereby producing an effluent gas stream containing H₂, CO, CO₂, H₂O, particulate carbon, and optionally at least one gas from the group H₂S, COS, N₂, A and CH₄;

2. cooling the effluent gas stream from (1) to a temperature in the range of about 300° to 900° F but above the dew point of water in said gas stream and simultaneously removing said entrained particulate carbon by discharging said effluent gas stream directly into a body of hot immersion fluid contained in a quench zone and compris-



ing a dispersion of liquid hydrocarbonaceous fuel and particulate carbon, and removing from said quench zone a clean gaseous stream comprising H₂, CO, CO₂, H₂O and optionally at least one material from the group particulate carbon, H₂S, COS, N₂, A, and C₁-C₁₀ hydrocarbons;

3. cooling at least a portion of the hot immersion fluid from (2) to a temperature in the range of about 300° to 850° F in an external cooler and recycling at least a portion of the cooled immersion fluid to said quench zone; and (4) introducing a portion of said hot immersion fluid from (2) or a portion of said cooled immersion fluid from (3) into said gas generation zone in (1) as at least a portion of said dispersion of particulate carbon in liquid hydrocarbonaceous fuel.

4,007,019

PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS
William L. Slater, La Habra; George N. Richter, San Marino; William B. Crouch, Whittier, and Lawrence E. Estabrook, Long Beach, all of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,561

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.² C10J 3/00; C10K 1/08

U.S. Cl. 48—197 R

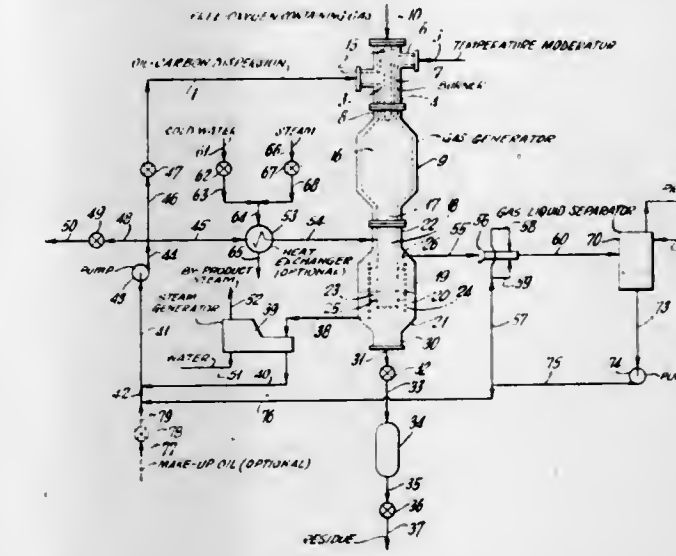
14 Claims

1. A continuous process for producing clean synthesis or fuel gas comprising:

1. introducing into the reaction zone of a free-flow, unpacked gas generation zone as feed materials a dispersion of particulate carbon in liquid hydrocarbonaceous fuel, a stream of free-oxygen-containing gas selected from the group consisting of air, oxygen-enriched air, i.e. at least 22 mole % oxygen, and substantially pure oxygen, i.e. at least 95 mole % oxygen, wherein the ratio of free-oxygen in the free-oxygen-containing gas to carbon in the feedstock (O/C atom/atom) is in the range of about 0.6 to 1.5, and optionally a temperature moderator selected from the group consisting of H₂O, CO₂, flue gas, a portion of cooled and recycled effluent gas from the gas generator,

and mixtures thereof, and reacting said feed materials by partial oxidation at a temperature in the range of about 1300° to 3000° F. and a pressure in the range of about 1 to 250 atmospheres, thereby producing an effluent gas stream containing H₂, CO, CO₂, H₂O, particulate carbon, and optionally at least one gas from the group H₂S, COS, N₂, A and CH₄;

2. cooling the effluent gas stream from (1) to a temperature in the range of about 300° to 900° F. but above the dew point of water in said gas stream and simultaneously removing said entrained particulate carbon by discharging said effluent gas stream directly into a body of hot immersion fluid contained in a quench zone and comprising a dispersion liquid hydrocarbonaceous fuel and par-



ticulate carbon, and removing from said quench zone a clean gaseous stream comprising H₂, CO, CO₂, H₂O and optionally at least one material from the group particulate carbon, H₂S, COS, N₂, A, and C₁-C₁₀ hydrocarbons;

3. cooling at least a portion of the hot immersion fluid from (2) to a temperature in the range of about 300° to 850° F. by indirect heat exchange with water in an external heat exchange zone thereby producing by-product steam and cooled immersion fluid, and recycling at least a portion of said cooled immersion fluid to said quench zone; and

4. introducing a portion of said hot immersion fluid from (2) or a portion of said cooled immersion fluid from (3) into said gas generation zone in (1) as at least a portion of said dispersion of particulate carbon in liquid hydrocarbonaceous fuel.

4,007,020

REFRACTORY ABRASIVE BODY CONTAINING CHROMIUM OXIDE AND METHOD OF PRODUCING IT
Peter K. Church, Cascade, and Oliver J. Knutson, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Continuation of Ser. No. 7,949, Feb. 2, 1970, abandoned, which is a division of Ser. No. 694,303, Dec. 28, 1967, Pat. No. 3,789,096. This application Nov. 19, 1973, Ser. No. 417,241

Int. Cl.² B24D 3/16, 3/18

U.S. Cl. 51—295

45 Claims



40. A chemically hardened abrasive body comprising:

a closely packed porous mass of a substantial amount of abrasive grain and finely divided discrete particles at least the surface of which consists of a refractory oxide of at least one metallic element having a vitrification temperature in excess of 600° F. essentially devoid of vitreous and/or sinter bonding between the particles with said particles being bonded together by chromic oxide at temperatures below vitrification temperature of the refractory oxide and grain and having substantial deposits of chromic oxide within the pores thereof.

4,007,021

METHOD OF AND DEVICE FOR DRYING COMPRESSED GASES, ESPECIALLY COMPRESSED AIR FOR BRAKE SYSTEMS IN MOTOR VEHICLES

Lars Anders Gustaf Gyllinder, Norrahammar, Sweden, assignor to Svenska Luftkompressor AB, Norrahammar, Sweden

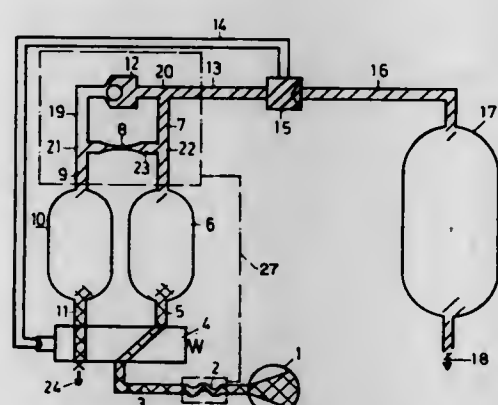
Filed May 8, 1975, Ser. No. 575,499

Claims priority, application United Kingdom, May 14, 1974, 21169/74

Int. Cl.² B01D 53/04

U.S. Cl. 55-33

5 Claims



1. A method of drying compressed gases in a treatment system having two treatment chambers, an inlet supply for moist compressed gas and an outlet valve for useful dried compressed gas, each of said treatment chambers having a regeneratable drying medium therein, comprising passing all of the gas from the inlet supply through one of said treatment chambers to dry the gas, diverting a minor part of the dried gas from said one chamber through the other chamber to regenerate the drying medium therein and exhausting the spent gas from said other chamber, thereafter interrupting the discharge of the dried gas through the outlet valve and during said interruption supplying moist compressed gas through said inlet supply, disconnecting the said one chamber from the inlet supply, connecting said other chamber to the inlet supply to dry the gas, diverting all of the dried gas from said other chamber through said one chamber to obtain maximum regeneration of the drying medium therein and exhausting the spent gas, and thereafter reconnecting the inlet supply to said one drying chamber when discharge of useful dried gas from said one chamber through the outlet valve is resumed.

4,007,022 PROCESS FOR THE REMOVAL OF GASEOUS MONOMERS FROM POLYVINYL CHLORIDE-WATER DISPERSIONS

Rudolf Schleicher, Hamm, Marl; Juergen Walther; Karl-Heinz Schoenberg, both of Marl, and Peter Rauth, Bochum, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

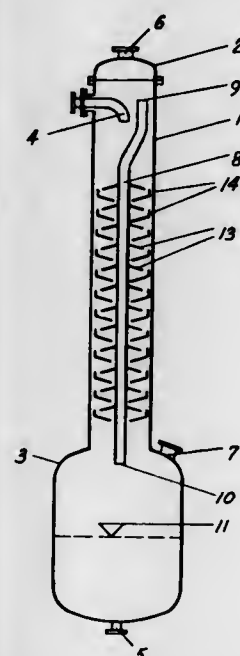
Filed Aug. 28, 1975, Ser. No. 608,699

Claims priority, application Germany, Aug. 29, 1974, 2441304

Int. Cl.² B01D 19/00

U.S. Cl. 55-41

4 Claims



1. A process for lowering the gaseous monomer content of solid-liquid dispersions obtained during the manufacture of polyvinyl chloride according to the suspension or emulsion method, comprising the steps of: flowing the dispersion over a succession of inclined surfaces forming an angle of about 45° to 80° with the vertical at temperatures of about 30°-90° C in a layer thickness of about 0.5 - 5 mm during a period of about 2-20 seconds; collecting the remaining dispersion and the gaseous phase of the monomers liberated by the flowing step; and removing the thus-liberated gaseous monomer directly from the interface between the dispersion and the gaseous phase of the monomers.

4,007,023 ELECTROSTATIC PRECIPITATOR WITH COLLECTOR-ELECTRODE SPACERS

Willi Bätz; Günter Baler, both of Offenbach, and Hermann Schmidt, Bergen-Enkheim, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 11, 1975, Ser. No. 595,082

Claims priority, application Germany, July 12, 1974, 2433596

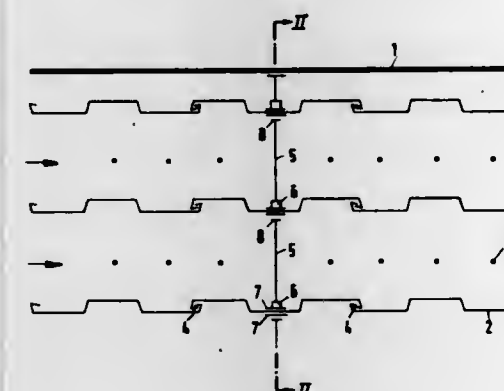
Int. Cl.² B03C 3/76

U.S. Cl. 55-112

6 Claims

1. A dust-collection electrostatic precipitator comprising: a housing; a plurality of upright parallel collecting electrodes in transversely spaced relationship within said housing and defining gas channels between them, each of said collecting electrodes being formed with a common carrier at the top thereof, a rapping member along the bottom of the collecting electrode, and a multiplicity of collecting-electrode strips secured at their tops to said carrier and at their bottoms to said member, said strips having adjacent lateral edges loosely hooked one into another, the end strips of each collecting electrode being engaged by pro-

filed supporting members extending over the entire height of the collecting-electrode strips; arrays of discharge electrodes between said collecting electrodes; spacers interposed between the individual collecting-electrode strips of said collecting-electrodes, each of said spacers projecting from a strip of one collecting electrode toward an opposing strip of another collecting electrode



across the channel between them but terminating short of said other strip to define a gap therewith, said spacers lying in horizontal rows spanning said housing between opposing walls thereof; a source of electric potential connected across said discharge and collecting electrodes; and mounting means on each collecting-electrode strip pivotally securing the respective spacer thereto whereby said spacers can be swung up against the respective electrode strip.

4,007,024

PORTABLE ELECTROSTATIC AIR CLEANER

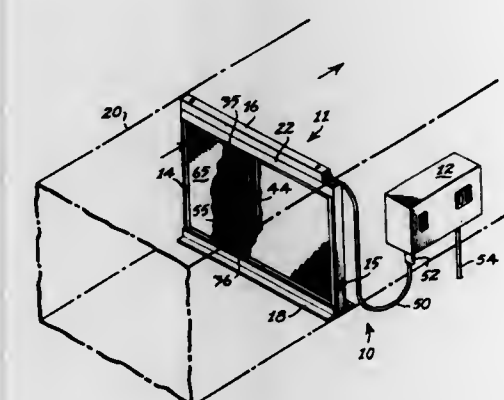
John P. Sallee; Bill W. Speight, and Bruce H. McLain, all of Nashville, Tenn., assignors to Air Control Industries, Inc., Nashville, Tenn.

Filed June 9, 1975, Ser. No. 584,958

Int. Cl.² B03C 3/01

U.S. Cl. 55-126

5 Claims



1. A portable electrostatic air cleaning device comprising: a frame having longitudinal, widthwise, and depthwise dimensions, an upstream end and a downstream end spaced depthwise from each other, said depthwise dimension being substantially less than said other dimensions so that said frame may be mounted in an air conduit transversely of the air flow; a plurality of elongated ionizer wire electrodes; means mounting said ionizer wire electrodes longitudinally within said frame and spaced apart in a plane widthwise of said frame between said upstream and downstream ends; a plurality of narrow, elongated collector plates; plate mounting means supporting said collector plates longitudinally within said frame between said upstream and downstream ends, each of said plates being spaced

widthwise of said frame and intercepting the plane of said ionizer wire electrodes; f. each of said ionizer wire electrodes being spaced substantially midway between a pair of said collector plates; g. said plate mounting means supporting said collector plates substantially parallel to each other and at acute angles to said depthwise dimension, to lengthen the air flow paths through said frame from said upstream end to said downstream end; h. a pre-filter screen mounted in said upstream end of said frame substantially normal to said depthwise dimension, said pre-filter screen being made at least partially from electrical conductive material; i. an after-filter screen mounted in said downstream end of said frame and substantially normal to said depthwise dimension, said after-filter screen being made at least partially from electrical conductive material; j. means for applying an electrical charge of one potential upon said ionizer electrodes and another electrical charge of a substantially different potential upon said collector plates and the electrical conductive material of said pre-filter screen and said after-filter screen, to establish a strong electrostatic field around each of said ionizer wire electrodes.

4,007,025

APPARATUS FOR CLEANING STACK GAS AND USING SAME FOR GENERATION OF ELECTRIC POWER

Karl-Rudolf Hegemann, Essen-Bergerhausen, Germany, assignor to Gottfried Bischoff Bau Kompl., Essen, Germany

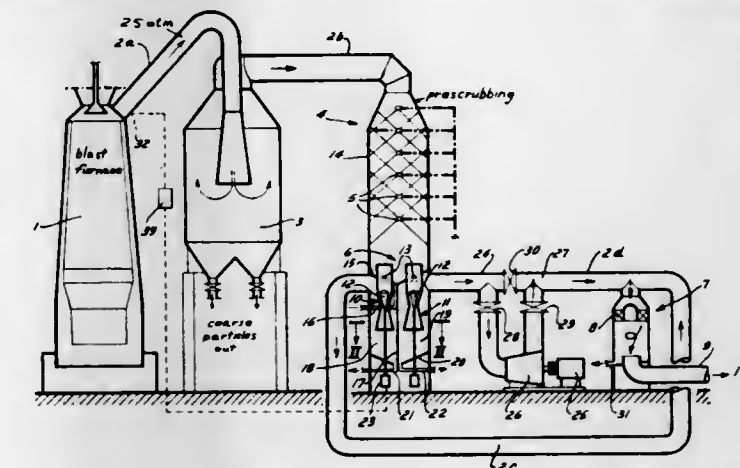
Filed Nov. 4, 1974, Ser. No. 520,920

Claims priority, application Germany, Nov. 6, 1973, 2355457; Aug. 20, 1974, 2439757; Aug. 20, 1974, 2439758

Int. Cl.² B01D 47/10

U.S. Cl. 55-213

5 Claims



1. An apparatus for cleaning stack gas from a blast furnace, said apparatus comprising: a first conduit having an input end connected to said blast furnace for collecting therefrom stack gas under pressure; particle separating means having an inlet connected to said first conduit for removing particles from said gas, said particle separating means having an outlet for the gas from which particles have been removed; a second conduit connected to said outlet; means connected to said second conduit downstream of said means for removing particles for scrubbing said gas, said scrubbing means having an outlet; a variable Venturi washer having an inlet communicating with said outlet of said scrubbing means and an outlet opening downstream of said inlet of said washer for reducing the pressure of and for scrubbing said gas; at least one other Venturi washer having an inlet communicating with said outlet of said scrubbing means and an outlet for reducing the pressure of and for scrubbing said gas; an expansion turbine having an input side connected to the outlet of said at least one other Venturi washer and an output side for discharging expanded gas; a generator operatively connected to said turbine; and

R₂ represents hydrogen or C₁-C₆-alkyl,
R₃ represents hydrogen or C₁-C₆-alkyl,
R₄ represents C₁-C₆-alkyl, C₃-C₆-cycloalkyl, C₂-C₆-alkoxy-
alkyl, C₂-C₆-cyanoalkyl or C₁-C₆-halogenoalkyl,
R₅ represents methoxy, ethoxy, methylthio, ethylthio or
azido (N₃), and
Y and Z each independently represent sulphur or oxygen.

4,007,033

HERBICIDAL SUBSTITUTED-HALOETHYL UREA
Makolm Scott Slinger, Richmond, Calif., assignor to Chevron
Research Company, San Francisco, Calif.

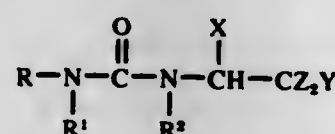
Division of Ser. No. 389,093, Aug. 17, 1973, Pat. No.
3,903,154, which is a continuation-in-part of Ser. No. 385,521,
Aug. 3, 1973, abandoned, which is a continuation-in-part of
Ser. Nos. 124,422, March 16, 1971, abandoned, and Ser. No.
124,423, March 16, 1971, abandoned. This application May
29, 1975, Ser. No. 581,985

Int. Cl.² A01N 9/20; C07C 127/19

U.S. Cl. 71-111

1. A compound of the formula

10 Claims



wherein R is phenyl substituted with up to 2 fluorine, chlorine,
bromine, trifluoromethyl, nitro, lower alkyl, or lower alkoxy;
R¹ is hydrogen or alkyl of 1 to 4 carbon atoms, R² is alkyl of
1 to 4 carbon atoms; Z is chlorine or bromine, Y is hydrogen
or Z, and X is carbalkoxyalkoxy of 2 to 6 carbon atoms.

6. A method for the control of undesirable vegetation which
comprises applying thereto pre-emergently or post-emer-
gently a herbicidally effective amount of the compound de-
fined in claim 1.

4,007,034

METHOD FOR MAKING STEEL

Jürgen Hartwig, Essen; Dieter Neuschütz, Langenfeld, and
Dietrich Radke, Essen, all of Germany, assignors to Fried.
Krupp Gesellschaft mit beschränkter Haftung, Essen, Ger-
many

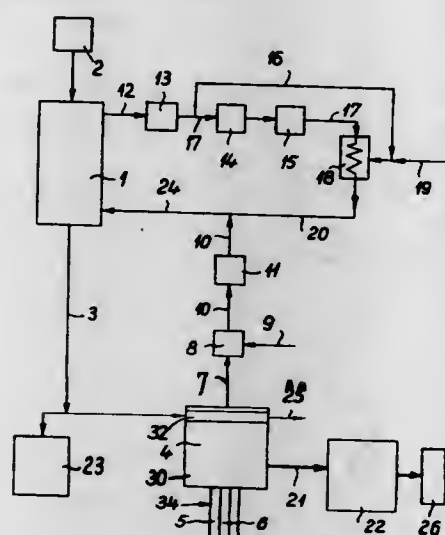
Filed May 21, 1975, Ser. No. 579,738

Claims priority, application Germany, May 22, 1974,
2424932

Int. Cl.² C21C 5/00

U.S. Cl. 75-46

14 Claims



1. A process for producing steel from iron oxide-containing
raw materials which comprises the steps of:

a. initially converting the raw materials, in a reduction
furnace by direct reduction with a reducing gas, to a
substantially metallized sponge iron;

- b. separating the sponge iron formed in the reduction fur-
nace from exhaust reduction gas which forms during the
reduction in the reduction furnace and transporting the
separated sponge iron into a metal melt of iron in a melt-
ing vessel;
- c. melting and finally reducing the sponge iron in the metal
melt with carbonaceous material which is introduced into
the metal melt and with oxygen introduced into the metal
melt via an oxygen-containing gas, with heat and strongly-
heated carbon monoxide-containing exhaust gas being
formed in the melting vessel due to the reaction of the
oxygen with the carbonaceous material, said carbona-
ceous material and oxygen-containing gas being intro-
duced into the metal melt below the surface of the metal
melt in immediate proximity to each other;
- d. reacting the entire strongly-heated carbon monoxide-
containing exhaust gas from the melting vessel in a reac-
tor by adding to said exhaust gas from the melting vessel
(1) carbonaceous material and (2) water vapor and/or
carbon dioxide to form a first reducing gas stream;
- e. introducing the first reducing gas stream into the reduc-
tion furnace as reducing gas for the direct reduction of
the iron oxide-containing raw materials;
- f. conducting a portion of the exhaust gas formed in the
direct reduction furnace through a gas processing system
to form a second reducing gas stream; and
- g. introducing the second reducing gas stream into the
reduction furnace as reducing gas for the direct reduction
of the iron oxide-containing raw materials.

4,007,035

**METHOD OF USING AN EXPENDABLE TAP HOLE
TUYERE IN OPEN HEARTH DECARBURIZATION**

Robert W. Smith, Lower Makefield Township, Bucks County,
Pa., assignor to United States Steel Corporation, Pittsburgh,
Pa.

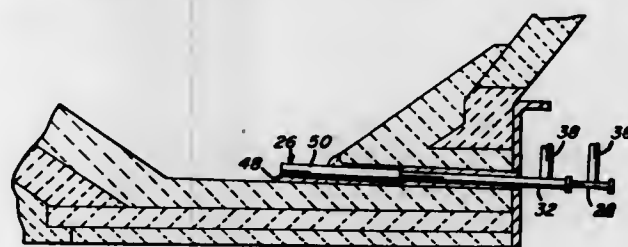
Continuation of Ser. No. 365,775, May 31, 1973, abandoned.

This application Jan. 27, 1975, Ser. No. 544,162

Int. Cl.² C21C 5/48

U.S. Cl. 75-60

13 Claims



3. A process in accordance with claim 2, wherein the refin-
ing fluid comprises a stream of oxygen and a protective jacket
fluid selected from the group consisting of hydrocarbon, inert
gas, steam, carbon dioxide, and non-explosive mixtures
thereof is simultaneously injected enveloping said stream of
oxygen.

4,007,036

METHOD OF SMELTING ALUMINUM

Hans-Joachim Gottschol, and Karl-Josef Gottschol, both of
Hagen-Haase, Germany, assignors to Dr. Ing. Gottschol
Metallurgie Kommanditgesellschaft, Berlin, Germany

Filed Nov. 11, 1974, Ser. No. 522,757

Claims priority, application Germany, Nov. 9, 1973,
2355951

Int. Cl.² C22B 21/00

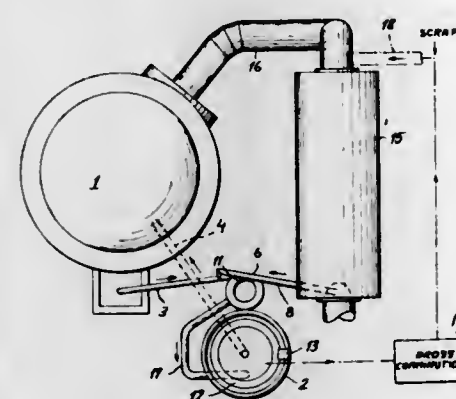
U.S. Cl. 75-68 R

6 Claims

1. A method of smelting pieces of a nonferrous metal, said
method comprising the steps of:

- a. drawing preheated pieces of said nonferrous metal by
suction into a stream of said nonferrous metal,
- b. turbulencing the resulting mixture;

- c. introducing the turbulenced mixture into a satellite fur-
nace, and



- d. heating said mixture in said satellite furnace to form a
molten body of said nonferrous metal and a layer of dross
on said body.

4,007,037

**COMPOSITION AND METHOD FOR CHEMICALLY
ETCHING COPPER ELEMENTS**

Robert M. Lukes, Louisville, and Jeffrey C. Sellins, Douglass
Hills, both of Ky., assignors to General Electric Company,
Louisville, Ky.

Filed July 9, 1975, Ser. No. 594,312

Int. Cl.² C22B 15/12

U.S. Cl. 75-117

25 Claims

1. A copper etching process, comprising:
contacting a copper element to be etched with an aqueous
etching solution, said copper etching solution comprising
a cupric compound and a complexing agent, said cupric
compound being water soluble and substantially free of
anions capable of forming a stable complex ion with
cuprous ions in said solution and said complexing agent
being a material capable of forming a stable complex ion
with cuprous ions and being substantially free of material
capable of forming a complex ion with cupric ion; and
maintaining the copper element in contact with said etching
solution under etching conditions for a time sufficient to
etch said copper element and form a cuprous complex
ion.

14. A process, as set forth in claim 1, including physically
treating the resultant copper etching solution having said
cuprous complex and converting the cuprous complex to said
cupric compound and said complexing agent; thereafter sepa-
rating at least one of copper metal, cuprous oxide, or a mix-
ture thereof, from the resultant solution; and recovering the
resultant cupric compound and complexing agent.

18. A process, as set forth in claim 14, including etching the
copper element in an etching tank and passing the recovered
resultant cupric compound and complexing agent to said
etching tank.

4,007,038

**PITTING RESISTANT STAINLESS STEEL ALLOY
HAVING IMPROVED HOT-WORKING**

CHARACTERISTICS
Harry E. Deverell, Natrona Heights, Pa., assignor to Allegheny
Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Apr. 25, 1975, Ser. No. 571,460

Int. Cl.² C22C 38/44

U.S. Cl. 75-122

4 Claims

1. An austenitic stainless steel consisting essentially of about
20% to 40% nickel, 14% to 21% chromium, about 6% to 12%
molybdenum, up to 0.2% carbon, up to 2% manganese,
0.010% to 0.080% cerium, 0.005% to 0.015% calcium, up to
about 0.006% sulfur, and the remainder essentially all iron.

4,007,039

**COPPER BASE ALLOYS WITH HIGH STRENGTH AND
HIGH ELECTRICAL CONDUCTIVITY**

Stanley Shapiro, New Haven; Eugene Shapiro, Hamden; Brian
Mravic, North Haven, and W. Gary Watson, Cheshire, all of
Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 17, 1975, Ser. No. 559,307

Int. Cl.² C22C 9/00

U.S. Cl. 75-153

4 Claims

1. A process for producing a high conductivity and high
strength copper base alloy comprising the steps of preparing a
molten alloy consisting essentially of 0.8 to 5% titanium, 1.2 to
5% antimony, balance copper, wherein the titanium and anti-
mony are present at an atomic ratio of not more than 10%
above 5 atoms of titanium per 3 atoms of antimony, casting
said alloy, then mechanically reducing the cross-section of the
cast alloy in successive steps with intervening thermal treat-
ments, and subjecting the alloy to an aging treatment at 250°
to 500° C for ½ to 24 hours.

4,007,040

HARD COPPER FREE DENTAL GOLD ALLOYS

Rudolf Kropp, Pforzheim-Wurm, Germany, assignor to Deut-
sche Gold- und Silber-Scheideanstalt vormals Roessler,
Frankfurt, Germany

Filed Jan. 27, 1976, Ser. No. 652,858

Claims priority, application Germany, Mar. 5, 1975,
2509476

Int. Cl.² C22C 5/02

U.S. Cl. 75-165

9 Claims

1. A hard copper free gold alloy suitable for dental purposes
consisting essentially of (a) 61 to 85 weight % of gold, 8 to 15
weight % platinum, 0 to 4 weight % palladium, 5 to 15 weight
% silver and 2 to 5 weight % zinc or (b) an alloy as defined in
(a) with 0.05 to 0.1 weight % of the platinum replaced by
iridium.

4,007,041

ELECTROPHOTOGRAPHIC PRINTING METHOD

Che Chung Chow, Penfield, N.Y., assignor to Xerox Corpora-
tion, Stamford, Conn.

Filed Mar. 10, 1975, Ser. No. 556,841

Int. Cl.² G03G 13/14

U.S. Cl. 96-1 LY

5 Claims

1. An offset printing method in which an image is electro-
photographically formed on a drum, developed with an ink
and transferred to a receiver sheet by means of an intermedi-
ate blanket roller, comprising coating the blanket roller with
an ink releasable material such that substantially all the inked
image is transferred from the master to the receiver sheet so as
to obviate the requirement of cleaning the blanket roller after
each print is made from a new image.

4,007,042

MIGRATION IMAGING METHOD

David A. Buckley; Roger N. Ciccarelli, both of Rochester, and
Frank G. Belli, Webster, all of N.Y., assignors to Xerox
Corporation, Stamford, Conn.

Division of Ser. No. 6,862, Jan. 29, 1970, which is a
continuation-in-part of Ser. No. 566,791, July 21, 1966,
abandoned. This application Apr. 3, 1975, Ser. No. 564,951

Int. Cl.² G03C 13/22

U.S. Cl. 96-1 PS

17 Claims

9. An imaging method comprising:
providing an imaging member comprising a supporting
substrate a single layer of softenable material containing
migration marking material overlying said substrate, said
softenable material containing as the entire upper portion
thereof a surface skin having a chemical composition
different from the bulk of the softenable material and
having a thickness not greater than about 0.3 micron and
a viscosity during imaging of said member greater than

that of the bulk of said softenable layer of softenable material, said softenable material capable of having its resistance to migration of migration marking material dispersed sufficiently to allow migration of migration marking material in depth in said softenable material toward said substrate;

applying an electrical imagewise migration force to the migration marking material, developing said member by decreasing the resistance of migration of migration marking material in depth in the softenable material at least sufficient to allow migration of migration marking material whereby migration marking material migrates at least in depth in said softenable material toward the substrate in imagewise configuration.

4,007,043

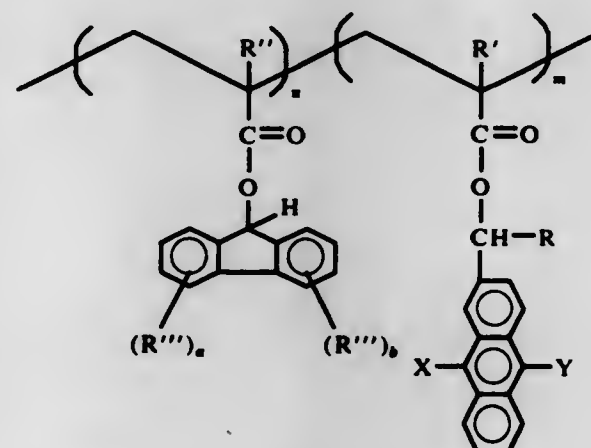
PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS

Milan Stolka, Fairport, and Sam R. Turner, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed July 16, 1975, Ser. No. 596,531
Int. Cl.³ G03G 5/04, 5/06

U.S. Cl. 96-1 PC

10 Claims

6. An electrophotographic imaging process comprising:
a. providing an electrophotographic imaging member having a photoconductive insulating layer containing a copolymer of the formula:



wherein

R is hydrogen or methyl;

R' is hydrogen or methyl;

R'' is alkyl of 1-5 carbon atoms;

R''' is selected from the group consisting of -NO₂, halogen, -CN and -CF₃;

X and Y are independently selected from the group consisting of hydrogen, chlorine, bromine, alkyl of 1-4 carbon atoms and phenyl;

a and b can range from 0-4; and

n can range from about 5 to about 95 percent of the total number of structural units of the copolymer; and

m can range from about 5 to about 95 percent of the total number of structural units of the copolymer; and

b. forming an electrostatic latent image on said member.

4,007,044

COLOR ELECTROPHOTOGRAPHIC PROCESS

Tsuyoshi Shiga, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan
Filed Nov. 14, 1974, Ser. No. 525,421
Claims priority, application Japan, Dec. 11, 1973, 48-139342; Dec. 14, 1973, 48-140899
Int. Cl.³ G03G 13/22

U.S. Cl. 96-1.2

5 Claims

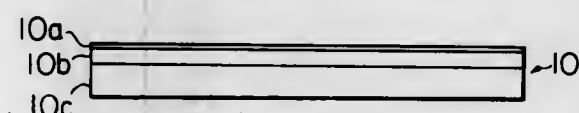
1. A color electrophotography process, comprising the steps of:

a. applying an electrostatic charge to a photoconductive

member having a protective transparent insulating layer formed on a surface thereof to create a charge of a first polarity at the surface, the insulating layer being bonded onto a photoconductive layer which is bonded to a conductive support layer;

b. uniformly illuminating the insulating layer;

c. applying a thin layer of a homogeneous mixture of translucent particles onto the insulating layer, the particles having a charge of a second polarity opposite to the first polarity and being provided in substantially equal numbers colored in three primary colors respectively;



d. applying a colored light image onto the insulating layer through the particles, the particles absorbing light of their complementary colors respectively;

e. applying a force to the insulating layer to remove particles from areas of the insulating layer where the electrostatic force between the photoconductive member and the particles has been reduced below a predetermined value during step d;

f. transferring the particles remaining on the insulating layer to the surface of a recording medium after performing step e.

4,007,045

ELECTROPHOTOGRAPHIC COLOR PROCESS AND ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL FOR USE IN THE ELECTROPHOTOGRAPHIC COLOR PROCESS

Eisuke Ishida, Nara; Yuji Takashima, Osaka; Hisanori Nishiguchi, Neyagawa, and Fujio Oda, Ashiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Mar. 14, 1975, Ser. No. 558,560
Claims priority, application Japan, Mar. 27, 1974, 49-34990; Apr. 9, 1974, 49-40536
Int. Cl.³ G03G 5/12, 5/04

U.S. Cl. 96-1.5

14 Claims

1. An electrophotographic process for color reproduction comprising the steps of:

a. charging an electrophotographic light-sensitive material by corona discharge, said material having at least two kinds of color-producing photoconductive particles disposed at random on an electroconductive support, said particles consisting essentially of a photoconductive particle, a sensitizer and a leuco dye,

b. exposing said charged material to light,

c. developing said material by a toner containing acid substance, and

d. producing color in the leuco dye by the interaction of the leuco dye with the acid substance by heating or by dissolving the leuco dye or the acid substance with a solvent.

10. An electrophotographic light-sensitive material comprising an electroconductive support and a photoconductive layer having three kinds of color-producing photoconductive particles disposed at random on the support, said color-producing photoconductive particles consisting of (i) a color-producing photoconductive particle comprising a photoconductive particle, a sensitizer absorbing blue-violet light and a leuco dye producing yellow color, (ii) a color-producing photoconductive particle comprising a photoconductive particle, a sensitizer absorbing green light and a leuco dye producing magenta color and (iii) a color-producing photoconductive particle comprising a photoconductive particle, a sensitizer absorbing red light and a leuco dye producing cyan color.

4,007,046

METHOD OF TREATMENT OF OFFSET MASTERS PRIOR TO CONVERSION

George M. Ort, Arlington Heights, Ill., assignor to A. B. Dick Company, Niles, Ill.
Filed Feb. 19, 1975, Ser. No. 550,974
Int. Cl.³ G03F 7/02

U.S. Cl. 96-33

6 Claims

1. In the preparation of an electrostatic offset master for use in the production of multiple copies by lithographic technique in which the non-imaged portion of an imaged master is water repellent and hydrophobic and must be converted to a hydrophilic, ink repellent, water receptive portion by treatment with a conversion composition before use of the imaged master for the production of copy by lithographic technique, the improvement which renders possible the storage of imaged masters for future use in the production of multiple copies without deterioration of copy quality comprising the step of wetting the imaged surface of the master with an organic solvent having a KB value below 50 immediately prior to conversion whereby residual solvent remains on the imaged areas as a barrier against the conversion composition to preclude over-conversion and subsequent blinding of the imaged areas with the deterioration of copy quality during subsequent use of the treated master in the production of copies.

4,007,047

MODIFIED PROCESSING OF POSITIVE PHOTORESISTS

Leon H. Kaplan, Yorktown Heights, and Steven M. Zimmerman, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 476,831, June 6, 1974, abandoned.
This application Dec. 10, 1975, Ser. No. 639,536
Int. Cl.³ G03F 7/08; G03C 5/00

U.S. Cl. 96-36

15 Claims

1. A photoresist process comprising the steps of:

a. providing on a substrate a layer of a light sensitive resist material consisting essentially of an alkali soluble phenol-formaldehyde resin and a naphthoquinone-(1,2)-diazide sulfonic acid ester sensitizer;

b. exposing said layer imagewise to radiation with sufficient energy to convert a majority of said diazo ketone to an alkali soluble form in the exposed portion of said layer;

c. treating said layer, following said exposure, with a mildly acidic aqueous solution;

d. exposing the entire layer with actinic radiation; and then

e. developing a negative relief image of resist on said substrate by removing the initially unexposed portions of said layer with an alkaline developer solution.

4,007,048

DARK RED TRANSPARENT REFRACTORY GLASS

Werner Sack, Mainz, and Herwig Scheidler, Finthen, both of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Germany
Filed June 17, 1975, Ser. No. 587,675
Claims priority, application Germany, June 20, 1974, 2429563
Int. Cl.³ C03B 32/00; C03C 3/22

U.S. Cl. 106-39.7

15 Claims

1. Dark red, transparent glass ceramic, particularly for the manufacture of articles which can be locally heated, said glass ceramic having a "heat stress factor" $R > 1000$, a crystal phase content being at least 30% and not more than 50% by weight, and an infrared transmission 13% in a layer of 4.5 mm. in thickness in the wave length range of from 1100 to 2700 nm. and formed from a basic glass consisting essentially of in percent by weight, calculated on an oxide basis:

SiO ₂	64.00 ± 0.30,
Al ₂ O ₃	21.30 ± 0.20,
Li ₂ O	3.50 ± 0.15,

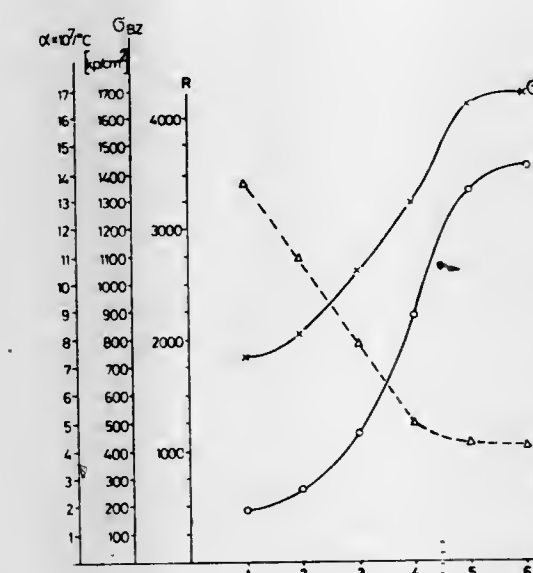
SiO ₂	64.00 ± 0.30,
Al ₂ O ₃	21.30 ± 0.20,
Li ₂ O	3.50 ± 0.15,

-continued

Na ₂ O	0.60 ± 0.15,
K ₂ O	0.50 ± 0.10,
BaO	2.50 ± 0.50,
CaO	0.20 ± 0.20,
MgO	0.10 ± 0.10,
ZnO	1.50 ± 0.50,
TiO ₂	2.30 ± 0.10,
ZrO ₂	1.60 ± 0.10,
MnO ₂	0.65 ± 0.15,
Fe ₂ O ₃	0.23 ± 0.03,
CoO	0.37 ± 0.05,
NiO	0.06 ± 0.02, and
Sb ₂ O ₃	0.85 ± 0.15,

said basic glass having the following characteristics:

$\alpha \times 10^7$ (20 to 300° C)° C	= 43 ± 1
Tg (° C); η ca. 10 ^{13.5} P	= 680 ± 5
V _A (° C); η = 10 ⁴ P	= 1290 ± 10
Density (g/cc.)	= 2.49 ± 0.05
position of the DTA-Peak _{max} in ° C at a heating rate of 6 to 6.5° C/min	= 840 ± 5



that transparent glass ceramic produced from that basic glass by at least one heat treating cycle consisting essentially of:

a. heating the basic glass at a temperature up to 900° C for a sufficient time to obtain that crystalline phase content of at least 30% and not more than 50% by weight and to obtain a heat stress factor R above 1000; and

b. cooling the heated glass at a rate of about 1° to 7° C/min within a temperature range of about 900° to 750° C and of about 1 to 200° C/min within a temperature range of 750° C to room temperature;

said crystalline phase content consisting essentially of a member selected from the group consisting of h-quartz solid solutions, h-spodumene, and mixtures thereof, dependent on the number of heat treating cycles employed.

10. A process for the manufacture of a glass ceramic comprising the steps of:

a. heating a basic glass at 800°-900° C for a sufficient time to obtain said crystalline phase content of at least 30% and not more than 50% by weight; and

b. cooling the heated glass at a rate of about 1° to 7° C/min within a temperature range of about 900° to 750° C and of about 1° to 200° C/min within a temperature range of 750° C to room temperature;

said basic glass consisting essentially of in percent by weight calculated on an oxide basis:

-continued

Na ₂ O	0.60 ± 0.15,
K ₂ O	0.50 ± 0.10,
BaO	2.50 ± 0.50,
CaO	0.20 ± 0.20,
MgO	0.10 ± 0.10,
ZnO	1.50 ± 0.50,
TiO ₂	2.30 ± 0.10,
ZrO ₂	1.60 ± 0.10,
MnO ₂	0.65 ± 0.15,
Fe ₂ O ₃	0.23 ± 0.03,
CoO	0.37 ± 0.05,
NiO	0.06 ± 0.02, and
Sb ₂ O ₃	0.85 ± 0.15,

4,007,049

THERMAL SHOCK RESISTANT CERAMIC COMPOSITE
 Ronald C. Rossi, and Robert D. Carnahan, both of Torrance, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
 Filed Aug. 6, 1968, Ser. No. 750,679

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C04B 35/04

U.S. Cl. 106—58

3 Claims

1. A hot-pressed ceramic oxide composite possessing a high degree of resistance to failure from thermal fracture, said composite consisting essentially of a blend composed of about 5 to 30 percent by volume of boron nitride flakes uniformly dispersed in a powdered refractory oxide matrix.

4,007,050

HYDROPHOBIC OXIDES OF METALS AND FOR METALLOIDS

Siegmar Laufer, and Roy Waldemar, both of Rheinfelden, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Division of Ser. No. 241,761, April 6, 1972, Pat. No. 3,920,865, which is a continuation-in-part of Ser. No. 23,330, March 27, 1970, abandoned. This application Jan. 23, 1975, Ser. No. 543,368

Claims priority, application Germany, Mar. 29, 1969, 1916360

Int. Cl.² C09C 3/12

U.S. Cl. 106—308 Q

13 Claims

1. An oxide product having hydrophobic characteristics, comprising oxide particles including SiO₂ particles having surfaces which are substantially free of silanol groups bound to each other by hydrogen bridges; and at least one organosilicon compound chemically bonded to said surfaces so as to impart hydrophobic properties to said particles, said compound being bonded to each of the respective surfaces at locations corresponding to those at which isolated silanol groups were present and with which said compound reacted chemically to become bonded to said surfaces.

4,007,051

COMPOSITION AND PREPARATION OF A DRY PREDISPERSED COATED PIGMENT

Oscar J. Gombar, Princeton, and James Howard, Somerset, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 554,365, March 3, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,567

Int. Cl.² C09C 3/08

U.S. Cl. 106—308 Q

8 Claims

1. A dry, predispersed, coated pigment composition comprising:

- a majority, varying from about 85 to 99.5 wt. %, of an organic or inorganic pigment, and
- a minority, varying from about 0.5 to 15 wt.%, of a natural hydrocarbon fossil resin, the wt. percents being based on the weight of the finished pigment composition.

4,007,052

PREPARATION OF ADJUVANT-FREE FRUCTOSE TABLETS

Helmut Heinemann, Heidelberg, and Werner Rothe, Hockenheim, both of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed Aug. 1, 1975, Ser. No. 601,571

Claims priority, application Germany, Aug. 23, 1974, 2440383

Int. Cl.² B29C 11/04; C13K 11/00

U.S. Cl. 127—30

10 Claims

1. The method of preparing adjuvant-free tablets from a tableting mass having a tendency to stick, comprising alternately in the same mold forming tablets from said tableting mass and from an adjuvant mass containing an easily tableted substance, a lubricant and a mold parting agent.

4,007,053

METHOD AND APPARATUS FOR SCRUBBING THE ENDS AND SIDES OF A MOTOR VEHICLE

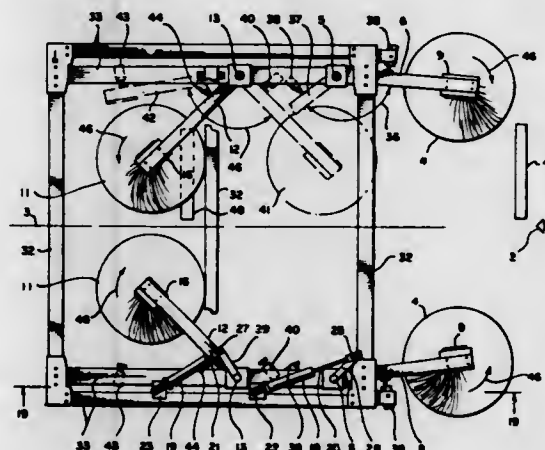
James H. Gray, Phoenix, Ariz., assignor to Cyprus Specialty Steel, Phoenix, Ariz.

Continuation of Ser. No. 405,329, Oct. 11, 1973, Pat. No. 3,926,663. This application Sept. 8, 1975, Ser. No. 611,279. The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.² B08B 1/02

U.S. Cl. 134—6

7 Claims



1. A method for scrubbing the front, rear and side surfaces of a vehicle as it moves relative to a washing installation, said installation having first and second pairs of independently pivoted brushes arranged so that the brushes of each pair move substantially simultaneously, and in substantially mirrored relationship, one with the other, said method including the sequentially initiated steps of:

- engaging each side surface of said vehicle with one brush in said first pair of brushes;
- transposing each brush in said first pair of brushes along the corresponding side surface of said vehicle from the front surface of said vehicle to the rear surface of said vehicle;
- engaging the front surface of said vehicle with said second pair of brushes;
- transposing each brush in said second pair of brushes across the front surface of said vehicle from the center of said vehicle to the side of said vehicle;
- engaging each side surface of said vehicle with one brush in said second pair of brushes;
- transposing each brush in said second pair of brushes along the corresponding side surface of said vehicle from the front surface of said vehicle to the rear surface of said vehicle;
- engaging the rear surface of said vehicle with said first pair of brushes;
- transposing each brush in said first pair of brushes across the rear surface of said vehicle from one side of the vehicle to at least the center of said vehicle;

whereby the front, rear and side surfaces of said vehicle are subjected to brushing while said vehicle only once passes said washing installation.

4,007,054

ELECTRIC CELL WITH ZINC COIL ANODE AND METHOD OF MAKING IT

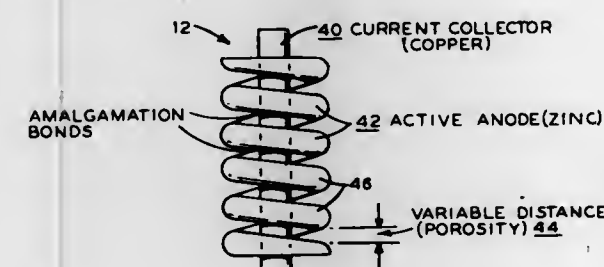
Nikola Marincic, Winchester, Mass.; Ronald Merz, Cleveland, Tenn., and Robert H. Kelsey, Acton, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of Ser. No. 204,062, Dec. 2, 1971, abandoned. This application Jan. 21, 1976, Ser. No. 651,377

Int. Cl.² H01M 35/04

U.S. Cl. 429—206

7 Claims



1. An alkaline electric cell comprising an anode embodying a helically wound zinc filamentary element surrounding and supported on a linear, elongated conductor of high electrical conductivity, said element being bonded to said conductor by amalgamation of mercury.

4,007,055

PREPARATION OF STOICHIOMETRIC TITANIUM DISULFIDE

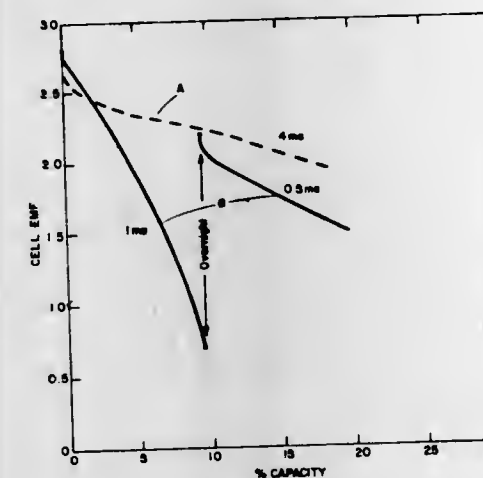
M. Stanley Whittingham, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed May 9, 1975, Ser. No. 575,994

Int. Cl.² H01M 4/36

U.S. Cl. 423—565

8 Claims



1. A process for producing stoichiometric titanium disulfide and having a small aspect ratio which comprises heating particulate titanium to a reaction temperature of between about 475° C. and about 600° C. and contacting the heated titanium with an atmosphere having a sulfur partial pressure substantially equal to the equilibrium sulfur partial pressure over titanium disulfide at the reaction temperature to form titanium disulfide, said titanium and sulfur being used in substantially stoichiometric amounts, and holding the heated titanium at the reaction temperature to homogenize the titanium disulfide.

4,007,056

LEAD BASE CADMIUM-TIN ALLOY USEFUL FOR FORMING BATTERY COMPONENTS

Purushothama Rao, Burnsville, and George W. Mao, St. Paul, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

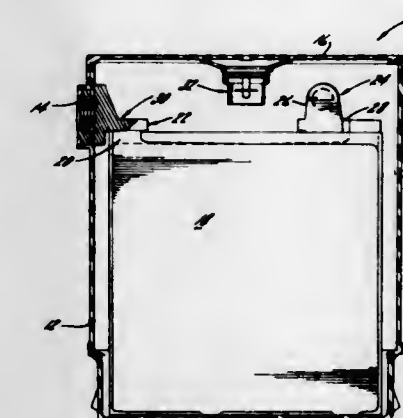
Continuation of Ser. No. 403,178, Oct. 3, 1973, abandoned.

This application May 23, 1975, Ser. No. 580,194

Int. Cl.² H01M 39/00

U.S. Cl. 429—222

7 Claims



1. In a lead-acid battery comprising a battery container having a plurality of cells, a cover sealed to the container, venting means providing passages for the escape of evolved gas and an electrolyte contained in the cells, each cell having components including a plurality of electrodes disposed therein comprising a grid supporting structure having a lug and formed of a calcium containing lead alloy and having a layer of active material attached thereto, a strap joining the lugs of the grids together, a pair of terminal posts electrically connected to the straps in two of the cells of the battery and intercell connectors connected to the straps and electrically connecting adjacent cells, the improvement wherein at least one of said components comprise an alloy composition consisting of a lead matrix having dispersed therein a cadmium-tin eutectic phase, the cadmium and tin being each present in an amount of from about 0.4 to about 1.4 percent by weight, based upon the total weight of said alloy composition.

4,007,057

CELL COMPRISING AN ALKALI METAL AND AQUEOUS ELECTROLYTE

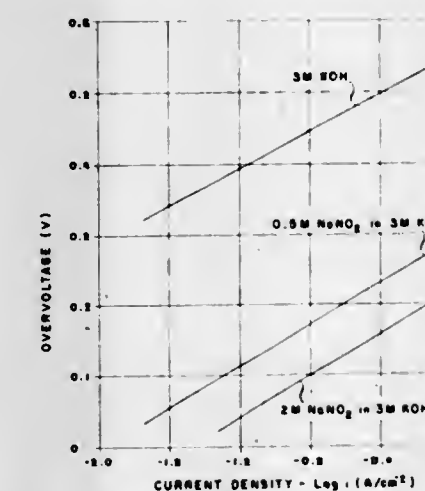
Ernest Lucius Littauer, Los Altos Hills; Roger Paul Hollandsworth, Mountain View, and Keh Chi Tsai, Saratoga, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 29, 1975, Ser. No. 645,199

Int. Cl.² H01M 6/04

U.S. Cl. 429—57

4 Claims



1. An electrochemical cell consisting essentially of an alkali metal anode highly reactive with water and spaced from a

cathode by an electrically insulating film formed on said anode in the presence of water, an aqueous alkaline hydroxide electrolyte in which said anode and cathode are immersed, said electrolyte permitting at the anode electrochemical dissolution of reactive metal to aqueous reactive metal ions and formation of an aqueous salt to a solid salt in the form of a porous film on said anode, and at least one soluble inorganic ion selected from the group of ions consisting of nitrite, hypochlorite, chlorate, bromate, dinitrogen trioxide and sulfite ions in said aqueous alkaline hydroxide electrolyte which is reduced preferentially to water at the cathode and substantially eliminates hydrogen evolution.

4,007,058

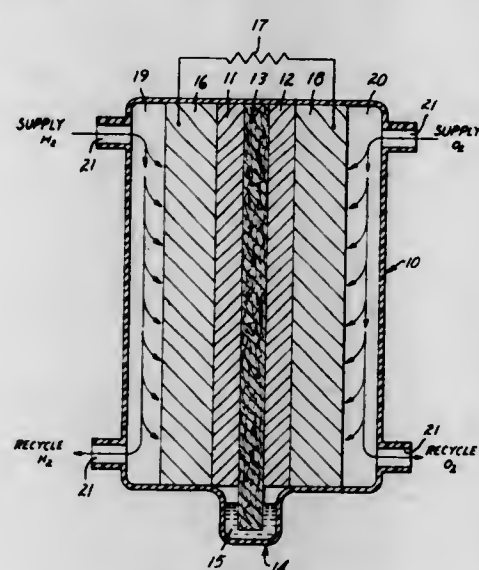
MATRIX CONSTRUCTION FOR FUEL CELLS

Alfred Dwayne Nelson, Stillwater, and Larry E. Espelien, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 347,545, April 4, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,718 Int. Cl.² H01M 8/00, 2/00

U.S. Cl. 429—34

4 Claims



1. In fuel cell comprising a case, positive and negative porous electrodes inserted within the case and enclosing an inner space, electrolyte within said inner space, means for introducing an oxidant gas through one porous electrode and a fuel through the other, the improvement comprising having the inner space occupied by a thin porous fibrous separator matrix consisting essentially of a self-supporting compressible porous fibrous mat of uniformly distributed but randomly dispersed and entangled microfibers of a high molecular weight thermoplastic polyarylsulfone ether polymer.

4,007,059

ELECTROCHEMICAL CELL ELECTRODE SEPARATOR AND METHOD OF MAKING IT AND FUEL CELL CONTAINING SAME

Romeo Richard Witherspoon, Utica; Edward Marion Doman-ski, Warren, and James Alvin Davis, Madison Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

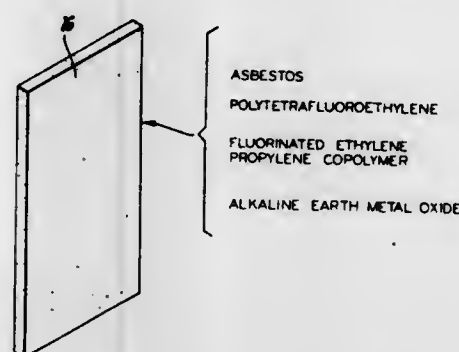
Filed Aug. 20, 1975, Ser. No. 605,985
Int. Cl.² H01M 8/02, 2/00

U.S. Cl. 429—9

6 Claims

5. A zinc-air hybrid fuel cell comprising a container and in said container a zinc anode, an oxygen cathode, an auxiliary electrode spaced between said anode and cathode and serving as a charging electrode, an alkaline electrolyte for ionically communicating said anode, cathode and auxiliary electrode, an ion permeable sheet-like member between said auxiliary electrode and said oxygen anode, said sheet-like member including about 10 to 15% by weight of an alkaline earth metal

oxide, about 40 to 60% by weight asbestos fibers of a length less than about 5 microns, about 20 to 35% by weight unsintered polytetrafluoroethylene fibers having a length less than about 40 microns, and about 5 to 15% by weight of a fluorinated ethylene-propylene copolymer bonding at least said fibers together to form a sheet-like body having a pore size as formed of less than about 0.20 microns, said sheet-like member separating said container into two chambers, one of said



chambers containing said zinc anode and said auxiliary electrode, the other of said chambers containing said oxygen cathode, means for receiving a voltage generated between said zinc anode and said oxygen cathode, means including a passageway around said sheet-like member for alternately removing electrolyte from said other chamber and returning it, and means for applying a charging voltage across said anode and auxiliary electrode while electrolyte has been removed from said other chamber.

4,007,060

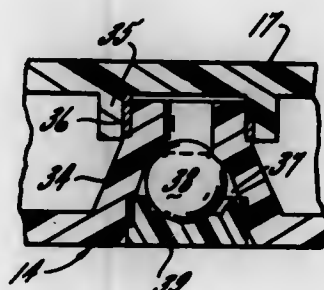
PLASTIC CASE FOR FLAT RECHARGEABLE CELL

Dennis Dean Sorensen, Bloomington, Minn.; Richard Allan Erickson, New Richmond, Wis., and Harry Ellwood Iepson, Lino Lakes, Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 30, 1975, Ser. No. 582,234
Int. Cl.² H01M 2/02

U.S. Cl. 429—53

9 Claims



1. A flat sealed case for a secondary cell comprising, in combination:

- a shallow, substantially flat base having a low peripheral wall;
- a thin substantially flat cover having peripheral edge means bonded to said peripheral wall; and,
- opposing means on said cover and base located internally thereof with respect to said peripheral edge means and said peripheral wall and bonded to one another for restraining said flat cover and base from bulging upon a build-up of internal pressure within said sealed cell case.

4,007,061

THERMOELECTRIC HEAT PUMP

Georges Le Couturier, 20, cours d'Herbouville, 69004 Lyon, France

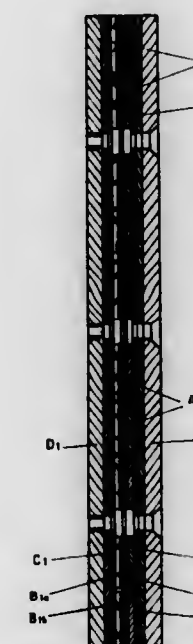
Filed June 5, 1975, Ser. No. 584,092

Claims priority, application France, June 5, 1974, 74.19360; Feb. 13, 1975, 75.04446

Int. Cl.² H01L 35/02, 35/04

U.S. Cl. 136—221

8 Claims



1. A heat pump comprising a set of thermoelements that are substantially of the same thickness and at least two flat radiant elements to provide diffusion or absorption of heat, the said pump being made in sandwich form comprising, in addition to the said radiant elements, two electrically insulating supports that are good heat conductors, said supports being disposed on either side of the thermoelements and providing both the electrical coupling of the thermoelements to one another and the thermal coupling of the radiant elements to the thermoelements, while producing a mechanical coupling of the arrangement of all the elements, each of said supports having a first face contacting with its entire surface one of the radiant elements and a second face covered by a layer of discontinuous electrically conducting elements separated by gaps, such elements being disposed on the two supports in such a manner that, the thermoelements being located between them in contact thereof, the said conductor elements produce the serial coupling of the thermoelements, the coupling points of a first thermoelectric kind being all situated on one of the layers and the coupling points of the other thermoelectric kind being all situated on the other of said layers and the two end conductor elements of one of the layers being provided with means for coupling to the opposite poles of a source of continuous electric current, and a plurality of locking members passing through the said sandwich in the said gaps, said locking members exerting a substantially uniform pressure at the level of the contacts between the thermoelements and the said discontinuous conductor elements and at least one thin sheet of good thermal conductor elastic material disposed between one of the radiant elements and the face of the support which faces the radiant elements.

4,007,062

REINFORCED COMPOSITE ALLOYS, PROCESS AND APPARATUS FOR THE PRODUCTION THEREOF

Raymond Henri Sifferlen, Veurey-Voroize, France, assignor to Societe Industrielle de Combustible Nucleaire, Annecy, France

Division of Ser. No. 368,434, June 8, 1973, Pat. No. 3,858,640.

This application Sept. 27, 1974, Ser. No. 510,000

Claims priority, application France, June 9, 1972, 72.20864

Int. Cl.² C22F 1/04; C22C 32/00

U.S. Cl. 148—2

5 Claims

1. A process for preparing a reinforced composite alloy without residual porosity, having improved properties and particularly good ductility, consisting of a matrix of very pure aluminum having dispersed therein 3 to 20% by weight of a refractory material addition in grain form, said addition being insoluble in aluminum both in the solid and liquid states, and said addition grains being dispersed homogeneously throughout the aluminum matrix to which they are bonded individually, said process comprising the following steps:

- a. forming a dispersion of grains of a refractory material using a fluidized suspension in a stream of preheated gas, which is neutral with respect to the addition grains and to the aluminum;
- b. desorbing moisture, oxygen and nitrogen from said grains to superficially activate said grains;
- c. introducing said dispersion into molten aluminum with energetic stirring, at a temperature selected in the range from 850° to 1300° C to form a homogeneous composite alloy;
- d. degassing the homogeneous composite alloy;
- e. casting and solidifying the composite alloy;
- f. subjecting the solidified composite alloy; to at least one hot-rolling step at about 400° C; and
- g. subjecting the rolled composite alloy to at least one annealing step at about 350° C.

4,007,063

HEAT TREATING METHOD FOR METAL FILM RESISTOR

Toshitaka Yasuda, No. 2211-6, Yamada-Shimo, Suita, Osaka; Hiroshi Takahama, No. 4, 4-Chome, Shuntoku-cho, Higashi-Osaka, Osaka; Hachiro Hamaguchi, No. 269, 3-chome, Gakuen-Daiwa-cho, Nara, Nara; Saji Shimizu, No. 81, Sumiyoshi-cho, Sumiyoshi, Osaka, Osaka, and Kenji Mori, No. 12-25, 1-chome, Hishiya-Higashi, Higashi-Osaka, Osaka, all of Japan

Filed June 12, 1975, Ser. No. 586,284

Claims priority, application Japan, Aug. 21, 1974, 49-96385

Int. Cl.² H01C 17/06

U.S. Cl. 148—6.3

24 Claims

1. A method for forming a metal film type resistor by heat-treating a metal film having a non-crystalline structure and having adsorbed foreign elements giving nonmetallic resistance characteristics to the film and having a temperature coefficient of resistance which is lower than the desired coefficient for forming the metal film type resistor therefrom, said method comprising:

- heating the metal film in an oxidizing atmosphere at a temperature between a first critical temperature and a second critical temperature, said first critical temperature being a temperature, at which heating removes said adsorbed foreign elements from the film and changes the film from a non-crystalline state to a crystalline state so that the metal film begins to have a more positive temperature coefficient of resistance, and said second critical temperature being a temperature at which the tendency of the temperature coefficient of resistance to become more negative due to oxidation becomes larger than the tendency for the coefficient to become more positive, said heating being continued until the temperature coefficient of resistance of the film changes the desired amount in the positive direction;

at a temperature above a third critical temperature, which is a temperature at which oxidation of the film reaches a saturation point so that the tendency of the temperature coefficient of resistance to become more negative due to oxidation becomes smaller than the tendency of the coefficient to become more positive due to the temperature rise, said whereby the temperature coefficient of resistance is adjusted to a desired value and a protective oxide film is formed on the film surface and the resistance and the temperature coefficient of resistance are stabilized.

4,007,064

PROCESS OF PRODUCING SURFACE-DECARBURIZED STEEL SHEETS OR PLATES

Giswalt Veltl, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

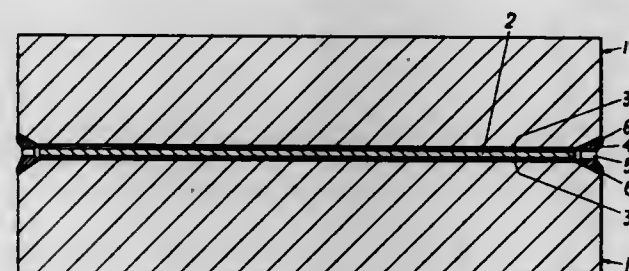
Filed Sept. 24, 1975, Ser. No. 616,380

Claims priority, application Austria, Oct. 23, 1974, 8503/74

Int. Cl.² C21D 1/74, 3/04

U.S. Cl. 148—12.1

6 Claims



1. A process for producing surface-decarburized steel sheets or plates, comprising the steps of forming a package by bringing together at least one sheet layer of a high alloy chromium steel consisting essentially of from between 0.02 and 0.15% C, 0.15 and 2% Mn, 0 and 2% Si, 5 and 30% Cr, 0 and 5% Ni, and from between 0 and 5% of an element selected from the group consisting of Mo, W and V, from between 0 and 2% of an element selected from the group consisting of Nb, Ta, Ti or Zr, and from between 0 and 1% rare earths, balance iron and usual impurities, to serve as decarburizing agent, and at least one steel sheet or plate, fixing the package by applying edge welding seams, heating the package to rolling temperature, subsequently rolling the package, subsequently annealing the package at a temperature within the carbide forming range, and thereupon separating the package.

4,007,065

HYSTERESIS ALLOY

Ralph M. Handren, Crystal Lake, Ill., and John P. McKay, Walworth, Wis., assignors to Arnold Engineering Company, Marengo, Ill.

Filed Feb. 28, 1975, Ser. No. 554,350

Int. Cl.² H01F 1/04

U.S. Cl. 148—31.57

2 Claims

1. A precipitation-hardened magnetic alloy, the components of which were heated to a temperature of at least about 1650° C to form a melt which is cast, heat treated and then aged to produce uniform magnetic properties throughout the casting and having a typical maximum energy product of BH max. of at least 0.85 MGO, and having a Rockwell hardness on the order of about C46, said alloy consisting essentially of about 14 to 17% nickel, 7 to 11% aluminum, 0.5 to 10% cobalt, 0.1 to 2% silicon and the balance substantially all iron.

4,007,066

MATERIAL HAVING A HIGH MAGNETIC PERMEABILITY

Kenzaburo Iijima, and Tomoo Yamagishi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 338,608, March 6, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,837 Claims priority, application Japan, Mar. 13, 1972, 47-25409

Int. Cl.² C04B 35/00

U.S. Cl. 148—31.55

11 Claims

1. A worked and heat treated magnetic alloy having a high magnetic permeability, consisting of: a base composition consisting of 75–82 weight percent of nickel, 2–6 weight percent of molybdenum, 1 or less weight percent of manganese, 1 or less weight percent of silicon and 7.8–18 weight percent iron; and an additive consisting of at least three different elements, one of said elements being an element selected from a first group of elements including zirconium, vanadium, tantalum, chromium or tungsten; a second element selected from a second group and being titanium, zirconium, vanadium, niobium, tantalum, chromium or tungsten and a third element said element of the second group being different from said element of the first group, said third element being different from said elements of said first group and of said second group; said additive being contained in said alloy in a total amount within the range of 1–8 weight percent, wherein said alloy is characterized by a Hv of at least 160 and a μ of at least 10,000.

4,007,067

METHOD FOR MAKING AND USING HOT STAMP TAPE

Richard E. Dunning, Hammond, Ind., assignor to Avery Products Corporation, San Marino, Calif.

Continuation of Ser. No. 233,463, March 10, 1972, abandoned, which is a division of Ser. No. 188,423, Oct. 12, 1971, Pat. No. 3,666,516. This application Mar. 27, 1975, Ser. No. 562,851

Int. Cl.² B44C 1/16; B41M 3/12; B44C 1/20

U.S. Cl. 156—61

16 Claims

1. In a method for forming on a substrate a finish having a surface in which discrete spaced apart portions vary in specular reflectance from the remaining portions of the surface, the steps of:

providing a heat-resistant, flexible, foldable carrier sheet having a surface having a predetermined specular reflectance;

coating onto said carrier sheet surface a plurality of discrete spaced apart portions of a synthetic resinous material, said spaced apart portions being coated onto the carrier in a fluid condition and shrunk during drying to form irregularly-shaped surfaces remote from the surface of the carrier sheet and having a lower specular reflectance than that of the uncoated portion of the carrier sheet surface, said spaced apart portions being so adherently attached to the carrier sheet that they will not transfer from the carrier when heat and pressure are applied thereto;

coating over the surface of the carrier sheet and said spaced apart portions a transferable replicating layer comprising a coating of sufficient thickness of a synthetic resinous material to replicate both the specular reflectance of the uncoated portion of the carrier sheet surface and the specular reflectance of the remote surfaces of said spaced apart portions without said spaced apart portions transferring from the carrier sheet;

providing an adherence coat for adhering the transferable replicating layer to a substrate;

pressing the carrier sheet and the replicating layer against the substrate and applying heat to adhere the replicating layer to the substrate; and

releasing the carrier sheet and said adherently attached

spaced apart portions from the surface of the replicating layer to provide the replicating layer as a surface finish attached to the substrate and having a plurality of discrete spaced apart portions having a lower specular reflectance than the remaining portion of the surface finish.

11. A method for making a hot transfer sheet comprising a carrier sheet and transferable material on one side of the carrier sheet, in which said transferable material is releasable from the carrier sheet and said transferable material is adherently attachable to a substrate in response to heat and pressure, the method comprising the steps of:

providing a heat-resistant, flexible, foldable carrier sheet having a surface having a predetermined specular reflectance;

coating onto said carrier sheet surface a plurality of discrete spaced apart portions of a synthetic resinous material, said spaced apart portions being coated onto the carrier in a fluid condition and shrunk during drying to form irregularly-shaped surfaces remote from the surface of the carrier sheet and having a lower specular reflectance than that of the uncoated portion of the carrier sheet surface, said spaced apart portions being so adherently attached to the carrier sheet that they will not transfer from the carrier when heat and pressure are applied thereto;

coating over the surface of the carrier sheet and said spaced apart portions a transferable replicating layer comprising a coating of sufficient thickness of a synthetic resinous material to replicate both the specular reflectance of the uncoated portion of the carrier sheet surface and the specular reflectance of the remote surfaces of said spaced apart portions without said spaced apart portions transferring from the carrier sheet; and

providing an adherence coat for adhering the transferable replicating layer to a substrate;

the carrier sheet and replicating layer being adherently attachable to a substrate, with the carrier sheet and said spaced apart portions being releasable from the surface of the replicating layer in response to the application of heat and pressure, without the spaced apart portions transferring from the carrier sheet, so that the surface of the replicating layer provides a surface finish having a plurality of discrete spaced apart portions having a lower specular reflectance than the remaining portion of the surface finish.

4,007,068

METHOD FOR PRESS-BONDING MOLDING OF BREAKER LAYERS FOR RADIAL TIRES

Hiroshi Uotani, Higashimurayama; Masayoshi Kubo, and Nobuhiko Irie, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 5, 1975, Ser. No. 584,198

Claims priority, application Japan, June 13, 1974, 49-66506

Int. Cl.² B29H 17/18

U.S. Cl. 156—123

1 Claim

1. A method for molding a radial tire breaker layer, comprising:

a. winding a first breaker ply upon the cylindrical, radially outer peripheral surface of a molding drum;

b. radially surrounding the first breaker ply with a radially expandable-contractile, pressure-applying member and uniformly radially contracting this member about the circumference thereof, thereby pressing the first breaker ply against said peripheral surface of the molding drum;

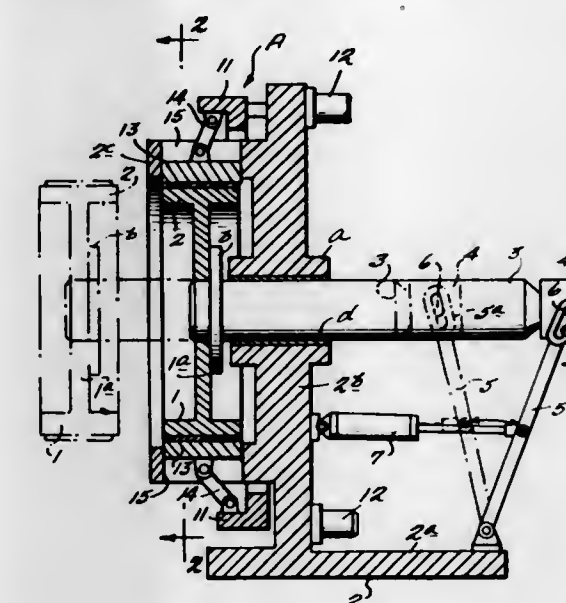
c. radially expanding the pressure-applying member away from the first breaker ply and removing this member from radially surrounding the first breaker ply;

d. winding a second breaker ply upon the first breaker ply;

e. radially surrounding the second breaker ply with a radially expandable-contractile, pressure-applying member and uniformly radially contracting this member about the circumference thereof, thereby pressing the second

breaker ply against said first breaker ply, and the first breaker ply against said peripheral surface of the molding drum to unite the first and second plies into a two ply breaker layer;

f. radially expanding the pressure-applying member away from the second breaker ply and removing this member from radially surrounding the two ply breaker layer;



g. for instances where a breaker layer of more than two plies is wanted, repeating steps (d), (e) and (f), thereby adding and uniting successive plies to the breaker layer to provide a multiple-ply breaker layer; and

h. generally radially contracting the molding drum to facilitate removal of the breaker layer; and

i. withdrawing the breaker layer from the contracted molding drum as an independent, unitary structure.

4,007,069

PROCESS FOR MAKING RADIAL TIRES

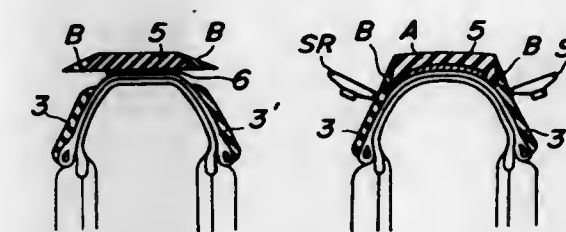
Toshiaki Takayanagi, Kodaira; Hiroaki Tsubakihara, Kurume, and Hiroshi Fukuyama, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 464,667, April 26, 1974, abandoned, which is a continuation of Ser. No. 212,937, Dec. 28, 1971, abandoned. This application July 9, 1975, Ser. No. 594,288 Claims priority, application Japan, Dec. 29, 1970, 46-120690

Int. Cl.² B29H 17/14, 17/26

U.S. Cl. 156—123

7 Claims



1. A process for making a pneumatic radial tire comprising forming a carcass means having at least one rubberized carcass ply directly on a cylindrical former, securing a pair of highly flexible side rubber layers in spaced relation to said carcass ply to form the outer part of the sidewalls of the tire, said carcass ply consisting of cords disposed at 70° to 90° to the equatorial direction of the tire, said side rubber layers consisting of a flexible rubber having a Shore A hardness upon vulcanization of 40° to 55°, forming a green case by forming the carcass means and side rubber layers into a toroidal shape, securing a rubberized breaker layer and a preformed tread rubber layer to the tire crown, said breaker layer consisting of cords disposed at 10° to 30° to the equatorial direction of the

tire, said tread rubber layer consisting of a central body portion having a width equal to the width of the tire crown and at least a portion of the shoulders and being made of a highly abrasion-resistant hard rubber material with a Shore A hardness upon vulcanization of 55° to 75° and in addition a pair of edge portions made of flexible rubber material like said side rubber layers and integrally prebonded to said central body portion to cover the opposing side edges of said central body portion, the overall width of said tread rubber layer being wider than the spacing of the pair of flexible side rubber layers, forming the tread rubber layer around the toroidal shape of the green case to place the edge portions of the tread rubber layer in overlapping relation with the adjacent edges of the flexible side rubber layers, securing the overlapped edge portions of the tread rubber layer directly to said flexible side rubber layers so that the entire outer surface of the sidewalls of the toroidal-shaped green case is protected by said flexible rubber, and vulcanizing the thus builtup toroidal-shaped green case.

4,007,070

METHOD OF CONSTRUCTING A HOSE

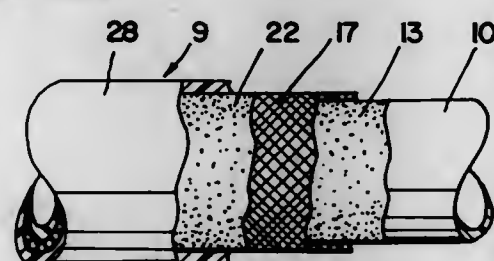
Wayne S. Busdiecker, Stow, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 17, 1974, Ser. No. 515,494

Int. Cl.² B32B 1/08

U.S. Cl. 156—143

8 Claims



1. The method of constructing a hose comprising providing a core tube of polyamide plastic material, coating the outer surface of the core tube with a solution comprising a urethane adhesive, resorcinol and a solvent from the group comprising dimethylformamide, acetone, methylethylketone, methylisobutylketone, methylene chloride and 1-1-1 trichloroethylene, heating the coating to evaporate therefrom a major portion of said solvent so that only a minor portion thereof remains in the coating, and applying an outer tubular member of solid wall plastic material from the group comprising polyester, polyurethane and polyvinyl chloride into contact with said coating, said resorcinol plastisizing and wetting said outer surface of said core tube and said solvent remainder wetting the inner surface of said outer member whereby molecules of said adhesive will engage in intimate contact with molecules of said core tube and said outer member to share electrons therewith to form a strong bond between said adhesive and said core tube and outer tubular member.

4,007,071

PROCESS FOR MAKING EMBOSSED NEEDLE-BONDED FABRIC WALL COVERINGS

Lee W. Addie, Millersville, and Harold W. Nikolaus, Columbia, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 475,326, May 31, 1974, Pat. No. 3,924,040. This application May 27, 1975, Ser. No. 581,264

Int. Cl.² B32B 3/00, 5/06, 31/08

U.S. Cl. 156—148

3 Claims

1. A process for making a fabric comprising the steps of: a. moving a scrim with a coarse open weave structure towards a needle-bonding means, b. placing on the upper surface of the scrim a non-woven felted fabric,

- c. passing both the scrim and its overlying felted fabric covering through a needle-bonding means to needle-bond the felted fabric to the scrim by mechanically locking the fibers of the felted material to the scrim and to themselves, d. passing the resulting composite product, with the felted fabric facing upward, to an embossing structure which has its embossing means engaging the upper surface of the composite product, e. heating said embossing means to a temperature which is approximately equal to the melt temperature of the felted



fabric and substantially below the melt temperature of the scrim; and

- f. embossing a pattern on the side of the composite structure containing the felted fabric to provide a definite pattern to the composite product while, at the same time, causing a softening of the individual fibers of the felted fabric to cause said felted fabric to assume the general surface contour of the scrim, whereby there is produced an end product which has both a definite pattern as provided by the embossing means and an irregular surface texturing which results from the softened felted fabric assuming generally the surface contour of the scrim.

4,007,072

FERROMAGNETIC METAL POWDER COMPRISING LEAD AND METHOD FOR MAKING THE SAME

Masashi Aonuma, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 18, 1974, Ser. No. 524,858

Claims priority, application Japan, Nov. 16, 1973, 48-128988

Int. Cl.² H01F 1/02

U.S. Cl. 148—105

25 Claims

1. A ferromagnetic metal powder for a magnetic recording medium comprising a. about 30 to 95% by weight of Fe; b. about 0.5 to 20% by weight of B; c. about 0.1 to 20% by weight of Pb; and d. about 0 to 70% by weight of Co and/or Ni produced by reducing in an aqueous solution a metal salt containing at least Fe and capable of forming a ferromagnetic substance and using at least one member selected from the group consisting of a borohydride compound and a derivative thereof wherein said reduction is in the presence of at least one lead compound in said aqueous solution.

4,007,073

METHOD OF PRODUCING ARTICLES HAVING ALTERNATING MAGNETIC AND NON-MAGNETIC PORTIONS FROM CONTINUOUS METAL BLANKS

Felix Lvovich Levin, Novo-Khoroshevskoe shosse, 26, korpus 3, kv. 29; Sergel Alexandrovich Golovanenko, 9 Parkovaya ulitsa, 57, korpus 3A, kv. 12, and Vladimir Alexandrovich Dmitriev, ulitsa Plekhanova, 3, korpus 5, kv. 73, all of Moscow, U.S.S.R.

Continuation of Ser. No. 515,023, Oct. 15, 1974, abandoned, which is a continuation of Ser. No. 371,872, June 20, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,406

Int. Cl.² H01F 1/00

U.S. Cl. 148—120

8 Claims

1. A method of producing an integral metal article having both magnetic and non-magnetic portions comprising the steps of: selecting a metal article made of an alloy having an unstable austenitic structure and consisting essentially of, by

weight, 0.03–0.3% carbon, 12–17% chromium, 30–55% cobalt, up to 7% molybdenum and the balance being iron; and plastically deforming portions of the article intended to form a magnetic structure at a temperature of from 0° to 800° C until the portions acquire the magnetic structure.

4,007,074

METHOD OF MAKING AN EPITAXIAL GROWTH LAYER OF GAAS_{1-x}P_x COMPOUND SEMICONDUCTOR

Masahiko Ogirima, Shinjyuku; Toshimitsu Shinoda, Hamura; Yuichi Ono, Kokubunji, and Hajime Kusumoto, Tama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 8, 1971, Ser. No. 105,006

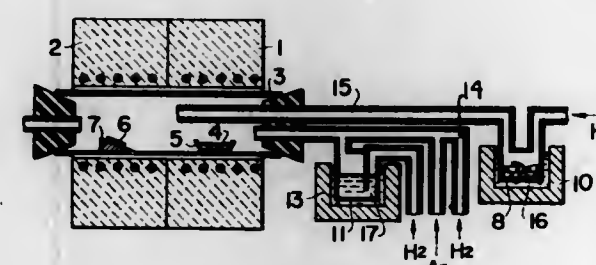
Claims priority, application Japan, Jan. 9, 1970, 45-2487; Jan. 9, 1970, 45-2488

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H01L 21/205, 21/18

U.S. Cl. 148—175

18 Claims



1. A method of making an epitaxial growth layer of GaAs_{1-x}P_x (0 < x < 1) compound semiconductor on a seed material that is crystallographically compatible with the layer, comprising the steps of: disposing a source material including Ga and said seed material in a reaction tube spaced from each other; maintaining said source material at a temperature higher than that of said seed material; heating element As to a temperature so as to obtain a controlled amount of As₂ gas; heating elemental P to a temperature so as to obtain a controlled amount of P₄ gas; introducing a gaseous material selected from the group consisting of a mixture of PCl₃, As₂ gas produced from said heated elemental As and H₂ gas, or a mixture of P₄ gas produced from said heated elemental P, AsCl₃, and H₂ gas into the reaction tube so as to contact at least said gaseous material with said source material, whereby a reaction gas including GaCl is produced; and contacting said reaction gas with said seed material.

4,007,075

METHOD OF MAKING A FIBERGLASS POLE

Stephen A. McClain, Puyallup; Harvey A. Doman, Tacoma, and Richard D. Entus, Gig Harbor, all of Wash., assignors to Cascade Pole Company, Tacoma, Wash.

Continuation of Ser. No. 422,994, Dec. 10, 1973, abandoned, which is a division of Ser. No. 298,028, Oct. 16, 1972, Pat. No. 3,813,837. This application June 16, 1975, Ser. No. 587,127

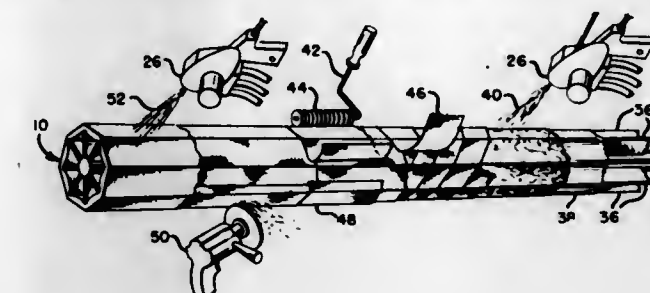
Int. Cl.² B31C 3/00; B65H 81/08

U.S. Cl. 156—62.2

9 Claims

1. A method of making a fiberglass pole of integral multi-sided cross section by spraying a mixture of chopped glass, resin and catalyst on a rotating mandrel, wrapping said mixture with one or more layers of fiberglass webbing, allowing said fiberglass to cure and removing said pole from said mandrel, the improvement comprising: initially mounting a mandrel having a center shaft and a plurality of longitudinal fins equal in number to the cross-sectional sides of the pole to be formed extending radially outward therefrom in a rotatable chuck;

loosely wrapping said finned mandrel with a thin sheet of paper such that the inner surface of said paper lightly overlies the fins of said mandrel; and, pressing said sprayed on chopped glass, resin and catalyst



mixture and said webbing onto said finned mandrel with rollers to deform said thin sheet of paper such that said paper and said mixture bow inwardly between said fins such that the cross sectional wall thickness of the finished pole varies regularly about its perimeter.

4,007,076

POST-PRESS EMBOSSED OF A CONSOLIDATED MAN-MADE BOARD

John T. Clarke, St. Charles; Royce K. Harker, Lombard, both of Ill.; Michael E. Hittmeier, Towanda, Pa., and James W. Eaton, Elgin, Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Dec. 30, 1974, Ser. No. 537,254

Int. Cl.² B29J 5/04; B31F 1/00

U.S. Cl. 156—62.8

12 Claims

1. A method of embossing a decorative man-made board comprising wetting the surface of a consolidated man-made board with an aqueous liquid in an amount sufficient to wet substantially the entire surface to be embossed, embossing the wetted man-made board with a contoured embossing plate at a pressure of at least about 1000 p.s.i., at a temperature in the range of about 400°–550° F. and for a period of time sufficient to permanently reshape at least one surface of the man-made board.

4,007,077

LIQUID CRYSTAL CELLS

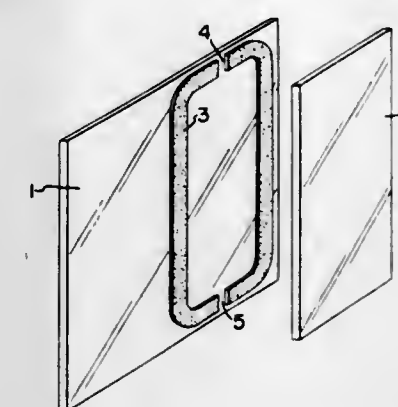
Masachika Yaguchi, Yokohama, Japan, assignor to Dai Nippon Toryo Kabushiki Kaisha, Japan

Continuation of Ser. No. 428,839, Dec. 27, 1973, abandoned. This application Aug. 21, 1975, Ser. No. 606,493

Int. Cl.² B32B 31/00

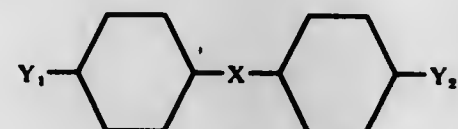
U.S. Cl. 156—145

8 Claims

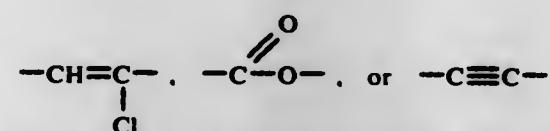
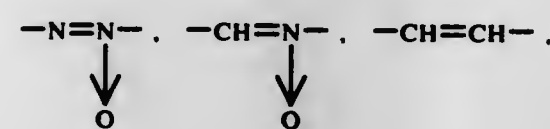


1. Process for sealing a liquid crystal cell having two planar supports fixed at limited intervals by a spacer and having at least one opening for pouring into the cell a liquid crystal material which process comprises pouring said liquid crystal material through said opening into the cell and applying at least one cyanoacrylate compound to each said opening thereby forming instantaneously an insoluble cured film on the boundary between the liquid crystal layer and the sealed

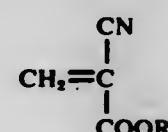
layer, said liquid crystal material consisting essentially of at least one compound having the formula:



wherein X represents $-\text{CH}=\text{N}-$, $-\text{N}=\text{N}-$,



radicals, and Y_1 and Y_2 each independently represents halogen or $-\text{R}$, $-\text{OR}$, $-\text{COR}$, $-\text{CN}$, $-\text{OCOOR}$ or $-\text{OCOR}$ radicals wherein R is hydrogen or a hydrocarbon radical having from 1 to 4 carbon atoms, and said cyanoacrylate compound having the formula:



wherein R is a hydrocarbon radical having 1 to 5 carbons atoms, whereby an insoluble cured film seal is formed between the seal layer and the liquid crystal layer so that incorporation or effusion of impurities into the liquid crystal layer is prevented and the liquid crystal cell so formed has improved mesomorphic range, current density and life.

4,007,078

METHOD FOR CONTINUOUSLY SUPPLYING PLASTICS FILM STRIP FROM EXTRUDER HEAD

Seiji Aoki; Akira Kamiyama, both of 52, 2, 1-chome, Gamonishi, Koshigaya, and Kokichi Matsuda, 6-3-504, Takesato, 89, Oeda, Kasukabe, all of Japan

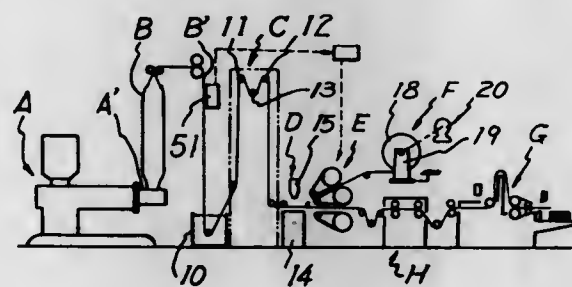
Filed Nov. 1, 1974, Ser. No. 520,214

Claims priority, application Japan, Nov. 1, 1973, 48-122173; Nov. 7, 1973, 48-124420

Int. Cl.² B31F 5/00; B29C 19/00

U.S. Cl. 156-159

1 Claim



1. A method of continuously supplying a film strip of a thermoplastic synthetic resin from an extruder, forming the strip, to a processing machine such as a printing machine, bag-making machine or packaging machine, said method comprising the steps of leading a film strip, supplied from the extruder during initial operation thereof and lacking a predetermined regular thickness and breadth, along a first passage for imperfect film strip, for winding thereof at a location adjacent but spaced from a processing machine; continuing winding of the initially extruded film strip until the wound

extruded film strip has such predetermined regular thickness and breadth and then interrupting such winding; reversely drawing the trailing end portion of a heat-weldable coupling film strip, previously supplied to the processing machine along a second perfect film strip passage and having such predetermined regular thickness and breadth, away from the processing machine to engage the newly extruded film strip at a heat sealing location upstream of the first passage; heat-sealing such trailing end portion of the coupling film strip to the newly extruded film strip at the heat-sealing location; severing the newly extruded film strip between the heat-sealing location and the first passage; drawing the coupling film strip, joined to the newly extruded film strip having such predetermined regular thickness and breadth, toward the processing machine to continuously supply a film strip, having such predetermined regular thickness and breadth, to the processing machine; following an interruption of the operation of the extruder and the processing machine, restarting the method by reversely drawing the trailing end portion of the wound imperfect film strip away from the winding location to the heat-sealing location; leading a film strip, supplied from the extruder during initial restarted operation thereof and lacking a predetermined regular thickness and breadth, to the heat-sealing location; heat-sealing the trailing end portion of the previously wound imperfect film strip to the leading end portion of the newly extruded imperfect film strip at the heat-sealing location; severing the perfect film strip, previously supplied to the processing machine along the second perfect film strip passage, at a location between the heat-sealing location and the second perfect film strip passage; and then supplying the previously wound imperfect film strip joined to the newly extruded imperfect film strip, lacking such predetermined regular thickness and breadth, along the first passage, for imperfect film strip, for winding thereof at the winding location until the wound extruded film strip supplied from the re-started extruder has such predetermined regular thickness and breadth, and then performing the first-mentioned method steps.

4,007,079

EPOXY COMPOSITION AND ITS USE AS AN ADHESIVE

Richard J. Turley, Orange, and Alexandre Ozolins, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 28, 1975, Ser. No. 626,288

Int. Cl.² C08G 59/18

U.S. Cl. 156-330

16 Claims

1. A liquid, curable epoxy composition comprised of
a. an epoxy resin having more than one α -epoxy group in the molecule,
b. a curing agent for said resin, and
c. a chlorine-containing polyol having an average of 2-8 hydroxy groups which is comprised of the product of the acid-catalyzed condensation of a polyhydroxy initiator with 4,4-trichloro-1,2-epoxybutane or a mixture thereof with a halogen-free epoxide.

4,007,080

DEVICE FOR TRANSFERRING TIRE CARCASSES FROM A TIRE BUILD-UP STATION TO A FORMING STATION

Friedrich Klöpper, Barsinghausen, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Feb. 27, 1975, Ser. No. 553,823

Claims priority, application Germany, Feb. 28, 1974, 2409586

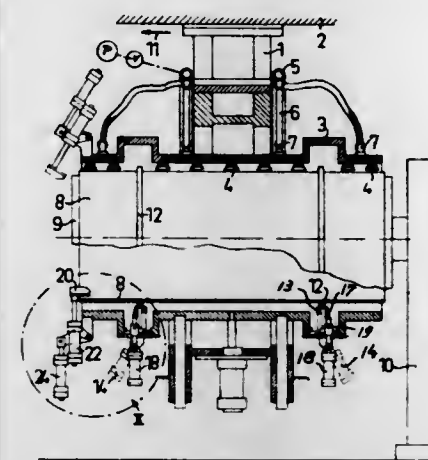
Int. Cl.² B29H 17/10

U.S. Cl. 156-396

10 Claims

1. A device for transferring a tire carcass having a substantially cylindrical outer surface and provided with bead core rings from a tire building-up station to a shape forming station,

the improvement in combination therewith which includes: annular holding means composed of segments and provided with suction cups adapted to be placed onto the outer substantially cylindrical surface of the carcass to be transferred for supporting said carcass, said holding means being variable in diameter and including supporting elements for the bead core rings of a carcass, carrier means carrying said holding means and operable to transfer said holding means from said tire



building-up station to said shape forming station, and curved segmental supporting means supported by said holding means for supporting at least one end portion of a carcass to be carried by said suction cup equipped holding means, said supporting elements for the bead core rings being formed by plier-shaped clamping jaws distributed uniformly over periphery of said holding means as well as abutment jaws provided therewith for supporting the bead core rings.

4,007,081

TIRE BUILDING APPARATUS

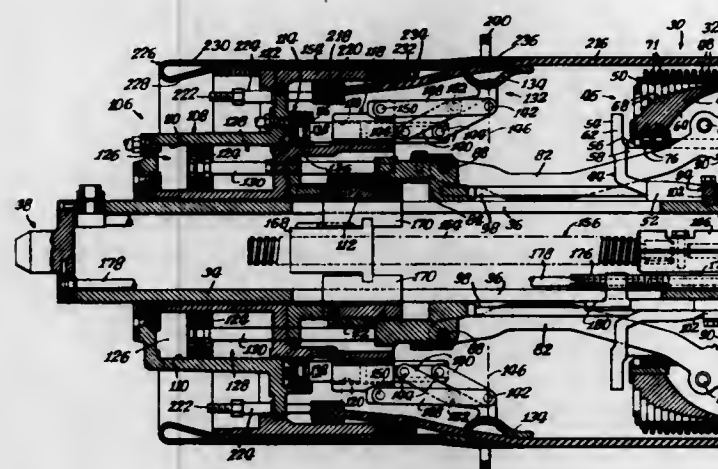
Edwin E. Mallory, Niles, Mich., assignor to National-Standard Company, Niles, Mich.

Filed Nov. 11, 1974, Ser. No. 522,484

Int. Cl.² B29H 17/26

U.S. Cl. 156-417

16 Claims



1. A tire building apparatus for building a complete tire in a single operation, the apparatus having an intermediate radially expandable drum, intermediate drum expanding and contracting means associated with the intermediate expandable drum to dispose the same in positions defining rigid supporting surfaces of different radii, and end drum assembly at each end of the intermediate drum, the intermediate drum and the end drum assemblies providing support of tire carcass material therearound, and the end drum assemblies having tire bead locating and supporting means for the beads of the tire carcass and ply turn up means, the combination including resilient expansion means as part of the intermediate drum expanding and contracting means for effecting at least a partial actuation of the intermediate drum expansion means, and

positive centering means for axially positioning the intermediate drum to maintain the center line of the tire carcass midway between the beads of the tire carcass.

4,007,082

KRAFT MILL RECOVERY SYSTEM

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

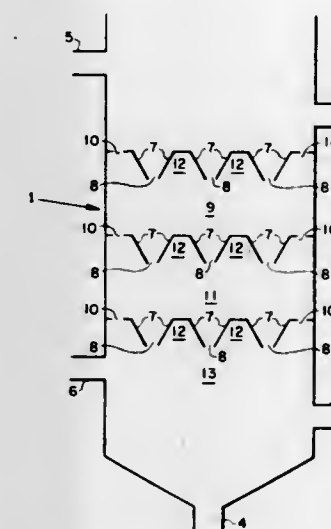
Filed Aug. 15, 1975, Ser. No. 605,094

The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.

Int. Cl.² D21C 11/04, 11/12

U.S. Cl. 162-30 K

9 Claims



1. In the process for the pulping of lignocellulosic material comprising the steps of looking the material with pulping liquor, evaporation of the pulping liquor, combustion of the pulping liquor and precipitation as precipitator catch of the solids that are admixed with the combustion gases, said precipitator catch containing sodium sulfate, sodium chloride, sodium carbonate and organic material, the process which comprises adding water to said precipitator catch to produce a flowable slurry thereof in a slurry tank, adding carbon dioxide to said slurry in an amount sufficient to convert said sodium carbonate to sodium bicarbonate, and separating said sodium chloride from said sodium sulfate and said sodium bicarbonate by passing said precipitator catch in a downward flow in a separatory column; countercurrently passing hot water upwardly through said column at a rate sufficient to effect washing of the downwardly flowing slurry; removing said sodium sulfate, sodium bicarbonate and organic material in the form of a slurry from the bottom of said separatory column.

4,007,083

METHOD FOR FORMING WET-LAID NON-WOVEN WEBS

Michael Ring, Warwick, N.Y.; Madhu P. Godsay, New Delhi, India; Roy S. Swenson, Central Valley, N.Y., and Joseph N. Kent, Lewisburg, Pa., assignors to International Paper Company, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,482

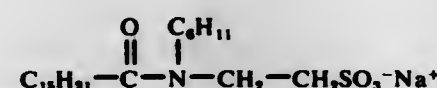
Int. Cl.² D21D 3/00

U.S. Cl. 162-101

15 Claims

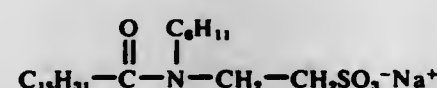
1. The method of uniformly dispersing selected non-fibrillated fibers in a substantially binder free aqueous medium, a majority of the fibers being man made nonfibrillatable hydrophobic fibers of not less than about $\frac{1}{4}$ inch in length and with a length to diameter ratio of between about 400:1 to about 700:1 including the steps of combining: water, a sufficient amount of the selected fibers for a dispersion having a fiber consistency of between about 0.35% to about 2% based on the bone dry weight of the fibers, and between about 0.007% to

about 0.03% by weight of a wetting agent consisting of a selected combination of alkylaryl polyether alcohol (octylphenol series) and N-cyclohexyl-N-Palmitoyl-Taurine having the formula



in a container to reduce the surface tension of the water to between about 30-35 dynes, and vigorously agitating the mixture in the container in the presence of air to create the tumbling vortex-free water surface conditions without the generation of any substantial amount of surface foam, thereby generating a steady state water/air emulsion in which the fibers are uniformly dispersed and in which the volume of air does not exceed about 4% of the volume of the water.

5. The method of producing a textile-like nonwoven sheet material on a wet-laying web forming wire characterized by forming a uniform initial high fiber consistency dispersion in a water/air emulsion according to claim 1 and thereafter diluting the dispersion to a uniform fiber consistency of between about 0.006% to about 0.01% based on the bone dry weight of the fibers by mixing the initial dispersion with a steady state water/air dilution emulsion in which the volume of air does not exceed about 4% of the volume of the water; which emulsion has been created by reducing the surface tension of the dilution water to between about 30-35 dynes by the addition to it of between about 0.007% to about 0.03% by weight of a wetting agent consisting of a selected combination of alkylaryl polyether alcohol (octylphenol series) and N-cyclohexyl-N-Palmitoyl-Taurine having the formula



and by vigorously agitating the dilution water with this wetting agent in it in the presence of air to create the water/air dilution emulsion without the generation of any substantial amount of surface foam; and then draining the non-fiber portion of the diluted fiber dispersion through the web forming wire to form the material.

4,007,084

DRY STRENGTH PAPER AND PROCESS THEREFOR
Lock-Lim Chan, Whitby, and Arthur Herbert Guitard, Pickering, both of Canada, assignors to Borden Products Limited, West Hill, Canada

Filed June 25, 1975, Ser. No. 590,313
Int. Cl.² D21D 3/00

U.S. Cl. 162-167

15 Claims

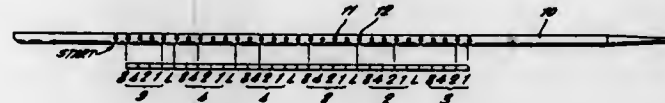
1. A process for the manufacture of paper of improved dry strength and negligible wet strength comprising forming an aqueous suspension of fibrous cellulosic material containing a polymeric reaction product of a ketone, aldehyde and a polyamine in sufficient amount to impart the desired dry strength to the paper; the mol ratios of the reactants being from 1.8 to 4 mols of the aldehyde and from 0.1 to 1 mol of the amine per mol of the ketone; and the reaction to form the product is carried out at pH of 8 to 10.

4,007,085
NUCLEAR REACTOR FUEL ELEMENTS
Albert Woodacre, Blackpool, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Jan. 20, 1975, Ser. No. 542,512
Claims priority, application United Kingdom, Jan. 21, 1974, 2753/74

Int. Cl.² G21C 3/10

U.S. Cl. 176-80

4 Claims



1. An elongated insert for a nuclear reactor fuel element whereby the fuel element may be individually identified, the elongated insert bearing a first array of markings at positions spaced along the length of said insert to produce a series of signals on presentation of the elongated insert to a detector responsive to each marking, each marking of said first array being located at a position spaced lengthwise of said insert from other markings of said first array, and a second array of markings at positions spaced along the length of said insert to vary the series of signals produced by the first array of markings on presentation to the detector, the marking of said second array being located at only some of the positions of said first array of markings.

4,007,086

INTERFERON INDUCTION

Ramon D. Hamilton, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 23, 1975, Ser. No. 543,508

Int. Cl.² C12K 9/00; B01J 1/10; A61K 45/02

U.S. Cl. 195-1.8

22 Claims

1. In the method of producing interferon in vitro which consists of inducing interferon-producing human or animal cells with an inducing-effective amount of a non-viral interferon inducer, the improvement comprising irradiating the cells with from about 50 ergs/mm² to about 2500 ergs/mm² of ultraviolet irradiation applied at a point in time during the time span of from 8 hours prior to until about 4 hours subsequent to, including concurrent with, the addition of the non-viral interferon inducer.

4,007,087

SPERM FRACTIONATION AND STORAGE

Ronald J. Ericsson, Sausalito, Calif., assignor to Gametrics Limited, Sausalito, Calif.

Filed Oct. 17, 1975, Ser. No. 623,543

Int. Cl.² C12K 9/00; A61K 35/52

U.S. Cl. 195-1.8

13 Claims

1. A process for reducing the motile sperm losses resulting from the storage of motile-sperm containing semen in a frozen state prior to use for artificial insemination purposes, which comprises (a) separating the motile sperm from the other components of the semen prior to freezing by (i) maintaining at least the sperm portion of the semen, as such or suspended in an aqueous suspending vehicle which is physiologically acceptable to the sperm and which does not substantially retard the downward migration rate of motile sperm, as an upper layer in interfacial contact, at a temperature at which the motile sperm are motile, with a lower discrete layer of an aqueous contacting medium which is physiologically acceptable to the sperm and in which the motile sperm migrate downwardly at a slower rate than in the upper layer, until at least a portion of the motile sperm of the separated sperm have migrated downwardly into the contacting medium, thereby producing a sperm fraction having a higher proportion of motile sperm than in the starting sperm, and (ii) thereafter separating the contacting medium, containing the motile

sperm enhanced fraction of the starting sperm, from the upper layer; and (b) storing the separated motile sperm fraction in a frozen state.

4,007,088

PROCESS OF MANUFACTURING NATIVE MICROBIAL PROTEIN WITH A LOW CONTENT OF NUCLEIC ACIDS
Zdenek Fencel, Frantisek Machek, and Vladimir Sillinger, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia
Continuation-in-part of Ser. No. 369,984, June 14, 1973, abandoned. This application Aug. 8, 1975, Ser. No. 603,153
Claims priority, application Czechoslovakia, June 14, 1972, 4170/72

Int. Cl.² C12D 13/06

U.S. Cl. 195-4

3 Claims

1. A process for producing native microbial protein from single-cell microbial cells having a content of nucleic acids lower than 1% and useful as food or feed, which comprises the steps of:

- disrupting microbial cells to release the nuclease contained therein and forming thereafter a homogenate having disrupted cells and nuclease;
- adjusting the pH value of the said homogenate to 5.9-8.0 and maintaining the temperature at 50°-60°C for 20 minutes-2.5 hours in order to permit the degradation of nucleic acids by means of the nucleases contained in the homogenate;
- precipitating protein material from the microbial homogenate by adjusting the pH value to the isoelectric point of the protein material;
- separating the precipitated protein material;
- drying the precipitated protein material;
- extracting the precipitated and dried protein material with alcohol to remove lipid substances; and
- drying again said extracted protein material.

4,007,089

METHOD FOR BINDING BIOLOGICALLY ACTIVE COMPOUNDS

Nathan L. Smith, III, Miami, Fla., assignor to Nelson Research & Development Company, Irvine, Calif.

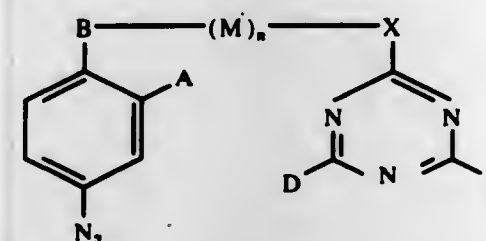
Filed Apr. 30, 1975, Ser. No. 573,363

Int. Cl.² C07G 7/02, 7/00

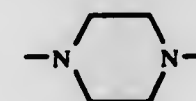
U.S. Cl. 195-68

7 Claims

1. A method for binding biologically active compounds to carriers comprising reacting an asymmetric bifunctional linking compound having the structural formula



wherein B is selected from the group consisting of NR, O, S,



and CH₂; (M)_n is a saturated or unsaturated hydrocarbon chain; X is selected from the group consisting of N, R, O and S; A is selected from the group consisting of SO₂R, CN, NO₂ and H; Y is selected from the group consisting of N₂, halogen and SH, R is H or a lower alkyl group, D is N₂ or halogen and n is 1-12, with a carrier in the presence of light to form a carrier bound to the linking compound through the phenyl

4,007,090

NOVEL FERMENTATION PROCESS FOR THE PREPARATION OF SULFOMYCIN

Louis Chalet, Springfield, N.J.; Sebastian Hernandez, Madrid, Spain, and Sheldon B. Zimmerman, Springfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 2, 1976, Ser. No. 673,039

Int. Cl.² C12D 9/00

U.S. Cl. 195-80 R

9 Claims

1. A process for the preparation of Sulfomycin I which comprises fermenting with a Sulfomycin I producing strain of Streptomyces cineroviridis, NRRI 8155 and mutants thereof an aqueous nutrient medium containing an assimilable source of carbon, an assimilable source of nitrogen and inorganic salts under aerobic conditions.

4,007,091

METHOD FOR MEASURING THE ACTIVITY OF LECITHIN CHOLESTEROL ACYL TRANSFERASE AND LECITHIN SUBSTRATE SOLUTION USEFUL THEREFOR
Toshihide Nagasaki, Takarazuka; Masaharu Takayama, Osaka; Akiyoshi Uesugi, Toyonaka; Isao Tanimizu, Ibaraki, and Kazuto Shintani, Toyonaka, all of Japan, assignors to Nippon Shoji Kaisha, Limited, Osaka, Japan

Filed Apr. 29, 1976, Ser. No. 681,410

Claims priority, application Japan, May 2, 1975, 50-53655

Int. Cl.² G01N 31/14

U.S. Cl. 195-99

10 Claims

1. A method for measuring the activity of lecithin cholesterol acyl transferase, which comprises adding a test sample to a lecithin substrate solution containing a lecithin and a non-ionic surfactant, incubating the mixture and then measuring the changed amount of the free cholesterol in the reaction system by an optical analysis.

4,007,092

PROCESS FOR PRODUCING LOW SULFUR COKE

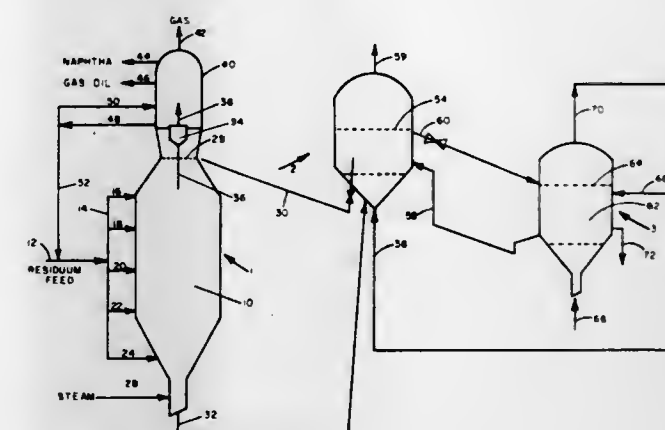
William J. Metralier, and Walter Weissman, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 18, 1975, Ser. No. 559,588

Int. Cl.² C10B 55/10

U.S. Cl. 201-17

8 Claims



1. In an integrated coking and gasification process for the production of a low sulfur coke comprising the steps of: reacting a carbonaceous material containing sulfur contaminants, said carbonaceous material having a Conradson carbon content of at least 5 weight percent in a coking zone containing a bed of fluidized solids maintained at a temperature ranging from about 850° to about 1250° F. to

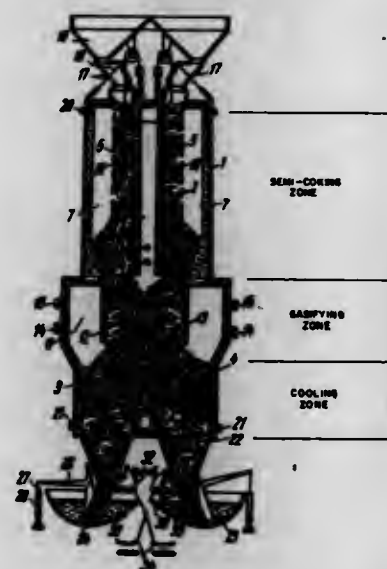
form coke containing sulfur contaminants, said coke depositing on said fluidized solids; introducing a portion of said solids with the coke deposition thereon into a heating zone operated at a temperature greater than said coking zone temperature to heat said portion of solids; recycling a first portion of heated solids from said heating zone to said coking zone and introducing a second portion of said heated solids to a fluid bed gasification zone maintained at a temperature of at least 1600° F., and passing a stream of solids from said gasification zone to said heating zone, the improvement which comprises: controlling the rate of circulation of said solids between each of said zones such as to maintain the thickness of a shell of deposited coke, subjected to treatment within the gasification zone in a single cycle, ranging at the time of exit from the gasification zone to a thickness not greater than 10 microns, while introducing steam into the lower portion of said fluidized bed gasification zone to produce a hydrogen-containing gas and introducing an oxygen-containing gas into the upper portion of said fluid bed gasification zone to convert at least a portion of said hydrogen to steam and thereby produce at least a portion of the heat requirements of said process and recovering a partially desulfurized coke.

4,007,093

FURNACE FOR THERMAL PROCESSING OF LUMP SOLID FUEL

Svyatoslav Kirillovich Dollov, ulitsa Kalevi, 23, kv. 25; Viktor Mikhailovich Efimov, ulitsa Vyidu, 4, kv. 5; Rikhard Eduardovich Ioonas, ulitsa Ametijukhingu, 7, kv. 25; Nikolai Andreevich Nazinin, ulitsa Vyidu, 12, kv. 30; Enn Edgarovich Pliik, Narvskoe shosse, 53, kv. 2, all of Estonskaya SSR, Kokhtla-Yarve; Khans Eduardovich Raad, ulitsa Hyukogude, 42, kv. 24, Estonskaya SSR, Kivlyli; Ivar Kharaldovich Roos, ulitsa Komsomoli, 27, kv. 24; Nikolai Dmitrievich Serebryannikov, ulitsa Lauristini, 5, kv. 17, both of Estonskaya SSR, Kokhtla-Yarve; Jury Vasilievich Shaganov, ulitsa Soo, 13, kv. 10, Estonskaya SSR, Kivlyli; Leonid Semenovitch Alaniev, ulitsa Komsomoli, 15, kv. 12, and Alexei Sergeevich Volkov, ulitsa Ala, 7, kv. 5, both of Estonskaya SSR, Kokhtla-Yarve, all of U.S.S.R.

Filed Apr. 30, 1975, Ser. No. 573,009

Int. Cl.² C10B 35/00, 39/04, 49/06; C10J 3/72
U.S. Cl. 202—121 15 Claims

1. A furnace for thermal processing of solid fuel, comprising: a generally hollow body, a first chamber portion located generally at the top of said body and defining a semicoking zone and including at least one gas distillation chamber, a second chamber portion located generally in the lower region of said body and defining a cooling zone, and a third chamber

portion generally intermediate said first and second chamber portions and defining a gasifying zone; gas feeding chambers within said body adapted for feeding gas into said semicoking and gasifying zones; a vapor-gas mixture chamber within said body adapted to discharge vapor-gas mixture from said gas distillation chamber; a loading device for charging solid fuel into said first chamber portion of said body; and an unloading device for discharging the solid waste material from said second chamber portion of said body, said unloading device comprising hopper means below said second chamber portion, water seal means for said hopper means, said water seal means having a bottom surface portion, pusher means located above said bottom surface portion of said water seal means and mounted thereto for at least partial movements along said bottom surface portion for advancing waste materials discharged by said hopper means into said water seal means to a discharging zone of said water seal means, first means for operating said pusher means, shovel means disposed generally in said discharging zone, and second means for moving said shovel means so that it shovels the waste material off said bottom surface portion of said water seal means, said pusher means and shovel means being arranged so that said pusher means is generally in its operative mode when said shovel means is generally in its idle condition.

4,007,094

PROCESS AND APPARATUS FOR RECOVERING CLEAN WATER FROM AQUEOUS WASTES

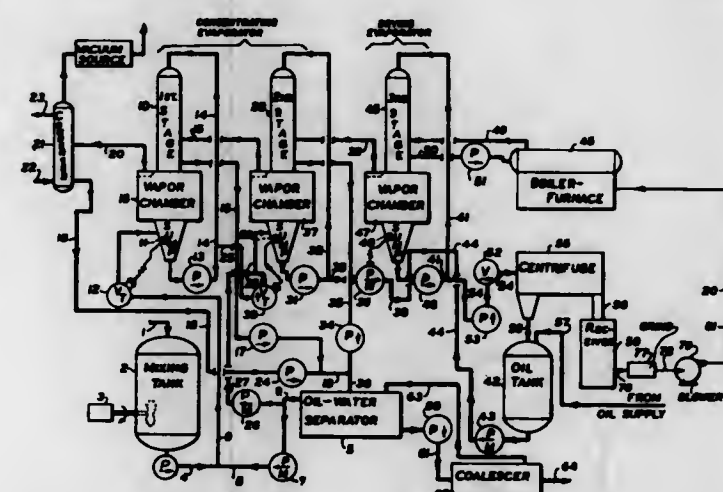
Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Hanover Research Corporation, East Hanover, N.J. Continuation-in-part of Ser. No. 165,070, July 22, 1971, Pat. No. 3,947,327. This application Dec. 15, 1975, Ser. No. 640,712

The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.

Int. Cl.² B01D 1/26, 3/34, 3/02

U.S. Cl. 202—174

3 Claims



1. An apparatus for recovering clean water from aqueous wastes, said apparatus comprising (1) a tank adapted to receive a stream of said aqueous wastes, (2) an evaporator, (3) a conduit extending from said tank to the evaporating region of said evaporator where through may flow a stream of aqueous wastes from said tank, (4) an oil-water separator, (5) means for transmitting volatile oil from said oil-water separator to said conduit extending from said tank to said evaporator whereby a mixed stream of aqueous wastes and volatile oil may be conducted into the evaporating region of said evaporator, (6) a condenser, (7) a conduit extending from said evaporator to the condensing region of said condenser through which may flow a vapor of water and volatile oil formed as a result of evaporation of said mixture of aqueous wastes and volatile oil, (8) a conduit extending from said condenser to said oil-water separator where through may flow a liquid mixture of water and volatile oil formed as a result of condensa-

tion of said vapor of water and volatile oil, (9) evaporative means for dehydrating mixtures of concentrated aqueous wastes and volatile oil, (10) a conduit extending from said evaporator to said evaporative means where through may flow a mixed stream of concentrated aqueous wastes and volatile oil from said evaporator, and (11) a conduit extending from said evaporative means to the heating region of said evaporator through which may flow a vapor of water and volatile oil formed as a result of dehydration of said concentrated aqueous wastes and volatile oil mixture, said vapor of water and volatile oil supplying evaporative heat to said evaporator.

4,007,095

RECOVERY OF ANHYDROUS DIOXANE EXTRACTIVELY DISTILLED WITH DIOLS OR ALKANOLAMINE

Dieter Wolf, Gruenstadt; Eberhard Bender, and Theodor Weber, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany Filed May 2, 1974, Ser. No. 466,304

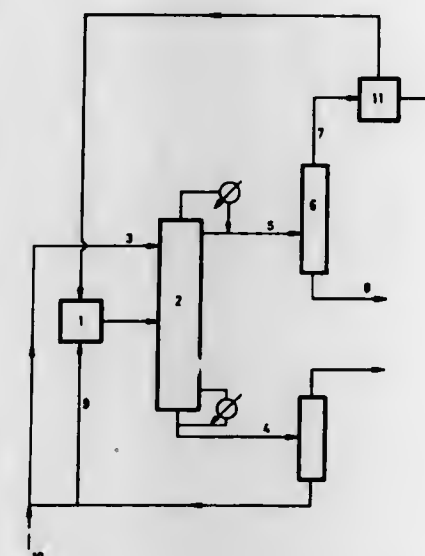
Claims priority, application Germany, May 5, 1973, 2322709

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B01D 3/00

U.S. Cl. 203—59

3 Claims



1. A process for the recovery of substantially anhydrous dioxane from a reaction mixture containing dioxane and minor amounts of water, 1-methyldioxolane and acetaldehyde as impurities which comprises feeding dioxane containing minor amounts of water, 1-methyldioxolane and acetaldehyde as impurities to the middle portion of an extractive distillation column, also feeding to the top of said column a solvent selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, propanetriol, propanediol, butanediol, a mono-lower alkanolamine, a di-lower alkanolamine, a tri-lower alkanolamine, and mixtures thereof at proportions of said solvent to dioxane in the range of 0.1:1 to 100:1, distilling off as overhead from said column substantially anhydrous dioxane plus the 1-methyldioxolane and acetaldehyde impurities, removing as bottoms from said column said solvent and most of the water impurity, and distilling said overhead to recover substantially pure dioxane.

4,007,096

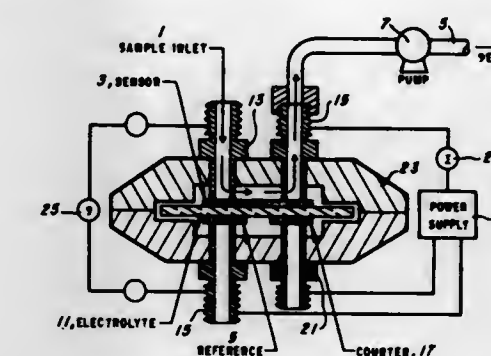
TRACE GAS DETECTION METHOD

Raymond J. Jasinski, and Isaac Trachtenberg, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 370,898, June 18, 1973, Pat. No. 3,909,384. This application May 1, 1975, Ser. No. 573,666 Int. Cl.² G01N 27/46

U.S. Cl. 204—1 T

10 Claims



1. A method of detecting the presence of gaseous NO₂ and more strongly oxidizing gases in a gaseous atmosphere including at least one gas taken from the group consisting of CO, O₂, N₂, SO₂, NO and chemically compatible mixtures of these gases, said method comprising:

providing an electro-chemical gas sensing cell including a sensor formed of a doped chalcogenide glass consisting of about 60 mole percent selenium, 28 mole percent germanium, 12 mole percent antimony and containing as a dopant about 1% to about 4% by weight of iron, an electrolyte contacting a side of said sensor; and a reference electrode contacting said electrolyte, exposing the doped chalcogenide glass sensor on the side opposite to said electrolyte — contacting side to a sample of the gaseous atmosphere, and measuring the electrical signal developed by the cell in response to the exposure of the doped chalcogenide glass sensor to the gas sample.

4,007,097

PROCESS FOR SELECTIVELY APPLYING A METAL COATING TO THE METALLIC PARTS OF ELEMENTS WHICH PASS THROUGH AN INSULATOR

Francis X. Noz, Triesen, Switzerland, assignor to Galentan A.G., Zug, Switzerland

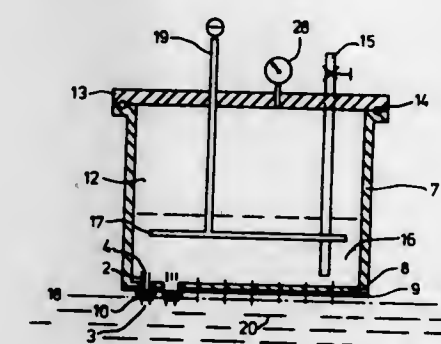
Filed Oct. 4, 1974, Ser. No. 512,398

Claims priority, application Switzerland, Oct. 4, 1973, 14213/70

Int. Cl.² C25D 5/02, 17/16

U.S. Cl. 204—15

1 Claim



1. A process for selectively applying a coating of a precious metal such as gold, to the metal parts of electrical components of a type having a housing in which electrical connectors have ends protruding through the sides thereof, comprising the steps of:

arranging said components in a fluid-tight fashion in apertures of an electrically insulating template in a manner such that the parts to be coated project on one side, and the parts not to be coated on the other side of the template, said template comprising the wall of a container and the parts not to be coated project inwardly of said container and the parts to be coated project exteriorly thereof, partially filling said container with a chemically inactive first electrolyte, rendering said container substantially air tight, evacuating sufficient air from said container to produce a vacuum to hold said connectors to said template while said container is in a first position such that the first electrolyte is not in contact with said connectors, inverting said container to a second position to bring the first electrolyte inside said container into contact with said parts of said connectors not to be coated, immersing the parts to be coated at least partially in a second electrolyte of the coating material which is electrically joined to an electrode to be connected to a current source, and connecting a second electrode of said current source to said first electrolyte.

4,007,098

BATHS AND ADDITIVES FOR THE ELECTRODEPOSITION OF BRIGHT ZINC

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Filed Sept. 4, 1975, Ser. No. 610,251

Int. Cl.² C25D 3/22

U.S. Cl. 204—55 R

43 Claims

1. A zinc brightener additive comprising: from about 99 percent to about 1 percent by weight by a linear aliphatic amine polymer prepared by reacting at a temperature of from about 110° F to about 220° F from about 50 percent to about 150 percent of a stoichiometric amount of an epihalohydrin selected from the group consisting of epichlorohydrin and epibromohydrin and a linear aliphatic polyamine selected from the group consisting of a compound having at least two primary amine groups, two secondary amine groups, or one primary and one secondary amine group, said amine groups separated by two through six methylene groups or alkyl substituted methylene groups, and including from about 1 to about 99 percent by weight of an ethylene oxide condensation product, said product resulting from condensing about 6 to about 30 moles of ethylene oxide with 1 mole of a compound selected from the group consisting of a long chain fatty alcohol, a long chain fatty amine, a long chain fatty acid, a long chain alkyl phenol, wherein said long chains contain from 6 to about 30 carbon atoms, and naphthol.

15. An aqueous, acid zinc electroplating bath for producing a bright electrodeposit of zinc, containing zinc ions, comprising:

having dissolved therein from about 0.5 to 10 grams/liter of an aliphatic amine polymer prepared by reacting from about 50 percent to about 150 percent of a stoichiometric amount of an epihalohydrin selected from the group consisting of epichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the group consisting of a compound having at least two primary amine groups, two secondary amine groups, or one primary and one secondary amine group, said amine groups separated by two through six methylene groups or alkyl substituted methylene groups, including from about 1 to about 10 grams/liter of an ethylene oxide condensate product, said ethylene oxide condensation product is formed by condensing at least 6 to about 30 moles of ethylene oxide with 1 mole of a compound selected from the group consisting of a long chain fatty alcohol, a long chain fatty

amine, a long chain fatty acid, a long chain alkyl phenol, wherein said long chains have from 6 to about 30 carbon atoms, and naphthol.

4,007,099

CATHODIC PRODUCTION OF MICROPORES IN CHROMIUM

Sidney H. L. Wu, Warrensville Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed Oct. 8, 1975, Ser. No. 620,511

Int. Cl.² C25D 5/48

U.S. Cl. 204—140

10 Claims

1. A method for the production of micropores in a chromium plate layer from about 0.002 to 0.10 mil thick on a substrate layer, said method comprising

- immersing said chromium plate layer as a cathode in an electric cell with a non-reactive anode, the electrolyte solution in said cell being an acidic aqueous solution having a pH at least high enough to avoid stripping said chromium plate from said substrate but no greater than 6.0 and containing from 0.5 to 390 grams per liter of hexavalent chromium in a combined state with oxygen and from about 1.5 to about 240 gram-millimoles per gram of hexavalent chromium of oxygen-containing ions of an element selected from the group consisting of sulfur, selenium and tellurium, said electrolyte being maintained in the temperature range of 68° to 195° F.; and
- introducing current into said cell at the rate of from at least about 0.3 to no greater than 4.5 amperes per square foot of said chromium plate layer exposed to said electrolyte solution for a time period of at least 3 seconds, whereby in said chromium plate layer there are produced micropores in a density of at least 50,000 micropores per square inch as determined by the Dubpernell Test.

4,007,100

PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

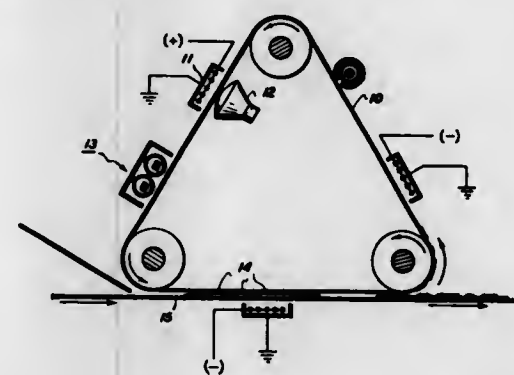
Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,295

Int. Cl.² B01J 1/10; G03G 5/04

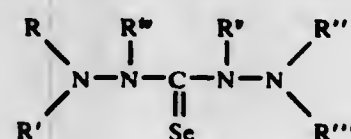
U.S. Cl. 204—158 R

1 Claim



1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:

a. forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein R, R', R'', R''', R^a and R^b are independently selected from hydrogen, alkyl of 1 - 10 carbon atoms, phenyl, substituted phenyl, benzyl and substituted benzyl; and subjecting said polymeric composition to sufficient energy to decompose said selenium compound whereby elemental selenium is deposited within the organic polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

4,007,101

PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

Joseph Y. C. Chu, Fairport, and Wolfgang H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,602

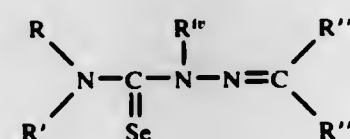
Int. Cl.² B01J 1/10

U.S. Cl. 204—158 R

1 Claim

1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:

- forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein

R, R', R'', R''', R^a and R^b are independently selected from hydrogen, alkyl of 1 - 10 carbon atoms, phenyl, substituted phenyl, benzyl, and substituted benzyl; and

- subjecting said polymeric composition to sufficient energy to decompose said selenium compound; whereby elemental selenium is deposited in the organic polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

4,007,102

ELECTROCOATING ALUMINUM SHEET OR STRIP

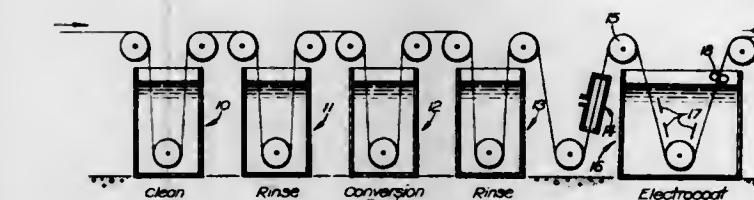
Willard J. Springer, Livermore, and Bruce A. Baker, Jr., Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 431,853, Jan. 9, 1974, Pat. No. 3,864,230. This application Dec. 12, 1974, Ser. No. 532,116

Int. Cl.² C25D 13/16, 13/20

U.S. Cl. 204—181

5 Claims



1. In the method of coating continuous lengths of aluminum sheet or strip which can be subjected to severe deformation in subsequent fabrication steps wherein said sheet or strip is cleaned, treated to form thereon a chemical conversion coating, coated with a primer coat and then coated with a top coat, the improvement comprising forming said chemical conversion coating by treating said sheet or strip for not more than 30 seconds with an acidic aqueous solution containing hexavalent chromium, phosphate and fluoride so as to form thereon from about 10-100 Mg/ft² (108-1080 Mg/m²) of a chromium phosphate conversion coating, applying the primer coat by

electrocoating a water-based polyelectrolyte resin onto the sheet or strip, applying the top coat in a suitable fashion onto the electrocoated resin and then curing both the electrocoated resin primer coat and the top coat in a single curing step.

4,007,103

PLANARIZING INSULATIVE LAYERS BY RESPUTTERING

Theodore Harris Baker, Wappingers Falls; Majid Ghafghaichi, Poughkeepsie; Richard Charles Stevens, Poughkeepsie, and Hans Wimpfheimer, Poughkeepsie, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

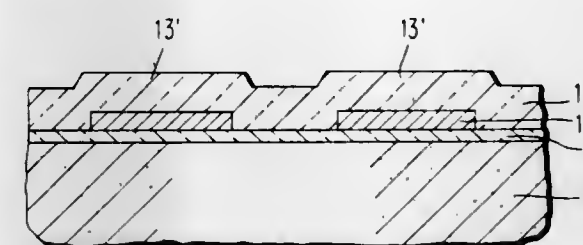
Filed Oct. 14, 1975, Ser. No. 621,899

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.² C23C 15/00

U.S. Cl. 204—192

10 Claims



1. A method of forming a planar electrically insulative layer over a non-planar integrated circuit substrate having raised portions comprising

- forming a plurality of recesses in a silicon substrate, forming over said substrate, an electrically insulative layer whereby said layer has elevations corresponding to the underlying unrecessed portions of said substrate, forming on said electrically insulative layer a masking layer of photoresist material having at least one opening therethrough coincident with an elevation in said insulative layer, said opening having smaller lateral dimensions than said coincident elevation,
- etching to planarize the portion of said elevation exposed in said opening to the level of the unelevated portions of said insulative layer,
- removing said masking layer, and
- resputtering said deposited insulative layer for a period of time sufficient to planarize the remainder of said etched elevation to the level of the unelevated portions of said insulative layer.

4,007,104

MESA FABRICATION PROCESS

John Gilbert Summers, Crowborough; Michael John Josh, Reigate, and Mildred Avis Ayling, Salfords, all of England, assignors to U.S. Philips Corporation, NY, N.Y.

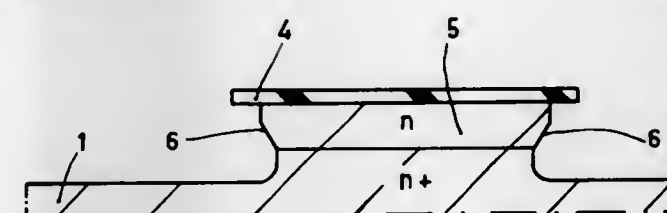
Filed Oct. 22, 1975, Ser. No. 624,724

Claims priority, application United Kingdom, Oct. 29, 1974, 46726/74

Int. Cl.² C23C 15/00

U.S. Cl. 204—192

7 Claims



1. A method of manufacturing a semiconductor device comprising:

- providing a semiconductor layer of one conductivity type on a semiconductor body portion of the same conductivity type but higher conductivity,

- b. forming an etch-masking layer on part of the semiconductor layer surface, and
- c. subjecting the semiconductor layer surface to an etching treatment in a gas plasma to etch through the semiconductor layer where exposed around said etch-masking layer and so leave a mesa portion of the semiconductor layer under said etch-masking layer and expose the part of said semiconductor body portion around said mesa portion, and, while using the etch-masking layer to mask the top of said mesa-portion, subjecting the exposed parts of said semiconductor body portion and said mesa portion to further etching which includes removing the material of said semiconductor body portion faster than that of said semiconductor layer to etch under said mesa portion of the semiconductor layer and cause the whole upper edge of said mesa portion to overhang the adjacent etched surface, the side of said mesa portion being bevelled by the further etching so that the area of the resulting mesa portion of the semiconductor layer increases from its interface with said semiconductor body portion.

4,007,105

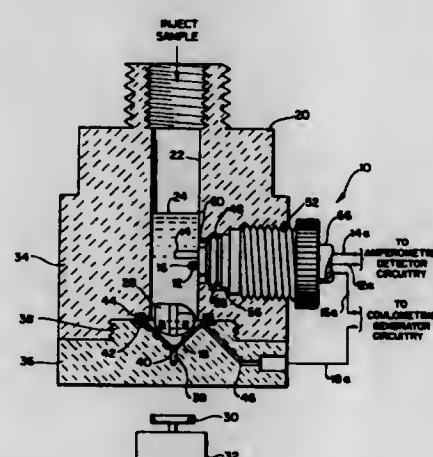
ELECTRODE MODULE FOR TITRATION APPARATUS
Edmund E. Buzza, Fullerton, and John E. Lillig, Diamond Bar, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 11, 1975, Ser. No. 595,207

Int. Cl.² G01N 27/44

U.S. Cl. 204—195 T

10 Claims



1. In titration apparatus of the type including an analysis cell having a chamber for receiving a sample to be analyzed, a coulometric generator anode and cathode electrode pair operative to generate ions combinable with a constituent of said sample, an amperometric detector anode and cathode electrode pair operative to detect the presence of uncombined ions after complete ionic combination of said constituent, the improvement comprising:

a bore communicating with said sample receiving chamber through a wall thereof;

an electrode module supporting said amperometric anode, said amperometric cathode, and said coulometric cathode in a fixed relationship, the electrodes of said electrode module being generally rod-shaped and having exposed lengths thereof disposed generally parallel to one another;

means for removably mounting said electrode module in an operative position within said bore with said exposed lengths of said electrodes communicating with said sample receiving chamber, said module being readily removable from said bore to facilitate cleaning of the electrodes thereof;

means for independently mounting said coulometric anode in operative position within said analysis cell; and wherein the exposed length of said amperometric cathode is longer than the exposed lengths of remaining ones of said electrodes to maximize collection of uncombined ions at said amperometric cathode.

4,007,106
DEVICE FOR MEASURING OXYGEN CONCENTRATION IN MOLTEN-METAL

Michel Hone, St. Placide, Canada, and Serge Houot, Lamber-sart, France, assignors to Canadian Patents and Development Limited, Ottawa, Canada

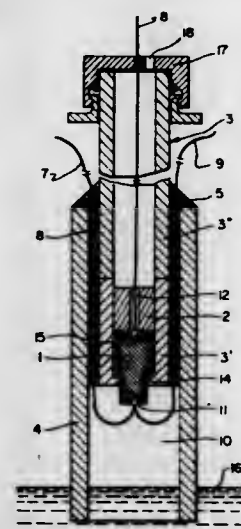
Continuation-in-part of Ser. No. 449,994, March 11, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 607,195

Claims priority, application Canada, June 22, 1973, 174777

Int. Cl.² G01N 27/46

U.S. Cl. 204—195 S

7 Claims



1. A probe for determining the concentration of oxygen in a molten metal comprising:
- a thermal shock resistant and electrical insulating tube having first and second ends;
 - a solid electrolyte loosely mounted at the second end of the tube to allow an inert gas injected into the first end of the tube to flow between the tube wall and the electrolyte, out of the second end of the tube, the tube and the electrolyte being adapted to fuse to form a gas tight seal when the probe is lowered into the molten metal;
 - cavity means located at the second end of the tube containing sufficient inert gas to prevent the actual contact between the electrolyte and the molten metal as the probe is lowered into the molten metal; and
 - a solid oxygen reference located within the tube in contact with the electrolyte and a pair of electrodes mounted across the electrolyte by which the emf across the electrolyte is detected.

4,007,107

ELECTROLYTIC ANODE

Harlan B. Johnson, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 18, 1974, Ser. No. 515,938

Int. Cl.² C25B 11/06, 11/10

U.S. Cl. 204—290 F

2 Claims

1. An electrode comprising:
- an electroconductive substrate; and
 - and electroconductive surface on said substrate consisting essentially of a congruently melting compound chosen from the group consisting of RuTi, RuV, Ru₂Zr, NbRu, RuTa, Mo₂Ru₃, W₂Ru₃, RuCr₃, Rh₂Ti, Rh₂V, Rh₂Zr, Rh₂Nb, Rh₂Ta, RhCr₃, OsTi, OsV, OsZr, Nb₂Os₂, Mo₂Os₂, Ta₂Os, WO₂, Cr₂Os, TiIr₃, VIr₃, ZrIr₃, Ir₂Nb, Mo₂Ir, TaIr₃, HfIrNi, Cr₂Ir, Mn₂Ir, Pt₂Ti, Pt₂V, Pt₂Zr, Pt₂Nb, Pt₂Mo, Pt₂Ta, PtCr₃, Re₂V, Re₂Zr, NbRe, MoRe, TaRe, WRe, Re₂Fe₃, CrRe, Mn₂Re₂, TiPd₃, Pd₂V, Pd₂Zr, PdTa, Pd₂Mn₂, and mixtures thereof.

4,007,108
CONVERTING SOLID FUELS TO GASEOUS AND LIQUID FUELS

Arnold Marcel Leas, P.O. Box 429, Columbia City, Ind. 46725

Filed June 2, 1975, Ser. No. 583,336

Int. Cl.² G10G 11/08

U.S. Cl. 208—10

13 Claims

1. A process for the production of liquid and gaseous fuels from coal which comprises
- admixing crushed coal with cobalt tetroxide catalyst;
 - introducing said mixture into a coal-oil extractor with hydrogen;
 - extracting liquids and gases from said coal while partially hydrogenating same at a temperature of from about 500° to about 900° F;
 - removing gaseous and vaporized liquids, desulfurizing and recovering as products;
 - removing the coal, oil and catalyst to a high pressure hydrogenator and hydrogenating the mixture at pressures of from about 500 to about 5,000 psig;
 - removing the hydrogenated oil, coal ash and catalyst to a coal reactor having upper middle, and lower zones;
 - admixing therewith hot sand, at a temperature of from about 800° to about 1,600° F;
 - cracking said oils in the upper zone of said coal reactor as the admixture flows downward through said coal reactor;
 - removing vaporized light oils to the coal-oil extractor;
 - reacting carbon-coated sand coal ash and catalyst in the middle zone of said coal reactor with a source of oxygen to gasify carbon to primarily carbon monoxide;
 - removing decarbonized ash and catalyst to a separator, separating and removing said ash from the system and returning said catalyst to the coal extractor;
 - feeding cobalt tetroxide and steam to the lower zone of the coal reactor, converting residual carbon and carbon monoxide to carbon dioxide;
 - removing said sand and cobalt from the lower zone to a separator, regenerating cobalt metal with air, and returning said sand and cobalt tetroxide to the coal reactor in a cyclic, continuous process;
 - removing hot producer gas from the middle zone of the reactor, desulfurizing and recovering as product.

4,007,109
COMBINED DESULFURIZATION AND HYDROCONVERSION WITH ALKALI METAL OXIDES

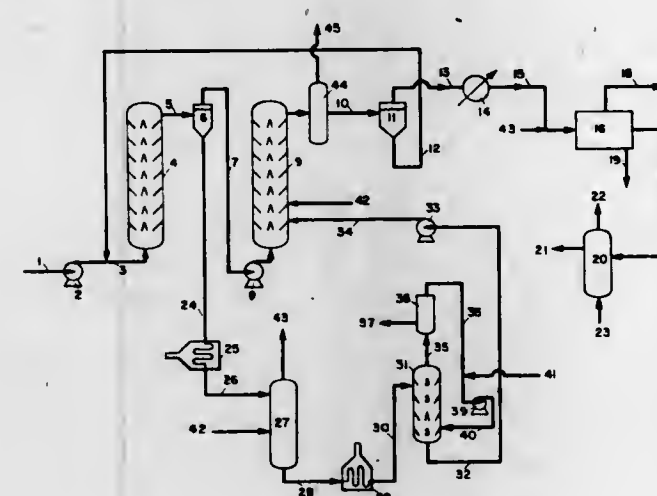
William C. Baird, Jr., and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,911

Int. Cl.² C10G 13/06; B01J 27/04

U.S. Cl. 208—108

12 Claims



1. A process for the combined desulfurization and hydroconversion of a sulfur-containing heavy hydrocarbon feed-

back containing at least about 10 weight percent materials boiling above about 1,050° F, which comprises contacting said hydrocarbon feedstock, while in the liquid phase, with an alkali metal oxide in a conversion zone, in the presence of sufficient added hydrogen to produce a hydrogen pressure of from about 1,000 to 5,000 psig, said conversion zone being maintained at elevated temperatures ranging from about 750° to 2,000° F, so that the sulfur content of said heavy hydrocarbon feedstock is substantially reduced and said hydrocarbon feedstock is simultaneously subjected to hydroconversion such that the 1,050° F+ fraction thereof is converted to lower-boiling products.

4,007,110

RESIDUA DESULFURIZATION WITH SODIUM OXIDE AND HYDROGEN

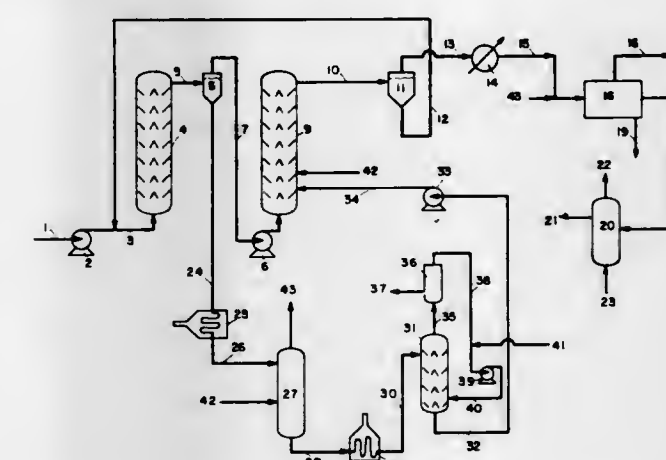
Roby Bearden, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,917

Int. Cl.² C10G 13/06; B01J 27/04

U.S. Cl. 208—108

12 Claims



1. A process for desulfurizing a sulfur-containing heavy hydrocarbon feedstock containing at least about 10 weight % materials boiling above about 1050° F, which comprises contacting said hydrocarbon feedstock, substantially in a liquid phase, with sodium oxide in a conversion zone, in the presence of hydrogen maintained at a pressure of between about 50 and 1000 psig, so that the sulfur content of said heavy hydrocarbon feedstock is substantially reduced.

4,007,111

RESIDUA DESULFURIZATION AND HYDROCONVERSION WITH SODAMIDE AND HYDROGEN

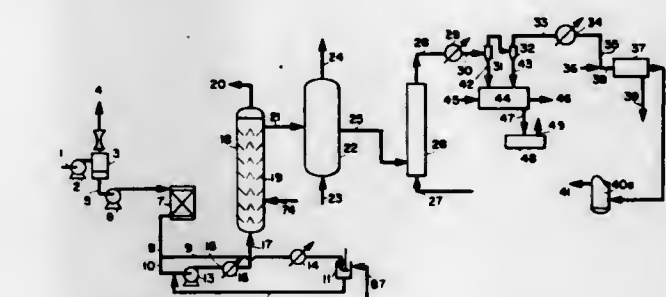
William Chalmers Baird, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,946

Int. Cl.² C10G 13/06; B01J 27/04

U.S. Cl. 208—108

19 Claims



1. A process for the simultaneous desulfurization and hydroconversion of a sulfur-containing petroleum oil feedstock, which comprises contacting said feedstock with sodamide in a

reaction zone, in the presence of added hydrogen, said feed-stock being maintained substantially in the liquid phase, to form an oil phase having a reduced sulfur and metals content, and reduced Conradson carbon content, and a salt phase.

4,007,112

METHOD OF CONTROLLING A DISTILLATION COLUMN FOR TOPPING CRUDE PETROLEUM

Guy Benker, Melun; Bernard Louvel, Versailles; Dominique Tauszig, St Foy les Lyon, and Bernard Vourron, Oullins, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activites Petrolieres Elf, Paris, France

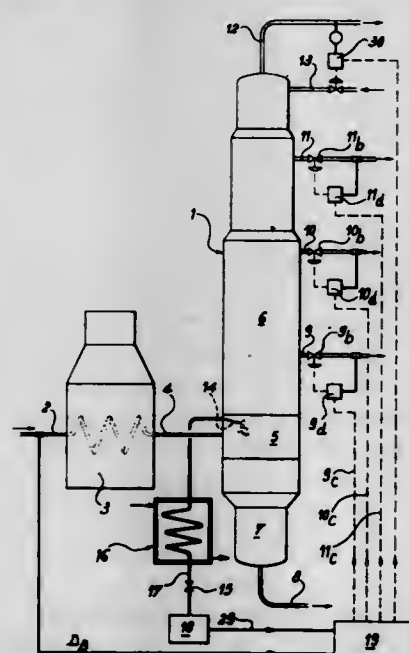
Filed May 27, 1975, Ser. No. 581,346

Claims priority, application France, May 30, 1974, 74.18869

Int. Cl.² B01D 3/42; C10G 7/00

U.S. Cl. 208—350

3 Claims



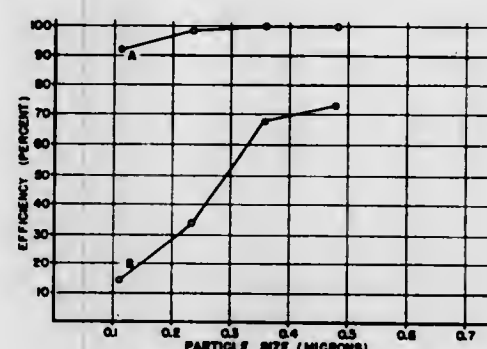
1. A method of controlling a distillation column having expansion and distillation zones for topping crude petroleum comprising introducing the crude petroleum into the expansion zone of the column to obtain a vaporized fraction having a known yield,

withdrawing a representative sample of the vaporized fraction from said expansion zone of said column, subjecting said sample to chromatographic analysis to obtain an output signal for determining the TBP distillation curve in which the hold-up time is in linear relation with the distillation temperature of each product in the analyzed fraction,

integrating the output signals supplied by the analysis to provide as a function of the temperature the value of the quantity of product analyzed,

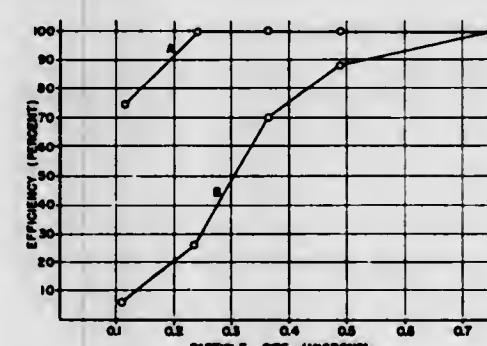
and using the information provided by said analysis for operating a control unit for generating signals for adjusting the rates of withdrawal of products at different predetermined levels of the distillation zone.

4,007,113
PARTICULATE FILTER MEDIUM AND PROCESS
Eugene A. Ostreicher, Farmington, Conn., assignor to AMF Incorporated, White Plains, N.Y.
Continuation-in-part of Ser. No. 358,822, May 9, 1973, abandoned. This application July 22, 1975, Ser. No. 598,097
Int. Cl.² B01D 13/00
U.S. Cl. 210—23 R 5 Claims



1. An improved filter medium consisting essentially of a matrix of self-bonding fibers, and diatomaceous earth, the surface of which is modified with melamine-formaldehyde cationic colloid.

4,007,114
FIBROUS FILTER MEDIUM AND PROCESS
Eugene A. Ostreicher, Farmington, Conn., assignor to AMF Incorporated, White Plains, N.Y.
Continuation-in-part of Ser. No. 358,822, May 9, 1973, abandoned. This application July 22, 1975, Ser. No. 597,931
Int. Cl.² B01D 13/00
U.S. Cl. 210—23 R 3 Claims



1. An improved filter medium of enhanced electrokinetic capture potential for contaminated liquids comprising suspended electronegative particles of about 0.1 to 0.7 micron diameter, said filter medium consisting essentially of

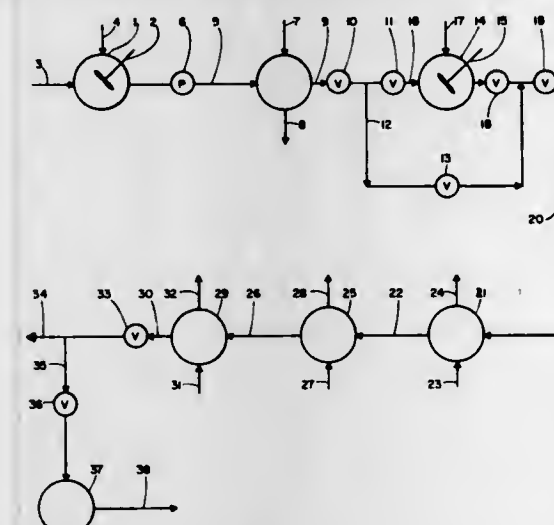
1. high surface area electronegative microfibers, the electric (zeta) potential of the surface of which is modified with melamine-formaldehyde cationic colloid; and
2. a matrix of self-bonding fibers.

4,007,115
PROCESS FOR TREATING SPENT MONENSIC ACID ANTIBIOTIC FERMENTATION BROTH CONTAINING RELATIVELY HIGH CONCENTRATIONS OF FATTY AND PROTEINACEOUS RESIDUES
Robert H. L. Howe, West Lafayette, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Continuation-in-part of Ser. No. 460,642, April 12, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,085
Int. Cl.² B01D 15/04
U.S. Cl. 210—27 7 Claims

1. A process for treating spent monensic acid antibiotic fermentation broth containing concentrations of from about 0.3 to about 12 percent fat and residues thereof and from

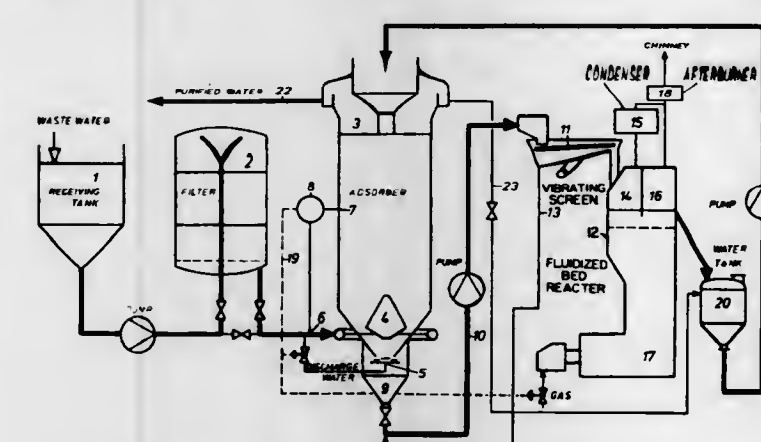
about 1.5 to about 9.5 percent protein and residues thereof comprising:

- acidifying the spent antibiotic fermentation broth to a pH of from about 3.0 to about 5.0;
- passing the acidified broth from step a) through a coalescing strainer wherein coalesced fat particles resulting from said acidification are impinged on a plate or screen disposed in such strainer, and removed from said broth;
- basifying the broth discharged from the coalescing strainer of step b) to a pH of from about 8.0 to about 9.0;



- passing the basified broth of step c) through a filtering means to remove coalesced protein materials formed in step c);
- passing the filtrate from the filtering means of step d) through an anion exchange column to remove the residual fatty materials from such filtrate; and
- passing the effluent from the anion exchange column of step e) through a cation exchange column to remove the residual proteinaceous material from such effluent.

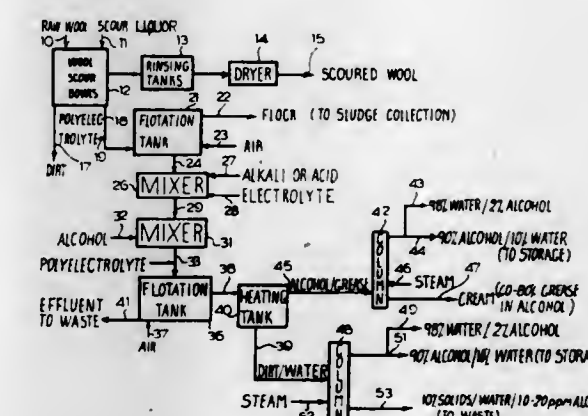
4,007,116
PROCESS FOR THE PURIFICATION OF WASTE WATERS WITH ACTIVATED CARBON
Günther Gappa, Gelsenkirchen-Buer; Harald Juntgen, Essen; Jürgen Klein, Essen, and Jürgen Reichenberger, Essen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany
Filed July 23, 1975, Ser. No. 598,385
Claims priority, application Germany, July 31, 1974, 2436792
Int. Cl.² B01D 15/00
U.S. Cl. 210—33 12 Claims



- A process for the purification of waste water containing dissolved organic carbon contaminants which comprises
- passing the waste water upwardly through a column of activated carbon particles,
- distributing the waste water equally over the entire cross-sectional area of the column of carbon particles,
- determining the total organic carbon content of the water before it enters the column and simultaneously at a loca-

- tion that is between 30 and 70% of the total height of the carbon particles in the column,
- continuously withdrawing spent carbon particles from the bottom of the column at such a rate as to maintain an essentially constant preselected difference between the total organic carbon content of the water as it enters the column and at the preselected location that is between 30 and 70% of the height of the carbon particles in the column,
- continuously introducing fresh activated carbon particles or reactivated carbon particles at the top of the column at such a rate as to compensate for those withdrawn at the bottom of the column, and
- recovering the thus-purified water at the top of the column.

4,007,117
METHODS OF RECOVERING WOOL GREASE FROM SPENT WOOL SCOURING LIQUOR
Donald Kenneth Smith, London, England, and Corran Norman Stuart McLachlan, Eastbourne, New Zealand, assignors to New Zealand Inventions Development Authority, Wellington, New Zealand
Filed Nov. 20, 1974, Ser. No. 525,631
Claims priority, application New Zealand, Nov. 21, 1973, 172664
Int. Cl.² C11B 1/00
U.S. Cl. 210—44 10 Claims



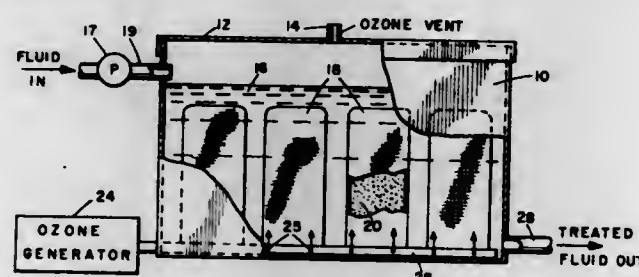
1. In a method of treating spent wool scour liquor containing wool grease comprising settling out solid dirt particles and flocculating out suspended particles by adding a polyelectrolyte flocculant in a floatation tank, the improvement which comprises:

- adjusting the pH of said liquor to at least 8,
- adding an aliphatic or cyclic alcohol having between four and eight carbon atoms in a quantity greater than that required to saturate said liquor and adding sufficient additional cationic or non-ionic organic polyelectrolyte flocculant to produce a concentration of 2-20 ppm weight/weight in said liquor,
- mixing said alcohol, flocculant and liquor at a temperature at least as high as ambient until substantially all of said wool grease is taken up by said alcohol,
- discontinuing said mixing to allow distinct alcoholic and aqueous phases to be formed, and
- separating said alcoholic phase from said aqueous phase and recovering wool grease from said alcoholic phase.

4,007,118
OZONE OXIDATION OF WASTE WATER
David Fred Clambrone, Santee, Calif., assignor to Cubic Corporation, San Diego, Calif.
Filed Oct. 16, 1975, Ser. No. 622,816
Int. Cl.² C02B 1/38
U.S. Cl. 210—63 Z 6 Claims

1. A method of ozone oxidation of waste water containing organic contaminants and bacteria comprising the steps of: injecting the waste water into a closed tank,

submerging fluid pervious bags with powdered transition metal oxide catalyst therein into the tank substantially filled with the waste water for oxidizing with ozone, restraining the catalyst in said fluid pervious bags, said catalyst being selected from a group consisting of manganese trioxide, ferric oxide, nickel oxide and copper oxide,



injecting ozone from a source of ozone into said bags in the waste water for exposure to said catalyst and for reacting with and rendering the waste water flowing through said bags, purified and inert, drawing the purified water out of the tank, and venting the ozone out of the upper portion of the tank.

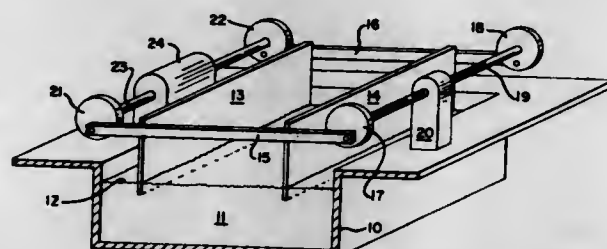
4,007,119

METHODS AND APPARATUS FOR SKIMMING LIQUIDS
John N. Antonevich, Jamestown, N.Y., assignor to Blackstone Corporation, Jamestown, N.Y.

Filed Sept. 9, 1975, Ser. No. 611,720
Int. Cl.² B01D 37/00

U.S. Cl. 210-65

2 Claims



1. A method of surface skimming liquids such as molten solder comprising the steps of:

- breaking the surface at two spaced parallel confining boundaries;
- moving the confined surface unidirectionally;
- removing the confining boundaries; and
- continuously repeating steps (a) through (c), said surface being broken by inserting a pair of spaced parallel blades which are moved in synchronism across the surface, removed, returned to their entry point and reinserted in the liquid in cyclic fashion.

2. An apparatus for skimming liquids in a confining pot comprising a pair of spaced parallel blades and means cyclically and synchronously driving said blades simultaneously to enter said liquid through the top surface in parallel, move across said liquid with a portion of the surface confined therebetween and rise from the surface at a point spaced from their entry a pair of spaced parallel shafts journaled adjacent the confining pot, cranks on each end of each shaft, crank arms interconnecting the cranks on each end of said shafts, said spaced parallel blades mounted on said crank arms and drive means synchronously driving said shafts.

4,007,120

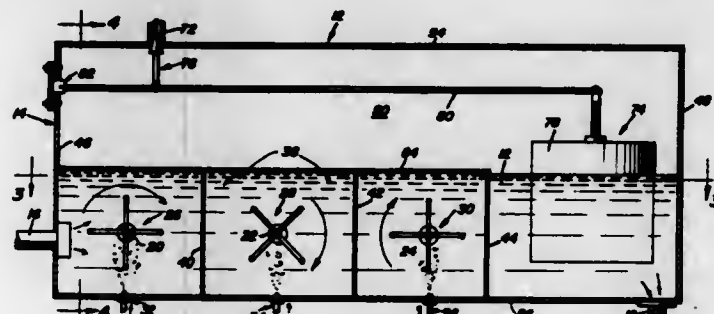
OXIDATION AND OZONATION CHAMBER

James H. Bowen, MacClenny, Fla., assignor to BDH, Inc. (Entire), Rome, Ga.

Continuation-in-part of Ser. No. 539,908, Jan. 9, 1975, abandoned. This application July 17, 1975, Ser. No. 596,892
Int. Cl.² C02B 3/08; C02C 5/04

U.S. Cl. 210-120

5 Claims



1. An oxidation and ozonation chamber for treating a liquid, comprising, in combination:

- a housing having an influent line and an effluent line, with the latter spaced from the influent line for creating a flow of a liquid to be treated through the housing along a predetermined path;
- a rotatable axle arranged extending through the housing transverse to a path directly between the influent line and the effluent line of the housing;
- a blade affixed to the axle for rotation therewith and agitating the liquid in order to form an electrostatic charge thereon and to mix oxygen and ozone with the liquid; and

- separate injecting means connected to the bottom of the housing for injecting and directing a flow of at least one of oxygen and ozone into the housing and toward the blade, for combining the electrostatic charge formed on the blade to create ozone in the present of a flow of oxygen, a plurality of axles are journaled in substantially parallel relationship transverse of the direct line between the influent line and the effluent line, and further including baffle means including a plurality of planar, substantially parallel plates disposed alternating with and substantially parallel to the axles for creating a tortuous flow by the axles between the influent line and effluent line of the housing, the housing being substantially rectangular in configuration and has a pair of end walls, longitudinal side walls, and top and bottom walls, the walls being joined to one another to form an enclosure, with the influent line being disposed in one of the end walls adjacent the bottom wall, and the effluent line being disposed in the bottom wall adjacent the other of the end walls, the axles lie in a plane substantially parallel to the bottom wall and are substantially uniformly spaced along the longitudinal side walls from adjacent the influent line, the plates of the baffle means alternatingly extending from one and the other of the side walls along the bottom wall toward, but spaced from, the opposite of the side walls and from the top wall for forming a plurality of compartments, one compartment to each of the axles, a plurality of blades are affixed to each of the axles, with each of the blades being a substantially U-shaped member having a back portion joining a pair of substantially parallel legs, the legs being affixed to the associated axle adjacent respective ones of the side walls of the housing, the back portion extending substantially the entire longitudinal extent of the associated axle, a normally open vent is provided in the top wall of the housing, and further including a float valve mounted on the housing and having a valve element arranged for effectively blocking the vent increasing the pressure within the housing and thus increasing the flow of liquid out the effluent line from the housing whenever the liquid in the housing reaches a predetermined level.

4,007,121

LUBRICATING OIL COMPOSITIONS CONTAINING A DISPERSANT AMOUNT OF AMINATED NITROKETONIZED HYDROCARBON TERPOLYMERS
Charles B. Holder, Wappingers Falls; Richard F. Love, and Donald R. Lachowicz, both of Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

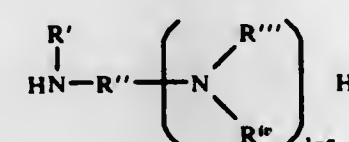
Filed June 3, 1974, Ser. No. 475,531

Int. Cl.² C10M 1/32

U.S. Cl. 252-51.5 A

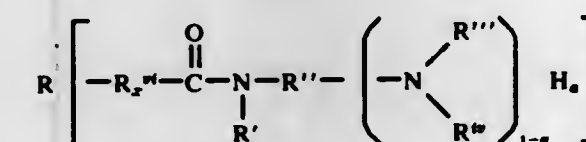
14 Claims

1. A lubricant composition comprising a major proportion of a lubricating oil and admixed therewith a dispersing amount of an ethylene-propylene-third monomer hydrocarbon terpolymer containing carbon atoms in the backbone and pendant from the backbone carbon atoms of at least some but less than all of the groups derived from the third monomer, an N-hydrocarbylcarbonamide group spaced from said backbone chain by a divalent saturated hydrocarbon, said terpolymer having been prepared by the method which comprises reacting (i) a nitroketonized terpolymer bearing pendant alpha nitroketone groups with (ii) an amine

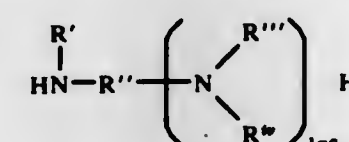


wherein R', R''' and R'' are hydrogen or saturated hydrocarbon, R'' is divalent saturated hydrocarbon and a is 0 or 1.

14. A concentrate containing in 20-80 parts of inert-diluent solvent 10-70 parts of an amide terpolymer



wherein R is a terpolymer residue of an ethylene-propylene-third monomer hydrocarbon terpolymer, R', R''' and R'' are hydrogen or saturated hydrocarbon, R'' and R''' are divalent saturated hydrocarbon, y = 1-100, a is 0 or 1, and x is 1, said terpolymer having been prepared by the method which comprises reacting (i) a nitroketonized terpolymer bearing pendant alpha nitroketone groups with (ii) an amine



wherein R', R''' and R'' are hydrogen or saturated hydrocarbon, R'' is divalent saturated hydrocarbon and a is 0 or 1.

4,007,122

SOLID ELECTROLYTES FOR USE IN SOLID STATE ELECTROCHEMICAL DEVICES

Boone B. Owens, Apple Valley, and Hilton J. Hanson, Farmington, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 465,432, April 29, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 571,953
Int. Cl.² H01G 1/00; H01M 6/06

U.S. Cl. 252-62.2

10 Claims

1. A solid electrolyte material for a solid state electrochemical device consisting essentially of a composition of a lithium halide, an oxide selected from the group consisting of SiO₂, Al₂O₃, and mixtures thereof and water, the lithium halide being present in an amount of from about 50 to about 90 mole

percent, based upon the total moles of lithium halide and the oxide, and the water being present in an amount of at least about 0.5 weight percent, based upon the total weight of the composition but in an amount insufficient to impair the performance of the solid electrolyte material.

4,007,123

FIRE RESISTANT FUNCTIONAL FLUID COMPOSITIONS
Martin B. Sheratte, Canoga Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 230,131, Feb. 28, 1972, abandoned, and a continuation-in-part of Ser. No. 449,623, March 11, 1974, Pat. No. 3,935,116. This application Oct. 15, 1974, Ser. No. 514,389

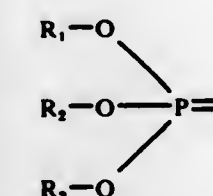
The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.

Int. Cl.² C10M 3/40, 3/32

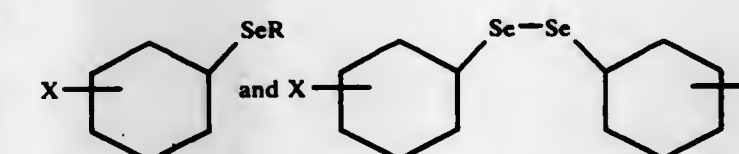
U.S. Cl. 252-78.5

25 Claims

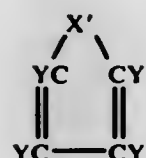
1. A functional fluid composition consisting essentially of (1) a phosphorus compound selected from the group consisting of phosphate esters and mixtures of said phosphate esters, said phosphate esters having the general formula:



where R₁ and R₂ are each a member selected from the group consisting of alkyl of from about 3 to about 10 carbon atoms, and alkoxyalkyl having from about 3 to about 8 carbon atoms, and R₃ is a member selected from the group consisting of alkyl and alkoxyalkyl, as above defined, aryl and alkaryl, containing from 6 to about 8 carbon atoms, (2) a polyalkylene glycol material, said glycol material selected from the group consisting of a polypropylene glycol mono- or diether, and a mono- or diether of an ethylene-propylene copolymer, said mono- or diethers having at least one terminal oxyalkyl group wherein the alkyl radicals contain from 1 to about 4 carbon atoms, and mixtures thereof, said polyalkylene glycol material having a molecular weight ranging from about 500 to about 2,000, said phosphorus compound being present in an amount ranging from about 15 to about 90%, and said glycol material being present in an amount ranging from about 9 to about 84%, by weight of said composition, said phosphorus compound and said glycol material being present in amounts such that said composition has a viscosity at -65° F of not greater than about 6,000 centistokes, and a viscosity at 210° F of not less than 2.25 centistokes, and (3) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:

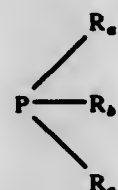


where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula

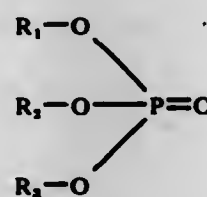


where X' is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen.

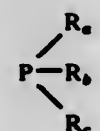
3. A functional fluid composition consisting essentially of (1) a phosphorus compound selected from the group consisting of phosphate esters and amides of an acid of phosphorus, said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures of said phosphate esters, (2) a polyalkylene glycol material having terminal groups selected from the class consisting of free hydroxyl and ether groups, said ether groups being oxyalkyl groups wherein the alkyl radicals contain from 1 to about 8 carbon atoms, and mixtures of said glycol material, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, and mixtures thereof, said polyalkylene glycol material having a molecular weight ranging from about 500 to about 25,000, said phosphorus compound and said glycol material being present in amounts such that said composition has a viscosity at -65°F of not greater than about 6,000 centistokes, and a viscosity at 210°F of not less than 2.25 centistokes, and (3) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:



where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula



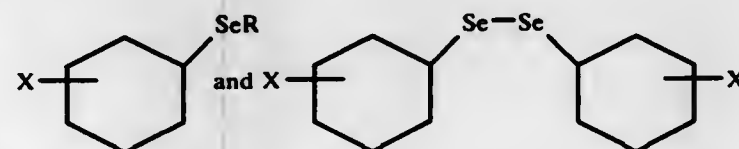
where X' is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen, and (4) a small amount of a tertiary organic phosphine having the formula:



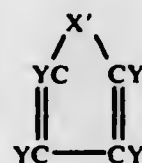
where R_a , R_b and R_c are each a member selected from the group consisting of aryl and alkaryl.

6. A functional fluid composition consisting essentially of (1) a combination of at least two phosphate esters, one of said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures thereof, and a second of said phosphate esters containing at least two aromatic groups selected from the class consisting of aryl and alkaryl groups, and mixtures thereof, (2) a combina-

tion of at least two polyalkylene glycol ethers containing terminal oxyalkyl groups wherein the alkyl radicals contain from 1 to about 8 carbon atoms, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, one of said polyalkylene glycol ethers having a molecular weight ranging from about 500 to about 2,000, and a second of said polyalkylene glycol ethers having a molecular weight ranging from above 2,000 up to about 25,000, said phosphate esters and said polyalkylene glycol ethers being present in amounts such that said composition has a viscosity at -65°F of not greater than about 6,000 centistokes, and a viscosity at 210°F of not less than 2.25 centistokes, and (3) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:



where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula



where X' is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen.

4,007,124 PROCESS FOR PREPARING A SILICATE-PYROPHOSPHATE DETERGENT COMPOSITION

Everett Joshua Collier, and John Edward Morrow, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 550,063, Feb. 14, 1975, abandoned. This application June 30, 1975, Ser. No. 592,010
Int. Cl.² C11D 3/08, 3/14, 11/02, 11/04

U.S. Cl. 252-109 19 Claims

1. A process for preparing a detergent composition comprising:

- acidifying an aqueous alkali metal silicate with acid, during agitation, thereby forming a silicate premix; wherein the alkali metal silicate has the formula $p\text{M}_2\text{O} \cdot \text{SiO}_2$, where M is alkali metal and p, the ratio of (mols M_2O) to (mols SiO_2), is from about 0.25 to about 0.50; and wherein the amount of acid, expressed as a ratio of (equivalents of acid) to (mols SiO_2 in the silicate), is between about 0.0005 and about 0.4;
- mixing said silicate premix with an aqueous slurry comprised of surfactant, water, and at least one structurant, i.e. structure-forming compound, thereby forming a crutcher mix; wherein the surfactant is anionic, nonionic, semi-polar, zwitterionic, ampholytic, or mixtures thereof; and wherein the structurant is selected from the group consisting of calcium carbonate; natural and synthetic clays; nitrilotriacetates; aluminosilicates; and alkali metal pyrophosphates, triphosphates, glassy phosphates, carbonates, bicarbonates, sesquicarbonates,

chlorides, borates, perborates, sulfates, bisulfates, aluminates, and mixtures thereof;
c. drying said crutcher mix to a moisture of from about 0.5% to about 15% by weight of the dried crutcher mix; and
d. adding admixed adjuvant to said dried crutcher mix, thereby forming said detergent composition;
wherein the admixed adjuvant is selected from the group consisting of calcium carbonate; sodium aluminosilicates; alkali metal pyrophosphates, carbonates, borates, bicarbonates and sulfates; water-soluble aminopolycarboxylates; water-soluble salts of phytic acid; water-soluble polyphosphonates; and water-soluble salts of mellitic acid, citric acid, pyromellitic acid, benzene pentacarboxylic acid, oxydiacetic acid, carboxymethylloxysuccinic acid, and oxydisuccinic acid; wherein percentages of the components by weight, expressed in relation to the final detergent composition, are: SiO_2 in the silicate from about 1.5% to about 16%; surfactant from about 4% to about 50%; structurant from about 4% to about 90%; and admixed adjuvant from 0 to about 80%; and wherein alkali metal pyrophosphate, $\text{M}_2\text{H}_2\text{P}_2\text{O}_7$, where M is alkali metal and x and y are integers having the sum of 4, is present in the composition in an amount from about 5% to about 60%, said pyrophosphate being present as either structurant or admixed adjuvant or both.

4,007,125 SYNTHETIC DETERGENT BAR

Leon M. Prince, Westfield, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,757
Int. Cl.² C11D 10/04

U.S. Cl. 252-117 7 Claims

1. A toilet detergent tablet comprising from about 30 to about 60% of water-soluble alkali metal detergent salts of esters of isethionic acid with mixed aliphatic fatty acids having from 6 to 18 carbon atoms and an iodine value of less than 20, of which mixed acids at least 75% have from 12 to 18 carbon atoms and up to 25% have from 6 to 10 carbon atoms, from 2 to 10% of at least one water-soluble suds-boosting detergent salt selected from the group consisting of alkali metal and organic amine higher aliphatic fatty alcohol sulfates, alkyl aryl sulfonates, and the higher aliphatic fatty acid taurides, from about 1 to about 9% water, from about 2.5 to about 25% of water-soluble higher fatty acid soap, from 10 to 40% of at least one higher fatty acid having from about twelve to about twenty-five carbon atoms as a binder and plasticizer, and as an anti-mushing agent, about 10 to about 20% of sodium alkane-sulfonate wherein the alkane group has 12 to 14 carbon atoms, or mixtures thereof, said tablet having improved hardness, improved firmness recovery characteristics, and being substantially free from efflorescence, and having a pH within the range of about 6 to about 8, measured as a 10% aqueous solution of the bar composition at 35°C .

4,007,126 ELECTROPHOTOGRAPHIC MASTER CONVERSION SOLUTION

David A. Wheatland, Cumberland Foreside, Maine, assignor to Scott Paper Company, Philadelphia, Pa.

Filed July 30, 1975, Ser. No. 600,226
Int. Cl.² G03C 5/24; G03G 9/16

U.S. Cl. 252-182 2 Claims

1. A conversion solution for electrophotographic master plates having a zinc oxide containing coating and capable of enhancing the hydrophilic properties of non-imaged portions of the electrophotographic master plate; comprising an acidic, aqueous solution containing a combination of ingredients selected from the group consisting of:

- phosphate ions in combination with an active amount of triethylenetetramine, and

- an alkali metal phosphate in combination with an active amount of ethylenediamine.

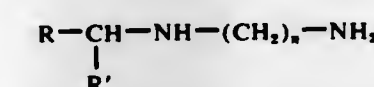
4,007,127 BITUMINOUS CATIONIC EMULSION

Rene Smadja, and Louis Houizot, both of Notre Dame de Gravenchon, France, assignors to Mobil Oil Corporation, New York, N.Y.

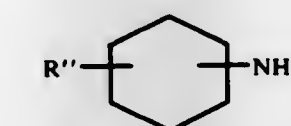
Filed Jan. 16, 1975, Ser. No. 541,533
Int. Cl.² B01J 13/00

U.S. Cl. 252-311.5 7 Claims

1. A bituminous cationic emulsion useful as a binder which comprises (1) from about 50 to about 75 percent by weight of said emulsion of a bitumen, (2) water, (3) a mineral acid, (4) from about 0.005 to about 5 percent by weight of said emulsion of a bitumen soluble N-hydrocarbyl diamine having the formula



wherein R is hydrogen, alkyl, aryl or aralkyl, R' is alkyl, aryl or aralkyl, the total carbon content of R and R' being from 4 to 30 carbon atoms and n being from 1 to 5, and (5) in amount sufficient to maintain the pH of said emulsion at from 1 to 7, a water soluble amine selected from the group consisting of aliphatic monoamine having from 1 to 9 carbon atoms, alkylene polyamine of the formula $\text{H}_2\text{N}(\text{C}_n\text{H}_{2n}\text{NH})_r\text{H}$, wherein M is 1 to 3 and r is 1 to 3; and an aromatic amine of the formula



wherein R'' is hydrogen or alkyl of 1 to 3 carbon atoms.

4,007,128 POLYAMINE SALTS OF ALUMINUM ALKYL ORTHOPHOSPHATES

Erwin Sigmund Poklacki, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 28, 1975, Ser. No. 636,348
Int. Cl.² B01J 13/00

U.S. Cl. 252-316 6 Claims

1. A gelled hydrocarbon composition comprising a liquid hydrocarbon, a partial aluminum salt of an alkyl acid orthophosphate, said partial aluminum salt having a P/Al ratio in the range of from 2.86/1 to about 10/1, said alkyl acid orthophosphate being a mixture of a monoalkyl diacid orthophosphate and dialkyl monoacid orthophosphate wherein the alkyl groups comprise a mixture of at least one C_1 to C_4 alkyl radical and at least one radical selected from the group consisting of C_6 to C_{22} alkyl radicals and C_6 to C_{22} alkenyl radicals, and a neutralizing amount of a polyamine compound selected from the group consisting of ethylene diamine, diethylene triamine, triethylene tetramine, tetraethylene pentamine, polyfunctional aromatic amines, and mixtures thereof.

4,007,129

PARTIAL COMBUSTION PROCESS FOR MANUFACTURING A PURIFIED GAS CONTAINING HYDROGEN AND CARBON MONOXIDE

Jaap E. Naber, Amsterdam, and Bernardus H. Mink, The Hague, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 21, 1974, Ser. No. 525,799

Claims priority, application United Kingdom, Nov. 27, 1973, 54876/73

Int. Cl.² C01B 2/02, 2/14

U.S. Cl. 252-373

12 Claims

1. In a process for manufacturing a hydrogen and carbon monoxide-containing gas by partially combusting a hydrocarbonaceous fuel in a reactor, cooling the crude gas obtained in a waste heat boiler and washing the cooled gas in a scrubber to remove entrained soot particles, the improvement which comprises: washing the crude, cooled gas in a scrubber with an aqueous salt solution containing at least 10%w of an alkaline water-soluble salt, said alkaline water-soluble salt being selected from the group consisting of sodium carbonate, potassium carbonate, sodium phosphate, potassium-phosphate and mixtures thereof, which salt solution is subsequently regenerated by removal of absorbed gases and suspended soot and recycled to the scrubber and wherein said gas leaves the scrubber at a temperature of at least about 100° C.

4,007,130

CATALYST REGENERATION METHOD

Harry S. Leach; Thomas C. Singleton, both of Texas City, and Yu Wen Wei, Houston, all of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,390

Int. Cl.² B01J 23/96

U.S. Cl. 252-411 R

9 Claims

1. A process for the regeneration of a spent catalyst solution comprising the complex reaction product formed from a rhodium or iridium component, an iodine component and carbon monoxide and containing metallic corrosion products which comprises intimately contacting said spent catalyst solution with a cation exchange resin in its hydrogen form and recovering said catalyst solution free of said metallic corrosion products.

4,007,131

HYDROPROCESSING CATALYST REGENERATION

Bernard M. Gillespie, Pitman; Henry R. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 438,158, Jan. 31, 1974, abandoned.

This application Sept. 22, 1975, Ser. No. 615,741

Int. Cl.² B01J 29/38, 21/20, 37/14

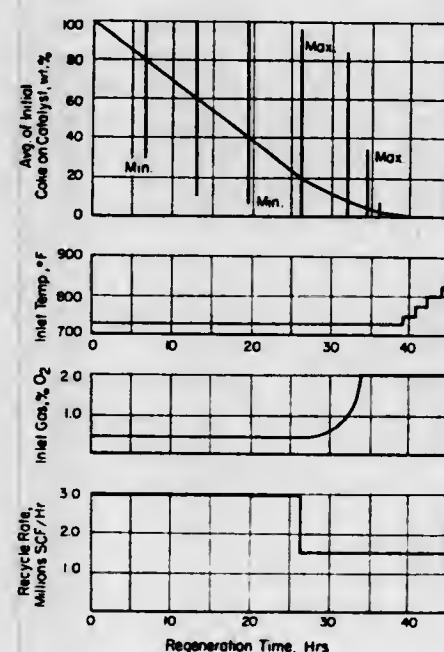
U.S. Cl. 252-419

5 Claims

1. In the multiple burn method of regenerating coked, deactivated hydrocracking catalyst contained within a reactor, which method comprises preheating a gas stream consisting essentially of about 0.5 volume percent oxygen in a substantially inert gas to an initial temperature of about 650° F, passing said preheated stream into an inlet of said reactor, through said catalyst to be regenerated, and out an outlet of said reactor at a pressure of at least about 100 psig and a space velocity of at least about 50 GHSV, continuing said passing of said preheated stream until the concentration of oxygen at the outlet of said reactor is substantially the same as the concentration at said inlet, whereby completing a first burn, and then increasing said initial temperature of said preheated stream at least once to induce at least a second burn, the improvement, whereby reducing regeneration time and catalyst deterioration, which comprises:

initiating said first burn with said initial temperature increased by 25° to 150° F, said oxygen concentration decreased, and said space velocity increased by an

amount sufficient to increase the burning rate, and continuing said passing of said preheated stream until only about 80% of said coke is burned and only until oxygen breakthrough occurs at said outlet of said reactor, and



then increasing further said increased preheat temperature, or increasing said decreased oxygen concentration, or both, thereby removing substantially all the remainder of said coke.

4,007,132

PROCESS FOR THE MANUFACTURE OF A CATALYST

Kurt Rust, Frankfurt am Main; Erwin Schrott, Sulzbach, Taunus; Helmut Strametz, Frankfurt am Main, and Hans-Jürgen Kahlitz, Liederbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 27, 1975, Ser. No. 553,810

Claims priority, application Germany, Jan. 30, 1975, 2503708; Jan. 30, 1975, 2503718

Int. Cl.² C08F 4/64

U.S. Cl. 252-429 B

17 Claims

1. In a process for the manufacture of a catalyst which comprises reacting titanium tetrachloride in an inert hydrocarbon solvent with an aluminum-organic compound containing an aluminum dialkyl chloride at a temperature of -20° to +20° C and in a molar proportion of aluminum dialkyl chloride to TiCl₄ of 0.8 : 1 to 1.5 : 1, thermally treating the TiCl₄-containing reaction product at a temperature of 40° to 150° C, separating and washing the reaction product (component A), and mixing it with an aluminum dialkyl halide (component B), the improvement which comprises effecting a further thermal treatment, of component A, at from 40° to 150° C in the presence of a dialkyl ether and a cyclopolyene in a molar ratio of from 1 : 0.001 to 1 : 0.15 of TiCl₄ to cyclopolyene.

7. In a process for the manufacture of a catalyst which comprises reacting titanium tetrachloride in an inert hydrocarbon solvent with an aluminum-organic compound containing an aluminum dialkyl chloride at a temperature of -20° to +20° C and in a molar proportion of aluminum dialkyl chloride to TiCl₄ of 0.8 : 1 to 1.5 : 1, thermally treating the TiCl₄-containing reaction product at a temperature of 40° to 150° C, separating and washing the reaction product (component A), and mixing it with an aluminum dialkyl halide (component B), the improvement which comprises effecting a further thermal treatment, of component A, at from 40° to 150° C in the presence of a dialkyl ether, and then subjecting component A to an after-treatment with an aluminum alkyl halide at a temperature of from 0° to 60° C in a molar ratio of aluminum alkyl halide to TiCl₄ of from 0.8 : 1 to 10 : 1.

4,007,133

PROCESS FOR THE MANUFACTURE OF A CATALYST
Kurt Rust, Frankfurt am Main; Erwin Schrott, Sulzbach, Taunus, and Helmut Strametz, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 27, 1975, Ser. No. 553,813

Claims priority, application Germany, Mar. 20, 1974, 2413261

Int. Cl.² C08F 4/66

U.S. Cl. 252-429 B

10 Claims

1. In the process for the manufacture of a catalyst by reacting titanium tetrachloride in an inert hydrocarbon solvent with an aluminum-organic compound selected from the group consisting of aluminum dialkyl chlorides and aluminum alkyl sesquichlorides wherein the alkyl group contains 1 to 6 carbon atoms, thermally treating the TiCl₄-containing reaction product, separating and washing the reaction product (component A) and mixing it with an aluminum dialkyl halide (component B) the improvement which comprises preparing component A by adding said aluminum-organic compound to the TiCl₄ at a temperature of from 31 20° to +20° C in a molar proportion of aluminum dialkyl chloride to TiCl₄ of from 0.8:1 to 1.5:1, subjecting the TiCl₄-containing solid reaction product to a thermal treatment at a temperature of from 40° to 150° C, effecting a further thermal treatment at a temperature of 70° to 150° C in the presence of a dialkyl ether at a TiCl₄-ether molar ratio of 1:0.6 to 1:1.2 and separating the solid reaction product.

4,007,134

BEVERAGE CARBONATION DEVICE

Alexander Leon Liepa, Montgomery, and Cornelis Hendrikus Japikse, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 445,200, Feb. 25, 1974, abandoned. This application July 17, 1974, Ser. No. 489,292

Int. Cl.² B01J 29/06

U.S. Cl. 252-455 Z

10 Claims

1. A rigid composite body for carbon dioxide adsorption and for subsequent release of said CO₂ when said body is brought in contact with water, said body comprising crystalline zeolite molecular sieves in an amount of at least 40% of the body by weight, and a relatively inert binder material, said body having a surface area to mass ratio of from about 4 cm²/g to about 200 cm²/g and having at least 6 grams of crystalline zeolite molecular sieves distributed substantially uniformly throughout said body.

5. The body of claim 1 wherein said body has a plurality of substantially parallel elongated channels extending from one surface of said body to the interior of said body with the longitudinal axis of said elongated channels substantially parallel to the axis of the vertical dimension of said body.

4,007,135

PROMOTED SILVER CATALYST FOR PRODUCING ALKYLENE OXIDES

Percy Hayden; Roy John Sampson; Christopher Buxton Spencer, and Harry Pinnegar, all of Billingham, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 22, 1974, Ser. No. 526,431

Claims priority, application United Kingdom, May 12, 1973, 56369/73; Sept. 1, 1974, 974/74; Sept. 1, 1974, 972/74; Mar. 4, 1974, 14786/74; Mar. 4, 1974, 14787/74; May 24, 1974, 23276/74; May 24, 1974, 23278/74; May 30, 1974, 24071/74; May 30, 1974, 24072/74; Aug. 5, 1974, 34333/74; Aug. 19, 1974, 36357/74; Sept. 19, 1974, 40882/74

Int. Cl.² B01J 23/50, 23/68

U.S. Cl. 252-467

6 Claims

1. A catalyst for producing ethylene or propylene oxide by

contacting ethylene or propylene and oxygen with the catalyst, which comprises

- a silver supported on a preformed porous heat resisting support, in which said silver is introduced by impregnating said support with a solution of a decomposable silver compound and decomposing it to silver metal,
- a promoting amount of sodium, cesium, rubidium, potassium or mixtures thereof, and
- strontium, calcium, barium or mixtures thereof in a promoting amount,

the amount of components (b) and (c) being in excess of any present in immobile form in the preformed support as impurities or cements.

4,007,136

SUPPORTED CATALYST FOR THE OXIDATION OF O-XYLENE AND/OR NAPHTHALENE TO PHTHALIC ANHYDRIDE

Kurt Blechschmitt, Schifferstadt; Friedrich Wirth; Paul Hornberger, both of Ludwigshafen; Peter Reuter, Bad Duerkheim, and Gert Buerger, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 30, 1975, Ser. No. 591,415

Claims priority, application Germany, July 26, 1974, 2436009

Int. Cl.² B01J 21/06, 23/04, 23/22

U.S. Cl. 252-476

1 Claim

1. A supported catalyst for the oxidation of o-xylene or naphthalene to phthalic anhydride, consisting of an inert nonporous carrier to which has been applied a thin layer of an active material which contains 1 to 40 percent by weight of vanadium pentoxide, and 60 to 98.84 percent by weight of titanium dioxide, and 0.16 to 0.6 percent by weight, based on titanium dioxide, of rubidium in the form of rubidium oxide, and the vanadium pentoxide content, based on supported catalyst, being from 0.05 to 4 percent by weight.

4,007,137

PROCESS FOR PRODUCING MIXTURE CONTAINING 4-(4-METHYL-4-HYDROXYAMYL)-Δ³-CYCLOHEX-ENECARBOXALDEHYDE, PRODUCT PRODUCED, AND ITS PERFUME USES

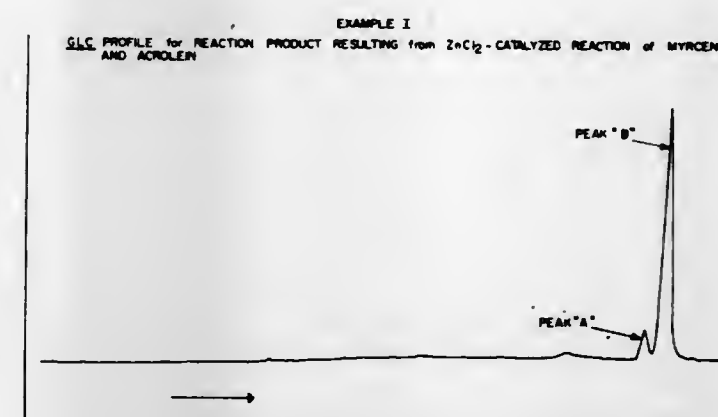
James Milton Sanders, Eatontown; William L. Schreiber, Jackson, and John B. Hall, Rumson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,354

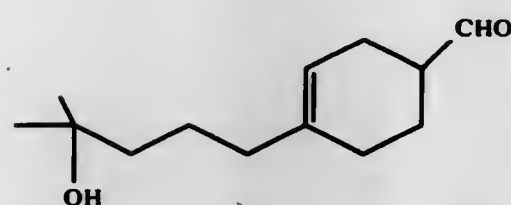
Int. Cl.² C11B 9/00

U.S. Cl. 252-522

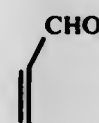
4 Claims



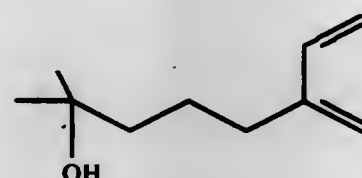
1. A process for producing a mixture containing a major proportion of 4-(4-methyl-4-hydroxyamyl)-Δ³-cyclohexenecarboxaldehyde having the structure:



comprising the step of intimately admixing acrolein having the structure:



with myrcenol having the structure:



- In the presence of a catalytic quantity of a ZnCl_2 catalyst;
 - At a temperature in the range of from about -20°C up to about 100°C ; and
 - At a pressure of from about 1 atmosphere up to about 100 atmospheres;
- the mole ratio of acrolein reactant:myrcenol reactant being in the range of from about 10:1 up to about 1:10; the weight percent of ZnCl_2 catalyst based upon the total weight of acrolein reactant and myrcenol reactant being from about 0.2% up to about 10%.

4,007,138

MANUFACTURE OF ION-EXCHANGING SHAPED ARTICLES

Gerhard Kanig, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 362,233, May 21, 1973, abandoned. This application Mar. 20, 1975, Ser. No. 560,123

Claims priority, application Germany, May 25, 1972, 2225329

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.² C08F 41/12

U.S. Cl. 260—2.1 E

16 Claims

1. A process for the manufacture of ion-exchanging shaped articles which comprises homogeneously mixing (a) a polyolefin selected from the group consisting of polyethylene, polypropylene, polybutene-1, polyisobutylene, a copolymer of ethylene and propylene, a copolymer of ethylene and butene-1, a copolymer of ethylene and isobutylene and mixtures thereof, with (b) a monovinylaromatic monomer and (c) an aromatic divinyl monomer selected from the group consisting of 1,2-divinylbenzene, 1,3-divinylbenzene, 1,4-divinylbenzene and mixtures thereof and (d) 5 to 90% by weight, with reference to the total weight of the mixture, of a solvent of low volatility; polymerizing the monomers in the mixture in the presence of a polymerization initiator at $100^\circ\text{--}220^\circ\text{C}$. to produce a crosslinked copolymer thereof in said mixture in which the crosslinked copolymer constitutes 10–75% by weight with reference to the weight of said polyolefin and said crosslinked copolymer, and said crosslinked copolymer being in the form of minute particles in the matrix of said polyolefin (a), shaping the resulting product into articles in the form of fibers, woven or non-woven fabrics, beads, membranes or

sheeting; removing the low-volatility solvent from said articles to provide said articles having micropores; and introducing ion-exchanging groups into the resultant microporous shaped articles.

4,007,139

HIGH RESILIENCY, FLEXIBLE POLYURETHANE FOAMS AND CROSSLINKERS FOR THE PREPARATION THEREOF

Arthur E. Gurgio, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 448,165, March 4, 1974, Pat. No. 3,907,721, and a continuation-in-part of Ser. No. 410,138, Oct. 26, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,729

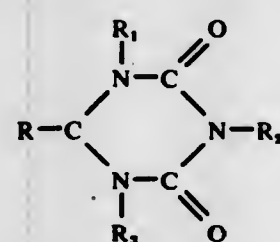
Int. Cl.² C08G 18/32, 18/14

U.S. Cl. 260—2.5 AQ

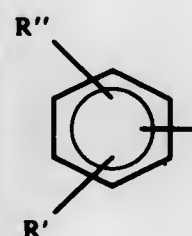
10 Claims

1. A flexible polyurethane foam having a resiliency greater than about 50%, a modulus of at least about 2.3 resulting from subjecting to foaming conditions, a composition which comprises

- from about 50 to 100 parts by weight of a primary, hydroxyl-containing polyether triol having an average hydroxyl equivalent weight of from about 900 to about 2500;
- from 0 to about 50 parts by weight of a polyol selected from a diol, a triol, a polymer-containing diol, a polymer-containing triol or mixtures thereof wherein said diols and triols have an average hydroxyl equivalent weight of from about 900 to about 2500 and said polymer has an average molecular weight of at least about 5000;
- an organic polyisocyanate consisting of
 - from about 50 to 100% by weight of 2,4-toluene diisocyanate, 2,6-toluene diisocyanate, NCO-containing prepolymers, thereof or mixtures thereof and
 - from 0 to about 50% by weight of an organic polyisocyanate having an average NCO functionality of at least 2;
- from about 1.0 to about 5 parts by weight of water per 100 parts by weight of Component (A);
- from about 0 to about 20 parts of a low boiling auxiliary blowing agent per 100 parts by weight of Component (A);
- from about 1 to about 10 parts per 100 parts by weight of Component (A) of a crosslinker composition consisting essentially of
 - from 30 to 100 percent by weight of a primary crosslinker component represented by the general formula

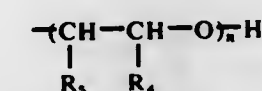


wherein R is a member of the group represented by the formula

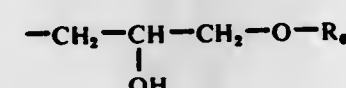


wherein each R' and R'' are independently hydrogen, Cl, Br,

OH or an alkyl group having from 1 to about 6 carbon atoms, each R_1 , R_2 and R_3 is independently selected from the formulas



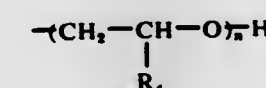
wherein each R_1 is independently hydrogen, phenyl, methyl, ethyl or halomethyl, each R_2 is independently hydrogen or methyl, each n is independently 1, 2 or 3; and



wherein R_4 is selected from the group consisting of allyl, methallyl, or a group represented by the formula



wherein Q is a halogen or an alkyl group and x has a value of 1 when Q is an alkyl group and a value of 1 or 2 when Q is a halogen or x has a value of zero; with the proviso that no more than 2 of the R_1 , R_2 and R_3 groups can be represented by the formula



- wherein R_4 is hydrogen, methyl or halomethyl;
- from 0 to about 70 percent by weight of an auxiliary crosslinker component;
 - from about 0.5 to about 4 parts by weight per 100 parts by weight of Component (A) of a catalyst for urethane formation;
 - from about 0.005 to about 1.5 parts by weight per 100 parts by weight of Component (A) of a silicone oil cell control agent;
- and wherein Components (A), (B), (C) and (E) are present in quantities so as to provide an NCO:active hydrogen equivalent ratio of from about 0.8:1.0 to about 1.3:1.0.

4,007,140

TERTIARY AMINES AS CATALYSTS IN POLYURETHANE MANUFACTURE

Arthur Ibbotson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 411,164, Oct. 30, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 539,404

Claims priority, application United Kingdom, Nov. 1, 1972, 50304/72

Int. Cl.² C08G 18/18

U.S. Cl. 260—2.5 AC

1 Claim

1. A method for the manufacture of polyurethane which comprises reacting an organic polyisocyanate with an organic polyol in the presence of a catalytically effective amount of $\text{N,N}'$ -Bis(3-dimethylaminopropylamino)urea.

4,007,141

OPAQUE, NON-PIGMENTED MICROPOROUS FILM AND PROCESS AND COMPOSITION FOR PREPARING SAME

Marco Wismer, Gibsonia, and Jerome A. Seiner, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 632,392, April 20, 1967, abandoned. This application Aug. 21, 1969, Ser. No. 852,055

Int. Cl.² C08J 9/22

U.S. Cl. 260—2.5 B

9 Claims

1. A resinous coating composition which upon drying forms a substantially continuous, highly opaque film, said composition comprising:

- liquid resinous film-forming binder material consisting essentially of at least one film-forming polymer which is substantially non-light absorbing, and
- dispersed in said binder material, particulate matter comprising discrete solid particles which contain therein one or more cells, the cells in said particulate matter having an average size between about 0.01 micron and about 15 microns, the particle walls having pigment incorporated therein and being composed of a substantially non-opaque material.

4,007,142

AMINE RESIN AND PROCESS

Barry John Clarke, Glenhuntingly; Robert William Kershaw, South Blackburn, and Frederick John Lubbeck, Beaumaris, all of Australia, assignors to Balm Paints Limited, Melbourne, Australia

Continuation of Ser. No. 463,786, April 24, 1974, abandoned. This application June 9, 1976, Ser. No. 694,490

Int. Cl.² C08J 9/24, 9/26

U.S. Cl. 260—2.5 F

14 Claims

1. Granules consisting essentially of hard, insoluble amine resin selected from the group consisting of urea-formaldehyde and melamine-formaldehyde resins, said granules having a retiporous structure in that there is spread throughout the granules a net-like web of non-cellular pores or ducts defined by the polymer comprising the granules and further characterized in that the pore volume is from 10–60% of the total granule volume and the pores have an average diameter of about 0.2–0.5 micron, said granules being essentially spheroidal in shape and having an essentially pore-free surface, said granules having a lattice-like structure being built-up by the fusion at random points of contact of neighboring particles.

4,007,143

METHOD OF GRAFTING MONOMERS TO WOOL WITH NITRIC ACID

John Lyndon Garnett, 29 Arabella St., Longueville, New South Wales, Australia (2066), and Robert Sydney Kenyon, 29 Glen St., Eastwood, New South Wales, Australia (2122)

Continuation of Ser. No. 462,331, April 19, 1974, abandoned, which is a continuation of Ser. No. 337,098, March 1, 1973, abandoned. This application June 10, 1975, Ser. No. 585,695

Claims priority, application Australia, Mar. 7, 1972, 8189/72

Int. Cl.² C08L 1/00, 3/00, 89/00

U.S. Cl. 260—8

9 Claims

1. A method of grafting a (monomeric substance) vinyl monomer containing sterically available vinyl group onto wool (comprising) consisting of contacting the wool with (the monomer or) a solution (of the monomer) containing at least 30% by weight monomer based on the total weight of the solution in a polar solvent in the presence of a single chemical catalyst, said chemical catalyst being (a mineral acid or an organic acid containing up to 3 carbon atoms) nitric acid, the acid being present in an amount such that the reaction mixture is not more than 0.5N relative to said acid.

4,007,144

THERMOSETTING CELLULOSE ESTER POWDER COATING COMPOSITIONS

Robert R. Sanders; Peter M. Grant, and Robert L. Combs, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,878
Int. Cl.² C08L 1/14

U.S. Cl. 260—15

6 Claims

1. A thermosetting coating composition in the form of a powder having an average particle size of between about 10 and about 300 microns comprising:

- cellulose acetate butyrate having a butyryl content of about 35 to 55% by weight, a hydroxyl content of about 0.5 to 3.0% by weight, an acetyl content of up to about 15% by weight, and a viscosity of about 0.05 to 1.0 second;
- about 2 to 15 phr by weight of hexaalkoxymethylmelamine cross-linking agent wherein the alkoxy group contains from 1 to 20 carbon atoms;
- a catalytic amount of latent acid crosslinking catalyst; and
- a plasticizing amount of (1) poly(tetramethylene glycol) having a molecular weight of about 650 to 1000, or (2) a poly(alkylene glycol) derived from propylene oxide or propylene oxide and ethylene oxide having a molecular weight of about 700 to 1500 and containing not more than 10 weight percent ethyleneoxy units.

4,007,145

METHOD OF POLYMERIZING CHLOROPRENE USING CONJUGATED LONG-CHAIN FATTY ACIDS AS EMULSIFIERS

Morris S. Edmondson, Alvin, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Jan. 10, 1975, Ser. No. 540,279
Int. Cl.² C08L 91/00

U.S. Cl. 260—23.7 H

17 Claims

1. In the process of aqueous emulsion polymerization of polymerizable monomer comprising chloroprene and up to 25 weight percent of polymerizable comonomer in the presence of catalyst, modifiers and emulsifiers at a temperature of 0°–90° C wherein the improvement comprises said emulsifier 10 to 100 weight % of a conjugated fatty acid having 10 to 30 carbon atoms and selected from 9, 11-octadecadienoic acid, 9, 11, 13-octadecatrienoic acid or 9, 11, 13, 15-octadecatetraenoic acid.

4,007,146

AQUEOUS INSULATING VARNISHES

Takashi Ishizuka; Shiro Mazaki; Naoki Miwa, and Masatoshi Maezawa, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Feb. 18, 1975, Ser. No. 550,504

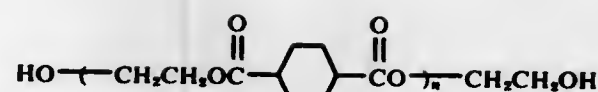
Claims priority, application Japan, Feb. 15, 1974, 49-18959
Int. Cl.² C08J 3/00

U.S. Cl. 260—29.2 E

12 Claims

1. An aqueous insulating varnish which comprises an aqueous medium containing dissolved therein a polyester resin having an acid value of about 20 to 200 with a volatile basic compound, the resin being obtained by reacting

- an organic polycarboxylic acid component comprising
 - at least 30 mol % of at least one of an aromatic tricarboxylic acid and the anhydride thereof in which up to about 30 mol % of the tricarboxylic acid and the anhydride thereof can be replaced by at least one of an aromatic tetracarboxylic acid and the anhydride thereof, and
 - about 0 to 70 mol % of at least one of a dicarboxylic acid and the anhydride thereof, and
- an organic polyhydric alcohol component containing at least 20 mol % of a polyethylene terephthalate oligomer represented by the formula



wherein n is an integer of 1 to 5, in a OH/COOH equivalent ratio of about 1.0 to 2.0.

4,007,147

WATER BASED HARDBOARD COATING COMPOSITIONS OF AN ACRYLIC ESTER INTERPOLYMER LATEX, A VINYL CHLORIDE POLYMER LATEX, A WATER REDUCIBLE THERMOSET RESIN, AND PIGMENT(S)

Edward J. Leeson, Avon Lake, and Robert U. Ludwig, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 30, 1975, Ser. No. 572,960
Int. Cl.² C08G 51/24

U.S. Cl. 260—29.4 UA

10 Claims

1. A water-based coating composition comprising (1) from about 50 parts to about 90 parts by weight on a dry basis of an acrylic ester interpolymer latex wherein the latex is prepared in the presence of from about 0.01 percent to about 3 percent by weight of soap emulsifier, the weight based upon the total weight of monomer, by the interpolymerization of (a) from about 9 percent to about 99 percent by weight of at least one acrylic ester monomer of the formula



wherein R' is selected from the group consisting of an alkyl radical containing 1 to about 18 carbon atoms and alkoxyalkyl, alkylthioalkyl, and cyanoalkyl radicals containing 2 to about 8 carbon atoms in the group, (b) up to 90 percent by weight of a vinylidene comonomer containing a terminal $\text{CH}_2=\text{C}<$ group, and (c) from about 1 percent to about 10 percent by weight of a reactive cure-site monomer selected from the group consisting of carboxyl-containing vinylidene monomers, hydroxyl-containing vinylidene monomers, and hydroxyl-containing vinylidene monomers in combination with a carboxyl-containing vinylidene monomer or an acrylamide monomer, (2) from about 10 parts to about 50 parts by weight on a dry basis of a vinyl chloride polymer latex having substantially uniform particle size, wherein the latex is prepared by interpolymerization of the monomer(s) in the presence of a fatty acid soap emulsifier, (3) from about 5 parts to about 35 parts by weight per 100 parts by weight of latex polymer of a water reducible thermoset resin selected from the group consisting of melamine-formaldehyde resins and urea-formaldehyde resins, and (4) from about a 5 percent to about a 60 percent pigment volume concentration per total volume of latex.

4,007,148

ELECTROCONDUCTIVE COATINGS HAVING EXCELLENT COATING HOLDOUT PROPERTIES

Sally P. Ginter, and Ralph E. Friedrich, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1974, Ser. No. 534,384
Int. Cl.² C08L 47/00

U.S. Cl. 260—29.6 WB

16 Claims

1. An aqueous coating composition comprising as ingredients (1) a water-dispersible, electroconductive polymer in an amount sufficient to reduce the surface electrical resistivity of a non-conductive substrate having its surface coated with said composition to a value no greater than 10^{12} ohms at 20% relative humidity, and (2) a water-swellaible polymer having

4,007,152

SEALING MATERIAL FOR PREVENTING WATER-LEAKAGE AND METHOD OF MANUFACTURING SAME

Yosikazu Kosaka, Otsu; Makoto Kounosu, Kyoto, and Masaaki Kondo, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,688

Int. Cl.² C08K 5/05, 5/10, 5/12; C08L 29/04

U.S. Cl. 260—31.6

5 Claims

1. Sealing material for prevention of waterleakage which possesses a degree of swelling with water of 50 to 300% by weight, a rate of swelling with water of 1.0 to 30% per minute and a hardness of 5 to 80 degrees, and consists essentially of (a) a water-insoluble partially saponified polyvinyl alcohol having a saponification degree of 35 to 65% by mole and a number average polymerization degree of 500 to 3,500, and (b) a mixture of glycerin and the glyceryl ester of a carboxylic acid selected from the group consisting of phthalic acid and propionic acid, the proportion of the glycerin to the glyceryl ester of a carboxylic acid being within the range of from 70:30 to 30:70 by weight and said mixture being present in an amount of 5 to 100 parts by weight based on 100 parts by weight of said water-insoluble partially saponified polyvinyl alcohol.

4,007,153

SILICONE DENTAL IMPRESSION COMPOSITIONS

Robert A. Smith, Schnectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed June 19, 1975, Ser. No. 588,202

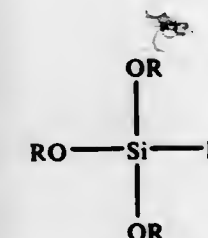
Int. Cl.² C08K 5/01

U.S. Cl. 260—33.6 SB

17 Claims

1. A room temperature vulcanizing silicone dental impression composition which, before curing, consists essentially of from about 0.3 to about 0.7 parts by weight of a metallic salt of a monocarboxylic acid as a catalyst to about 100 parts of a base composition consisting essentially of:

- from about 25 to about 35% by weight of a fluid diorganopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of from 2,000 to 250,000 cps. at 25° C.;
- from about 60 to about 75% by weight of a filler composition consisting essentially of an admixture of zinc oxide, calcium carbonate and pumice, said zinc oxide and calcium carbonate each being present in at least a sufficient amount to provide bulking and whitening and said pumice being present in at least a sufficient amount to provide putty-like consistency;
- from about 0.05 to about 2% by weight of an organo-silicon cross-linker having the general formula:



wherein R is a radical selected from the group consisting of alkyl, alkenyl and aryl radicals and R' is a member of the group consisting of alkyl, alkenyl, aryl and alkoxy radicals.

4,007,149

PROCESS FOR PREPARING LATICES OF SULFONATED ELASTOMERS

Gilbert W. Burton, Mountainside, and Charles P. O'Farrell, Clark, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 2, 1975, Ser. No. 592,461

Int. Cl.² C08L 47/00

U.S. Cl. 260—29.7 B

14 Claims

1. A process for preparing a latex of a sulfonated low unsaturation elastomer, the elastomer being butyl rubber or EPDM, which comprises the steps of:

- providing a cement of the elastomer and a volatile solvent;
- sulfonating the elastomer cement with an acyl sulfate sulfonating agent;
- passivating the sulfonated cement with at least a stoichiometric amount of an organic epoxide containing at least one reactive oxirane group;
- providing an emulsion in water of the product of step (c) in neutralized form using an anionic surfactant, said product being neutralized with a weak base before or after emulsification; and
- thereafter stripping off excess water and solvent whereby a stable latex emulsion is obtained.

4,007,150

USE OF PERFLUOROALKANESULPHONIC ACID AMIDES AND/OR CYCLIMMONIUM SALTS OF PERFLUOROALKANESULPHONIC ACIDS AS MOLD RELEASE AGENTS

Siegfried Adelmann, Krefeld; Dieter Margotte, Krefeld-Fischeln; Hugo Vernaleken, Krefeld-Bockum; Hans Niederprim, Monheim; Johann Nikolaus Meussdoerffer, and Werner Nouvertne, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 9, 1976, Ser. No. 656,226

Claims priority, application Germany, Feb. 18, 1975, 2506726

Int. Cl.² C08K 5/36

U.S. Cl. 260—30.8 R

8 Claims

1. A molding composition comprising an aromatic polycarbonate and from about 0.001 to 1% by weight of a mold release agent selected from the group consisting of perfluoroalkanesulphonic acid amides and cyclimmonium salts of perfluoroalkanesulphonic acids.

4,007,151

POLYURETHANE COATING COMPOSITION

Shinsaku Ogawa; Matsuei Yamanoue, and Norio Oyabu, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 2, 1975, Ser. No. 583,221

Claims priority, application Japan, May 31, 1974, 49-60761

Int. Cl.² C08K 5/09

U.S. Cl. 260—31.2 N

13 Claims

1. A polyurethane coating composition comprising an aliphatic or alicyclic polyisocyanate containing at least 3 isocyanate groups; at least $\frac{1}{4}$ equivalent, based on the isocyanate groups, of a monohydric alcohol; and a low-molecular-weight polyhydric alcohol containing at least 3 active hydrogen atoms capable of reacting with the isocyanate.

4,007,154

NOVEL PIGMENT PASTE FOR CATIONIC ELECTRODEPOSITION

Karl F. Schimmel, Verona; Percy E. Pierce, Monroeville, and James E. Jones, Lower Burrell, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1975, Ser. No. 601,108

Int. Cl.² C08L 63/02

U.S. Cl. 260—37 EP

5 Claims

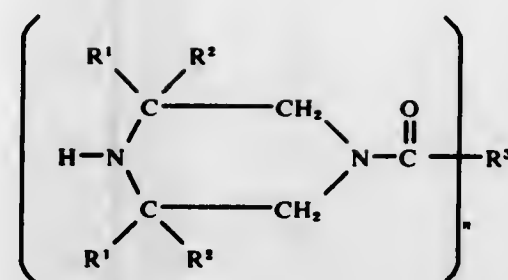
1. A pigment paste suitable for cationic electrodeposition comprising:

A. a resinous vehicle comprising the acidified reaction product of:

1. an organic polyepoxide material
2. an organic tertiary amine containing blocked isocyanate groups capable of unblocking at elevated temperature;

B. a pigment dispersed therein;

the pigment to resinous vehicle weight ratio being at least 2:1.

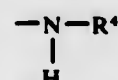


wherein

R¹ and R² together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group;

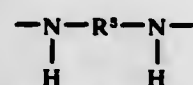
n is an integer from 1 to 2;

when n is 1, R³ is alkyl having from 1 to 24 carbon atoms, a phenyl group, or a group having the formula



wherein R⁴ is alkyl having from 1 to 24 carbon atoms or phenyl;

when n is 2, R³ is alkylene having from 1 to 10 carbon atoms, a carbon to carbon bond, a phenylene group or the group having the formula



wherein R⁵ is alkylene having from 1 to 10 carbon atoms, a phenylene or (lower)alkyl substituted phenylene group.

15. A composition of matter stabilized against ultraviolet deterioration consisting essentially of a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.01% to 2% by weight of the polymer of a stabilizing compound according to claim 1.

4,007,157

SUBSTITUTED PIPERAZINES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

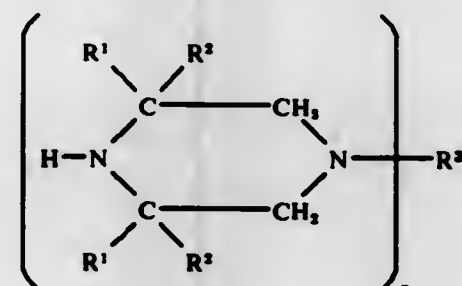
Continuation of Ser. No. 378,368, July 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 239,350, March 29, 1972, abandoned. This application June 27, 1975, Ser. No. 591,222

Int. Cl.² C07D 241/38

U.S. Cl. 260—45.8 N

23 Claims

1. A compound of the formula



wherein

R¹ and R² together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group;

n is an integer of from 1 to 2;

when n is 1, R³ is hydrogen, alkyl of from 1 to 20 carbon atoms or benzyl;

4,007,156

ACYLATED DERIVATIVES OF SUBSTITUTED PIPERAZINES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 379,289, July 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 249,025, May 1, 1972, abandoned. This application June 27, 1975, Ser. No. 591,221

Int. Cl.² C07D 241/36

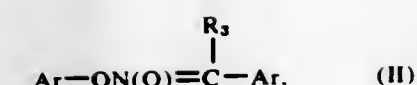
U.S. Cl. 260—45.8 N

23 Claims

1. A compound of the formula

when n is 2, R³ is alkylene of from 1 to 20 carbon atoms.

15. A composition of matter stabilized against ultraviolet deterioration consisting essentially of a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.01 to 2% by weight of the polymer of a stabilizing compound according to claim 1.



wherein Ar is as previously described and R₃ represents a lower C₁-C₄ alkyl or a methoxy or ethoxy substituted lower C₁-C₄ alkyl radical.

4,007,158

NOVEL PIPERIDINE DERIVATIVES FOR THE STABILIZATION OF SYNTHETIC POLYMERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka; Toshimasa Toda; Elko Mori; Hideo Horiuchi; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohta, and Hisayasu Osawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,567

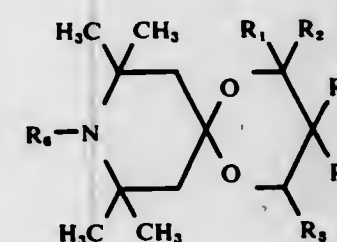
Claims priority, application Japan, July 20, 1973, 48-81369

Int. Cl.² C08K 5/00

U.S. Cl. 260—45.8 NZ

6 Claims

1. An improved polymer composition of the type comprising a synthetic polymer and a stabilizer therefor, the improvement comprising using as stabilizer at least one compound of formula:



wherein:

2 or 3 of R₁, R₂, R₃, R₄ and R₅ represent alkyl groups having from 1 to 4 carbon atoms, and the remainder of R₁, R₂, R₃, R₄ and R₅ represent hydrogen atoms; and

R₄ is selected from the group consisting of: a hydrogen atom, alkyl groups, alkenyl groups, alkynyl groups, aralkyl groups, hydroxyalkyl groups, alkoxyalkyl groups, aliphatic and aromatic acyloxyalkyl groups, cyanoalkyl groups, haloalkyl groups, epoxyalkyl groups, alkoxy carbonylalkyl groups, aliphatic acyl groups, alkoxy carbonyl groups and aralkoxy carbonyl groups.

4,007,159

ORGANIC SUBSTRATES STABILIZED BY NITROALKANE BASED HINDERED PHENOL COMPOUNDS

Harry Douchis, Lawrenceville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

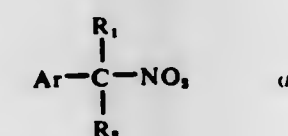
Continuation-in-part of Ser. No. 475,318, May 31, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,837

Int. Cl.² C08K 5/32

U.S. Cl. 260—45.9 E

10 Claims

1. Stabilized compositions comprising an organic material normally susceptible to oxidative deterioration containing per 100 parts of said organic material from about 0.001 to 5 parts by weight of a stabilizing antioxidant compound selected from the group having the formulas:



wherein Ar represents a 3,5-di-tert-butyl-4-hydroxybenzyl radical, R₁ and R₂ each may represent hydrogen, a lower C₁-C₄ alkyl radical or an Ar radical, and

(I)

4,007,161

POLYMERS CONTAINING CARBON ATOMS IN THE BACKBONE WITH PENDANT N-HYDROCARBYLCARBOXAMIDE GROUPS

Charles B. Holder, Wappingers Falls; Richard F. Love, and Donald R. Lachowicz, both of Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

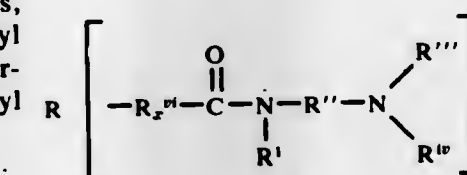
Division of Ser. No. 475,531, June 3, 1974. This application Dec. 30, 1974, Ser. No. 537,160

Int. Cl.² C08G 16/06, 2/38

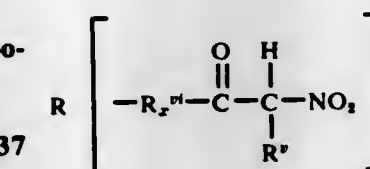
U.S. Cl. 260—66

14 Claims

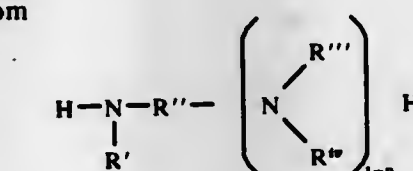
1. The method of preparing an amide polymer



which comprises reacting an alpha-nitroketone

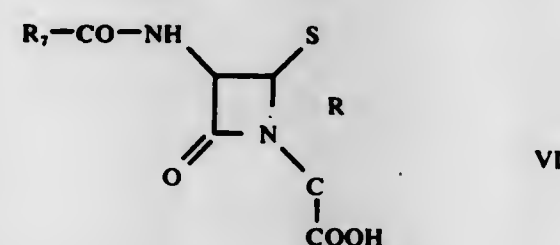


with an amine



wherein R is a carbon containing polymer residue, R', R'', and R''' are hydrogen or saturated hydrocarbon, R'' is saturated hydrocarbon, R'' and R''' are divalent saturated hydrocarbon, y is 1 - 100, a is 0 or 1, and x is 1 thereby forming product amide polymer.

treating said compound with water or an alcohol having from 1 to 5 carbon atoms resulting in a compound of the formula



wherein R and R₁ are as defined above.

4,007,169

METHOD OF PREPARING DERIVATIVES OF RIFAMYCIN S

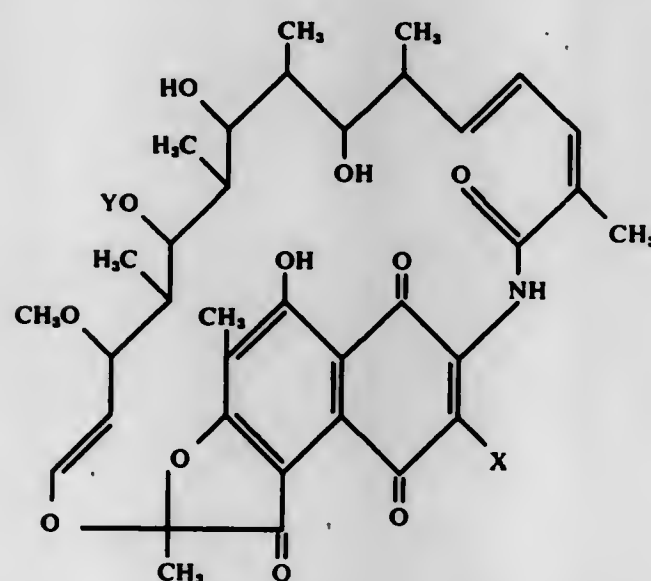
Leonardo Marsili, Milan; Vittorio Rossetti, Melzo (Milan), and Carmine Pasqualucci, Milan, all of Italy, assignors to Archifar Industrie Chimiche del Trentino S.p.A., Roverto, Italy
Filed Oct. 16, 1975, Ser. No. 623,117

Claims priority, application Italy, Oct. 29, 1974, 28908/74
Int. Cl.² C07D 498/08

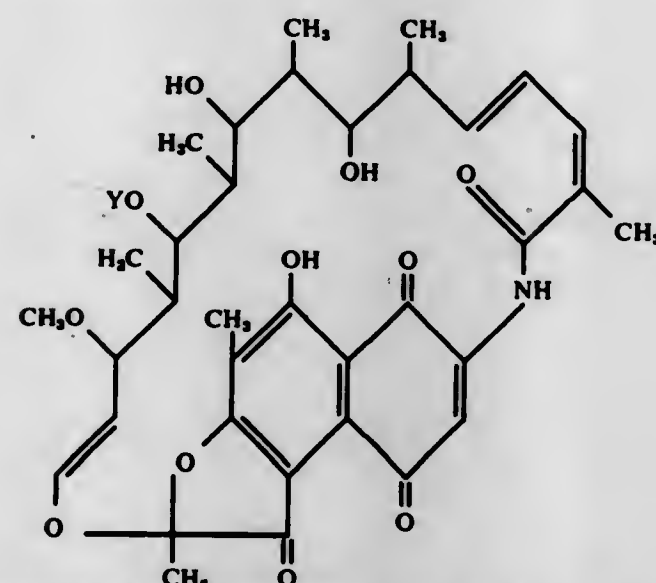
U.S. Cl. 260-239.3 P

7 Claims

1. A method of preparing a Rifamycin S having the formula:



wherein X is -N₃ or -NH₂ and Y is -H or -COCH₃, wherein a compound having the formula:



in which Y is as above defined, is dissolved in a dipolar aprotic solvent at a temperature ranging between 0° and +100° C, adding sodium azide and stirring for at least 30 minutes, a compound of formula I so obtained being recovered from the reaction mass.

4,007,170 PHOTOGRAPHIC EMULSIONS CONTAINING METHINE DYES HAVING A 1H-IMIDAZO[4,5-b]PYRAZINE NUCLEUS

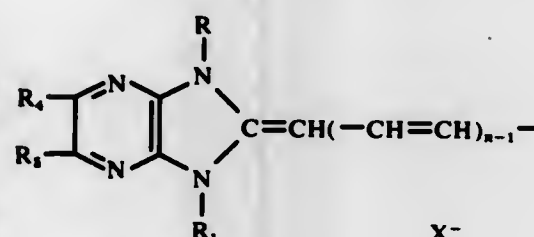
Wilbur Seth Gaugh, Webster; Donald Warren Heseltine, Rochester; David Michael Sturmer, Pittsford, and John Paul Freeman, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 388,867, Aug. 16, 1973, Pat. No. 3,936,308. This application June 26, 1974, Ser. No. 483,336
Int. Cl.² C07C 471/04, 401/06, 403/06

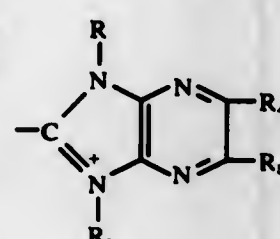
U.S. Cl. 260-240 E

4 Claims

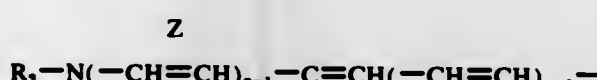
1. A silver halide sensitizing methine dye selected from those having one of the following formulas:



(I)



(II)

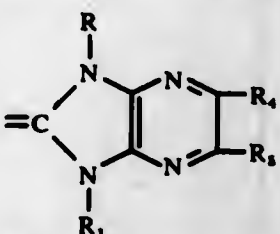


and

Q



(II)



wherein n represents a positive integer of from 1 to 4; g represents a positive integer of from 1 to 2; d represents a positive integer of from 1 to 3; R, R₁, R₂, R₃, R₄ and R₅ each represents a member selected from the group consisting of an alkyl, alkenyl, alkaryl and an aryl substituent; R₄ and R₅ also each represent in the alternative a member selected from the group consisting of alkoxy, halogen and cyano substituents, said substituents R, R₁, R₂, R₃, R₄ and R₅ chosen such that the resulting nucleus is of the silver halide sensitizing type; X⁻ represents an acid anion; Z represents the non-metallic atoms required to complete a sensitizing heterocyclic nucleus of the type used in cyanine dyes containing from 5 to 6 atoms in the heterocyclic ring; and Q represents the nonmetallic atoms required to complete a 5 or 6 membered silver halide sensitizing heterocyclic nucleus of the type used in merocyanine dyes.

4,007,171

INTERMEDIATES FOR PROSTANOIC ACIDS

Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 351,381, April 16, 1973, Pat. No. 3,917,668. This application Apr. 10, 1975, Ser. No. 567,036
Int. Cl.² C07C 69/74

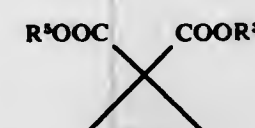
U.S. Cl. 260-240 R

10 Claims

1. A compound of the formula

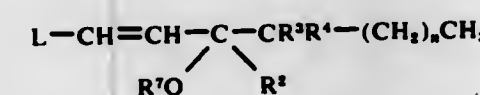


in which L is the radical



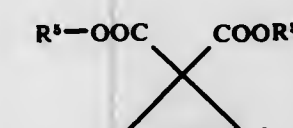
wherein R⁵ is lower alkyl, R³ and R⁴ each are hydrogen or lower alkyl with the proviso that at least one of R³ and R⁴ is lower alkyl, and n is an integer from two to five.

5. A compound of the formula



(4)

in which L is the radical



wherein R⁵ is lower alkyl, R³, R³ and R⁴ each are hydrogen or lower alkyl with the provisos that at least one of R³, R³ or R⁴ is hydrogen and at least one of R³, R³ and R⁴ is lower alkyl, R⁷ is hydrogen or a radical suitable for protecting a hydroxyl group selected from the class consisting of tetrahydropyran-2-yl, tetramethylsilyl, dimethylisopropylsilyl and tertiarybutyl, and n is an integer from two to five.

4,007,172

DYESTUFF INCLUDING PYRIMIDO-INDOLE MOIETY

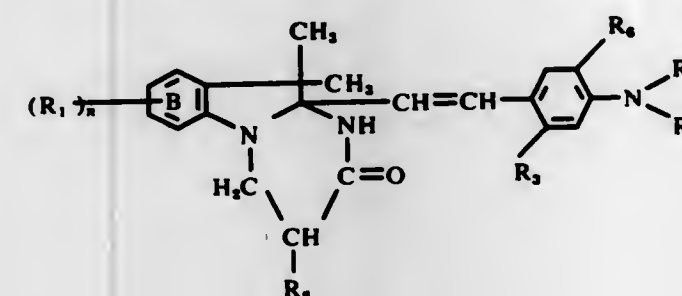
Hubertus Psarr, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Mar. 2, 1976, Ser. No. 663,138

Claims priority, application Germany, Mar. 8, 1975, 2510238

Int. Cl.² C07C 487/04

U.S. Cl. 260-240.9

1. Compounds of the formula



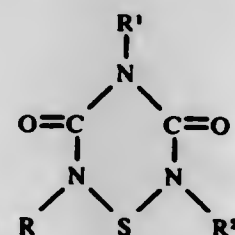
4,007,175

2,4,6-SUBSTITUTED-3,5-DIOXO-1,2,4,6-THIATRIAZINES
Hans Georg Franke, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 453,149, March 21, 1974, Pat. No. 3,915,688, which is a division of Ser. No. 146,498, May 24, 1971, Pat. No. 3,817,993. This application Aug. 4, 1975, Ser. No. 601,871
Int. Cl.² C07D 285/00

U.S. Cl. 260-243 R

1. A compound of the formula



wherein R is alkyl of 1 to 4 carbon atoms; R¹ is alkoxy of 1 to 3 carbon atoms; and R² is phenyl substituted with 0 to 2 halogen atoms of atomic number 9 to 35, 0 to 1 alkyl group of 1 to 4 carbon atoms or 0 to 1 alkoxy group of 1 to 4 carbon atoms.

4,007,176

CEPHALOSPORIN DERIVATIVES

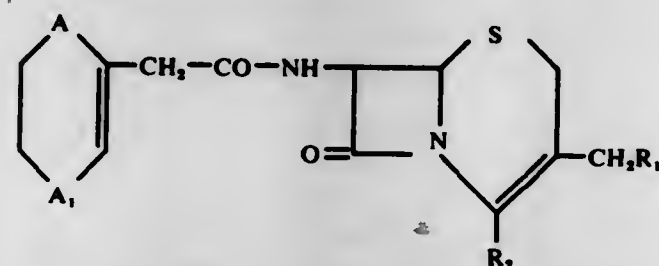
Christian Berger, Le Plessis Robinson; Daniel Farge, Thiais; Georges Gros, Bourg-la-Reine; Mayer Naoum Messer, Bievres, and Claude Moutonnier, Le Plessis-Robinson, all of France, assignors to Rhone-Poulenc S.A., Paris, France
Filed Nov. 12, 1974, Ser. No. 523,007

Claims priority, application France, Nov. 14, 1973, 73.40431; Apr. 25, 1974, 74.14436

Int. Cl.² C07D 501/24

U.S. Cl. 260-243 C

1. A cephalosporin derivative of the formula:



wherein one of A and A₁ represents oxygen or sulphur and the other represents sulphur, R₁ represents hydrogen, acetoxy, (5-methyl-1,3,4-thiadiazol-2-yl)thio or (1-methyl-1,2,3,4-tetrazol-5-yl)thio and R₂ represents carboxy, or R₁ represents a pyridinio radical and R₂ represents the carboxylate ion, and when R₂ represents the carboxy radical pharmaceutically-acceptable salts thereof.

4,007,177

CEPHALOSPORIN DERIVATIVES

Hideo Nakao; Hiroaki Yanagisawa; Mitsuo Nagano; Bunji Shimizu; Masakatsu Kaneko, and Shinichi Sugawara, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

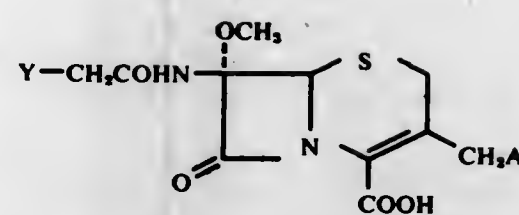
Filed Nov. 14, 1974, Ser. No. 523,819

Claims priority, application Japan, Nov. 26, 1973, 48-132441; Nov. 26, 1973, 48-132442; Dec. 18, 1973, 48-142097; Aug. 12, 1974, 49-92129; Aug. 12, 1974, 49-92131

Int. Cl.² C07D 501/50, 501/56

U.S. Cl. 260-243 C

1. A compound having the formula



wherein A represents a (1-methyl-1H-tetrazol-5-yl)thio group and Y represents a 2-hydroxy-ethylthio group, a methylsulfonyl group, an ethylsulfonyl group, or a sydnon-3-yl group and a nontoxic pharmaceutically acceptable salt thereof.

4,007,178

O-ACYL-7-ACYLAMINOCEPHALOSPORANESIC ACIDS
David A. Berges, Audubon, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

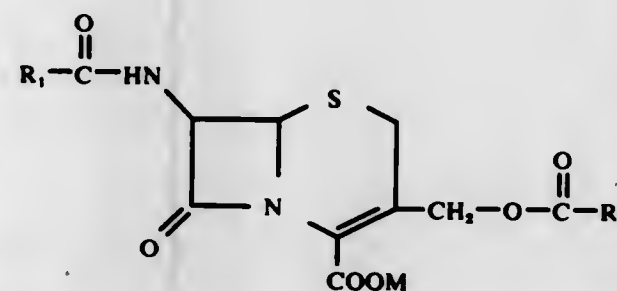
Division of Ser. No. 255,632, May 22, 1972, Pat. No. 3,905,967, which is a continuation-in-part of Ser. No. 141,380, May 7, 1971, abandoned. This application May 15, 1975, Ser. No. 577,816

Claims priority, application United Kingdom, Apr. 10, 1972, 16342/72

Int. Cl.² C07D 501/34

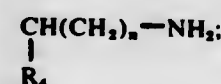
U.S. Cl. 260-243 C

1. A compound of the formula:



in which:

R₁ is 2-thienylmethyl, 4-pyridylthiomethyl, cyanomethyl, tetrazolylmethyl, sydnone-3-methyl, α-hydroxybenzyl, α-hydroxy-2-thienylmethyl, α-aminobenzyl, α-aminocyclohexa-1,4-dienylmethyl or α-amino-2-thienylmethyl; R₂ is



R₄ is hydrogen, phenyl, benzyl or lower alkyl, optionally substituted by a lower alkylthio, mercapto, hydroxy, carboxy or amino substituent; n is 0-3 and M is hydrogen, an alkali metal cation or a quaternary ammonium cation.

4,007,179

OXOINDANYLPROPIONIC ACIDS AND PROCESS FOR THE PREPARATION THEREOF

Norio Yoshida, and Kichiro Tanaka, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Jan. 27, 1976, Ser. No. 652,727

Claims priority, application Japan, Feb. 19, 1975, 50-20696

Int. Cl.² C07D 295/00

U.S. Cl. 260-247.2 R

1. An oxoindanylpropionic acid having the formula

4,007,181

ADAMANTYL CONTAINING GUANIDINES
Donald W. DuCharme, Copper Township, Kalamazoo County, and Louis L. Skaletzky, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

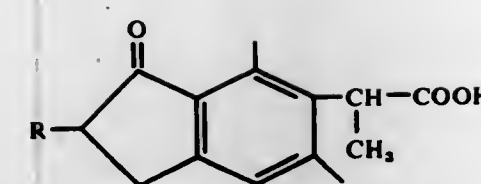
Filed Feb. 11, 1974, Ser. No. 441,398

Int. Cl.² C07D 295/14

U.S. Cl. 260-247.5 R

1. A compound of the formula

7 Claims



wherein R represents ethyl or isopropyl and a salt thereof.

5. The piperidine salt of the acid of claim 2.

4,007,180

PERINONE DYESTUFFS

Helmut Tröster, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Division of Ser. No. 384,794, Aug. 2, 1973, Pat. No. 3,920,662.

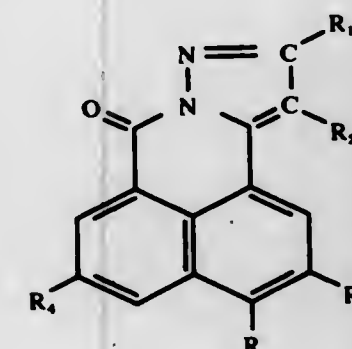
This application Mar. 27, 1975, Ser. No. 562,847

Claims priority, application Germany, Aug. 4, 1972, 2238378

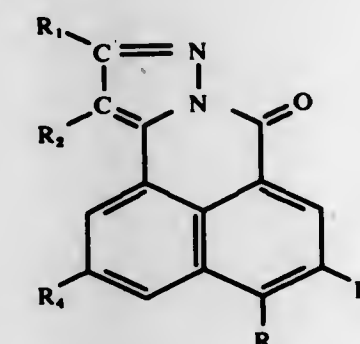
Int. Cl.² C07D 471/06

U.S. Cl. 260-247.2 A

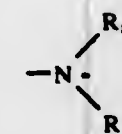
1. Dyestuffs consisting of the mixture of isomers of the formulae



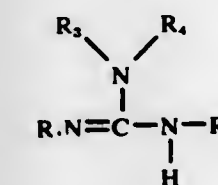
and



wherein R₁ is hydrogen, alkyl with 1 to 20 carbon atoms, alkoxyalkyl or alkoxyalkoxyalkyl each with up to 4 carbon atoms, benzyl, alkoxyalkoxyalkyl with up to 20 carbon atoms or phenyl, R₂ is alkoxyalkoxyalkyl with up to 20 carbon atoms, cyano, alkanoyl, alkoxyalkoxyalkoxyalkyl each with up to 4 carbon atoms, carbonamido, phenylcarbonamido, mono- or dialkylcarbonamido with up to 8 carbon atoms or cyclohexylcarbonamido, R₃ and R₄ are identical and are hydrogen or alkoxy with 1 to 4 carbon atoms or R₃ is alkoxy with 1 to 4 carbon atoms and R₄ is hydrogen and R is an amino group of the formula



wherein R₃ and R₄ together are morpholine or 2,6-dimethylmorpholine.



wherein R₁ and R₂ are the same or different and when R₁ and R₂ are the same they are adamantyl and when R₁ and R₂ are different, R₁ is adamantyl and R₂ is cycloalkyl of five to seven carbon atoms, inclusive;

R₃ and R₄ taken together with the nitrogen atom to which they are attached form a saturated heterocyclic ring



wherein



is pyrrolidino, piperidino, hexamethylenimine, piperazino, N-alkylpiperazino wherein alkyl is one to three carbon atoms, inclusive, morpholino or thiomorpholino.

4,007,182

PROCESS FOR PRODUCING TRICHLOROISOCYANURIC ACID FROM SELECTED SYMMETRICAL TRIAZINES
John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 24, 1976, Ser. No. 660,962

Int. Cl.² C07D 251/36

U.S. Cl. 260-248 C

13 Claims

1. A process for producing trichloroisocyanuric acid by the reaction of a symmetrical triazine compound selected from the group consisting of ammeline, chlorosubstituted ammeline, an alkaline, an alkali metal salt of ammeline, ammelide, chlorosubstituted ammelide, an alkali metal salt of ammelide, and mixtures thereof with hypochlorous acid to form a reaction mixture containing trichloroisocyanuric acid in which the number of moles of said hypochlorous acid reacted per mole of said symmetrical triazine compound is at least X + 2Y, where X represents the number of hydrogen and alkali metal atoms present in said symmetrical triazine compound and Y represents the number of nitrogen atoms in said symmetrical triazine compound which are replaced by oxygen atoms, and separating said trichloroisocyanuric acid from said reaction mixture.

4,007,183

STABILISERS FOR POLYOLEFINES

Helmut Müller, Binningen; Siegfried Rosenberger, Riehen, both of Germany, and Kurt Schwarzenbach, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 150,757, June 7, 1971, Pat. No. 3,850,918.

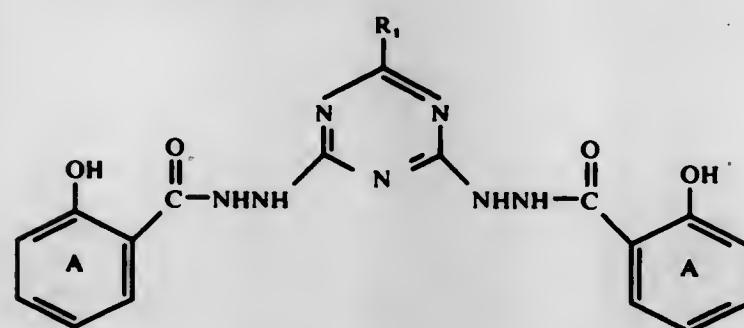
This application May 20, 1974, Ser. No. 471,408

Claims priority, application Sweden, June 17, 1970, 9182; Oct. 2, 1970, 14666/70

Int. Cl.² C07D 251/48

U.S. Cl. 260—249.8

1. Compounds of the formula



wherein R₁ is alkyl of 1 to 18 carbon atoms or alkoxy of 1 to 18 carbon atoms, groups or the group and the rings A are unsubstituted or are substituted by 1 to 2 alkyl groups with 1 to 8 carbon atoms each, an alkoxy group with 1 to 18 carbon atoms and/or 1 to 3 chlorine atoms.

4,007,184

SUBSTITUTED ALKYL ESTERS OF QUINOXALINE-DI-N-OXIDE-2-CARBOXYLIC ACID

Timothy H. Cronin, East Lyme, and Kenneth Richardson, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 397,162, Sept. 13, 1973, Pat. No. 3,915,975, which is a division of Ser. No. 135,792, April 20, 1971, Pat. No. 3,818,007, and a continuation-in-part of Ser. No. 20,841, March 18, 1970, abandoned. This application Oct. 9, 1975, Ser. No. 621,219

Int. Cl.² C07D 241/52

U.S. Cl. 260—250 QN

1. 3-Methyl-2-quinoxalinecarboxylic acid, 2-aminoethyl ester, 1,4-dioxide.

4,007,185

3,5-SUBSTITUTED-1,2,4-OXADIAZOLE INNER QUATERNARY AMMONIUM SALTS

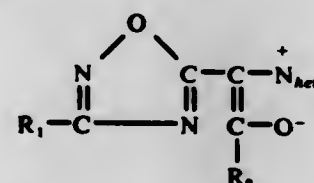
Anne Mary Von Esch, North Chicago, and Aldo Joseph Crovetto, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 316,189, Dec. 18, 1972, Pat. No. 3,907,809, which is a division of Ser. No. 85,747, Oct. 30, 1970, Pat. No. 3,725,424. This application May 22, 1975, Ser. No. 580,085

Int. Cl.² C07D 271/06

U.S. Cl. 260—251 R

1. The compound of the formula



in which N_{het} is selected from the group consisting of pyrimidinyl; halo and loweralkyl substituted pyrimidinyl; R₁ is selected from the group consisting of loweralkyl, phenyl nitrophenyl, dinitrophenyl, nitrofuryl, and nitrothienyl; and R₂ is

selected from the group consisting of hydrogen and a loweralkyl wherein said loweralkyl groups have from 1-4 carbon atoms.

4,007,186

PROCESS FOR PREPARING URIC ACID

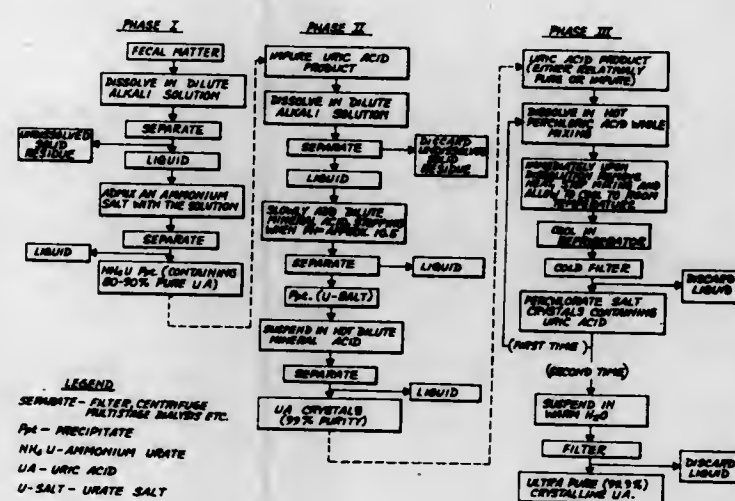
Carl F. Emanuel, deceased, late of Bellevue, Wash., and Mary Victoria Emanuel, administratrix, 1025 156th NE., Bellevue, Wash. 98007

Filed Sept. 20, 1974, Ser. No. 507,728

Int. Cl.² C07D 473/04

U.S. Cl. 260—255

18 Claims



1. A process of preparing ultra pure crystalline uric acid comprising dissolving a uric acid product in a first hot perchloric acid solution, gradually cooling said perchloric acid solution upon dissolution of said uric acid product to form perchlorate salt crystals containing uric acid, separating the perchlorate salt crystals from said solution, redissolving the perchlorate salt crystals in a second hot perchloric acid solution, cooling said second perchloric acid solution upon dissolution of said perchlorate salt crystals to again form perchlorate salt crystals containing uric acid, separating the perchlorate salt crystals obtained from the second perchloric acid solution, suspending said separated perchlorate salt crystals in a warm water solution to dissolve the perchloric acid and precipitate uric acid crystals, and separating said uric acid crystals from said warm water solution thereby obtaining ultra pure crystalline uric acid.

4,007,187

FURO (2,3D) PYRIMIDINES

Claude P. Fauran, Paris; Guy R. Bourgety, Colombes; Guy M. Raynaud, and Nicole A. M. Dorme, both of Paris, all of France, assignors to Delalande S.A., Courbevoie, France

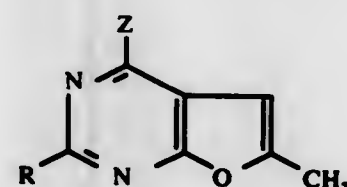
Filed Sept. 17, 1974, Ser. No. 506,826

Claims priority, application France, Oct. 2, 1973, 73.35190; May 20, 1974, 74.17484

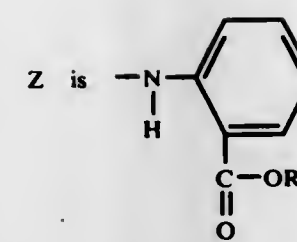
Int. Cl.² C07D 239/00

U.S. Cl. 260—256.4 F

1. A compound having the formula



in which R is alkyl having one to 4 carbon atoms, phenyl, or phenyl substituted by at least one halogen or by a trifluoromethyl,



in which R₁ is hydrogen or alkyl containing one to 4 carbon atoms.

4,007,188

COUMARIN AND COUMARINIMIDE DERIVATIVES

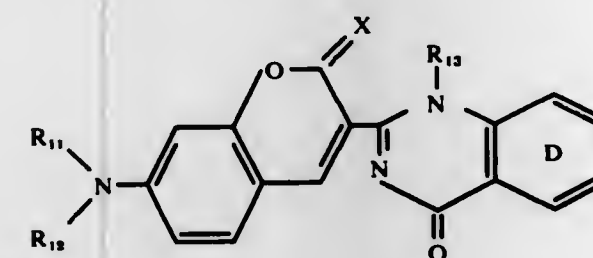
Werner Koch, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 332,431, Feb. 14, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,956
Claims priority, application Switzerland, Jan. 2, 1973, 51/73

Int. Cl.² C07D 405/04

U.S. Cl. 260—256.4 Q

1. A compound of formula Ia,



wherein

X is O or NH,

R₁₁ is C₁₋₄alkyl or monosubstituted C₁₋₄alkyl, wherein the substituent of monosubstituted C₁₋₄alkyl is C₁₋₄alkoxy, cyano, formyloxy, C₁₋₄alkylcarbonyloxy, C₁₋₄alkoxycarbonyloxy, C₁₋₄alkoxycarbonyl, allyl or phenyl,

R₁₂ is hydrogen or has one of the significances of R₁₁,

R₁₃ is hydrogen, C₁₋₄alkyl, phenyl, C₁₋₄alkylaminoC₁₋₄alkyl, C₁₋₄alkylaminoC₁₋₄alkylphenyl, thionyl, thiazolyl, benzothiazolyl, methoxybenzothiazolyl, C₁₋₄alkylcarbonyl, benzoyl, C₁₋₄alkylsulfonyl, phenylsulfonyl or toluylsulfonyl, and

ring D is unsubstituted or substituted by 1 or 2 substituents selected from chloro, bromo, methyl, methoxy, acetyl, benzoyl, methylsulfonyl, phenylsulfonyl, toluylsulfonyl, aminosulfonyl and C₁₋₄alkylaminosulfonyl.

4,007,189

PYRROLOTRIAZOLOPYRIMIDINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Yasunobu Sato; Hiromu Takagi; Yasuo Shimoji, and Selji Kumakura, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

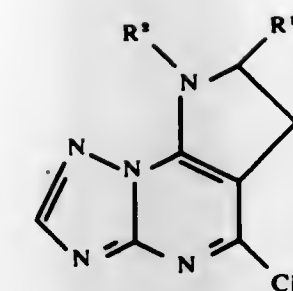
Filed May 4, 1976, Ser. No. 683,055

Claims priority, application Japan, May 31, 1975, 50-65832

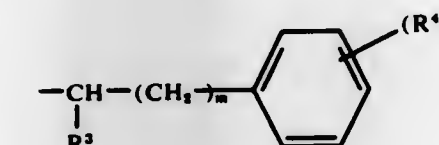
Int. Cl.² C07D 487/14

U.S. Cl. 260—256.4 F

1. A pyrrolotriazolopyrimidine having the formula



wherein R₁ represents hydrogen or alkyl having from 1 to 4 carbon atoms and R₂ represents alkyl having from 1 to 4 carbon atoms, cycloalkyl having from 5 to 8 carbon atoms, phenyl, phenyl substituted with halogen selected from the group consisting of fluorine, chlorine or bromine, or a phenylalkyl having the formula



in which R₃ represents hydrogen or alkyl having from 1 to 4 carbon atoms, R₄ represents halogen selected from the group consisting of fluorine, chlorine or bromine, alkyl having from 1 to 4 carbon atoms or alkoxy having from 1 to 4 carbon atoms, m represents an integer from 0 to 2 and n represents an integer from 0 to 3, and pharmacologically acceptable salts thereof.

4,007,190

3,6-BIS(2-PIPERIDINYL)-2,5-PIPERAZINEDIONE COMPOUNDS

Tsung-Ying Shen, Westfield; Norman P. Jensen, Watchung, and Arthur F. Wagner, Princeton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

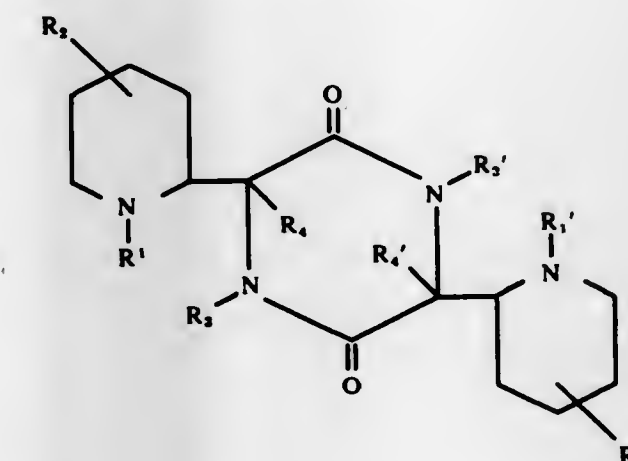
Division of Ser. No. 201,956, Nov. 24, 1971, abandoned. This application June 21, 1974, Ser. No. 481,622

Int. Cl.² C07D 401/14

U.S. Cl. 260—268 DK

1. A compound having the formula:

3 Claims



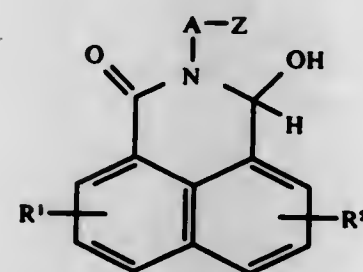
4,007,191
2-PIPERIDINYL OR
TETRAHYDROPYRIDINYL)-ALKYL)-2,3-DIHYDRO-3-
HYDROXY-1H-BENZ(DE)ISOQUINOLIN-1-ONES
Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt,
Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Prince-
ton, N.J.

Filed Oct. 14, 1975, Ser. No. 621,939
Int. Cl.² C07D 401/06

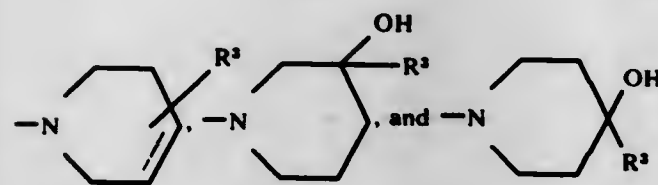
U.S. Cl. 260-288 CF

1. A compound of the formula:

15 Claims



wherein R¹ and R² are independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, lower alkylthio, trifluoromethyl, nitro, amino and cyano; Z is selected from the group consisting of



wherein the dashed line indicates the optional presence of a double bond; R² is selected from the group consisting of phenyl, phenyl-lower alkyl, substituted phenyl and substituted phenyl-lower alkyl wherein said substituent is one or two members selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, amino, nitro, and trifluoromethyl provided that only one phenyl substituent is selected from amino, nitro, trifluoromethyl, and lower alkylthio; and A is straight or branched chain alkylene of 2 to 8 carbons.

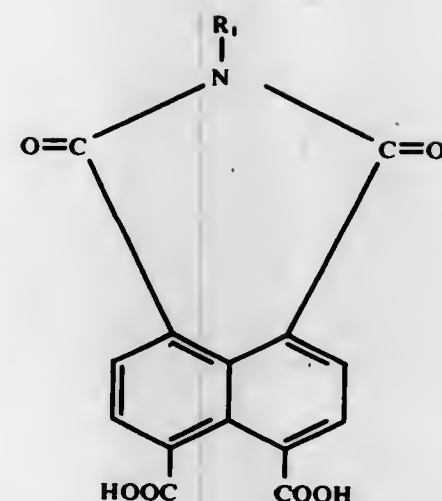
4,007,192
NAPHTHALIMIDE-4,5-DICARBOXYLIC ACIDS
Otto Fuchs, Frankfurt am Main, and Adolf Kroh, Munster,
Oberlahnkreis, both of Germany, assignors to Hoechst Ak-
tiengesellschaft, Frankfurt am Main, Germany
Division of Ser. No. 398,410, Sept. 18, 1973, abandoned. This
application Sept. 13, 1974, Ser. No. 505,624
Claims priority, application Germany, Sept. 20, 1972,
2246111

Int. Cl.² C07D 217/24, 491/06

U.S. Cl. 260-281 F

1. A compound of the formula

1 Claim



or the anhydride thereof, wherein R₁ is 3-(4'-hydroxy)-butoxypropyl.

4,007,193
SUBSTITUTED 3-(2-PYRIDINYL)-4(1H)-QUINOLINONE
N-OXIDES

David T. Connor, Parsippany; Patricia A. Young, Madison,
and Maximilian von Strandmann, Rockaway Township, all
of N.J., assignors to Warner-Lambert Company, Morris
Plains, N.J.

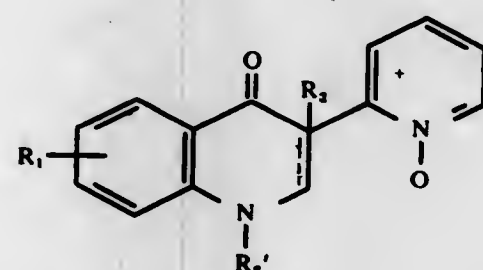
Filed Sept. 8, 1975, Ser. No. 611,036

Int. Cl.² C07D 401/04

U.S. Cl. 260-288 CE

1. A compound of the formula IV:

8 Claims



wherein R₁ is hydrogen, halogen, 1 to 7 carbon lower alkyl, hydroxy or 1 to 7 carbon lower alkoxy; R₂ is 1 to 7 lower alkyl; R₃ is hydrogen or hydroxymethyl; and the pharmaceutically acceptable acid addition salts thereof.

5. A compound according to claim 1 which is 2,3-dihydro-1-methyl-3-(2-pyridinyl)-4(1H)-quinolinone N-oxide.

4,007,194
PROCESS AND INTERMEDIATES FOR MANUFACTURE
OF 2-AZASTERIODS

Robert J. Chorvat, Arlington Heights, and Raphael Pappo,
Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago,
Ill.

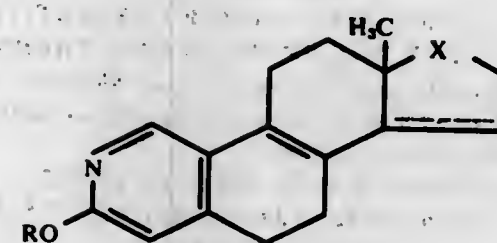
Filed May 6, 1974, Ser. No. 467,217

Int. Cl.² C07D 217/12

U.S. Cl. 260-289 AZ

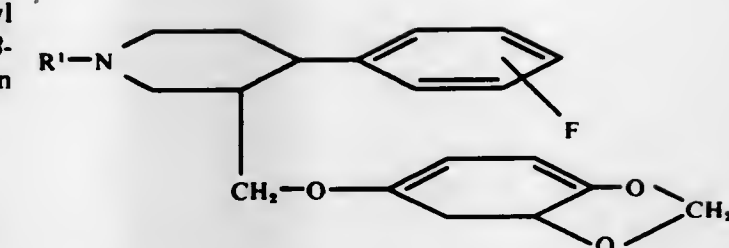
1. A dl-compound of the formula

6 Claims



wherein R is a lower alkyl group having 1-7 carbon atoms

inclusive, a tri(lower alkyl)silyl group wherein lower alkyl is a group having 1-7 carbon atoms inclusive or a lower cycloalkyl group having 5 or 6 carbon atoms, X is a carbonyl or β -hydroxymethylene group and the dotted line represents an optionally doubly-bonded linkage.

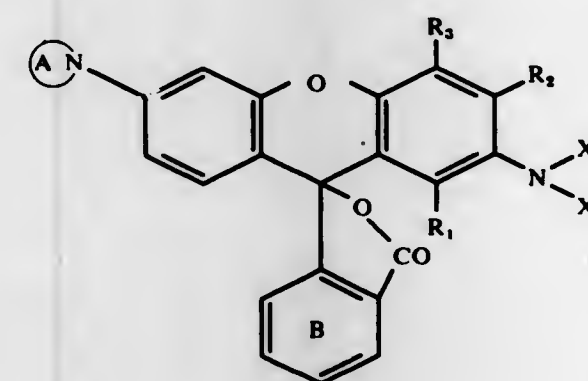


4,007,195
HETEROCYCLIC SUBSTITUTED FLUORANS
Robert Garner, Ramsbottom Bury, England, and Jean Claude
Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-
Geigy AG, Basel, Switzerland
Division of Ser. No. 507,158, Sept. 18, 1974, Pat. No.
3,929,831. This application Sept. 30, 1975, Ser. No. 618,102
Int. Cl.² C07D 271/00

U.S. Cl. 260-293.58

1. A fluoran compound of the formula

6 Claims



wherein

R₁, R₂ and R₃ independently of the other, represent hydrogen, alkyl with 1 to 4 carbon atoms, nitro or halogen, or R₂ and R₃ together complete a condensed carbocyclic ring, X₁ and X₂ independently of the other, represent hydrogen, alkyl with 1 to 12 carbon atoms, alkenyl with at most 12 carbon atoms, alkoxyalkyl with 2 to 8 carbon atoms, alkoxyalkyl with 3 to 9 carbon atoms, cycloalkyl with 5 or 6 carbon atoms, acyl having 1 to 12 carbon atoms, or an unsubstituted or substituted benzyl, phenyl or naphthyl radical substituted by substituents selected from the group consisting of alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkoxyalkyl with 2 to 5 carbon atoms, acyl having 1 to 4 carbon atoms, nitro, halogen or an amino optionally substituted by alkyl with 1 to 4 carbon atoms or by benzyl, and the nitrogen ring A represents the piperidino radical and the benzene ring B is unsubstituted or substituted by nitro or 1 to 4 halogen atoms.

4,007,196
4-PHENYLPYPERIDINE COMPOUNDS
Jørgen Anders Christensen, Virum, and Richard Felt Squires,
Gl. Olstykke, both of Denmark, assignors to A/S Ferrosan,
Denmark

Continuation-in-part of Ser. No. 435,006, Jan. 21, 1974, Pat.
No. 3,912,743. This application July 23, 1975, Ser. No.
598,146

Claims priority, application United Kingdom, Jan. 30, 1973,
4496/73

The portion of the term of this patent subsequent to Oct. 14,
1992, has been disclaimed.
Int. Cl.² C07D 405/12

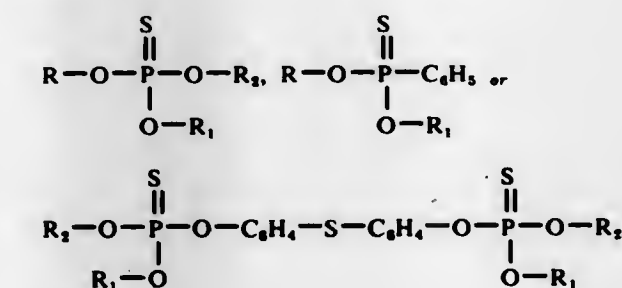
U.S. Cl. 260-293.58

1. A 3-substituted 1-alkyl-4-fluorophenyl-piperidine of the formula

4,007,197
PROCESS FOR PREPARING PHOSPHOROTHIOATES
AND PHENYLPHOSPHONOTHIOATES
Harold H. Freedman, Newton Center, Mass.; Stanley D. Mc-
Gregor; Masao Yoshimine, both of Midland, Mich., and
Lorraine M. Kroposki, Walnut Creek, Calif., assignors to
The Dow Chemical Company, Midland, Mich.
Filed June 10, 1975, Ser. No. 585,554
Int. Cl.² C07D 213/83

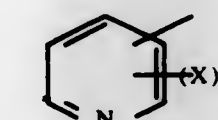
U.S. Cl. 260-294.8 K

1. In the process of preparing a compound corresponding to the formula



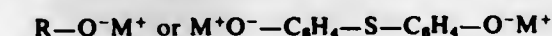
wherein:

R₁ and R₂ are each independently lower alkyl; and

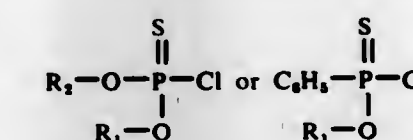


wherein:

n is 0, 1, 2 or 3; and
X is nitro, cyano, halo, lower alkyl, lower alkoxy, lower alkylthio or lower alkylsulfinyl,
with the proviso that R does not bear more than one nitro group, lower alkylthio group or lower alkylsulfinyl group; by reacting in an inert liquid reaction medium under alkaline conditions (a) a compound corresponding to the formula



with (b) a compound corresponding to the formula



wherein M is an alkali metal and R, R₁ and R₂ have the afore-
said meaning;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of (1) a quaternary ammonium or phosphonium salt having a minimum

solubility of at least 1 weight percent in the liquid reaction medium at 25°C and (2) an organic, sterically unhindered, nucleophilic tertiary amine, with the proviso that said amine is not 1,4-diazabicyclo[2.2.2]octane or an N-substituted diazole when 1) is a quaternary ammonium salt.

4,007,198

SUBSTITUTED 1,2,4-TRIAZOLE CARBOXAMIDE

Howard Newman, Monsey, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

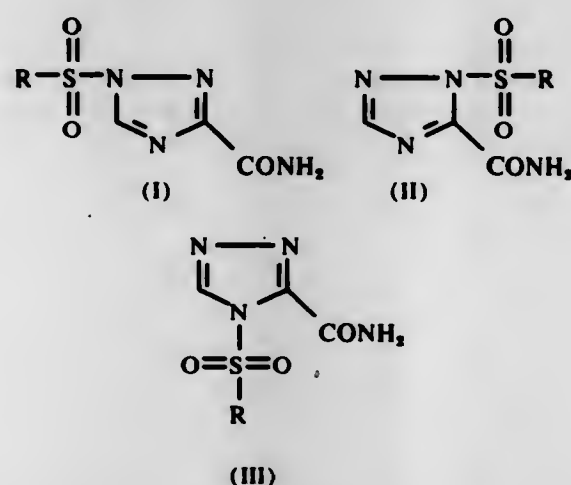
Filed May 1, 1975, Ser. No. 573,687

Int. Cl.² C07D 249/10; A61K 31/41

U.S. Cl. 260—308 R

5 Claims

1. Mixtures of 1-sulfonyl-s-triazole-3-carboxamide (I), 2-sulfonyl-s-triazole-3-carboxamide (II), and 4-sulfonyl-s-triazole-3-carboxamide (III) of the formulae:



wherein R is the same in (I), (II), and (III) in each mixture and wherein R is selected from the group consisting of alkyl having 1 to 4 carbon atoms, phenyl, p halophenyl and p-tolyl.

4,007,199

POLYGLYCIDYL COMPOUNDS CONTAINING N-HETEROCYCLIC STRUCTURE

Jürgen Habermeyer, Pfaffingen; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 371,449, June 19, 1973, Pat. No. 3,900,493. This application July 7, 1975, Ser. No. 593,916

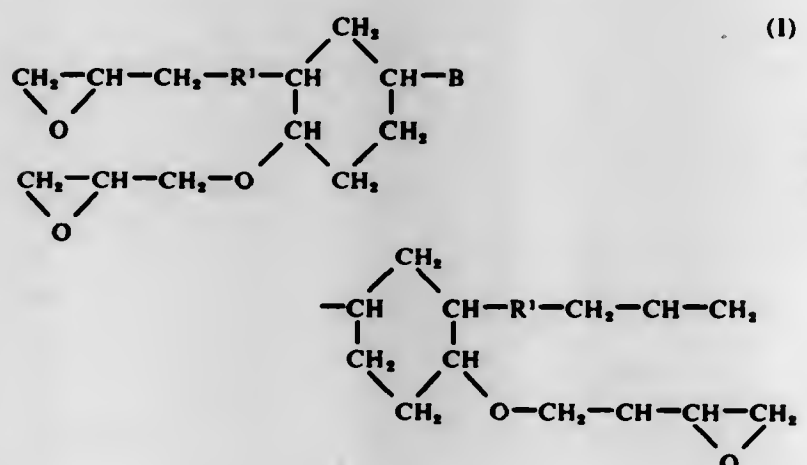
Claims priority, application Switzerland, June 23, 1972, 9528/72

Int. Cl.² C07D 49/32

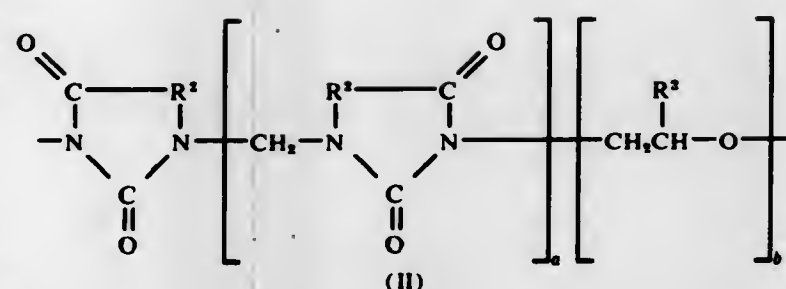
U.S. Cl. 260—309.5

1 Claim

1. A polyglycidyl compound of the formula

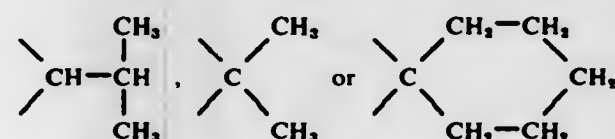


wherein B denotes the radical $\text{—CH}_2\text{—O—CO—}$, R¹ denotes a divalent radical of the formula



wherein a and b are identical or different and denote either 0 or 1;

R² is hydrogen or methyl; and R² denotes one of the radicals



4,007,200

IMIDAZOLINES AND A METHOD FOR THEIR PRODUCTION

Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccet, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

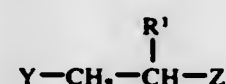
Filed May 6, 1974, Ser. No. 467,332

Int. Cl.² C07D 49/34

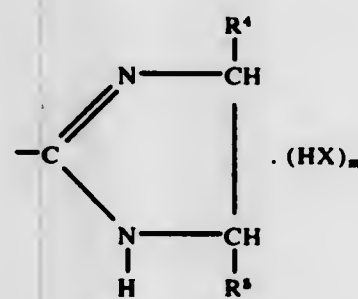
U.S. Cl. 260—309.6

2 Claims

1. A compound having the formula



wherein Y is R²O, R² being alkyl (C₁—C₁₀), R¹ is hydrogen or methyl and Z is



wherein m is 0 or 1, X is halogen and R⁴ and R⁵ are, individually, hydrogen, alkyl (C₁—C₄), aryl (C₆—C₁₀), aralkyl (C₇—C₁₁) or alkaryl (C₇—C₁₁).

4,007,201

NOVEL PYRAZOLE DERIVATIVES

Tsutomu Irikura, Tokyo, Japan, assignor to Kyorin Pharmaceutical Co. Ltd., Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,268

Int. Cl.² C07D 231/12; A61K 31/415

U.S. Cl. 260—310 R

5 Claims

1. A compound of the general formula

4,007,203

4-(1-PYROLIDENYL)-2H-1-BENZOTHIOPYRAN-3-CARBOXANILIDE

Harold Zinnes, Rockaway, and Neil A. Lindo, Chatham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

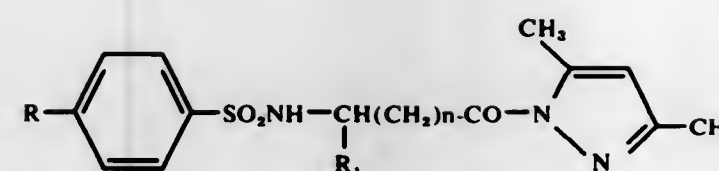
Continuation of Ser. No. 421,556, Dec. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 163,076, July 15, 1971, abandoned. This application Aug. 13, 1975, Ser. No. 604,369

Int. Cl.² C07D 417/04

U.S. Cl. 260—326.34

1 Claim

1. 4-(1-pyrrolidinyl)-2H-1-benzothiopyran-3-carboxanilide.



wherein

R is isobutyl, cyclohexyl or chlorine; R₁ is hydrogen, methyl, phenyl or benzyl; and n is 0 or 1 when R₁ is hydrogen and is 0 when R₁ is methyl, phenyl, or benzyl.

4,007,202

AZETIDINE DERIVATIVES

Jan Verweij, Leiden, and Hong Sheng Tan, Bleiswijk, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Feb. 7, 1975, Ser. No. 547,948

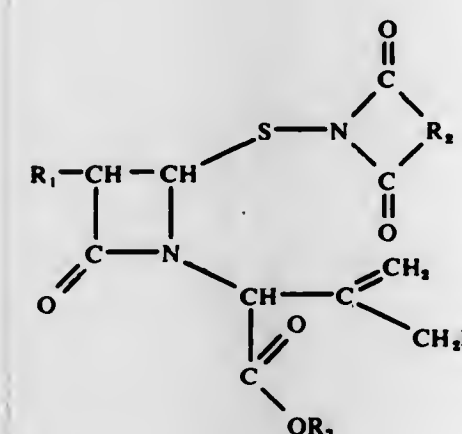
Claims priority, application United Kingdom, Feb. 8, 1974, 05811/74

Int. Cl.² C07D 207/12, 209/48

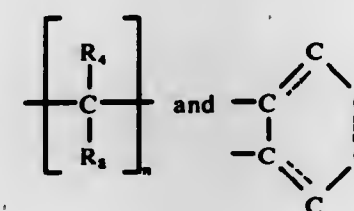
U.S. Cl. 260—326 S

10 Claims

1. An azetidine compound of the formula



wherein R₁ is a penicillin acylamido group, R₂ is selected from the group consisting of



wherein R₄ and R₅ are individually selected from the group consisting of hydrogen, lower alkyl and lower alkenyl, n is 2 and — in the case when R₂ is a phenyl this group may carry one to four substituents selected from the group consisting of halogen, lower alkyl, lower alkenyl and phenyl, and R₃ is lower alkyl optionally substituted with 1 or 2 phenyls which phenyl groups may be substituted with nitro and the dotted lines of the second formula indicate the optional presence of double bonds.

4,007,204

BENZOTHIOPHENE COMPOUNDS AND THE PRODUCTION AND USE THEREOF

Marcel Descamps, Crainhem, and Jean Gubin, Brussels, both of Belgium, assignors to Labaz, Paris, France

Filed Apr. 21, 1975, Ser. No. 569,819

Claims priority, application United Kingdom, June 6, 1974, 25256/74

Int. Cl.² C07D 333/52

U.S. Cl. 260—330.5

1 Claim

1. 2-Methyl-3-(3,5-dimethyl-4-γ-di-n-butylaminopropoxy-benzoyl)-benzo[b]thiophene.

4,007,205

7-SUBSTITUTED-9-OXOXANTHENE-2-CARBOXALDEHYDES

David T. Connor, Parsippany, and Max von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

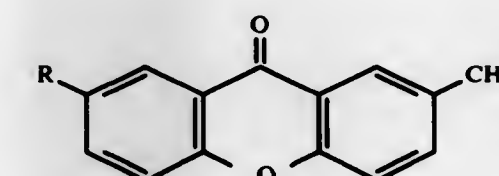
Filed Mar. 16, 1976, Ser. No. 667,922

Int. Cl.² C07D 311/86

U.S. Cl. 260—335

3 Claims

1. A compound of the formula:



in which R is lower alkoxy or hydroxy.

3. 9-hydroxy-7-methoxy-9H-xanthene-2-methanol.

4,007,206

2,3:4,6-DI-O(SUBSTITUTED)-2-KETO-L-GULONIC ACID, SALTS AND ESTERS

William Szkrybalo, Verona, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

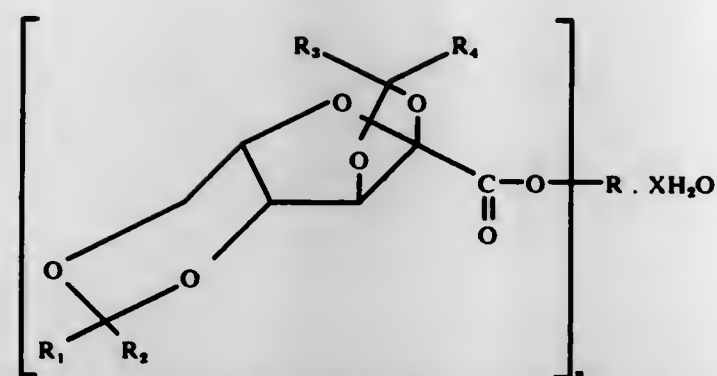
Continuation-in-part of Ser. No. 335,607, Feb. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 277,538, Aug. 3, 1972, abandoned. This application Mar. 17, 1975, Ser. No. 559,209

Int. Cl.² C07D 319/06; A01N 9/28

U.S. Cl. 260—340.7

11 Claims

1. A compound represented by the formula



wherein, when n is 1, R is straight or branched chain alkyl of from 1 to 20 carbon atoms, straight or branched chain alkenyl of from 5 to 20 carbon atoms, straight or branched chain alkynyl of from 2 to 20 carbon atoms or halo-lower alkyl and, when n is 2, R is lower alkylene; R_1 , R_2 , R_3 and R_4 are hydrogen, straight or branched chain alkyl of from 1 to 7 carbon atoms, straight or branched chain alkenyl of from 2 to 7 carbon atoms, straight or branched chain alkynyl of from 2 to 7 carbon atoms, fluoro-lower alkyl, phenyl or phenyl having one or more substituents selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy and halo-lower alkoxy; n is an integer from 1 to 2 and X is a number from 0 to 11; its enantiomers and racemic mixtures, with the proviso that when R is alkyl of from 1 to 4 carbon atoms or alkenyl of from 5 to 6 carbon atoms, at least one of R_1 , R_2 , R_3 and R_4 is other than methyl.

4,007,207

ALKYL SUBSTITUTED-4-OXO-CYCLOPENTA BENZOPYRANS

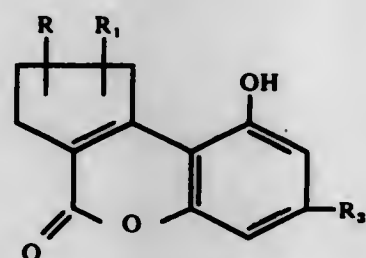
Martin Winn, Deerfield, Ill.; Raj Kumar Razdan, Belmont, Mass.; Haldean Cloyce Dalzell, Weston, Mass., and Joyce Ruth Krel, Glenview, Ill., assignors to Sharps Associates, Cambridge, Mass.

Division of Ser. No. 392,635, Aug. 29, 1973, Pat. No. 3,929,835. This application July 9, 1975, Ser. No. 594,534
Int. Cl.³ C07D 311/78

U.S. Cl. 260—343.2 R

1. A compound of the formula

6 Claims



wherein R is a lower alkyl group having 1 to 5 carbons, R_1 is hydrogen or a lower alkyl group having 1 to 5 carbons and R_2 is an alkyl group having 1 to 20 carbon atoms, a phenyl-lower alkyl group or a cycloalkyl-lower alkyl group.

4,007,208

HYDROXYCITRIC ACID DERIVATIVES

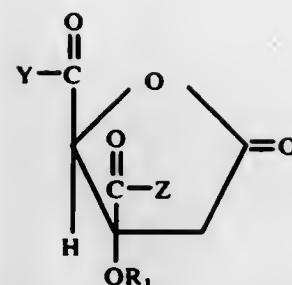
Robert William Guthrie, Fairfield, and Richard Wightman Kierstead, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 376,478, July 5, 1973, Pat. No. 3,919,478, which is a division of Ser. No. 204,288, Dec. 2, 1971, Pat. No. 3,767,678. This application Aug. 1, 1975, Ser. No. 601,246
Int. Cl.³ C07D 307/32

U.S. Cl. 260—343.6

1. A compound of the formula

7 Claims



wherein R_1 is lower alkanoyl; Y is OR_2 ; Z is OR_2 ; where R_2 is hydrogen; R_2' is lower alkyl or aryl lower alkyl; where aryl is selected from the group consisting of phenyl and phenyl monosubstituted with chlorine, bromine, iodine, fluorine, lower alkyl, hydroxy, lower alkoxy, nitro, cyano, carboxyl or alkanoyl-amino, wherein, alkanoyl is of up to 20 carbon atoms or an optical antipode or a pharmaceutically acceptable salt thereof.

4,007,209

ACETALS WHICH ACT AS PHOTOINITIATORS

Eckhard Hickmann, Ludwigshafen; Martin Fischer, Ellersstadt; Otto Volkert, and Mong-Jon Jun, both of Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Continuation of Ser. No. 375,176, June 29, 1973, abandoned.

This application Mar. 10, 1975, Ser. No. 557,046

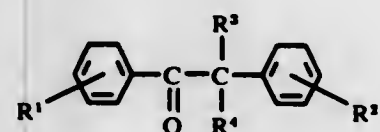
Claims priority, application Germany, July 1, 1972, 2232497

Int. Cl.³ C07D 309/08

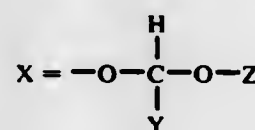
U.S. Cl. 260—345.9

5 Claims

1. Acetals of benzoin compounds which act as photoinitiators and which have the formula



which contain at least one acetal group



in the radicals R^3 or R^4 , Y being CH_3 and Z being C_2-C_4 -alkyl, or Y and Z together forming a propylene or butylene group; R^1 and R^2 are H , C_1-C_4 -alkyl, C_1-C_4 -alkoxy or Cl , R^3 is H , CH_3 , CH_2OR^5 or CH_2X , R^4 is X or OR^5 and R^5 is C_1-C_6 -alkyl.

4,007,210

NOVEL 3-TRIPHENYLMETHOXY-1-ALKYNES, 3-TRIPHENYLMETHOXY-1-TRANS-ALKENYL-DIALKYL-ALANES, AND LITHIUM 3-TRIPHENYL-METHOXY-1-TRANS-ALKENYL-DIALKYL-ALANATES

Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 355,350, April 27, 1973, Pat. No. 3,932,479. This application Sept. 18, 1975, Ser. No. 613,776
Int. Cl.³ C09B 11/06

U.S. Cl. 260—395

1. Compounds of the formula:

13 Claims

4,007,212

NOVEL AMIDE COMPOUNDS

Harris L. Curtis, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

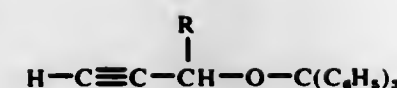
Division of Ser. No. 20,482, March 26, 1970, Pat. No. 3,923,779, which is a continuation of Ser. No. 655,304, July 24, 1967, abandoned. This application Apr. 28, 1975, Ser. No. 572,073

Int. Cl.³ C07C 103/44

U.S. Cl. 260—404.5

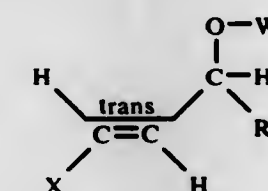
5 Claims

1. A compound of the formula:



wherein R is selected from the group consisting of a straight chain alkyl group having from 2 to 10 carbon atoms, a straight chain alkyl group having from 2 to 10 carbon atoms and substituted with one or two alkyl groups each having from one to three carbon atoms, a straight chain alkenylmethyl group having from 3 to 10 carbon atoms and a straight chain alkenylmethyl group having from 3 to 10 carbon atoms and substituted with one or two alkyl groups having between them 2 to 5 carbon atoms.

7. Compounds of the formula:



wherein X is iodo or bromo; R is a straight chain alkyl group having from 2 to 10 carbon atoms, a straight chain alkyl group having from 2 to 10 carbon atoms and substituted with one or two alkyl groups having from 1 to 3 carbon atoms, a straight chain alkenylmethyl group having from 3 to 10 carbon atoms, or a straight chain alkenylmethyl group having from 3 to 10 carbon atoms and substituted with one or two alkyl groups having between them 2 to 5 carbon atoms; and W is lower alkyl, triphenylmethyl, or triphenylmethyl wherein one or two of the phenyl rings is substituted with a lower alkoxy group.

4,007,211

CONVERSION OF ORGANIC CARBOXYLIC ACID TO CORRESPONDING KETONE WITH LOSS OF CARBON ATOM

Barry M. Trost, and Yoshinao Tamaru, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

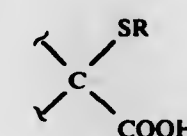
Filed May 19, 1975, Ser. No. 578,533

Int. Cl.³ C07J 5/00

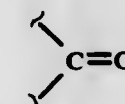
U.S. Cl. 260—397.3

19 Claims

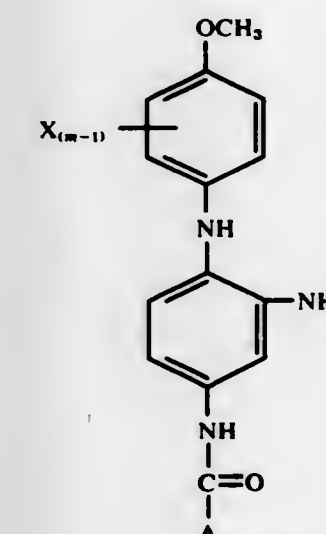
1. The method of converting an alpha thio carboxylic acid compound having the general formula



to the corresponding ketone having the general formula



wherein the carboxylic carbon is removed and in which R is an organic group other than an alkenyl or alkynyl group comprising subjecting the alpha thio carboxylic acid compound to oxidative decarboxylation by reaction of the alpha thio carboxylic acid compound with a positive halogen source.



wherein:

X is methyl, methoxy, hydroxy, amino, chloro, or carboxy; m is a positive integer from 1 to 2; and A is an alkyl radical having from 9-17 carbon atoms.

4,007,213

PROCESS FOR PREPARING

1-(N-β-CYANETHYLAMINO)-3-ACYLAMINO BENZENES

Rudolf Schickflus, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Apr. 27, 1976, Ser. No. 680,706

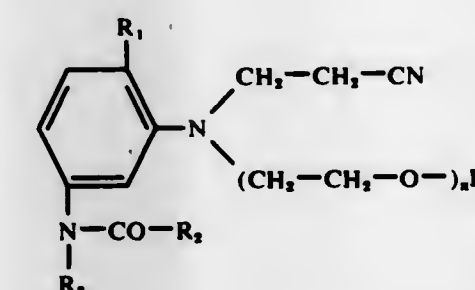
Claims priority, application Germany, Apr. 29, 1975, 2519002

Int. Cl.³ C07C 121/78

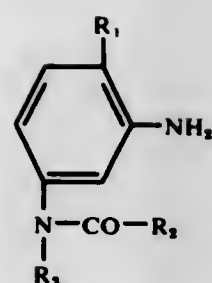
U.S. Cl. 260—465 D

4 Claims

1. Process for the manufacture of 1-(N-β-cyanethylamino)-3-acylamino benzenes of the formula (1)



in which R_1 represents hydrogen, methyl or alkoxy of 1 to 4 carbon atoms, R_2 represents hydrogen, alkyl from 1 to 3 carbon atoms or phenyl, R_3 represents hydrogen or alkyl from 1 to 3 carbon atoms, and n represents the integer 0 or 1, which comprises reacting 1 mole of an amine of the formula (2)



in which R_1 , R_2 and R_3 are defined as above, with 1 to 1.75 moles of acrylonitrile between 70° and 150° C in water with the addition of 1 to 30% by weight of an organic carboxylic acid or carbonic acid, and oxethylating the compound of the said formula (1) obtained, if n stands for the integer 0, without or after isolation, with 1 to 10 moles of ethylene oxide between 50° and 100° C.

4,007,214

DICYCLOHEXADIENE TETRAACYL COMPOUNDS
Steven A. Cerefece, Naperville, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 405,837, Oct. 12, 1973, Pat. No. 3,929,711. This application June 6, 1975, Ser. No. 584,638
Int. Cl.² C07C 69/74

U.S. Cl. 260—468 G

4 Claims

1. A tetra ester of a dicyclohexadiene tetracarboxylic acid selected from the group consisting of tricyclo [6.2.2.0^{2,7}]dodeca-3,9-diene-5,6,11,12-tetracarboxylic acid and tricyclo [6.2.2.0^{2,7}]dodeca-4,9-diene-5,6,11,12-tetracarboxylic acid wherein the ester moieties of said tetra ester are selected from at least one member of the class consisting of alkyl groups containing from 1 to 24 carbon atoms, aryl groups containing from 6 to 24 carbon atoms, aralkyl groups containing from 7 to 24 carbon atoms and alkenyl groups containing from 3 to 24 carbon atoms.

4,007,215

1-(BIS-ETHOXYCARBONYL)-ACETYLAMINO-3-METHYL-3-(BIS-ETHOXYCARBONYL)-ACETYLAMINOMETHYL-5-DIMETHYL-CYCLOHEXANE

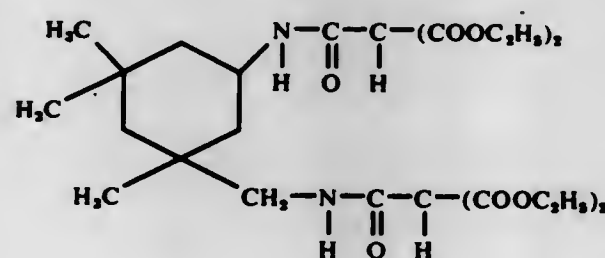
Heinrich Hartmann, Limburgerhof, and Wolfgang Druschke, Dirmstein, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 7, 1975, Ser. No. 593,762
Claims priority, application Germany, July 31, 1974, 2436872

Int. Cl.² C07C 103/48

U.S. Cl. 260—468 J

1. The compound of the formula



4,007,216

2-METHOXY-4-METHYL-3-OXO-CYCLOPENT-1-ENE-1,4-DICARBOXYLIC ACID ESTERS

(2) Thurman Chestler McFearn, Jr., Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.
Division of Ser. No. 426,021, Dec. 19, 1973, Pat. No. 3,922,296. This application May 12, 1975, Ser. No. 576,742
Int. Cl.² C07C 69/74

U.S. Cl. 260—468 K

1 Claim

1. As a composition of matter 2-methoxy-3,5-dicarboalkoxy-5-methylcyclopent-2-ene-1-one.

4,007,217

PROCESS FOR PRODUCING 2-HYDROXY-3-BUTENOIC ACID DERIVATIVES

Katsura Kogure, Kawagoe; Noriyoshi Sueda, Tokyo; Sizu Himoto, Kawagoe; Youzuro Yoshino, Tokyo, and Kunio Nakagawa, Kawagoe, all of Japan, assignors to Nissin Flour Milling Co., Ltd., Nihonba, Japan

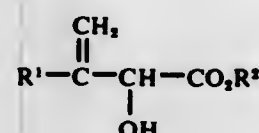
Filed July 28, 1975, Ser. No. 599,776

Claims priority, application Japan, July 27, 1974, 49-85621
Int. Cl.² C07C 69/76

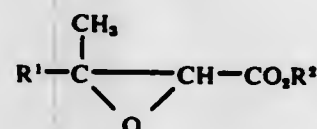
U.S. Cl. 260—473 A

4 Claims

1. A process for producing a 2-hydroxy-3-butenic acid ester of the general formula,



wherein R^1 is a radical selected from the group consisting of aliphatic, alicyclic and aromatic radicals and R^2 is a lower alkyl group, which comprises reacting in the absence of water and in the presence of inorganic or organic acid selected from the group consisting of sulfuric acid, hydrochloric acid, phosphoric acid and p-toluenesulfonic acid, a glycidic acid ester derivative of the general formula,



wherein R^1 and R^2 are as defined above and forming said 2-hydroxy-3-butenic acid ester.

4,007,218

ESTERIFICATION REACTION

Ibrahim Ghanayem, Downers Grove, and Alvin E. Trevillyan, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 422,676, Dec. 7, 1973, abandoned. This application July 31, 1975, Ser. No. 600,858
Int. Cl.² C07C 69/44, 69/50, 69/76, 69/80

U.S. Cl. 260—475 R

9 Claims

1. The process of producing relatively pure esters, which comprises reacting a solution of at least one organic polycarboxylic acid compound selected from the group consisting of phthalic acid, phthalic anhydride, isophthalic acid, terephthalic acid, 2,5-dibromoterephthalic acid, trimellitic anhydride, trimellitic acid, adipic acid, adipic anhydride, and sebacic acid in the presence of a tetraalkyl titanate esterification catalyst in excess monohydroxy hydrocarbon compounds selected from the group consisting of alcohols containing from 1 to 24 carbon atoms and aromatic hydroxy compounds containing 6 to 18 carbon atoms to produce a monohydroxy solution of organic ester, treating the dissolved organic ester in the substantial absence of unbound water at a temperature of at least 120° C with at least one solid alkaline earth metal

compound selected from the group consisting of alkaline earth metal oxide and alkaline earth metal hydroxide, adding subsequently two to twenty mols of water per mol of alkaline earth compound to the dissolved ester at up to 100° C and partitioning solid alkaline earth metal compound from the dissolved organic ester, wherein the concentration of alkaline earth metal compound is 0.1 to 35 equivalents per equivalent of acid material in the monohydroxy solution of organic ester.

4,007,219

BENZOPHENONE GLYCINAMIDE DERIVATIVES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smith, Welwyn, and William Anthony Thomas, Huntingdon, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Aug. 18, 1975, Ser. No. 605,580

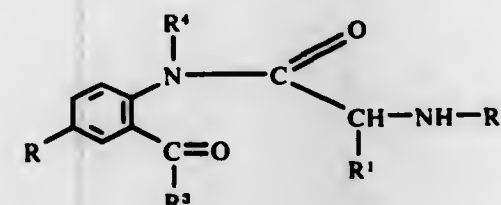
Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21821/75; Aug. 11, 1975, 36567/75

Int. Cl.² C07C 103/28, 103/127, 103/30; A61K 31/165

U.S. Cl. 260—501.17

2 Claims

1. A compound of the formula



wherein R is selected from the group consisting of a halogen atom, nitro and a trifluoromethyl group; R^1 is a hydrogen atom or a lower alkyl group; R^2 is an acyl group derived from a naturally occurring amino acid; R^3 is selected from the group consisting of phenyl and halophenyl; and R^4 is selected from the group consisting of a hydrogen atom, a methyl, cyclopropylmethyl, di(C_{1-4} alkyl) aminoethyl, methoxymethyl and a hydroxyethyl group and the acid addition salts thereof.

4,007,220

PREPARATION OF PHTHALALDEHYDIC ACID FROM $\alpha,\alpha,\alpha',\alpha'$ -PENTACHLORO-O-XYLENE

Giorgio Montorsi, Milan; Renato Pellizzato, Varese, and Anacleto Gianantonio, Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Aug. 13, 1975, Ser. No. 604,293

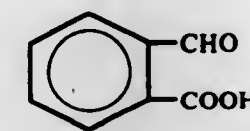
Claims priority, application United Kingdom, Sept. 20, 1974, 40984/74

Int. Cl.² C07C 63/04

U.S. Cl. 260—515 R

4 Claims

1. A process for preparing phthalaldehydic acid having the formula



by heating at a temperature between about 80° and about 180° C a mixture of $\alpha,\alpha,\alpha',\alpha'$ -pentachloro-o-xylene and at least 0.1 part by weight of phthalaldehydic acid per part by weight of said pentachloro-o-xylene as the sole catalyst in at least the stoichiometric amount of water necessary to hydrolyze said pentachloro-o-xylene for a time sufficient to hydrolyze said pentachloro-o-xylene to phthalaldehydic acid.

4,007,221

MANUFACTURE OF NUCLEAR-IODINATED IODINE COMPOUNDS OF AROMATIC CHARACTER

Hans Urbach, Lampertheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Jan. 16, 1976, Ser. No. 649,580

Claims priority, application Germany, Jan. 29, 1975, 2503504

Int. Cl.² C07C 51/01, 79/12; C07B 9/00

U.S. Cl. 260—515 A

10 Claims

1. In a process for the manufacture of an aromatic nuclear-iodinated iodine compound by reacting an aromatic diazonium salt with hydriodic acid or a salt thereof, the improvement which comprises carrying out the reaction in aqueous solution and in the presence of a reducing agent.

4,007,222

PROCESS FOR THE PRODUCTION OF 2-CHLOROCAPROIC ACIDS

Heinz Haschke, Weissenstein, Austria; Wolfgang Leuchtenberger, Bruchkobel, Germany; Gerd Schreyer, Hanau, Germany, and Werner Schwarze, Frankfurt, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Aug. 22, 1975, Ser. No. 607,051

Claims priority, application Germany, Aug. 22, 1974, 2440213

Int. Cl.² C07B 9/00

U.S. Cl. 260—518 A

12 Claims

1. A process for the production of 2-chloro-n-caproic acid or 6-substituted-2-chloro-n-caproic acid from (1) n-caproic acid or (2) 6-substituted n-caproic acid wherein the substituent is an acylamino where the acyl is the acyl of a carboxylic acid, phthalimido, p-toluenesulfonamido, benzenesulfonamido, —NH—CO—N(CH₂)₃—COOH, —NH—CS—NH—(CH₂)₃—COOH, chlorine or bromine comprising chlorinating in the presence of a sulfur chloride, sulfur bromide, phosphorus chloride or phosphorus bromide as a catalyst at 110° to 130° C., using up to 1.2 mole of chlorine per mole of (1) or (2) as the chlorinating agent.

4,007,223

METHOD OF PREPARING P-NITROBENZOIC ACID

Marcel Feld, Porz-Wahn, and Hermann Richtzenhain, Much-Schwellenbach, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Filed Dec. 23, 1974, Ser. No. 535,862

Claims priority, application Germany, Dec. 29, 1973, 2365131

Int. Cl.² C07C 51/33

U.S. Cl. 260—524 R

17 Claims

1. Process of preparing p-nitrobenzoic acid of high purity by oxidation of p-nitrotoluene with oxygen, which comprises contacting the oxygen with the p-nitrotoluene in an acetic acid reaction medium and in the presence of a cobalt-containing and bromine-containing catalyst for the oxidation, at a temperature of 80° to 150° C for a time sufficient for the oxidation, the cobalt being present as a cobalt salt in the amount of 0.01 to 0.1 moles per mole of p-nitrotoluene, and the amount of acetic acid being 3 to 15 moles per mole p-nitrotoluene.

4,007,224

PROCESS OF MANUFACTURING DICHLOROACETYL CHLORIDE

Harold M. Pitt, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 494,671, Aug. 5, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 553,936
Int. Cl.² C07G 51/58

U.S. Cl. 260—544 Y

8 Claims

1. In a process for producing dichloroacetyl chloride comprising reacting trichloroethylene in the liquid phase with an

oxygen containing gas in the presence of a catalytic amount of free chlorine or bromine and a chlorine activating source to form a mixture of dichloroacetyl chloride and trichloroethylene oxide, and then treating said mixture with a catalytically effective amount of an amine catalyst to cause rearrangement of the trichloroethylene oxide to dichloroacetyl chloride, the improvement comprising continuously contacting the reaction mixture of trichloroethylene and oxygen during the oxidation of the trichloroethylene with an amide catalyst selected from the group of primary alkyl amides and secondary alkyl amides, in which the alkyl groups contain from 1 to 6 carbon atoms to effect continuous rearrangement of trichloroethylene oxide formed to dichloroacetyl chloride.

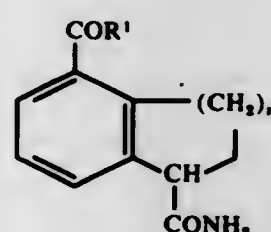
4,007,225

4-BENZOYLINDAN-1-CARBOXAMIDE AND DERIVATIVES THEREOF

Shunsaku Noguchi, Osaka; Tetsuya Aono, Kyoto; Yoshiaki Araki, Osaka, and Kiyohisa Kawal, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan
Division of Ser. No. 496,855, Aug. 12, 1974, Pat. No. 3,953,500. This application Jan. 9, 1976, Ser. No. 647,810
Claims priority, application Japan, Aug. 11, 1973, 48-90274; Sept. 1, 1973, 48-98371; Sept. 13, 1973, 48-103602; Sept. 13, 1973, 48-103604; Sept. 13, 1973, 48-103605; Sept. 13, 1973, 48-103606; Oct. 31, 1973, 48-122490; May 7, 1974, 49-51034; May 24, 1974, 49-59017; May 31, 1974, 49-62300
Int. Cl.² C07C 103/22, 103/28; A61K 31/165

U.S. Cl. 260—558 R

1. A compound of the formula



wherein R' is phenyl which is unsubstituted or substituted by lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, halogen, mono- or di-alkylamino having 1 to 3 carbon atoms, acetylamino, or propionylamino and n is 1 or 2.

4,007,226

NITRILE HYDROGENATION PROCESS

Jefferson W. Reynolds, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 59,368, July 29, 1970, Pat. No. 3,728,284.
This application Jan. 31, 1973, Ser. No. 328,211
Int. Cl.² C07C 85/10, 87/14

U.S. Cl. 260—563 D

6 Claims

1. A process for the preparation of primary and secondary amines which comprises subjecting a monomeric nitrile of the formula R(CN)_n, wherein R is a hydrocarbon radical of 1 to 18 carbons and n is a number of 1 to 4, to hydrogenation with a gas consisting essentially of hydrogen at a temperature of about 50° to 135° C. and a pressure of about 250 to 3000 psi in the presence of a hydrogenation catalyst comprising noninterfered macrosize particles of a hydrogen-reduced mixture of sodium silicate and an oxide of cobalt wherein the weight ratio of sodium silicate to the oxide of cobalt, figured as CoO, is from about 1:1 to about 1:9.

4,007,227 CERTAIN OXIME COMPOSITIONS AND THEIR USE IN CONTROLLING FUNGI

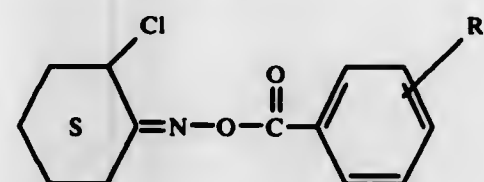
Don R. Baker, Orinda, and Arnold D. Gutman, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 330,764, Feb. 8, 1973, Pat. No. 3,885,043, which is a continuation of Ser. No. 875,576, Nov. 10, 1969, abandoned. This application Feb. 28, 1975, Ser. No. 554,288
Int. Cl.² C07C 131/02, 131/04, 131/06

U.S. Cl. 260—566 AE

6 Claims

1. A compound having the formula



wherein R' is chlorine or bromine.

4,007,228

SUBSTITUTED-2-NITRO-PARAPHENYLENEDIAMINES AND PROCESSES FOR PRODUCING SAME

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne-sur-Mer, both of France, assignors to L'Oreal, Paris, France
Division of Ser. No. 508,568, Nov. 18, 1965, Pat. No. 3,555,584. This application Sept. 2, 1970, Ser. No. 69,116

Claims priority, application Luxembourg, Nov. 19, 1964, 47386
Int. Cl.² C07C 91/06

U.S. Cl. 260—573

3 Claims

1. (2'-hydroxyethyl)-1-amino-2-nitro-(2'-hydroxyethyl)-4-methylamino benzene.

4,007,229

PREPARATION OF HYDROXYALKYL PHOSPHINE OXIDES AND SULFIDES

Ingenuin Hechenbleikner, West Cornwall, Conn., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 12, 1975, Ser. No. 549,405

Int. Cl.² C07F 9/53; B01J 1/10

U.S. Cl. 260—606.5 P

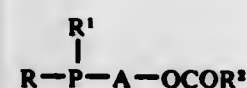
9 Claims

1. A process for the preparation of hydroxyalkylphosphine oxides and sulfides comprising the steps of (1) alcoholysis and (2) oxidation, of an ester-substituted phosphine having the structural formula:



where R and R' are hydrogen, alkyl, aryl, cycloalkyl, aralkyl or A—OCOR², A is ethylene or propylene, and R² is alkyl of 2-17 carbon atoms.

2. A process for the preparation of hydroxyalkylphosphine oxides and sulfides comprising the steps of (1) hydrolysis and (2) oxidation, of an ester-substituted phosphine having the structural formula:



where R and R' are hydrogen, alkyl, aryl, cycloalkyl, aralkyl or A—OCOR², A is ethylene or propylene, and R² is alkyl of 2-17 carbon atoms.

6. A process for the preparation of hydroxyalkylphosphine oxides and sulfides comprising the steps of (1) oxidation and (2) alcoholysis, of an ester-substituted phosphine having the structural formula:

4,007,232

ACRYLIC SYNTHETIC FIBER SUPERIOR IN NON-INFLAMMABILITY

Taoru Yamazaki, Akashi; Shiyunichiro Kurioka; Takashi Hatano, both of Kobe; Yukihiko Higashiyama, and Sadame Asada, both of Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1975, Ser. No. 643,811

Claims priority, application Japan, Dec. 23, 1974, 50-1374; Dec. 23, 1974, 50-1373; Jan. 9, 1975, 50-5392; Jan. 29, 1975, 50-12663

Int. Cl.² C08K 3/22

U.S. Cl. 260—836

7 Claims

6. An acrylic synthetic fiber comprising an acrylic copolymer consisting essentially of a mixture of olefinic monomers (A) excluding monomers having dyeable sites in their molecular structure and mainly comprising acrylonitrile, said acrylonitrile being in an amount of from 40 to 65 weight percent of said copolymer, vinyl chloride and vinylidene chloride in amounts within the range defined by the following

$$102.8 < A + B + 1.29C < 107.4$$

wherein A is in weight percents, B is the weight percent of vinyl chloride and C is the weight percent of vinylidene chloride, and 0.2 to 20 weight percent of homopolymer or copolymer of glycidyl methacrylate.

4,007,233

RUBBER CEMENT COMPOSITIONS

Yuji Kako, Shizuoka; Toyoji Kikuga, and Akira Toko, both of Fujieda, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 322,265, Jan. 9, 1973, abandoned. This application Oct. 30, 1974, Ser. No. 519,314

Int. Cl.² C08L 61/10, 61/12

U.S. Cl. 260—845

10 Claims

1. In a rubber cement composition comprising nitrile rubber and a phenolic resin derived from a mono-hydroxyphenol, the improvement wherein the phenolic resin consists essentially of phenolic resin produced by (a) condensing a bifunctional phenol and an aldehyde in a molar ratio of about 0.5 to 3 moles of aldehyde per mole of bifunctional phenol under alkaline conditions, and (b) reacting the resulting condensation product with a polyfunctional phenol having at least 3 reactive positions on the phenyl nucleus in a molar ratio of about 0.05 to 2.5 moles of polyfunctional phenol per mole of bifunctional phenol in said condensation product in the presence of a sufficient amount of acid to provide acid catalysis of the condensation of the aldehyde and the phenol, to produce a phenolic resin having a number average molecular weight of about 700 to 1,900 and a melting point of about 80° to 160° centigrade.

4,007,234

PROCESS FOR PREPARING IMPACT RESISTANT STYRENE POLYMERS

Horst-Dieter Schuddemage, Florsheim, Horst Jastrow, Niederhochstadt, and Harry Barth, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 26, 1975, Ser. No. 590,571

Claims priority, application Germany, June 28, 1974, 2431125

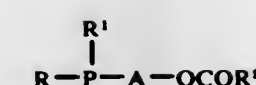
Int. Cl.² C08J 3/24; C08F 255/06

U.S. Cl. 260—878 R

7 Claims

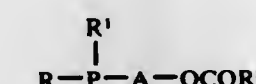
1. Process for preparing impact resistant styrene graft copolymers by a mass or suspension polymerization initiated thermally or by monomer soluble initiators of

- (a) 98 to 70% by weight of a mixture of
aa. 90 to 70% by weight of a monomer selected from styrene, α -methyl styrene, styrene methylated in the



where R and R' are hydrogen, alkyl, aryl, cycloalkyl, aralkyl or A—OCOR², A is ethylene or propylene, and R² is alkyl of 2-17 carbon atoms.

7. A process for the preparation of hydroxyalkylphosphine oxides and sulfides comprising the steps of (1) oxidation and (2) hydrolysis, of an ester-substituted phosphine having the structural formula:



where R and R' are hydrogen, alkyl, aryl, cycloalkyl, aralkyl or A—OCOR², A is ethylene or propylene, and R² is alkyl of 2-17 carbon atoms.

4,007,230

ANTIOXIDANT COMPOSITION FOR STABILIZING POLYOLS

Kenneth J. Hinze, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 24, 1975, Ser. No. 552,095

Int. Cl.² C07C 41/12

U.S. Cl. 260—611.5

9 Claims

1. A polyether polyol or mixture of such polyols containing as a stabilizer against oxidative degradation from about 500 to about 100,000 ppm of an antioxidant composition containing:
A. from about 15 to about 85 percent by weight of a phenolic antioxidant selected from the group consisting of

- 2,4-dimethyl-6-octyl phenol,
- 2,6-ditertiarybutyl-4-methyl phenol,
- 2,6-ditertiarybutyl-4-ethyl phenol,
- 2,6-ditertiarybutyl-4-n-butyl phenol,
- 2,2'-methylenebis (4-methyl-6-tertiarybutyl phenol),
- 2,2'-methylenebis (4-ethyl-6-tertiarybutyl phenol),
- 2,4-dimethyl-6-tertiarybutyl phenol,
- 4-hydroxymethyl-2,6-ditertiarybutyl phenol, n-octadecyl-beta (3,5-ditertiarybutyl-4-hydroxyphenyl)propionate,

and mixtures thereof;

B. from about 85 to about 15 percent by weight of 4,4'-bis-(α,α -dimethylbenzyl)diphenylamine;
and wherein said polyether polyol contains from 2 to about 8 hydroxyl groups and has a molecular weight of from about 250 to about 10,000.

4,007,231

SELECTIVE PRODUCTION OF PARA-XYLENE

Stephen Allan Butter, East Windsor, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,992

Int. Cl.² C07C 15/08, 3/62; B01J 29/36

U.S. Cl. 260—672 T

6 Claims

1. A process for the selective production of para-xylene which comprises contacting toluene under disproportionation conditions, with a catalyst comprising a composite of a crystalline aluminosilicate zeolite and antimony oxide, said zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, collecting the resultant product and separating para-xylene therefrom.

interengage with said recesses respectively when the limbs of said supporting element are pushed onto said pipe thereby to positively locate said supporting element relative to said pipe.

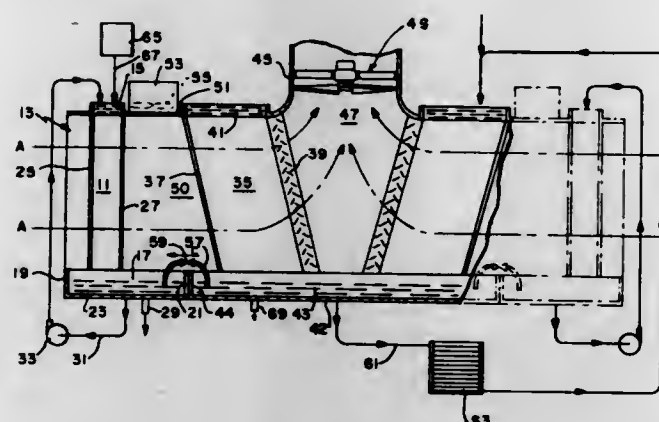
4,007,241

COMBINATION HUMIDIFYING AND COOLING APPARATUS AND METHOD

Peter M. Phelps, 15 Buckeye Way, Kentfield, Calif. 94904
Continuation-in-part of Ser. No. 327,154, Jan. 26, 1973, Pat. No. 3,917,764. This application Oct. 1, 1975, Ser. No. 618,499
Int. Cl.² F28C 1/06

U.S. Cl. 261-149

16 Claims



1. A combination humidifying and cooling apparatus comprising:

- a humidifying section including fill means, an air inlet opening communicating with the surrounding air, an air outlet opening, liquid distribution means disposed in the upper portion of the section, liquid collection means disposed in the lower portion of the section, and a blow-down liquid outlet for said liquid collection means,
- recycle means consisting essentially of a conduit and associated pumping means for directing liquid from the humidifying section liquid collection means directly to the humidifying liquid distribution means,
- a liquid cooling section including fill means, an air inlet opening in generally open communication with the humidifying section air outlet opening, an air outlet opening, liquid distribution means disposed in the upper portion of the liquid cooling section to distribute the liquid onto said fill means, and liquid collection means disposed in the lower portion of the same, said air inlet and outlet openings being disposed to provide an air path through said fill means to intersect liquid gravitating through the same,
- barrier means for separating said cooling section collection means and humidifying section collection means, and
- a recycle line to provide communication with said cooling section liquid collection means and cooling section liquid distribution means, and heat exchange means associated with said recycle line for transmitting heat from a heat source to the liquid flowing through the heat exchanger.

4,007,242

PROCESS FOR THE MANUFACTURE OF ORIENTED HOLLOW PLASTIC ARTICLES

Michel Lorge, Brussels, and Roger Houba, Gembloux, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium
Filed Jan. 24, 1975, Ser. No. 543,932

Claims priority, application France, Feb. 14, 1974, 74.05461

Int. Cl.² B29C 17/07

U.S. Cl. 264-89

6 Claims

1. In a process for manufacturing oriented hollow plastic articles by pre-blowing, in a preform mold, a portion of a cylindrical parison into a preform having a cylindrical shape over one part of its length and a sealed end defining the base of the preform, thermally conditioning the preform to bring it

to a temperature at which the plastic will undergo molecular orientation during a subsequent blowing operation, and then placing the conditioned preform in a final blow-mold and effecting such subsequent blowing operation by applying excess pressure internally of the preform to cause it to be shaped by stretching into its final form, the improvement wherein said step of pre-blowing comprises: sealing the end of the parison, in the preform mold, along a straight line to define



the base; and applying excess pressure internally of the sealed parison in the preform mold to produce the preform in a manner such that the base is substantially equal in length to one-half the perimeter of the cylindrical part and to create an intermediate length part which is interposed between the cylindrical part and the base and has a cross section which varies progressively from the cylindrical shape of the cylindrical part to the straight-line shape of the base while maintaining a substantially constant perimeter.

4,007,243

METHOD OF BLOW MOLDING

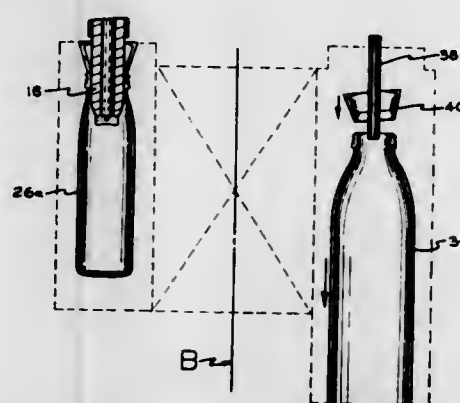
Samuel J. Rupert, Ann Arbor, Mich., assignor to Hoover Ball and Bearing Company, Sallme, Mich.

Continuation of Ser. No. 445,566, Feb. 25, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 605,235

Int. Cl.² B29C 17/07

U.S. Cl. 264-89

3 Claims



1. In a method of blow molding a thermoplastic article from a blow moldable thermoplastic material, the steps of extruding a tubular parison of said material at a preblowing station spaced laterally from a separate final blowing station and simultaneously supporting a previously blown preform on a blow pin at said final blowing station, closing a preform mold on the tubular parison while closing a final blow mold on the previously blown preform, immediately upon closing the molds blowing the tubular parison to the shape of the preform blow mold, blowing the preform to the shape of the final blow mold, retracting the blow pin from the mold at said final blowing station, shifting both molds laterally so that the preform blow mold is at said final blowing station and the final

blow mold is at a discharge station, inserting the blow pin into the mold at said final blowing station and inserting a pin into the blown article in the mold at said discharge station, opening both molds while supporting the blown preform on the blow pin at the final blowing station and while maintaining the pin in the blown article at said discharge station, thereby assuring that the blown article is removed from the final blow mold, returning both molds laterally to their initial open positions, and repeating the steps.

4,007,244

AUTOMATED BLOW MOLDING MACHINE STARTUP

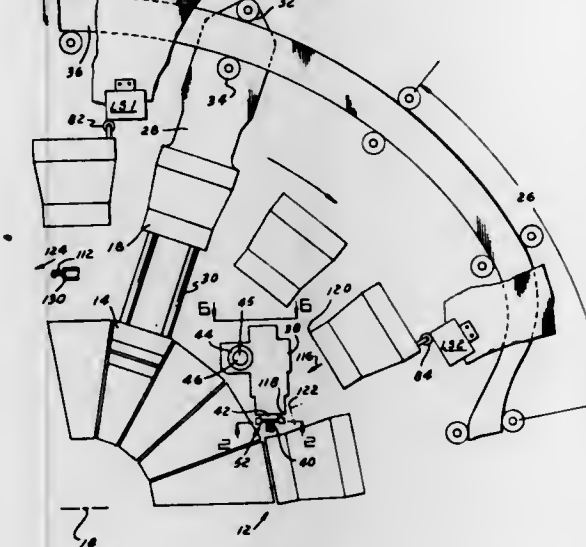
Michael J. Avery, Forrestville; Lawrence A. Martino, East Hartford, and Jon D. Yonko, Vernon, all of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 29, 1975, Ser. No. 544,947

Int. Cl.² B29C 17/07

U.S. Cl. 264-99

5 Claims



1. In the process of loading successive molds of a multistation, rotary blow molding machine which involves: closing sections of each of said molds on portions of a continuously extruding parison in a confined region of limited dimensional extent adjacent the outlet of an extruder head while said molds continuously traverse an arcuate path of travel;

the improvements in such process occurring during startup of the machine prior to loading the initial mold comprising the steps of:

- directing the continuous parison out of said region;
- increasing the speed of the machine to a level such that the rate at which successive molds would be loaded with parison portions approaches the rate at which the parison issues or will issue from the head after startup while maintaining the parison directed out of said region without manual manipulation thereof; and thereafter
- severing the parison substantially at the outlet of the head by a device actuated outside said arcuate path of travel; whereby the parison portion exiting the head after severance is immediately clamped between closing sections of the next mold arriving beneath the head.

4,007,245

STRENGTHENING OF FIBER GLASS REINFORCED EPOXY RESIN COMPOSITES BY VACUUM HEAT TREATMENT

Daniel A. Scola, Glastonbury, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,813

Int. Cl.² B29C 25/00

U.S. Cl. 264-101

1 Claim

1. A method of improving the shear strength properties of a

glass fiber/epoxy resin composite article that has undergone degradation from exposure to a polar compound, said method comprising:

- Placing said glass fiber/epoxy resin composite article in a container that is provided with means for evacuating and means for heating;
- evacuating said container to a low pressure of about 1 mm of mercury and heating the container to a temperature of about 300° F.
- maintaining said pressure and said temperature for at least one cycle of operation which is about 24 hours; and thereafter,
- allowing said composite article to cool to ambient temperature.

4,007,246

VARIABLE STRENGTH PLASTIC WRAP ON GLASS BOTTLES

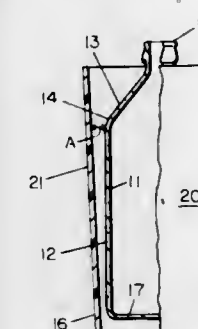
Edward L. Bailey, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 9, 1975, Ser. No. 585,226

Int. Cl.² B29C 27/00; B29D 3/00

U.S. Cl. 264-129

10 Claims



1. The method of enhancing the fragment retention of a glass container having a neck wall section encircling a head space portion of the container when filled and in upright position comprising the steps of:

- encircling the exterior surface of the container with a preformed sleeve of a heat shrinkable, polymeric material, the encircled exterior surface including said neck wall section thereof, and
- heat shrinking said encircling sleeve about the container to provide a polymeric exterior layer of said material of variable thickness, the maximum thickness of said exterior layer overlying the said neck wall section of the container; and
- the outer surface of the sleeve before shrinking comprising a frusto-conical surface having a major outside diameter and minor outside diameter, said major outside diameter thereof being located opposite the neck wall section of the container, and the shrinking step causing the material adjacent said major outside diameter to form a thicker exterior layer of the material overlying the neck wall section of the container than the remainder of the layer thereon.

4,007,247

PRODUCTION OF FIBRILS

Denis George Harold Ballard; Robert Thomas Murray, and George Michael Fingland Jeffs, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 20, 1973, Ser. No. 399,273

Claims priority, application United Kingdom, Sept. 26, 1972, 43899/72

Int. Cl.² D01D 5/04

U.S. Cl. 264-140

15 Claims

1. A process for producing fibrils of a thermoplastic polymer, said fibrils having a diameter <25μm and aspect ratio >20 which comprises subjecting a dispersion of thermoplas-

vinyl-2-pyrrolidone, methyl methacrylate, and divinyl benzene wherein the monomer mixture contains based upon the total weight of N-vinyl-2-pyrrolidone, methyl methacrylate, and divinyl benzene, from about 90 to about 45% by weight of the N-vinyl-2-pyrrolidone, from about 5 to about 50% by weight of the methacrylate, and from about 0.5 to about 15% by weight of divinyl benzene;

D. the molecular size or weight of the biological binding agent being sufficient to cause retention of said biological binding agent in said matrix and to prevent egress of said biological binding agent from said matrix during the treatment period.

4,007,259

DENTAL CREAM

Armando Patino, Mexico City, and Bernardo Maldonado, Cd. Satellite Edo, both of Mexico, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 412,444, Nov. 2, 1973, Pat. No. 3,711,604, which is a continuation of Ser. No. 256,309, May 24, 1972, abandoned. This application Apr. 25, 1975, Ser. No. 571,825. The portion of the term of this patent subsequent to Jan. 16, 1990, has been disclaimed.

Int. Cl.² A61K 7/16

U.S. Cl. 424-49

10 Claims

1. A white opaque clear or translucent aqueous dental cream toothpaste containing at least about 1 up to about 5% by weight chloroform and having dispersed therein 0.2 to 10% by weight of particles of 10 to 300 parts of a water insoluble unpre-flavored polymeric thermoplastic low molecular weight polyolefin, per part of dental cream contrasting pigments, or lakes, which otherwise have a tendency to bleed into chloroform containing toothpaste, and that are visible and substantially insoluble in the toothpaste base, being substantially inert to said chloroform, and said particles comprising water and chloroform insoluble pigmented but unflavored plastic sub-particles of a desired contrasting color that are visible against the contrasting dental cream background, said chloroform being blended into the dental cream after the particles are first dispersed therein, thereby imparting bleed-resistance of said color in said toothpaste base, said speckles of pigmented plastic particles thereby retaining their distinct and contrasting appearance for at least the normal shelf life of the product and the time it takes to be used by the consumer, without significant attack by the chloroform of the pigment in the pigmented visible particles which would otherwise result in leaching or bleeding of the pigment from the particles into the contrasting color toothpaste base.

4,007,260

DENTIFRICES

Keun Y. Kim, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 435,052, Jan. 21, 1974, Pat. No. 3,939,262. This application July 18, 1975, Ser. No. 597,852

Int. Cl.² A61K 7/18

U.S. Cl. 424-52

4 Claims

1. An opaque dentifrice composition containing a polishing amount of a finely divided synthetic amorphous silica polishing agent, said polishing agent having an average refractive index from about 1.410 to 1.440 and an average particle diameter of from about 1 to about 30 microns.

4,007,261

PEARLESCENT HAIR CONDITIONER

Ralph P. Sorrentino, Old Bridge, and Burton M. Like, East Brunswick, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Filed Aug. 23, 1972, Ser. No. 283,089

Int. Cl.² A61K 7/06

U.S. Cl. 424-70

4 Claims

1. A method of simultaneously obtaining pearlescence and conditioning of hair which comprises applying to the hair an aqueous composition consisting essentially of a conditioning agent and water, said conditioning agent being alkyl dimethylamine oxide wherein the alkyl is substantially straight chain and has 16 to 22 carbon atoms and said conditioning agent being applied in an effective amount sufficient to obtain both pearlescence and conditioning of the hair.

4,007,262

ODOR CONTROL COMPOSITIONS FOR USE IN CHEMICAL TOILET SYSTEMS

Wayne E. Bowers, P.O. Box 615, Stanhope, N.J. 07874

Filed Apr. 5, 1973, Ser. No. 348,150

Int. Cl.² A61L 13/00

U.S. Cl. 424-76

9 Claims

1. An aqueous odor control composition for closed system chemical toilets comprising water, an admixture of zinc sulfate and zinc nitrate, and sufficient ammonium hydroxide to convert all of the zinc to the water soluble stoichiometric ammonia complex and to maintain a pH in the solution of at least about 10.5, adding sodium nitrate as an oxidizing agent, together with sufficient acetic acid to attain an aqueous solution having a pH of between about 7.0 and about 7.5.

4,007,263

STOMA TREATMENT

Virgil F. Pichieri, 53 Brigham Hill Road, Grafton, Mass. 01519

Continuation of Ser. No. 387,332, Aug. 10, 1973, abandoned.

This application Mar. 25, 1975, Ser. No. 561,851

Int. Cl.² A61K 31/74

U.S. Cl. 424-78

4 Claims

1. A method of relieving irritation of skin surrounding an iliac stoma; comprising the application to the skin, of a paste comprising an effective of at least 40 percent by weight of calcium, sodium poly(vinyl methyl ether-maleate) in a petroleum jelly base.

4,007,264

METHOD OF TREATING DIARRHEA EMPLOYING A FORMALDEHYDE-MODIFIED CASEIN

Andre Queuille, Nolsy-le-Sec, and Raymond Larde, Coubron, both of France, assignors to Roussel-UCLAF, Paris, France

Continuation of Ser. No. 870,356, Sept. 30, 1969, abandoned.

This application Jan. 30, 1975, Ser. No. 545,160

Claims priority, application France, Oct. 7, 1968, 68.168987

Int. Cl.² A61K 31/74

U.S. Cl. 424-82

2 Claims

1. A method of treating chronic or infectious diarrhea in humans and warm-blooded animals suffering from symptoms or diarrhea caused by infections, food poisonings, changes in diet, excessive use of laxatives, diseases of extra-intestinal origin, and treatment with antibiotics, which consist essentially of orally administering an effective antidiarrheal amount of from 25 to 125 mg/kg daily of a formaldehyde-modified casein consisting of rennet casein reacted with from 0.6 to 2.5 gm per 100 gm of formaldehyde in the presence of an aqueous medium, and freed of unreacted formaldehyde.

4,007,265

METHOD FOR TREATING TETANUS TOXIN WITH A PROTEINASE TO PRODUCE AN ATOXIC IMMUNOGENIC PRODUCT

Torsten Bertil Helting, Marbach near Marburg an der Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Oct. 31, 1974, Ser. No. 519,762

Claims priority, application Germany, Nov. 3, 1973, 2355094

Int. Cl.² A61K 39/02; C12B 1/00

U.S. Cl. 424-92

13 Claims

1. The method of making an atoxic immunogenic product, adaptable to injection, which consists essentially of treating tetanus toxin with a peptide-peptidohydrolase at a pH between 5 and 10 and not to cause the irreversible denaturation of the protein body of tetanus toxin.

10. An atoxic immunogenic product, adaptable to injection, prepared by the method of claim 1.

4,007,266

PHARMACEUTICAL COMPOSITION CONTAINING VITAMIN B₁₂, PROCESS OF MAKING THE SAME AND METHOD OF TREATMENT

Jean Choay, Neuilly-sur-Seine, France, assignor to Choay S.A., Paris, France

Division of Ser. No. 264,752, June 21, 1972, Pat. No.

3,876,765, which is a continuation-in-part of Ser. No. 820,296, April 29, 1969, abandoned, and a continuation-in-part of Ser. No. 820,297, April 29, 1969, abandoned. This application Feb.

26, 1975, Ser. No. 553,434

The portion of the term of this patent subsequent to

April 8, 1992, has been disclaimed.

Claims priority, application France, May 3, 1968, 68.150415; May 3, 1968, 68.150416

Int. Cl.² A61K 31/48, 31/68, 31/70, 31/195

U.S. Cl. 424-105

11 Claims

1. A method for the treatment of an animal or human patient suffering from a loss of elasticity or loss of thickness of the skin or from excessive dryness of the skin due to aging of the skin, the said method comprising applying topically to the affected area of the skin an effective amount of a pharmaceutical composition comprising a homogeneous mixture of an aqueous solution of cyanocobalamin or hydroxycyanocobalamin and a pharmaceutically acceptable percutaneous penetration vehicle therefor, the said composition having a pH between about 4.0 and 7.0, being resistant to both oxidation and reduction, and being pharmaceutically acceptable for repeated application to cutaneous connective tissue over prolonged periods of time.

4,007,267

ANTIBIOTIC B-98891

Toyokazu Kishi, Nara; Takashi Iwasa, Kyoto; Takaki Kusaka, and Setsuo Harada, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 28, 1975, Ser. No. 562,935

Claims priority, application Japan, Mar. 28, 1974, 49-35254

Int. Cl.² H61K 35/74

U.S. Cl. 424-116

9 Claims

1. A member selected from the group consisting of antibiotic B-98891 and the acid addition salts thereof, wherein the antibiotic has the following properties:

- Melting point: Starts being gradually discolored at about 220° C, and does not show a definite melting point.
- Elemental analysis: C, 42.73±1.5%; H, 6.01±0.5%; N, 20.48±1.0%; O, 30.05±2.0%.
- The molecular weight estimated by titration method is 529±100.
- Specific rotation: $[\alpha]_D^{20} = 91.8 \pm 10^\circ$ (c=0.5, H₂O); 68.5±10° (c=0.5, 1/10N HCl)
- pKa: 4.2±0.2, 7.0±0.2 (titration)

f. Ultraviolet absorption spectrum:

$\lambda_{max}^{pH 7} 271 \pm 2$ nm ($E_{1cm}^{1\%} = 157$)

$\lambda_{max}^{1/10N NaOH} 271 \pm 2$ nm ($E_{1cm}^{1\%} = 154$)

$\lambda_{max}^{1/10N HCl} 280 \pm 2$ nm ($E_{1cm}^{1\%} = 228$)

g. Significant infrared absorption bands measured in KBr disc method in wave numbers (cm⁻¹): 3330, 3160 (shoulder), 2900, 2850, 1660, 1600, 1505, 1485, 1400, 1375, 1295, 1230, 1180, 1130, 1065, 910, 780, 700, 480.

h. Color reactions:

Greig-Leaback reaction: positive

Sakaguchi reaction: positive

Potassium permanganate reaction: positive

Anilin phthalate reaction: doubtful positive

Ninhydrine reaction: doubtful positive

Pauly reaction: negative

Ehrlich reaction: negative

Dragendorff reaction: negative

Barton reaction: negative

Bentidine periodate: negative

Ferric chloride-sulfosalicylic acid reaction: negative.

4,007,268

PROCESS FOR ALLEVIATING PROLIFERATIVE SKIN DISEASES

John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. Nos. 324,012, Jan. 16, 1973, abandoned, and Ser. No. 425,063, Dec. 17, 1963, abandoned.

This application May 22, 1975, Ser. No. 580,014

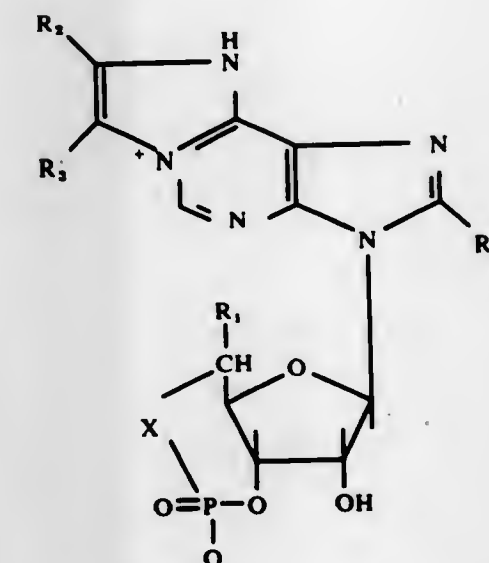
Int. Cl.² A61K 31/675

U.S. Cl. 424-200

4 Claims

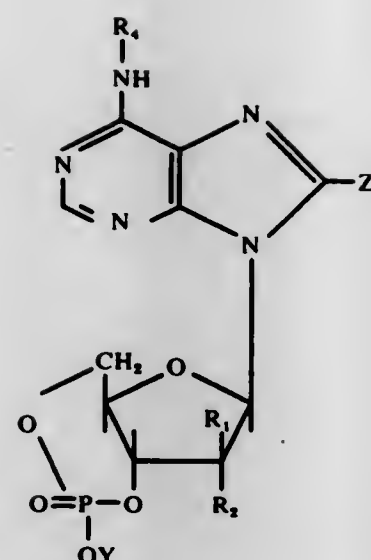
1. A process for treating proliferating skin diseases which comprises administering to the afflicted human or animal, a composition containing as an active component at least one of the compounds selected from the groups:

I. A compound of the formula

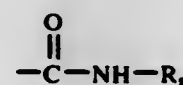


wherein R₁ is H or methyl; R₂ is H or phenyl; R₃ is propyl, isopropyl or phenyl; R₄ is H, bromine, methylthio, or benzylthio; X is oxygen or methylene;

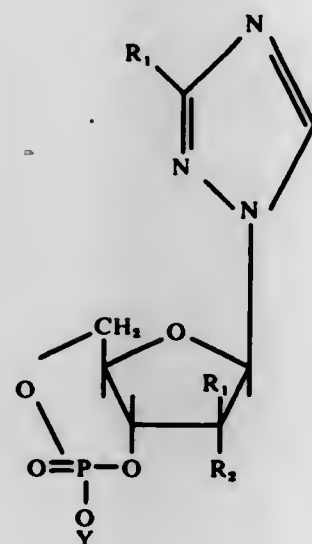
II. A compound of the formula



wherein R_1 and R_2 are hydrogen or hydroxyl; Y is hydrogen or alkali metal; Z is hydrogen, benzylthio, thiol, halogen, alkylthio wherein alkyl is from 1 to 8 carbon atoms, inclusive, and hydroxy; R_4 is hydrogen.



wherein R_5 is phenyl, benzyl or alkyl of 1 to 8 carbon atoms; III. A compound of the formula



wherein R_1 is $-\text{CONH}_2$, $-\text{CSNH}_2$, $-\text{C}(\text{NH})\text{NH}_2$, $-\text{C}(\text{NH})\text{NHOH}$, $-\text{CN}$, or $-\text{COOCH}_3$; R_1 and R_2 are hydrogen or hydroxy; Y is hydrogen or alkali metal, said compounds being in association with a pharmaceutical carrier wherein the concentration of said active component is effective to alleviate a proliferative skin disease.

4,007,269

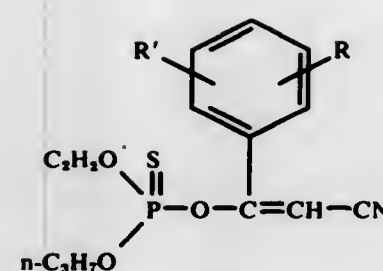
O-ETHYL-O-n-PROPYL-O-[1-(SUBSTITUTED-PHENYL)-2-CYANO-VINYL]-THIONOPHOSPHORIC ACID ESTERS
Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1975, Ser. No. 554,345
Int. Cl.² A01N 9/36; C07F 9/165

U.S. Cl. 424-210

10 Claims

1. An O-ethyl-O-n-propyl-O-[1-(substituted-phenyl)-2-cyano-vinyl]-thionophosphoric acid ester of the formula



in which
R is hydrogen, $\text{C}_1\text{--C}_4$ alkyl, $\text{C}_1\text{--C}_4$ alkoxy or halogen, and
 R' is $\text{C}_1\text{--C}_4$ alkyl, $\text{C}_1\text{--C}_4$ alkoxy or halogen.

4,007,270

COMPLEMENT INHIBITORS

Seymour Bernstein, New City; Norman Bauman, Nanuet, and Milton David Heller, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 18, 1975, Ser. No. 632,931

Int. Cl.² A61K 31/60

U.S. Cl. 424-230

11 Claims

1. A method of inhibiting the complement system in a warm-blooded animal in need of such therapy which comprises internally administering to said animal an effective complement inhibiting amount of pharmaceutically acceptable compound selected from the group consisting of aurin tricarboxylic acid, $(\text{C}_1\text{--C}_8)$ acylates thereof, $(\text{C}_1\text{--C}_8)$ alkyl esters thereof and salts thereof.

4,007,271

DERMATOLOGICAL COMPOUNDS AND COMPOSITIONS

Andrew Robertson, Newcastle-upon-Tyne, England, assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 449,539, March 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 308,261, Nov. 20, 1972, abandoned. This application May 21, 1976, Ser. No. 688,616

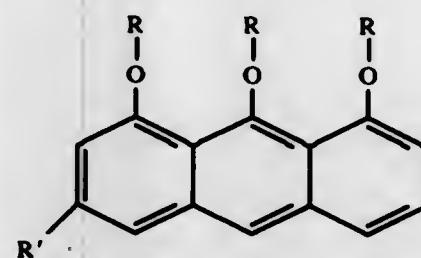
Claims priority, application United Kingdom, Nov. 26, 1971, 54927/71

Int. Cl.² C07C 69/78

U.S. Cl. 424-234

37 Claims

1. A compound having the formula:



wherein:

each R is a hydrogen atom or an X,Y-substituted-benzoyl group, at least one R being an X,Y-substituted-benzoyl group;

X is a halogen atom, hydroxy, nitro, lower-alkyl, lower-alkoxy, phenoxy, trifluoromethyl, lower-alkylcarboxy or lower-alkoxycarbonyl;

Y is a hydrogen atom or has the meaning given hereinabove for X, and

R' is a hydrogen atom or a methyl group.

4,007,272 SUBSTITUTED BENZODIAZEPIN-10-ONES IN TREATING PAIN AND DEPRESSION

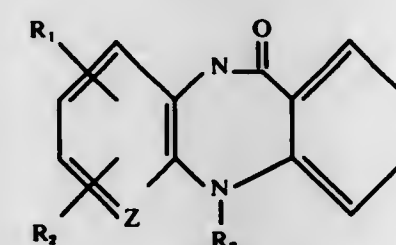
Sidney Robert Safir, River Edge, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 552,023, Feb. 24, 1975, Pat. No. 3,953,430. This application Jan. 29, 1976, Ser. No. 653,404
Int. Cl.² A61K 31/33, 31/445, 31/495, 31/535

U.S. Cl. 424-248.51

1 Claim

1. A method for the treatment of pain and depression in a warm-blooded animal which comprises administering to said animal a pharmaceutical carrier and an analgesic and antidepressant amount of a compound of the formula:



wherein Z is selected from the group CH and N; R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, nitro, trifluoromethyl, methylthio, methylsulfonyl and hydroxy; R_3 is selected from the group consisting of hydrogen, lower alkyl and phenylloweralkyl and R is selected from the group comprising hydrogen, diloweralkylaminoloweralkyl, piperidyloweralkyl, morpholinoloweralkyl, pyrrolidinoloweralkyl and piperazinyloweralkyl and acid addition salts thereof, with the proviso that when Z is N, then R_1 and R_2 are hydrogen.

4,007,273

TREATMENT AND PRE-TREATMENT OF DYSMETRIC DYSLEXIA BY IMPROVING SEQUENTIAL SCANNING AND OCULAR FIXATION ABILITIES AND THERAPEUTIC COMPOUNDS

Harold N. Levinson, 15 Lake Road, Great Neck, N.Y. 11020, and Jan Frank, 45 E 82nd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 424,104, Dec. 12, 1973, abandoned, Division of Ser. No. 528,139, Nov. 29, 1974, Pat. No. 3,940,485. This application Dec. 8, 1975, Ser. No. 638,336

Int. Cl.² A61K 31/52, 31/54, 31/135, 31/445

U.S. Cl. 424-247

5 Claims

1. A method of obviating eye tracking difficulties for a dysmetric dyslexic patient preparatory to said patient participating in reading or scanning activity, which method is based on the discoveries of a cerebellar-vestibular dysfunction and a resulting sub-clinical eye oscillation indicative of said dysfunction, said method comprising the steps of preceding any reading or scanning by such patient with an administered quantity of a cerebellar-vestibular harmonizing drug selected from the group consisting of diphenhydramine, dimenhydrinate, diphenidol and promethazine in a dosage effective to suppress input to and within said patient's cerebellar-vestibular circuits, and only allowing reading or scanning activity by said patient during the effective period of said administered drug, whereby the adverse effect of said sub-clinical eye oscillation as input to said patient's cerebellar-vestibular circuits is obviated by said drug during said reading or scanning activity to thereby enhance said patient's eye tracking ability.

4,007,274

METHOD OF CONTROLLING THE GROWTH OF BACTERIA AND FUNGI USING SUBSTITUTED TETRAHYDRO-S-TRIAZIN-2(1H)-ONE COMPOUNDS

Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Mar. 22, 1976, Ser. No. 669,356

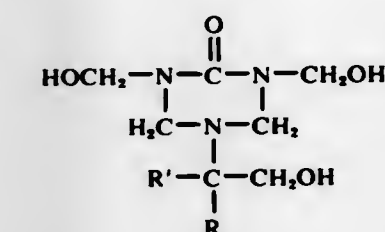
Int. Cl.² A01N 9/22

U.S. Cl. 424-249

9 Claims

1. A method of controlling the growth of bacteria or fungi

by applying to them or to the environment inhabited by them an anti-bacterial or anti-fungal amount of from 50 to 3000 ppm of a compound represented by the formula



wherein R and R' are hydrogen, methyl, hydroxymethyl or ethyl and can be the same or different.

4,007,275

N-(QUINOLYL)-ANTHRANILATES, THEIR COMPOSITIONS, AND USE

Anne Farthouat, Romainville, and Jean Meier, La Varenne Saint-Hilaire, both of France, assignors to Roussel-UCLAF, Paris, France

Continuation-in-part of Ser. No. 474,885, May 31, 1974, Pat. No. 3,944,555. This application Dec. 10, 1975, Ser. No. 639,393

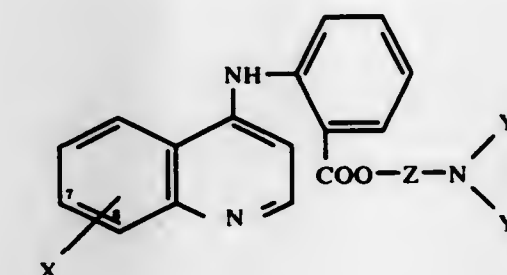
Claims priority, application France, June 13, 1973, 73.21434

Int. Cl.² C07D 215/44

U.S. Cl. 424-258

6 Claims

1. Substituted anthranilates selected from the group consisting of N-(7- or 8-substituted-quinolyl-4)-anthranilates of the formula



wherein x is trihalomethylthio in the 7 or 8 position, Z is a member selected from the group consisting of $-(\text{CH}_2)_n-$, where n is an integer from 2 to 6, and $-(\text{CH}_2)_m-\text{O}-(\text{CH}_2)_p-$, where m and p are each an integer from 2 to 3, and Y_1 and Y_2 are alkyl having from 1 to 6 carbon atoms, and their non-toxic, pharmaceutically acceptable acid addition salts.

5. An analgesic and anti-inflammatory composition comprising an analgesically and anti-inflammatorily effective amount of a compound of claim 1 and a major amount of a pharmaceutical carrier.

4,007,276

TRIAZOLO ISOINDOLE DERIVATIVES

Amedeo Omodei Sale, Voghera (Pavia); Pietro Consonni, and Leonard J. Lerner, both of Milan, all of Italy, assignors to Gruppo Lepetit, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 473,256, May 24, 1974, abandoned. This application May 10, 1976, Ser. No. 684,592

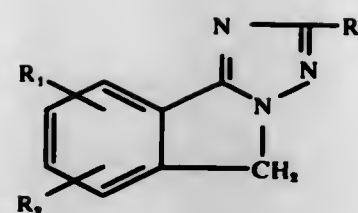
Claims priority, application United Kingdom, May 25, 1973, 25163/73

Int. Cl.² C07D 249/16

U.S. Cl. 424-263

18 Claims

1. A compound of the formula



wherein R is selected from hydrogen, amino, lower alkyl amino, di-lower alkyl amino, lower alkanoylamino, di-lower alkanoylamino, benzoylamino, ureido, thioureido, carbethoxythioureido, benzoylthioureido, sulphydryl, lower alkyl, trifluoromethyl, phenyl, pyridyl, methylpyridyl, dimethylpyridyl and phenyl having one to three substituents independently selected from lower alkyl, lower alkoxy, lower alkenyloxy, lower alkynyloxy, methylenedioxy, halo, trifluoromethyl, hydroxy, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, benzyloxy, carboxymethoxy, carbo(lower alkoxy)-methoxy, amino, lower alkylamino, di-lower alkylamino, lower alkanoylamino and nitro; and R₁ and R₂ each independently represents hydrogen, chloro or lower alkoxy.

4,007,277 PHENYL- AND

1-NAPHTHYL-THIODEOXYNUPHARIDIN-6-OL-OLS

Robert Thomas La Londe; Amy Inn-Mei Tsal, both of Syracuse; Chun Juan Wang, Jamesville, and Chunfook Wong, Syracuse, all of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 546,143
Int. Cl.³ C07D 455/02

U.S. Cl. 424-267 8 Claims
1. A compound selected from the group consisting of:
7β-Phenylthiodeoxynupharidin-6α-ol,
7β-(p-Chlorophenyl)-thiodeoxynupharidin-6α-ol,
7β-(m-Chlorophenyl)-thiodeoxynupharidin-6α-ol,
7β-(p-Carbomethoxyphenyl)-thiodeoxynupharidin-6α-ol,
and
7β-(1-Naphthyl)-thiodeoxynupharidin-6α-ol.

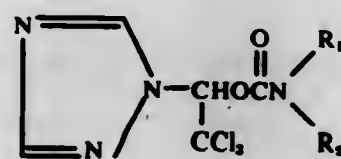
4,007,278

1-(1-CARBAMOYLOXY-2,2,2-TRICHLOROETHYL)-1,2,4-TRIAZOLE DERIVATIVES AS PESTICIDES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,052
Claims priority, application Switzerland, Feb. 19, 1974, 2277/74; June 10, 1974, 7883/74; Dec. 20, 1974, 17033/74
Int. Cl.³ A01N 9/22; C07D 209/08

U.S. Cl. 424-269 18 Claims
1. A compound of formula I



wherein

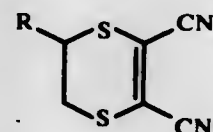
R₁ represents hydrogen, C₁-C₃-alkyl or C₁-C₃-alkoxy, and R₂ represents C₁-C₆-alkyl or C₃-C₆-alkenyl both optionally substituted by cyano, halogen, nitro, C₁-C₃-alkoxy or C₁-C₃-alkylthio, or C₃-C₆-cycloalkyl or C₃-C₆-cycloalkenyl both optionally substituted by C₁-C₃-alkyl.

4,007,279 FUNGICIDES

Takaaki Ohtsuka; Keigo Satake; Shiro Yamazaki, and Takeo Watanabe, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1975, Ser. No. 544,895
Claims priority, application Japan, Jan. 31, 1974, 49-12257; Sept. 11, 1974, 49-103864
Int. Cl.³ C07D 339/08

U.S. Cl. 424-277 8 Claims
1. A method for the treatment of fungus diseases in plants comprising applying to fungi a fungicidally effective amount of a composition comprising an inert carrier and an active ingredient having the formula:



wherein R is H, isopropyl, or n-alkyl having 1 to 6 carbon atoms.

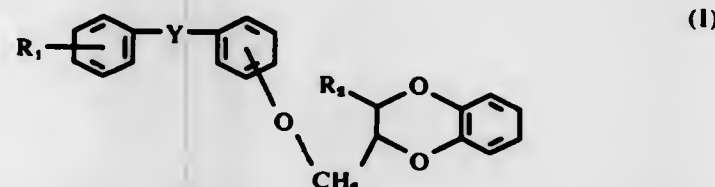
4,007,280

1,4-BENZODIOXAN DERIVATIVES AND PESTICIDAL USE THEREOF

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

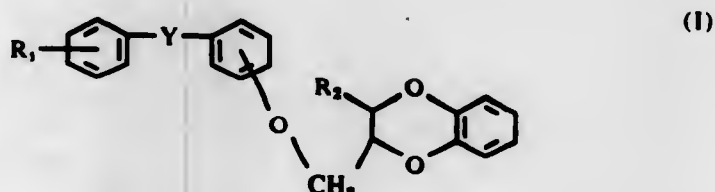
Filed June 16, 1975, Ser. No. 587,446
Claims priority, application Switzerland, June 21, 1974, 8542/74; Feb. 25, 1975, 2375/75; May 29, 1975, 6945/75
Int. Cl.³ A01N 9/28; C07D 319/20

U.S. Cl. 424-278 15 Claims
1. A compound of the formula



wherein R₁ represents hydrogen, alkyl of 1 to 3 carbon atoms or chlorine, R₂ represents hydrogen or alkyl of 1 to 3 carbon atoms, and Y represents -O-, -CH₂-, -S- or >C=O.

13. An insecticidal and acaricidal composition which contains as active component an insecticidally and acaricidally effective amount of a compound of the formula

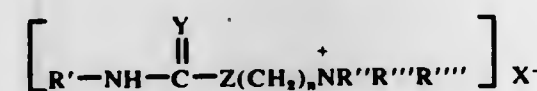
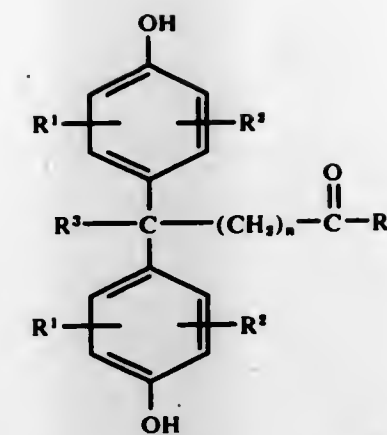


wherein R₁ represents hydrogen, alkyl of 1 to 3 carbon atoms or chlorine, R₂ represents hydrogen or alkyl of 1 to 3 carbon atoms, and Y represents -O-, -CH₂-, -S- or >C=O, together with a suitable carrier therefor.

4,007,281 PHARMACEUTICAL COMPOSITIONS CONTAINING QUATERNARY AMMONIUM COMPOUNDS

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Division of Ser. No. 134,827, April 16, 1971, which is a division of Ser. No. 712,968, March 14, 1968, Pat. No. 3,621,048, which is a continuation-in-part of Ser. No. 578,981, Sept. 13, 1966, abandoned. This application Feb. 20, 1976, Ser. No. 659,618

Int. Cl.³ A01N 9/20 8 Claims
U.S. Cl. 424-300 8 Claims
1. A pharmaceutical composition comprising an effective amount of a chemical compound effective against gram positive microorganisms represented by the formula



where

R' is selected from the group consisting of an alkyl group containing 1 to 22 carbon atoms, a phenyl group, a phenyl group substituted by an alkyl group containing 1 to 5 carbon atoms and a phenyl group substituted by an alkoxy group containing 1 to 5 carbon atoms and a phenyl group substituted by halogen; selected from the group consisting of chlorine and bromine
R'' and R''' are each selected from the group consisting of an alkyl group containing 1 to 2 carbon atoms;
R'''' is selected from the group consisting of an alkyl group containing 10 to 22 carbon atoms, a phenyl group substituted by halogen selected from the group consisting of chlorine and bromine, a phenyl group substituted by an alkyl group containing 1 to 5 carbon atoms, a phenyl group substituted by an alkoxy group containing 1 to 5 carbon atoms, a divalent phenyl group and a monovalent phenyl group;
Y is selected from the group consisting of oxygen and sulfur;
Z is selected from the group consisting of oxygen and sulfur, at least one of Y and Z being sulfur;
n is an integer 2 to 6; and
X is a compatible anion selected from the group consisting of chloride, bromide, iodide and methosulfate; said compound being admixed with a pharmaceutically acceptable carrier.

4,007,282

LOWERING LIPID AND SUGAR LEVELS IN THE BLOOD WITH A BIS(4-HYDROXYPHENYL)ALKANOIC ACID OR ESTER THEREOF

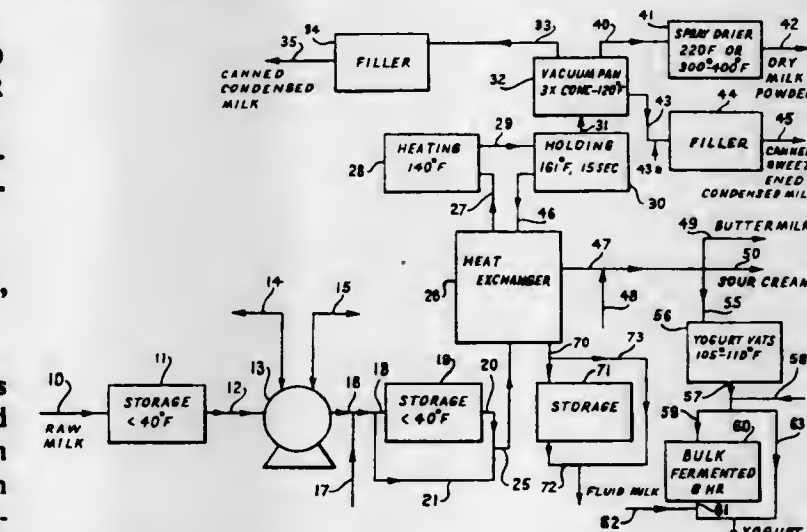
Otto Mauz, Liederbach, Taunus, and Ernoel Granzer, Kelheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed June 7, 1973, Ser. No. 367,887

Claims priority, application Germany, June 10, 1972, 2228448

Int. Cl.³ A61K 31/19, 31/215

U.S. Cl. 424-308 13 Claims

1. A dry pharmaceutical composition for lowering lipid and sugar levels in the blood of a human or animal suffering from hyperlipemia, said composition being in dosage unit form suitable for oral administration and comprising a physiologically acceptable excipient and 0.1 to 1 g of a metabolically active bis(4-hydroxyphenyl) alkanolic acid or ester thereof corresponding to the formula



1. Lactase derived from thermophilic fungi and in a form suitable for use in catalyzing the hydrolysis of lactose in a

dairy product to glucose and galactose, said lactase having a high enzymatic activity and being characterized by retention of such activity for a substantial period of time at a temperature of 55°–60° C and a pH not exceeding 5.

8. Lactase that is thermostable and that has optimum activity at a pH not greater than 5.

9. An admixture of (1) thermostable lactase and (2) thermolabile lactase, said lactase (1) having and retaining a high degree of enzymatic activity at a temperature of 55°–60° C. and a pH between 4 and 5, said lactase (2) having its optimum activity and stability at temperatures substantially below 55° C. and at a pH about 7; each said lactase component being present in substantial proportion sufficient to effectively catalyze hydrolysis of lactose to glucose and galactose at its optimum conditions of temperature and pH.

10. A method of producing thermostable lactase having its optimum activity at a pH below 5 which comprises inoculating a culture medium having lactose as the sole or a major source of carbon with cells of a thermophilic fungus, said culture medium being suitable for proliferation of such cells, maintaining conditions of temperature and pH favorable to cell growth and proliferation, causing such growth and proliferation, and harvesting the resulting mycelium, said fungus being selected from a genus and species capable of producing thermostable lactase in such culture medium at a substantial rate, such lactase having its maximum activity at a pH below 5.

16. A method of treating a dairy product to reduce its lactose content by hydrolyzing the lactose to glucose and galactose; said method comprising subjecting the dairy product to contact with thermostable lactase having its optimum activity at a pH not greater than 5, said contact being at a temperature not less than about 55° C and at a pH not greater than 5 and causing hydrolysis of lactose at such temperature.

4,007,284

PROCESS FOR MANUFACTURING A FATTY CONCENTRATE

Mikhail Ivanovich Goryaev, ulitsa M. Gorkogo, 60, kv. 15; Antonina Demidovna Ulyanova, ulitsa Masanchi, 56, kv. 11; Reingold Georgievich Maier, 11 mikrorajon, 28, kv. 92, and Vadim Nikolaevich Startsev, Krasnogvardeisky trakt, 263/16, kv. 2, all of Alma-Ata, U.S.S.R.

Filed June 20, 1975, Ser. No. 588,955

Claims priority, application U.S.S.R., June 28, 1974, 2040319; July 1, 1974, 2039910

Int. Cl.² A23D 5/04, 5/02

U.S. Cl. 426—98

9 Claims

1. A process for manufacturing a fatty concentrate, which comprises heating a fat selected from the group consisting of animal and vegetable fats to a temperature of from 20° to 40° C.; emulsifying said heated fat in the medium of an adsorbent selected from the group consisting of protein and carbohydrate adsorbents, said protein adsorbents selected from whole animal blood, defibrinated animal blood and meat broth, said carbohydrate adsorbent is meal and forming a protective coating on the particles of the fat being emulsified, said components being taken in the ratio of 1 fat to from 2 to 10 adsorbent; and drying the thus produced fat emulsion containing said adsorbent.

4,007,285

POPCORN CONTAINER AND HANDLE ASSEMBLY

Gary W. Maier, Mount Clemens, and David H. Jehn, Richmond, both of Mich., assignors to Dun-Hot, Inc., Mount Clemens, Mich.

Filed Sept. 19, 1974, Ser. No. 507,350

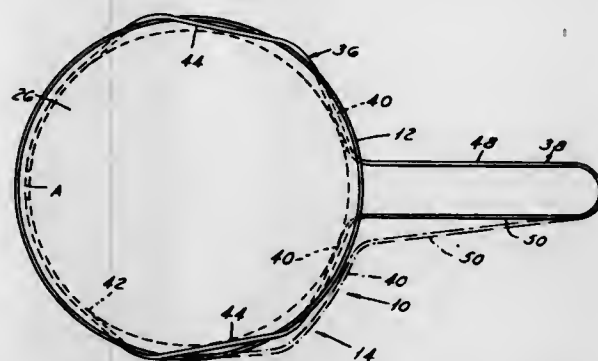
Int. Cl.² A23F 1/10; A45C 11/00

U.S. Cl. 426—108

2 Claims

1. A popcorn container and handle assembly comprising a first popcorn package having an open-top relatively shallow pan fabricated of semi-rigid self-supporting metallic sheet material, said pan having an annular rim, a cover of flexible

sheet material extending across and into the pan and having substantially the same relatively shallow outline as the pan, and a charge of popcorn kernels and cooking oil confined between the pan and cover, said cover being outwardly expandable upon heating of the charge, said rim comprising a first generally radially outwardly extending rim portion and a second overlying reversely bent rim portion, the marginal peripheral edge portion of said cover being clamped between said rim portions, and a detachable utensil made from a single piece of solid metal wire of circular cross-section having the opposite ends thereof secured permanently together to form an endless utensil and comprising a non-circular, non-rectangular, expandable contractable loop for engaging the upper and lower surfaces of the rim of said pan and an elongated expandable and contractable handle of generally U-shape configuration extending from said loop, said loop including front, rear and intermediate portions engageable with said rim, said handle extending from said front portions of said loop and having a pair of arms connected together on the outer ends thereof, said front portions of said loop adjacent said handle being spaced apart to permit said loop to be ex-



panded by applying a force urging the arms of said handle apart and increasing the size of said loop to permit the loop of said utensil to be placed on the rim of said pan, with said handle extending laterally outwardly from said pan, said rear portion of said loop being engaged with only the lower surface and not the upper surface of the rim of said pan, said front portions of said loop being spaced from said rear portion and engaged with only the lower surface and not the upper surface on another portion of said rim, and said intermediate portions of said loop being elongated and located between and connecting, said front and rear portions, each of said intermediate portions including a straight elongated central portion having substantially its entire longitudinal extent engaged with only the upper surface and not the lower surface of other portions of said rim, each of said intermediate portions including integral end portions connecting said central portion to said front and rear portions such that the plane of said central portions is spaced from and parallel to the plane of said front and rear portions and said end portions form an angle with said planes, said loop decreasing in size and firmly gripping said engaged portions of the rim of said pan upon the removal of the force applied to the arms of said handle.

4,007,286

PRODUCTION OF POTATO GRANULES

Buncha Ooraiikul, Selangor, Malaysia, assignor to Canadian Patents and Development Ltd., Ontario, Canada

Filed June 3, 1974, Ser. No. 476,053

Int. Cl.² A23B 7/14

U.S. Cl. 426—262

23 Claims

1. A method for the preparation of dehydrated potato granules which comprises subjecting potatoes to the following steps in order:

- preparing the potatoes for cooking;
- cooking the potatoes;
- immediately mashing the cooked potatoes at a temperature of at least 160° F;
- cooling and freezing the potato mash;
- thawing the mash;

f. immediately predrying the thawed mash by evaporation to reduce the moisture content to a range of about 35–42%; thereby producing potato cells which are separated into single units or cell aggregates

g. thereafter granulating the predried mash under conditions such that the moisture content remains within said 35–42% range during the entire granulating operation; and

h. drying the potato granules at a temperature and for a period of time sufficient to reduce the moisture content to not more than about 7%.

4,007,287

FLAVORING WITH (ALLYL)(2-METHYL-3-FURYL) SULFIDE

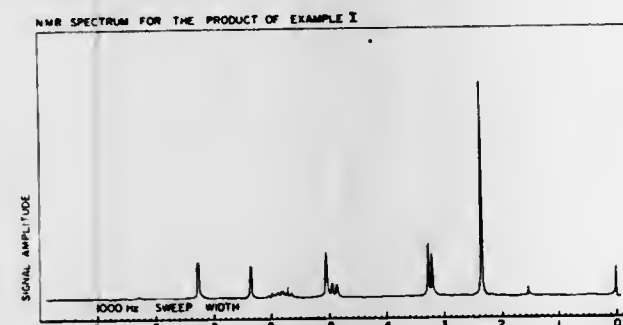
William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet; Manfred Hugo Vock, Locust, and Christopher Giacino, Calton, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 581,962, May 29, 1975. This application Mar. 12, 1976, Ser. No. 666,347

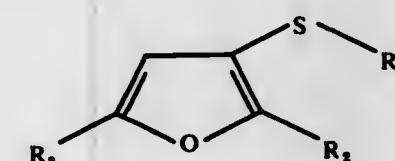
Int. Cl.² A23L 1/226

U.S. Cl. 426—535

2 Claims



1. A process for augmenting or enhancing the alliaceous flavor of a foodstuff comprising adding to said foodstuff from about 0.0001 ppm up to about 250 ppm of a 3-furyl sulfide compound having the structure:



where R₁ allyl, R₂ is methyl.

4,007,288

LOW CALORIE SWEETENING COMPOSITION AND METHOD FOR MAKING SAME

Martin Glicksman, Valley Cottage, N.Y., and Bartley N. Wankler, Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 55,561, July 16, 1970, Pat. No. 3,761,288. This application Aug. 13, 1973, Ser. No. 387,846

The portion of the term of this patent subsequent to Sept. 25, 1990, has been disclaimed.

Int. Cl.² A23L 1/236

U.S. Cl. 426—548

3 Claims

1. A method for producing a rapidly soluble sweetening composition comprising the steps of forming an aqueous solution of an edible bulking agent and L-aspartyl-L-phenylalanine methyl ester, said bulking agent being selected from the group consisting of organic acids, hydrolyzed starch materials and sugars, said aqueous solution containing less than one part L-aspartyl-L-phenylalanine methyl ester per part of bulking agent, and vacuum drum drying the solution at a drum temperature below 100° C and at subatmospheric pressure.

4,007,289

PROTEIN-RICH BAKING PRODUCT AND METHOD FOR ITS MANUFACTURE

Guenter Jaegerling, Soennern near Werl, Germany
Continuation of Ser. No. 410,252, Oct. 26, 1973, abandoned.
This application Apr. 28, 1975, Ser. No. 572,210

Int. Cl.² A21D 13/06

2 Claims

1. A process for making a protein-rich baked product having an extended shelf-life and which can be cleanly sliced.

consisting essentially of the steps of:

adding approximately 60 to 70 parts by weight vital wheat protein having a moisture content of approximately 8–13% and a quantity of cereal starch having a moisture content of approximately 10 to 15% sufficient to make 100 parts by weight to not more than 70 parts by weight of water whereby there is less water than that which the mixture has the capacity to absorb; then

kneading the mixture of vital wheat protein, cereal starch, and water until it reaches a consistency which will register from approximately 600 to 650 units on a Brabender farinograph;

allowing the kneaded mixture to stand for approximately 30 to 90 minutes at a temperature of from 30° to 15° C to develop the inner structure of the dough; subsequently cutting the dough into pieces as required by the product to be prepared; and thereafter

baking the dough pieces at a temperature which is initially at approximately 210° C and which decreases to 190° C for a period of time sufficient to form a crust;

the steam formed during baking effecting expansion of the baked product, free from requiring chemical leavening agents.

4,007,290

CAFFEINE ANTAGONISM

Benjamin Raphael Zeltin, Suffern; Alan Bryan Pritchard, Hartsdale, both of N.Y., and Harold S. Levenson, Stamford, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 9, 1974, Ser. No. 431,797

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A23F 1/04, 1/10

U.S. Cl. 426—594

14 Claims

1. A composition for preparing a coffee beverage comprising (a) coffee containing caffeine, said coffee being selected from the group consisting of roasted and ground coffee and soluble coffee solids from roasted coffee, and (b) nicotinic acid or a soluble salt thereof, the amount of nicotinic acid or soluble salt thereof being sufficient to provide from about 6 mg to about 50 mg per cup of coffee beverage prepared from said coffee, wherein a cup of coffee beverage comprises an aqueous solution containing from about 1.5 to 2.0 grams of soluble coffee solids, and the amount of nicotinic acid or soluble salt thereof present in the coffee beverage is effective to at least partially antagonize the sleep disturbing characteristics of the caffeine present in the coffee.

4,007,291

METHOD FOR FIXING COFFEE GRINDER GAS

Dennis Ted Siedlecki, Babylon, N.Y., and James F. Meinhold, Jersey City, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 20, 1974, Ser. No. 471,631

Int. Cl.² A23F 1/04

U.S. Cl. 426—594

6 Claims

1. A method for aromatizing soluble coffee with an aromatized glyceride comprising the steps of:

- condensing, as a frost, an aroma-containing gas which has a high carbon dioxide content,
- placing the aroma-containing frost in a pressure vessel,
- isolating the vessel from the atmosphere,

- d. supplying heat to the contents of the vessel to produce an internal pressure of at least 700 p.s.i.g. and an internal temperature above the congeal point of the glyceride carrier of step c,
- e. contacting, within said pressurized vessel, the frost aromas and a liquid glyceride phase, said glyceride being present in the vessel at a level of about 1 gram of glyceride to 0.5 to 6 grams of the frost,
- f. thereafter, slowly and isothermally releasing the pressure within the vessel so that the glyceride carrier is maintained in a liquid state, and then,
- g. combining the aromatized glyceride with coffee solids.

4,007,292

METHOD OF MAKING A PARFRIED FROZEN POTATO PRODUCT

Mounir A. Shatila, and Samuel J. Huffman, both of Blackfoot, Idaho, assignors to Ampco Foods Inc., San Francisco, Calif.
Filed Dec. 5, 1975, Ser. No. 637,991
Int. Cl.² A23L 1/216

U.S. Cl. 426—637

2 Claims

1. A process for producing an extruded parfried quick-frozen unit suitable for toasting either in frozen or thawed state to produce French fried potatoes, comprising the steps of:

- a. providing a quantity of formable potato dough consisting of 23–40% solids and 60–77% water by weight, said solids comprising essentially intact cooked separated potato cells about 1.5% guar gum and about 7% raw starch, all by weight;
- b. extruding said dough into a continuous extrudate having a plurality of French fry forms in parallel substantially planar relationship, each form having a central longitudinal void extending throughout, said forms being interconnected by a thin, narrow, easily rupturable film of said dough;
- c. crosscutting said extrudate to form a unit having dimensions approximating a standard slice of bread;
- d. browning said unit by parfrying for about 90 seconds in fat at a temperature of 330°–360° F. to reduce the moisture content to 35–45% by weight and to impart freeze thaw stability;
- e. quick freezing the browned parfried unit; and
- f. storing the quick frozen unit at 0° to –10° F. until desired for consumption.

4,007,293

MECHANICALLY VIABLE DEVELOPER MATERIALS

Joseph L. Mincer, Lewisville, Tex., and John M. Pochan, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 1, 1976, Ser. No. 662,641
Int. Cl.² G03G 13/08, 13/09, 9/10

U.S. Cl. 427—19

24 Claims

1. A carrier particle for electrostatographic developer mixtures, said carrier particle having an average particle diameter from between about 30 microns and about 1,000 microns, said carrier particle comprising a core having an outer coating, said outer coating comprising a mixture of poly(2-vinyl-pyridine) and polyurethane.

4,007,294

METHOD OF TREATING A LAYER OF SILICON DIOXIDE

Murray Henderson Woods, and Richard Williams, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 476,837, June 6, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,878
Int. Cl.² B05D 3/06

U.S. Cl. 427—39

10 Claims

1. A method of treating a layer of silicon dioxide having a pair of opposite surfaces comprising the steps of:

applying an ionic fluoride compound to one surface of said layer of silicon dioxide, and
directing a corona discharge onto said one surface between a negative electrode spaced from said one surface of said silicon dioxide layer, and the other surface of said silicon dioxide layer which is connected to a source of potential more positive than said negative electrode to drive fluoride ions of said compound into said layer of silicon dioxide.

4,007,295

OLEFIN-SO₂ COPOLYMER FILM ADHESION TO A SUBSTRATE

Eugene Samuel Poliniak, Willingboro; Richard Joseph Himics, Skillman, both of N.J., and Henry Wielicki, Wyndmoor, Pa., assignors to RCA Corporation, New York, N.Y.

Filed July 28, 1975, Ser. No. 599,589

Int. Cl.² H04N 5/82

U.S. Cl. 427—43

7 Claims

1. In the method of fabricating a video disc record whereby a grooved copper recording master is coated with an olefin-SO₂ copolymer electron beam resist, the electron beam resist is exposed to a video signal-modulated beam of electrons produced by a scanning electron microscope, developed with a developer solvent to form a geometric surface relief pattern in the bottom of the groove, and electroplated with nickel to form a stamping master negative of said recording master, the improvement which comprises applying a layer of gold onto the grooved copper recording master prior to applying the olefin-SO₂ copolymer resist.

4,007,296

METHOD FOR MAKING THICK FILM CAPACITORS

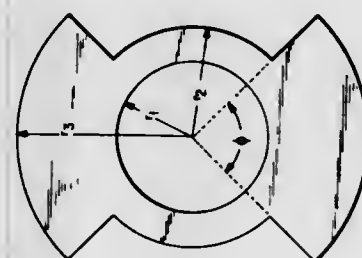
Joseph L. Ansell, Rockville; Phillip G. Bruslus, Wheaton, and Raymond J. Baker, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 29, 1974, Ser. No. 484,019

Int. Cl.² H01G 4/06

U.S. Cl. 427—79

1 Claim



1. A method of making a capacitor of a desired capacitance comprising the steps of

selecting an electrode pattern for said capacitor having a center point, wherein said electrode pattern is an annulus having inside and outside radii which annulus is extended in diametrically opposed directions by two diametrically opposed portions of a circle, each of said portions being defined by an inside arc having the same radius as said outside radius of said annulus and an outside arc having a greater radius, and each of said portions subtending an arc of less than 180°, and which when printed on opposite faces of a substrate, with respective center points aligned, and when the patterns are rotated such that the printed electrode pattern on each face is rotated relative to the electrode on the opposite face, the electrodes provide an area of electrode overlap which varies according to a linear function of the relative rotation between the two patterns,

determining the specific amount of said relative rotation which results in the overlap corresponding to said desired capacitance,
conductively printing a first one of said patterns on one face of a substrate,
conductively printing a second one of said patterns on the opposite face of said substrate with the center point of said second pattern aligned with the center point of said first pattern, but with said second pattern relatively rotated by said specific amount with respect to said first pattern.

4,007,297

METHOD OF TREATING SEMICONDUCTOR DEVICE TO IMPROVE ITS ELECTRICAL CHARACTERISTICS

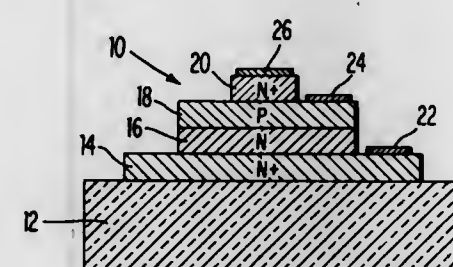
Paul Harvey Robinson, Trenton, and Ram Shaul Ronen, Kendall Park, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,982

Int. Cl.² H01L 21/38

U.S. Cl. 427—93

1 Claim



1. A method of improving the electrical characteristics of a semiconductor device which includes a body of single crystalline silicon comprising:

depositing a layer of silicon oxide directly on a surface of the silicon body from a thermally reacted gas containing silicon and oxygen, and
exposing said semiconductor device with said layer formed thereon to a substantially water vapor free atmosphere consisting of chlorine gas and oxygen, the concentration of the chlorine gas in the atmosphere being between about 0.5 and 5.0% by volume, while heating said semiconductor device to a temperature of between 800° C and 1200° C.

4,007,298

POLYETHYLENE COATING FOR FERROUS METALS

Chester E. Feehan, Allentown, and Ernest F. Wagner, Delanco, both of N.J., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Division of Ser. No. 464,658, April 26, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 570,086

Int. Cl.² B05D 3/02, 3/08, 3/10

U.S. Cl. 427—195

2 Claims

1. A method of coating a metal article with a polyethylene composition comprising the steps of preparing a blend of high density and low density polyethylene powders, said blend containing a range by volume of from 1 part of high density polyethylene and 1 part of low density polyethylene to 1 part of high density polyethylene to 3 parts of low density polyethylene, heating a surface of said metal article to a temperature of between above 450° to about 600° F. applying said blend of powders over said heated surface of said metal article to a desired thickness, maintaining said surface at a temperature of between over 450° to about 600° F. for a period of from about 5 to 15 minutes, and the cooling said metal article to ambient temperature.

4,007,299

METHOD FOR MAKING MATT FINISH COATINGS

Felix Schilde, Wulfen; Johann Obendorf, Dorsten; Kurt Neubold, Gladbeck, and Gunter Dörmann, Bochum, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Division of Ser. No. 470,232, May 15, 1974, Pat. No.

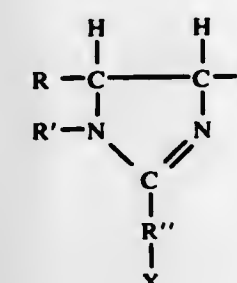
3,947,384. This application Aug. 21, 1975, Ser. No. 606,623

Int. Cl.² B05D 3/02, 3/10

U.S. Cl. 427—195

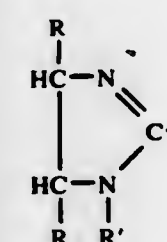
7 Claims

1. Method for making matt finish coatings which comprises
a. applying a powder varnish to a substrate, said powder varnish comprising a finely divided mixture of
i. a 1,2-epoxy compound having at least one 1,2-epoxy group in the molecule and a lower melting point greater than 40° C; and
ii. a salt of a polycarboxylic acid having three or more carboxyl groups; and a cyclic amidine having the formula



wherein

R is H, alkyl or aryl;
R' is the same as R and in addition cycloalkyl, or a heterocycloalkyl radical obtained by substituting one or more —N—, —S—, and/or —O— atoms in a cycloalkyl ring;
R'' is alkyl and aryl substituted alkylene or arylene; and
X hydrogen or the radical



wherein

R and R' are as defined previously; and
b. thereafter reacting said powder varnish at a temperature of 100° to 240° C to form a matt finish coating.

4,007,300

METHOD OF CONDITIONING FABRICS IN A CLOTHES DRYER

Agnes R. McQueary, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 347,606, April 3, 1973, Pat. No.

3,956,556. This application Nov. 10, 1975, Ser. No. 630,371

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.² B05D 3/12

U.S. Cl. 427—242

3 Claims

1. The method of conditioning fabrics in a laundry dryer which comprises commingling said fabrics in said dryer with a fabric-conditioning article comprising a flexible web substrate carrying a fabric-conditioning agent removable to fabrics by contact therewith, said fabric-conditioning article having perforations sufficient in size and number as to permit at least 75% of the normal volume of air flow through said dryer when said article is used therein.

4,007,301

METHOD FOR PRECOATING A FILTER WITH A MIXTURE OF ANION AND CATION EXCHANGE RESIN PARTICLES

Roberto De Martino, Milan, Italy, assignor to Ecodyne Corporation, Chicago, Ill.

Filed July 29, 1974, Ser. No. 492,465

Int. Cl.² B01D 37/02; B05D 5/00

U.S. Cl. 427-244

6 Claims

1. A method for precoating a filter with a mixture of anion and cation exchange resin particles in the size range of about 60 to 400 mesh comprising: mixing said anion and cation exchange resins in aqueous suspension at a temperature of about 100° to 212° F., whereby to cause said resins to agglomerate with one another to form larger particles; and coating said resins onto a filter.

4,007,302

CASE-HARDENING METHOD FOR CARBON STEEL

Hiroshi Hashimoto, Chiba; Takeo Taniuchi, Tokyo; Kiyomitsu Suga, Kawaguchi, and Toshio Shimizu, Tokyo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Feb. 11, 1975, Ser. No. 548,975

Claims priority, application Japan, June 25, 1974, 49-71896

Int. Cl.² C23F 11/08, 9/02

U.S. Cl. 427-249

8 Claims

1. A case-hardening method for carbon steel in the metallic cementation thereof according to a solid powder method, comprising the steps of preparing a powder mixture by combining a halogenated salt as catalyst with titanium powder and chromium oxide powder, embedding carbon steel in said powder mixture and subjecting the resultant mixture to a heat treatment to thereby form a carbide hardened layer mainly composed of titanium carbide, wherein the proportion of said chromium oxide in said mixture is sufficient to provide said carbon steel with a uniformly thick layer of titanium carbide having an hardness of approximately at least 3000 Hv.

4,007,303

METHOD OF MAKING PINTLE WIRE FOR HIGH LOAD HINGE CONNECTIONS

Wilhelm Schuster, Frankfurt; Klaus Wollmann, Eschhofen, and Jürgen Stahl, Frankfurt, all of Germany, assignors to Fitzschverwaltungs-Gesellschaft mit beschränkter Haftung, Frankfurt, Germany

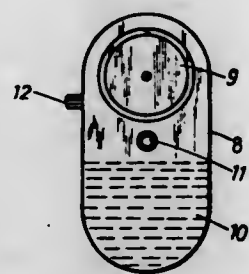
Division of Ser. No. 192,008, Oct. 26, 1971, abandoned. This application Aug. 12, 1974, Ser. No. 496,910

Claims priority, application Germany, Oct. 30, 1970, 2053273

Int. Cl.² B05D 11/18, 3/00

U.S. Cl. 427-296

6 Claims



1. A method of producing a pintle wire for hinge connections, especially for textile webs and transmission belts, which includes in combination the steps of: building up a multi-layer skeleton of braided synthetic fibers in the form of a hose, desizing the thus built-up skeleton by means of a solvent, drying the thus desized skeleton of braided synthetic fibers, introducing into a lower portion of a container a permeating solution adapted after removal of its solvent and after hardening to form a heat hardenable synthetic material, introducing

the multi-layer skeleton of braided synthetic fibers into the container above the solution, thereupon evacuating said container with the skeleton of fibers above the solution, thereby first removing any gaseous components and air from said skeleton of fibers and also from said solution prior to dipping said skeleton of fibers into the permeating solution, subsequently while in the evacuated container immersing said synthetic fibers into said immersing solution, thereupon by means of a water-free gas above said solution producing an overpressure of from 5 to 10 atmospheres above atmospheric pressure in said container, maintaining said last mentioned pressure for a number of hours, after pressure equalization has occurred in said container withdrawing the impregnated synthetic fibers from said container through a calibrated nozzle and through a heating zone having a temperature of from 50° to 100° C. for hardening the heat hardenable synthetic material, and winding up the thus produced synthetic fibers on reel means.

4,007,304

METHOD FOR COATING SURFACES

James L. Dunn, Jr., Lake Jackson; John K. Ward, Angleton, and Patrick H. Martin, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 237,274, March 23, 1972,

abandoned. This application June 23, 1975, Ser. No. 589,226

Int. Cl.² B05D 3/04, 1/36

U.S. Cl. 427-314

4 Claims

1. An improved method for forming a film on a surface comprising

establishing a first zone of vapors of a volatile organic solvent employed in coating composition containing the film forming agent, said zone being at atmospheric pressure and at the atmospheric boiling point of said organic solvent.

establishing a second zone of vapors of said volatile organic solvent in interfacial relationship with said first zone but substantially free of direct contact with the ambient atmosphere, said second zone being maintained at a temperature above the atmospheric boiling point of said organic solvent by supplying heat to said zone external of said heat of vapors arising from the coating composition or the first zone;

introducing the surface to be coated into said first zone; applying the coating composition to said surface upon the surface reaching equilibrium with said zone;

introducing said coated surface into said second zone and maintaining said coated surface and said second zone in such condition that solvent will evaporate from the applied film at a controlled rate such that the film is gelled to prevent its sagging, held in this gelled state in said second zone for a time sufficient for surface imperfections to level out, and finally dried to a tack free and essentially solvent free condition, the surface being then at a temperature above the atmospheric boiling point of said organic solvent;

and removing said surface from said second zone through said first zone or a third zone of the same nature as said first zone into the ambient atmosphere.

4,007,305

METHOD OF IMPARTING NONDURABLE SOIL RELEASE AND SOIL REPELLENCY PROPERTIES TO TEXTILE MATERIALS

Sarwan K. Kakar, Southgate; Frank R. Kappler, Wyandotte; Gilbert S. Gomes, Southgate, and John J. Cramer, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1974, Ser. No. 535,264

Int. Cl.² B05D 3/00

U.S. Cl. 427-322

15 Claims

1. A method of imparting nondurable soil release and soil repellency properties to textile material including textile fibers

4,007,307

ARTIFICIAL LAWN

Hans-Joachim Friedrich, Backnang, Germany, assignor to J. F. Adolff AG, Backnang, Germany

Continuation of Ser. No. 189,635, Oct. 15, 1971, abandoned.

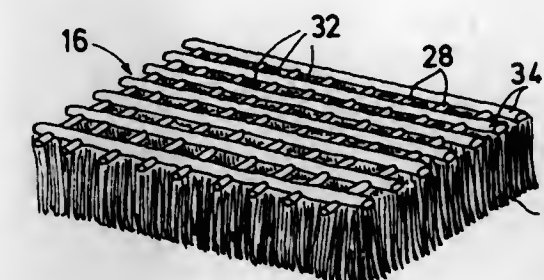
This application June 25, 1974, Ser. No. 483,062

Claims priority, application Germany, Oct. 17, 1970, 5110842

Int. Cl.² A01N 3/00; A41G 1/00

U.S. Cl. 428-17

22 Claims



comprising the steps of intimately contacting the fibers of the said textile material with an alkaline aqueous medium containing as the essential ingredients for imparting the said nondurable soil release and repellency properties (a) a dissolved water soluble hydrophilic soil release polymer containing carboxylic acid groups whereby a soil release finish comprising the said soil release polymer is deposited on the surfaces of the fibers, (b) a dispersed hydrophobic soil repellent fluorochemical finish whereby a soil repellent finish comprising the said fluorochemical is deposited on the surfaces of the fibers, and (c) water soluble polyvinylpyrrolidone, the said aqueous medium having a pH value of about 7.5-11 and containing about 0.25-4% by weight of the soil release polymer, about 0.05-1% by weight of the soil repellent fluorochemical, and about 0.05-1% by weight of the water soluble polyvinylpyrrolidone, and drying the textile material having the said soil release polymer and the said soil repellent fluorochemical deposited on the fibers thereof to produce a dry textile material having nondurable soil release and soil repellency properties.

4,007,306

METHOD OF APPLYING AQUEOUS COATING COMPOSITIONS

George Lim Poy, Orchard Lakes, Mich., and Edward A. Sproul, Anaheim, Calif., assignors to Inmont Corporation, New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 527,393

Int. Cl.² B05D 3/02, 1/02

U.S. Cl. 427-377

16 Claims

1. A method of applying coatings to automobiles comprising:

a. spraying the automobile in a relative humidity throughout the coating process of 40 to 60% with an aqueous thermosetting coating composition having a threshold cross-linking temperature above 300° F. and comprised of:

A. 0 to 20% pigment,

B. 3 to 16% water compatible aminoplast cross-linking agent,

C. 4 to 25% volatile water miscible organic solvent which forms an azeotrope with water which boils at 70°-99° C.,

D. 10 to 32% of a water soluble acrylic copolymer having a Tg of 20° C. to 80° C., a molecular weight of 2,000 to 100,000, said copolymer being the copolymerization product of (a) 60 to 86.5% by weight of at least one monomer of the group consisting of 1-4 carbon alkyl acrylates, 1-4 carbon alkyl methacrylates, styrene, vinyl toluene, and diacetone acrylamide; (b) 5.0 to 34% by weight of a reactive monomer of the group consisting of hydroxyethyl, hydroxypropyl and glycidyl esters of acrylic and methacrylic acids; (c) 0.5 to 6% by weight of an α , B-ethylenically unsaturated nitrile, and (d) 5 to 18% by weight of an α , B-unsaturated carboxylic acid of the group consisting of acrylic acid, methacrylic acid, maleic anhydride and fumaric acid,

E. an acrylic copolymer solubilizing reagent of the group consisting of ammonia and volatile amines, in an amount sufficient to solubilize the acrylic copolymer at a pH of 7 to 12 and

F. water,

b. heating the wet coated surface at a temperature below the threshold cross-linking temperature of the coating to remove substantially all of the volatile components before appreciable cross-linking begins and

c. then heating the coating above 300° F. until the coating is cured.

4,007,308

PROCESS FOR THE PRODUCTION OF PILE SURFACED ARTICLES FROM POLYESTERS

Malcolm Hemming, Delamere, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 13, 1975, Ser. No. 557,903

Claims priority, application United Kingdom, Mar. 19, 1974, 12077/74

Int. Cl.² B29C 17/02

U.S. Cl. 428-92

15 Claims

1. A process for the production of pile surfaced sheets from crystal forming polymers with glass/rubber transition temperatures above ambient temperatures comprising feeding the polymer in its amorphous state into contact with a heated surface, rapidly raising the temperature of the polymer to a temperature which is below the crystalline melting point but at which it may be drawn into fibrils and at which it adheres to the surface and separating the polymer sheet from the surface so that fibrils of the polymer are drawn out due to its adhesion to the surface, cooling the fibrils as they are formed and crystallizing the polymer.

13. Pile surfaced material comprising a polyester sheet having fibrils extending from one side thereof said fibrils being integral with the remainder of the sheet the polymer in said fibrils being crystalline and oriented substantially along the major length of the fibrils.

4,007,309

SAG RESISTANT HONEYCOMB LOAD SPACER

James Sewell, Ypsilanti, Mich., assignor to Narad, Inc., Wayne, Mich.

Filed July 12, 1973, Ser. No. 378,643

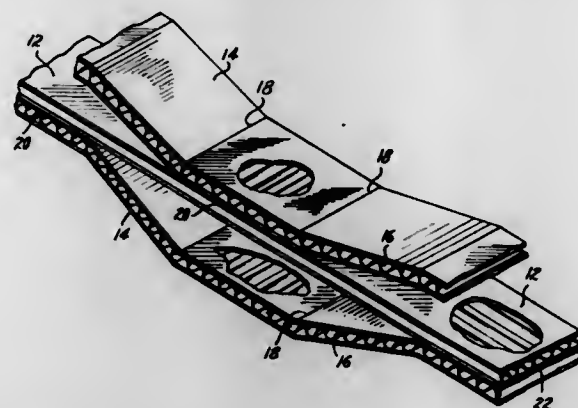
Int. Cl.² B32B 3/12, 3/28

U.S. Cl. 428-116

1 Claim

1. A structure expandable to form a honeycomb structure comprising a stack of elongated generally flat strips of sheet material, the strips of said stack being secured to adjacent strips at spaced and staggered positions whereby said stack may be expanded to define a honeycomb slab having a multiplicity of cells; a majority of said strips being readily foldable

along lines transverse thereto, at least adjacent those regions where they are secured to adjacent strips; the strips other than said majority of said stack being stiffer, in a direction lengthwise thereof, than said majority of strips and resistant to folding along said transverse lines, said other strips being relatively few in number and being separated in said stack by a plurality



of said majority of strips whereby said other strips prevent undue vertical elongation of said cells when said slab is suspended from its upper edge portion, said majority of strips comprising corrugated paperboard arranged with the corrugations thereof extending transversely of said strips; said other strips being of corrugated paperboard arranged with the corrugations thereof extending lengthwise of said strips.

4,007,310 METHOD OF DESENSITIZATION USING DESENSITIZING COMPOSITION

Akio Miyamoto; Hiroharu Matsukawa, both of Fujimiya, and Nobuo Yamamoto, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Mar. 21, 1975, Ser. No. 560,680

Claims priority, application Japan, Mar. 22, 1974, 49-32337

Int. Cl.² B41M 5/12

U.S. Cl. 428-195

9 Claims

1. A method for desensitizing a color developer capable of forming a color upon contact with a color former comprising contacting the color developer with a desensitizing composition which includes as a desensitizing agent the reaction product of (a) an alkylsiloxane, an alkylmethylene or an alkylsilane, and (b) an alkylene oxide or an alkylene imine, wherein the alkylene imine may be tertiary amine, said desensitizing agent having a Si-O-Si bond, a Si-C-Si bond or a Si-Si bond in the molecule and containing an alkyleneoxy group or an alkyleneimino group in the molecule, and wherein said desensitizing agent is employed in amounts of about 1 to 60% by weight of said desensitizing composition.

4,007,311 POLYACRYLATE-GRAFTED BLOCK COPOLYMER ADHESIVE COMPOSITIONS

James T. Harlan, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 6, 1975, Ser. No. 629,455

Int. Cl.² C08L 27/00, 75/00

U.S. Cl. 428-246

8 Claims

1. An adhesive composition comprising:
a. 5 to 50% by weight of a graft copolymer of a block copolymer and a polymerized alkyl ester of an acid of the acrylic acid series wherein said block copolymer is selected from the group consisting of monoalkenyl arene-conjugated diene block copolymers and selectively hydrogenated monoalkenylarene-conjugated diene block copolymers; and
b. 95% to 50% by weight of a polyurethane cement.

4,007,312 METHOD OF BONDING SOLID LIGNOCELLULOSIC MATERIAL, AND RESULTING PRODUCT

Jan Stoffko, Albany, and Eugene Zavarin, San Francisco, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sept. 27, 1973, Ser. No. 401,370

Int. Cl.² C09J 1/00, 5/00

U.S. Cl. 428-420

16 Claims

16. Plywood laminate obtained by the method of claim 6.

4,007,313 MAGNETIC RECORDING MEDIUM

Shigetaka Higuchi; Yoshiaki Hisagen, both of Sendai; Minoru Takamizawa, and Masatoshi Takita, both of Annaka, all of Japan, assignors to Sony Corporation, Tokyo, Japan and Shin-Etsu Chemical Co., Inc., both of Tokyo, Japan

Filed Oct. 1, 1975, Ser. No. 618,368

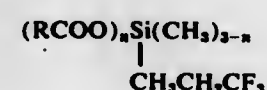
Claims priority, application Japan, Oct. 2, 1974, 49-114391

Int. Cl.² H01F 1/37; B32B 9/04

U.S. Cl. 428-447

8 Claims

1. In a magnetic recording medium having a non-magnetic base and a magnetic layer formed thereon containing magnetizable particles dispersed in a resinous binder, the improvement comprising said magnetic layer having an organosilicon compound represented by the formula



where R is an aliphatic group having from 7 to 17 carbon atoms and n is an integer from 1 to 3, said organosilicon compound being present in an amount sufficient to provide lubricating properties to said magnetic layer.

4,007,314 MAGNETIC RECORDING MEDIUM WITH SILANE LUBRICANT

Shigetaka Higuchi; Yoshiaki Hisagen, both of Sendai; Minoru Takamizawa, and Masatoshi Takita, both of Annaka, all of Japan, assignors to Sony Corporation and Shinetsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Oct. 1, 1975, Ser. No. 618,367

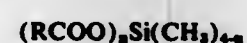
Claims priority, application Japan, Oct. 2, 1974, 49-114390

Int. Cl.² B32B 9/04

U.S. Cl. 428-447

7 Claims

1. In a magnetic recording medium having a non-magnetic base and a magnetic layer formed thereon containing magnetizable particles dispersed in a resinous binder, the improvement comprising said magnetic layer having an organosilicon compound represented by the formula



where R is an aliphatic group containing from 7 to 17 carbon atoms and n is an integer from 1 to 3, said compound being present in an amount of from 0.3 to 5 parts by weight for every 100 parts by weight of said magnetizable particles.

4,007,315 BATTERY CELL COOLING SYSTEM

Jürgen Brinkmann, Hagen, and Hermann Franke, Ennepetal, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

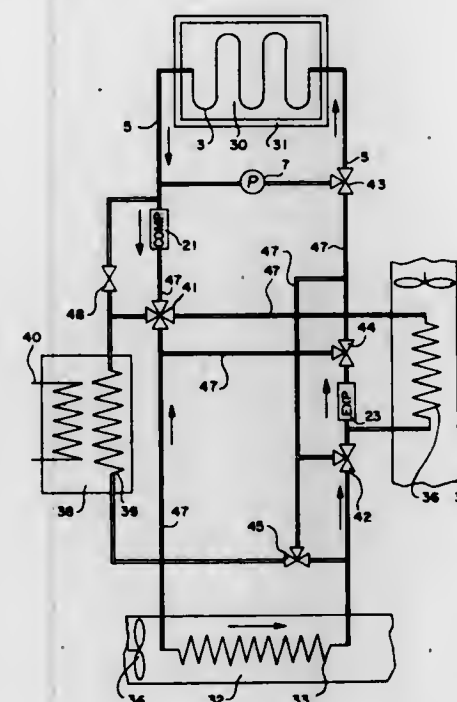
Filed Mar. 12, 1975, Ser. No. 557,831

Claims priority, application Germany, Mar. 27, 1974, 2414758

Int. Cl.² H01M 10/50

U.S. Cl. 429-62

17 Claims



1. A system for dissipating the heat developed in the cells of a multicell storage battery, comprising:
cooling elements immersed in the electrolyte in the tops of said battery cells;
said cooling elements being formed of material having high heat conductivity and electric resistance, and said medium having low electric resistance, whereby said cooling medium is caused to circulate through said elements in a substantially potential-free manner, and
said cooling elements being connected between manifolds in groupings;
means for causing a cooling medium to circulate through said cooling elements, said circulation of cooling medium being produced by a pump causing passage of said medium via said manifolds through said elements;
heat exchanger means connected between said manifolds and equipped with a blower for forced air cooling;
a bypass conduit for said heat exchanger also connected between said manifolds;
a two-way valve for causing said medium to flow alternatively through said heat exchanger means and said bypass conduit;
heat sensing means located in individual cells for separately controlling said pump, said two-way valve and said forced air cooling blower; and
compressor means connected to one side, and expansion means connected to the other side of said heat exchanger means, said pump being positioned in said bypass conduit.

4,007,316 DEFERRED ACTION BATTERY HAVING AN IMPROVED DEPOLARIZER

Ralph F. Koontz, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Nov. 19, 1975, Ser. No. 633,536

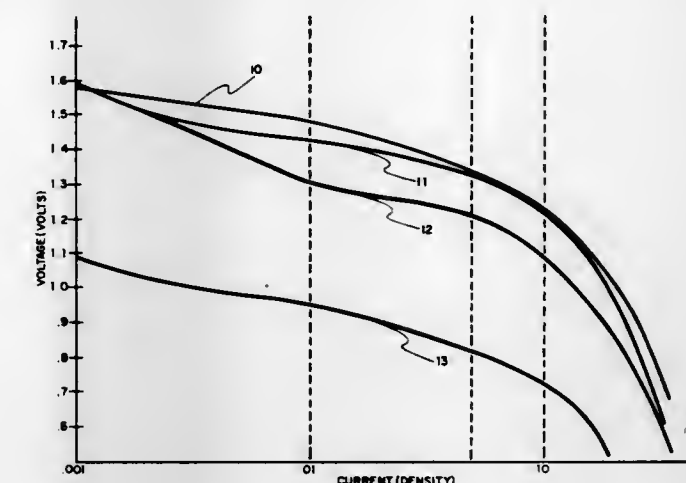
Int. Cl.² H01M 6/00

U.S. Cl. 429-118

14 Claims

6. A deferred action battery having an anode selected from

the group consisting essentially of magnesium, aluminum, and zinc with a cathode depolarizer comprising a conductive material, a binder and heavy metal derivatives of aliphatic



monocarboxylic acids wherein the heavy metal derivative includes copper formate.

4,007,317 PHOTOSENSITIVE POLYMERIC MATERIAL AND ELECTROPHOTOMETRIC MATERIAL AND METHODS OF MANUFACTURING SAME

Ekaterina Egorovna Sirotkina, prospekt Lenina, 87, kv. 8; Vadim Petrovich Lopatinsky, prospekt Lenina, 43, kv. 10a; Viktor Dmitrievich Filimonov, ulitsa Usova, 25b, kv. 9; Rita Moiseevna Kogan, ulitsa Vershinina, 37 kv. 205; Vyacheslav Dmitrievich Pirogov, Studgorodok, 2, kv. 8; Sofya Ivanovna Kudinova, Komsomolsky prospekt, 39/2, kv. 6; Ljubov Sergeevna Sizova, ulitsa Osipenko, 31, kv. 215; Svetlana Stepanovna Reznikova, ulitsa Usova, 11a, kv. 109; Georgy Nikolaevich Ivanov, prospekt Kirova, 1, kv. 3a; Nina Alexandrovna Tsekhanovskaya, poselok Sputnik 8, kv. 316, all of Tomsk; Jonas-Donatos Bronyus Sidaravichus, ulitsa R. Charno, 1, kv. 48, Vilnius; Larisa Vasilievna Randina, prospekt Lenina 30, Tomsk; Svetlana Lepnikovna Bocharova, prospekt Lenina 30, Tomsk; Galina Petrovna Gulyaeva, prospekt Lenina 30, Tomsk; Raisa Ivanovna Bondarenko, prospekt Lenina, 30, Tomsk; Galina Ivanovna Rybalko, ulitsa Zhirmanu, 20 kv. 82, and Yanina Antono Adomanite, ulitsa Antokalne, 96 kv. 75, both of Vilnius, all of U.S.S.R. Division of Ser. No. 307,224, Nov. 16, 1972. This application Aug. 6, 1975, Ser. No. 602,521

Int. Cl.² C08F 126/06

U.S. Cl. 526-11.1

2 Claims

1. A film-forming polymer comprising a poly-N-vinyl heterocyclic secondary amine selected from the group consisting of poly-N-vinyl-2-acetyl carbazole, poly-N-vinyl-3-acetyl carbazole, and poly-N-vinyl-3,6-diacetyl-carbazole.

4,007,318 PHOSPHORYLATED POLYSTYRENE AND METHOD FOR FORMING SAME

Louis A. Mango, III, Louisville, Ky., and Jimmy L. Webb, Saratoga, N.Y., assignors to General Electric Company, Louisville, Ky.

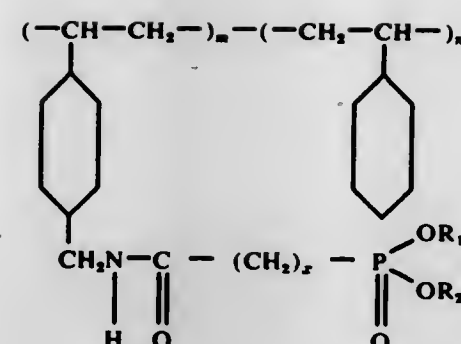
Filed May 21, 1975, Ser. No. 579,435

Int. Cl.² C07F 9/40

U.S. Cl. 526-21

12 Claims

1. A copolymer of styrene and phosphorylated styrene, said copolymer being represented by the formula



where R_1 and R_2 are alkyl groups having 1 to 6 carbon atoms and x has a value of 1, 2, or 3, the copolymer contains 0.1 to 10 wt. pct. phosphorus, said polystyrene copolymer being substantially non-crosslinked.

4,007,319

MONITORING SUSPENSION STABILITY

Eugene P. Weisser, Verona; G. Alan Osan, Cheswick, and Edward P. Mailki, Lower Burrell, all of Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Nov. 10, 1975, Ser. No. 630,484

Int. Cl.² C08F 2/18

U.S. Cl. 526—60

3 Claims

1. In a method of making polymer particles by polymerizing monomer in an aqueous suspension, stabilized by suitable suspension stabilizers, in a closed polymerization reactor, the improvement comprising continuously monitoring the electrical conductivity of the suspension during the polymerization until a sudden drop in conductivity is measured, at which point additional suspension stabilizers are added to prevent failure of suspension.

4,007,320

PROCESS FOR REDUCING POLYMER BUILD-UP

Jorgen Petersen, Sundsvall, Sweden, assignor to Kemanord Aktiebolag, Stockholm, Sweden

Filed Apr. 29, 1975, Ser. No. 572,807

Claims priority, application Sweden, May 21, 1974, 7406731; Dec. 16, 1974, 7415794

Int. Cl.² C08F 2/16

U.S. Cl. 526—62

9 Claims

1. A process for reducing the build-up of polymer on the internal surfaces of a reaction vessel for polymerization of ethylenically unsaturated polymerizable compounds in aqueous dispersion which comprises the steps of
a. coating major parts of said surfaces with a polymeric material containing hydroxy groups, and
b. insolubilizing said polymeric material by cross-linking with an organic titanate.

4,007,321

MANUFACTURE OF PARTICULATE OLEFIN POLYMERS
Norbert Scholz, Mannheim; Georg Friedrich Vock, Ludwigshafen; Kurt Erdmann, Lambheim; Guenther John, Ludwigshafen; Hans Frielingdorf, Bad Duerkheim; Wolfgang Gruber, Frankenthal, and Heinz Mueller-Tamm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 20, 1975, Ser. No. 551,494

Claims priority, application Germany, Mar. 1, 1974, 2409839

Int. Cl.² C08F 2/14, 6/24

U.S. Cl. 526—64

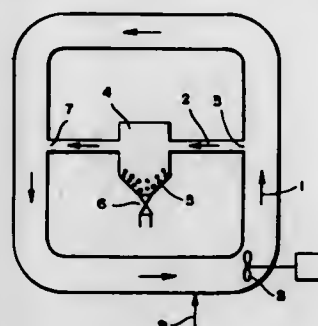
4 Claims

1. A process for the manufacture of particulate olefin polymers consisting of the catalytic polymerization of C_2 - to C_8 - α -monoolefins at temperatures of from 20° to 110° C and olefin pressures of from 0.01 to 40 bars in an auxiliary liquid containing the monomers to be polymerized in dissolved form and

the particulate polymer formed in suspended form, the reaction mixture being circulated in a loop to which the starting materials are fed and from which the particulate polymer formed is removed, wherein

a. a side stream is branched off from said loop to remove from 0.01 to 30% of the material present in the loop at the branching point,

b. the side stream is caused to pass through a separating



zone wherein from 1 to 90% of the particulate olefin polymer suspended in the side stream is separated solely by centrifugal acceleration into a solid phase of particulate polymer and a liquid phase which is a suspension of residual polymer particles at temperatures and pressures in the same range as in the loop and

c. the separated particulate olefin polymer is discharged through a flashing means and the liquid phase is returned to said loop.

4,007,322

ACRYLIC ANAEROBIC SEALANT COMPOSITIONS AND METHOD OF BONDING

Jack L. House, Memphis, Tenn., assignor to Accrabond Corporation, Cordova, Tenn.

Filed Oct. 7, 1974, Ser. No. 512,955

Int. Cl.² C08F 20/20

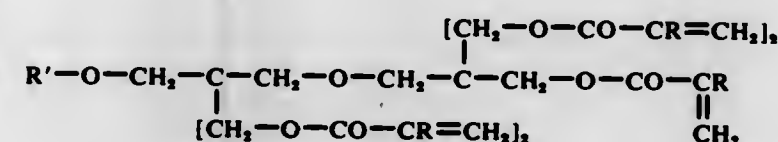
U.S. Cl. 526—292

12 Claims

1. In an anaerobic sealant composition having extended shelf life in the presence of oxygen and capable of rapid polymerization when oxygen is excluded therefrom including a monomer, a polymerization catalyst for the monomer, selected from the group consisting of peroxy and peroxy-ester compounds, and a polymerization inhibitor for the monomer, the improvement comprising a monomer having the general formula



or



wherein R is hydrogen, halogen, or alkyl containing 1 to 5 carbon atoms and wherein R' is hydrogen, halogen, alkyl containing 1 to 5 carbon atoms, or $-\text{CO}-\text{CR}=\text{CH}_2$.

4,007,323

INITIATOR FOR ANAEROBIC COMPOSITIONS

Bernard Miles Malofsky, Bloomfield, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Oct. 28, 1975, Ser. No. 626,145

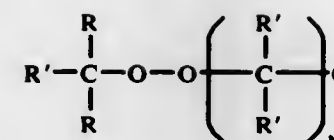
Int. Cl.² C08F 120/20

U.S. Cl. 526—312

20 Claims

1. An adhesive or sealant composition having anaerobic curing properties, comprising:

a. an anaerobically curable monomer containing polymerizable acrylate functionality; and
b. about 0.01 to about 10% by weight of the composition of a peroxide of the formula

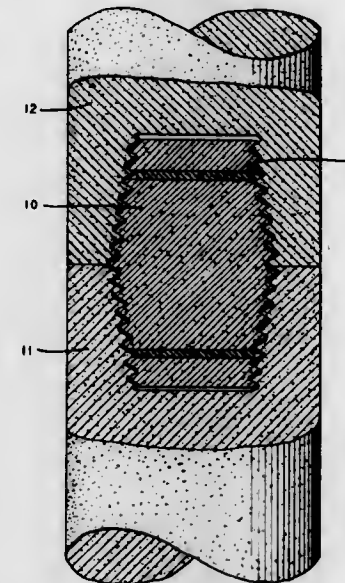


wherein

R is selected from the group consisting of C_1 to about C_{10} alkyl, alkenyl, cycloalkyl, and cycloalkenyl and C_6 to about C_{15} aryl, aralkyl and alkaryl; R' is hydrogen or R; y is 2 or 3; and Q is a polar moiety selected from the group consisting of hydroxyl, amino, halo, nitro, nitrile, carboxyl, sulfo, sulfinio and mercapto.

ELECTRICAL

4,007,324
NIPPLE FOR ELECTRODE JOINT
**Rudolph W. Wallouch, Lewiston, N.Y., assignor to Airco, Inc.,
Montvale, N.J.**
**Division of Ser. No. 511,851, Oct. 3, 1974, Pat. No. 3,976,496,
which is a continuation of Ser. No. 302,435, Oct. 31, 1972,
abandoned. This application Dec. 15, 1975, Ser. No. 640,354**
Int. Cl.² H05B 7/14
U.S. Cl. 13—18
3 Claims



1. In a carbon electrode nipple of the type including a formed void and a locking pitch composition deposited in said void for displacement to the thread clearance spaces of an electrode joint during use of said nipple in joining abutting carbon electrode sections, the improvement wherein said locking pitch composition is a heat-foamable, thermoplastic composition, consisting essentially of a major proportion of finely divided particles of a coal tar pitch having a softening point between 90° C and 180° C dispersed in a minor proportion of a binder comprising lignin sulfonate and water.

4,007,325
FURNACE ASSEMBLY
Arnold G. Bowles; Andrew S. D. Crum, both of Warren, and
Melvin E. Speicher, Tidluote, all of Pa., assignors to National
Forge Company, Irvine, Pa.
Filed Aug. 13, 1975, Ser. No. 604,169
Int. Cl.² H05B 3/66
U.S. Cl. 13—22 25 Claims

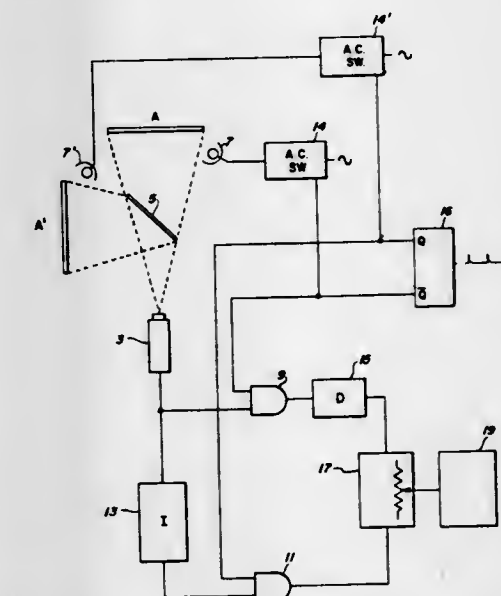


1. An electrically heated furnace assembly, which comprises:
an inner shell, disposed about the longitudinal axis of the furnace assembly;

955 O.G.-24

- a plurality of windings of a resistance heating element, helically wound about the longitudinal axis of the furnace assembly and about the inner shell;
- a plurality of rigid insulating sleeves enclosing the heating element and substantially covering the surface of the heating element; the plurality of insulating sleeves abutting against the leading and trailing edges of one another, against the outer, upper and lower surfaces of one another, and against the inner shell;
- an outer shell; disposed about the longitudinal axis of the furnace assembly and about the inner shell and adapted to hold the insulating sleeves on the heating element against the inner shell; and
- a spiral shelf provided about the longitudinal axis of the furnace assembly and about the inner shell, underlying the heating element and abutting against the outer lower surfaces of the insulating sleeves which enclose the lowermost winding of the heating element.

4,007,326
ELECTRONIC COPY ANALYSIS
Borg Bernsen, Buena Park, Calif., assignor to Xerox Corporation,
Stamford, Conn.
Filed Jan. 15, 1976, Ser. No. 649,301
Int. Cl.² G01B 9/08; H04N 7/18
U.S. Cl. 358—280
5 Claims



1. An apparatus for comparing the quality of a copy of a standard pattern to its original, comprising:

- a vidicon;
- a substantially half and half transmission/reflection mirror so interposed between said vidicon and the copy and the original that the image of the copy is superimposed on the image of the original formed on said vidicon;
- means for illuminating the original and the copy in succession in such a manner that said vidicon forms a video image of the original and a video image of the copy; and,
- means for comparing the copy image to the original image and generating a comparison signal;
- said means for comparing and generating a comparison signal includes;
- a comparator;
- delay means;
- first gating means for gating the output of said vidicon to said comparator via said delay means;
- inverting means for inverting the output of said vidicon;
- second gating means for gating the output of said inverting means to said comparator;
- means for actuating said first and second gating means in succession in synchronization with the illumination of the original and the copy; and,
- whereby said comparator receives the video images of the original and the copy simultaneously and generating the

1. An improved artificial reverberation system including:
an original signal input terminal;
a delayed signal output terminal;

a unitary electrodynamic transducer coupled to both said input terminal and said output terminal;
at least one spring coupled at one end to said transducer and at the other end to a fixed terminator;
said unitary transducer being responsive to an original signal applied to said input terminal to produce a travelling wave in said at least one spring;
said unitary transducer being responsive to a travelling wave reflected from said fixed terminator to produce a delayed signal at said output terminal;
and rejection means coupled between said input and output terminals for minimizing the level of said original signal appearing at said output terminal.

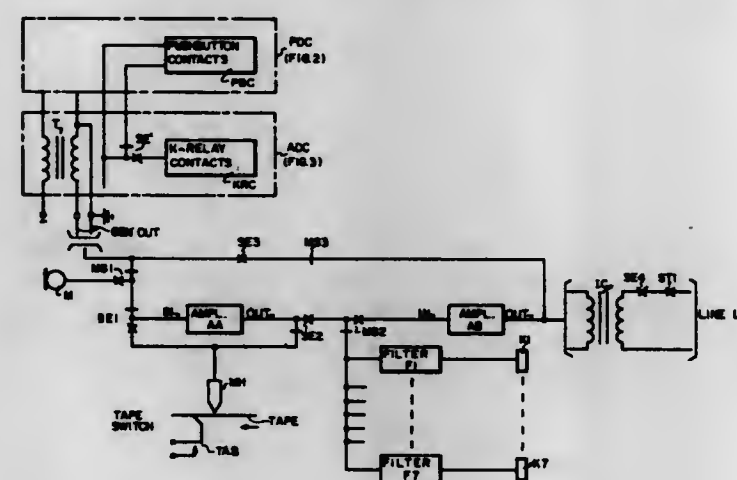
4,007,333

AUTOMATIC CALL TRANSMITTER OF THE DUAL TONE MULTIFREQUENCY TYPE

Edward A. Marheine, Brookfield, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed May 31, 1974, Ser. No. 475,004
Int. Cl.² H04M 1/00, 11/00

U.S. Cl. 179-6 D

8 Claims



1. A telephone reporting unit comprising:
record/playback means operable in both record and playback modes;
signal generating means connected to said record/playback means;
mode selection means including circuit connections to said signal generating means and to said record/playback means, initially operated manually to condition said record/playback means for operation in the record mode; initiating means connected to said record/playback means, initially operated manually to render said record/playback means operable;
said signal generating means manually operated to generate at least one voice frequency signal;
said record/playback means operated in response to said generated voice frequency signal to record said signal;
switching means including circuit connections to said mode selection means;
said mode selection means further operated manually, to condition said record/playback means for operation in the playback mode, to disconnect said signal generating means from said record/playback means, to connect said switching means to said signal generating means and connect said record/playback means to said switching means;
said initiating means further operated to render said record/playback means operated in the playback mode;
said switching means operated in response to said recorded signal to operate said signal generating means to generate a voice frequency signal of the same frequency as said recorded signal;
and midcycle shift means connected to said signal generating means, and connected to a microphone, said midcycle

shift means initially operated, when said record/playback means are in the record mode in response to termination of voice frequency signals from said signal generating means, to disconnect said generating means from said record/playback means and connect said microphone to said record/playback means, and further operated when said record/playback means is in the playback mode, in response to termination of voice frequency signals from said signal generating means, to disconnect said switching means from said record/playback means.

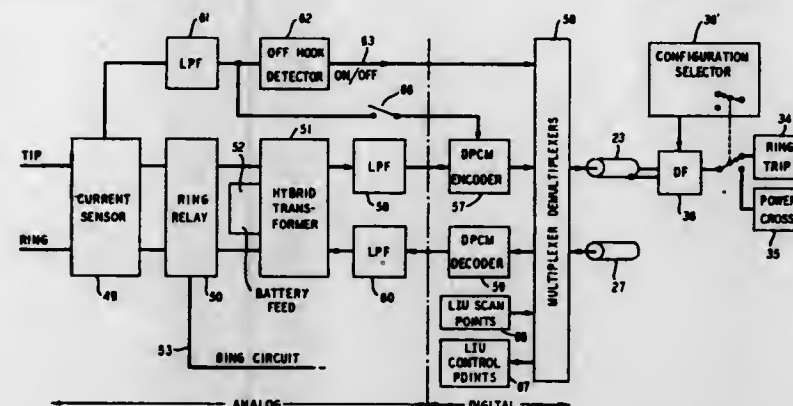
4,007,334

TIME DIVISION DIGITAL LOCAL TELEPHONE OFFICE WITH TELEMETERING LINE UNIT

Henry Stanton McDonald, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed July 2, 1975, Ser. No. 592,514
Int. Cl.² H04J 3/02, 3/12

U.S. Cl. 179-15 AT

34 Claims



27. A line interface unit for a switchable electric signal line interconnection system, each signal line having one such unit comprising,
means for converting analog signals to corresponding digital representations,
an output digital circuit,
plural electric circuit scan points at which there are produced signals indicative of plural predetermined functions of said unit other than the net signal level of a line to which said unit is connected, and
means for time multiplexing, into discrete time intervals on said digital circuit, electric signals from an output of said converting means with signals at said scan points.

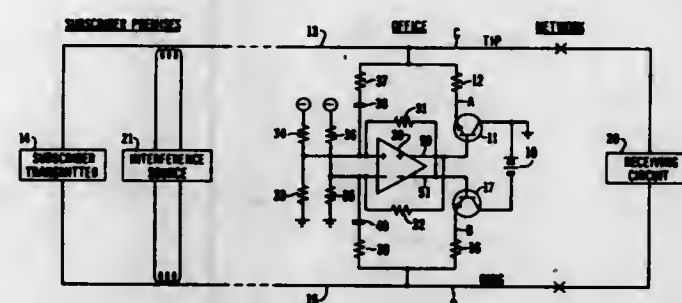
4,007,335

TELEPHONE LINE BATTERY FEED CIRCUIT

Irvine Keers Hetherington, St. Charles, and DeWitt Paul Smith, Naperville, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 12, 1975, Ser. No. 631,086
Int. Cl.² H04M 1/76

U.S. Cl. 179-16 AA

11 Claims



1. A circuit for supplying talking current from a power supply for a two-wire transmission path and for reducing undesirable common mode signals thereon comprising:
a first and a second controllable coupling means each comprising input, output, and control terminals for coupling said power supply to said transmission path; and

differential operational amplifier means comprising:
a first and a second input a.c. coupled to said transmission path;
a first and a second output respectively connected to said control terminals of said first and second coupling means; and
means for generating signals at said outputs corresponding to signals present at said inputs
whereby said coupling means present a high impedance from said transmission path to said power supply for differential mode signals and a low impedance from said transmission path to said power supply for common mode signals thereby substantially reducing the latter.

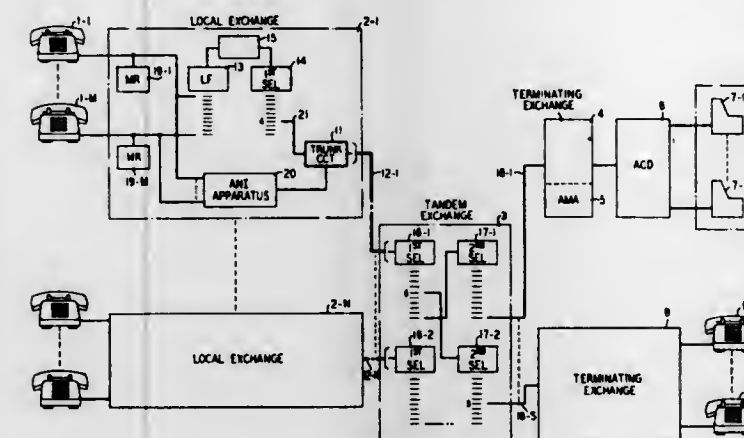
4,007,336

CLASS OF CALL DISCRIMINATING TRUNK CIRCUIT

Robert Wayne Hutton, Sr., Oaklawn, Ill., assignor to Western Electric Company, Inc., New York, N.Y.
Filed Feb. 24, 1976, Ser. No. 660,938
Int. Cl.² H04M 7/00, 15/16

U.S. Cl. 179-18 AH

19 Claims



1. A communication system comprising
subscriber stations,
first means for billing individual ones of said stations for a first class of call established by said communication system,
second means for billing individual ones of said stations for a second class of call established by said communication system,
a trunk circuit adapted for connection to a calling one of said stations for both said first and second classes of calls, and
means in said trunk circuit responsive to coded signals from said calling station for selecting one of said first and second billing systems in accordance with the class of call defined by the coded signals received.

4,007,337

ARRANGEMENT AND METHOD OF ACHIEVING A DIAL PULSE MUTING FUNCTION IN A REGISTER SENDER PABX SYSTEM

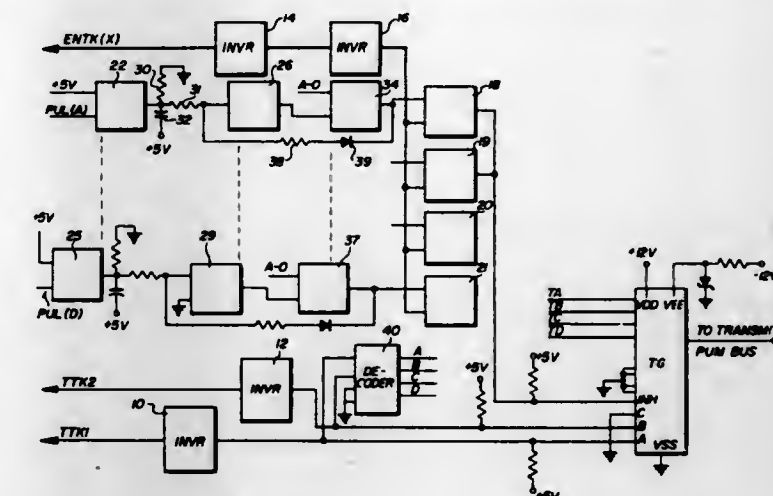
Lloyd L. Langsdorf, Streamwood; Lawrence J. Kusan, Glendale Heights, and Dinesh K. Srivastava, Westmont, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Dec. 22, 1975, Ser. No. 643,434
Int. Cl.² H04M 7/14; H04Q 3/62

U.S. Cl. 179-18 AH

7 Claims

1. In a private automatic branch exchange telephone system of the register sender type having a plurality of trunk cards, each of said trunk cards having thereon a transmit gate, a receive gate and a plurality of trunk circuits, said trunk circuits on a trunk card each being selectively connectable via the transmit gate and the receive gate to a transmit bus and a receive bus, respectively, for extending calls from subscriber's line circuits and each including a pulse relay and a relay driver for operating the pulsing relay to generate dial pulses, a dial pulse being generated when a pulsing relay restores after being

operated, each of the transmit and receive gates having an inhibit input and trunk identity inputs, a trunk circuit on a trunk card normally being selected and identified by coded signals coupled to the trunk identity inputs and a card enable signal coupled to the inhibit input, the improvement comprising a dial pulse muting arrangement for preventing a subscriber from hearing sender outpulsing, said arrangement comprising a first and a second gating means associated with each of said trunk circuits, the output of each of said first gating means being coupled to an input of said second gating means, the outputs of said second gating means all being coupled to said inhibit input of said transmit gate, said relay driver being coupled to and operating said first gating means to provide an output signal to said second gating means each time said relay driver is operated to operate said pulsing relay to close its contacts, said output signal to said second gating means being a delayed output signal and being removed sub-



stantially immediately when said relay driver releases said pulsing relay permitting it to restore, said card enable signal being coupled to another input of said second gating means and said second gating means being operated upon receipt in coincidence of said delayed output signal from said first gating means and said card enable signal to provide an output signal to said inhibit input of said transmit gate to enable said transmit gate, each time a pulsing relay associated with a selected trunk circuit on a selected trunk card is operated by its associated relay driver, said first gating means to which said relay driver is coupled being operated to provide said delayed output signal to said second gating means to thereby enable the latter to provide said output signal to said inhibit input of said transmit gate to enable said transmit gate, said first gating means removing said delayed output signal when said relay driver releases said pulsing relay so that said transmit gate is disabled before said pulsing relay can be restored, whereby said transmit gate is enabled after a pulsing relay restores.

4,007,338

SWITCHING AND TRANSMISSION TECHNIQUE USING A METHOD AND ARRANGEMENT OF CHANNEL ALLOCATION FOR PROVIDING CONFERENCING

Donald W. McLaughlin, Bolingbrook, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Sept. 18, 1975, Ser. No. 614,407
Int. Cl.² H04M 3/56

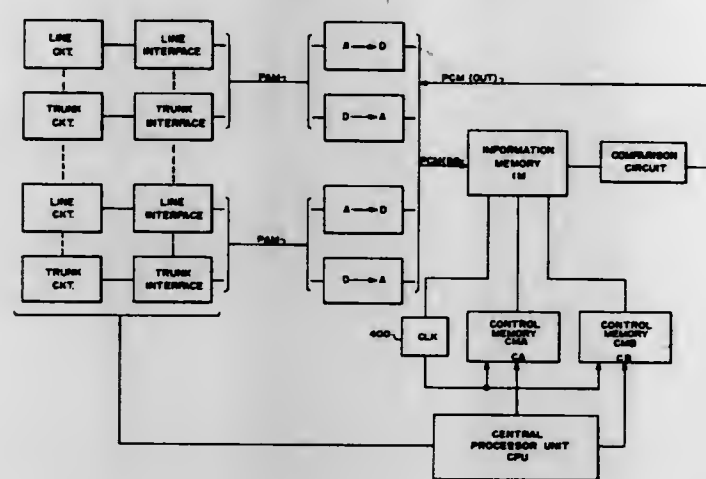
U.S. Cl. 179-18 BC

14 Claims

1. In a pulse code modulated communication system having
a. a plurality of terminations;
b. a plurality of channels, each of which is assigned a time slot;
c. an information memory for storing information from each of the plurality of channels, the transmit side of each of the plurality of channels appearing in a fixed location on one side of the information memory and the receive side of each of the plurality of channels appearing in a fixed location on the other side thereof,
d. a control memory having a control memory word corresponding to each of the plurality of channels for storing

the address location within the information memory of the channel to which that channel is to be connected for conversation, and

- e. control means for cyclically controlling the operation of the system, said control means during a time slot assigned to a channel writing the information from that channel into the information memory, reading the control memory word corresponding to that channel from the control memory to address the information memory to read out the information stored therein at the addressed location, and to transmit the information read therefrom to that channel, to thereby permit that channel to engage in conversation with another channel, the improvement comprising:
- f. channel allocating means for allocating said channels to said terminations on a per call basis; and
- g. a channel memory having channel memory words corresponding to each of the plurality of channels for storing the address of the termination allocated that channel;
- h. said channel memory being cyclically read and the addressed termination being activated to transmit to or receive information from said information memory;



- i. a second control memory having a control memory word corresponding to each of the plurality of channels for storing the address location within the information memory of a second channel to which that channel is to be connected for conversation, and
- j. a comparison means for comparing a transmitting as an output thereof the larger of two samples of information coupled to it,
- k. said control means during a time slot assigned to a channel writing the information from that channel into the information memory, reading the control memory words corresponding to that channel from each of the control memories for addressing the information memory to read out the information stored therein at the two addressed locations, and to transmit the information to said comparison means, the largest of the two samples of information coupled to said comparison means being coupled to that channel,
- l. whereby 3-way conferencing between the plurality of channels can be provided.

4,007,339

ARRANGEMENT SERVING OPERATOR ASSISTANCE CALLS REQUIRING ROUTING BACK TO ORIGINATING OFFICES

Amos Edward Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 28, 1975, Ser. No. 636,027

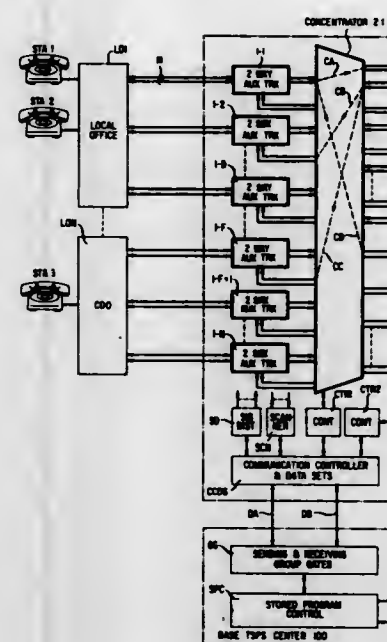
Int. Cl. H04M 3/60

U.S. Cl. 179-27 FF

11 Claims

1. A traffic service position system comprising a plurality of operator positions (OPPOS1-OPPOSN), a plurality of toll trunks (2-) terminated in a toll office, network and trans-

mission means for connecting said toll trunks to said operator positions including a first concentrator (8:1) connecting said toll trunks to transmission paths (BRT1-BRTN) extendable to said operator positions, and CHARACTERIZED IN THAT said system further comprises a second concentrator (2:1) terminating said toll trunks thereon and physically associated with said first concentrator; a plurality of trunks of a first type (1-) terminated on said second concentrator and extending



thereto from a local office; a plurality of trunks of a second type (3-) terminated on said second concentrator and extendable therefrom to said local office; a controller (CTR1) for controlling said second concentrator to selectively connect a calling one of said first type trunks to one of said second type trunks or to one of said toll trunks dependent upon the destination of the call; and wherein said network and transmission means also connect said second type trunks to said operator positions.

4,007,340

DISTANCE-RELATED VARIABLE GAIN AMPLIFIER

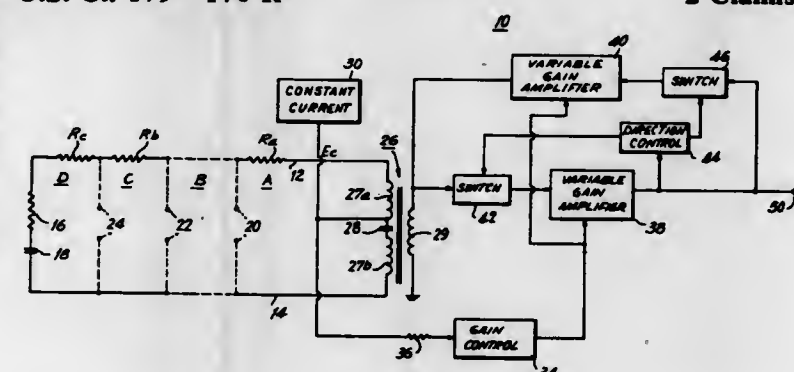
Taft B. Russell, Edison, N.J., assignor to Edison Control Corporation, Metuchen, N.J.

Filed Feb. 25, 1975, Ser. No. 552,788

Int. Cl. H04B 3/36

U.S. Cl. 179-170 R

2 Claims



1. Apparatus for communicating electrical information signals between a given location and a remote location, the remote location being variably spaced from said given location and being connected thereto via electrical conductors such that the resistive impedance between said given and remote locations is a function of the distance therebetween, comprising an amplifier connected in series between said given location and said remote location for variably amplifying the electrical information signals communicated therebetween, said amplifier having a gain determinative feedback

resistive element comprised of a transconductance amplifier having a transconductance g_m that is a function of a current supplied thereto such that the feedback current of said amplifier varies proportionately with said supplied current; a source of constant current coupled to said electrical conductors for supplying a current of predetermined constant magnitude thereto; means for deriving a voltage that is a function of the product of said current and said resistive impedance between said given and remote locations; and a linearizing circuit responsive to said derived voltage for supplying said current to said transconductance amplifier such that said gain of said amplifier is linearly related to said resistive impedance between said given and remote locations, whereby said gain is increased as said distance is increased.

4,007,341

ECHO CANCELLING DEVICE

Jacques Sourgens, Massy; Dominique Lajotte, Ris Orangis, and Francois Michelin, Bretigny-sur-Orge, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

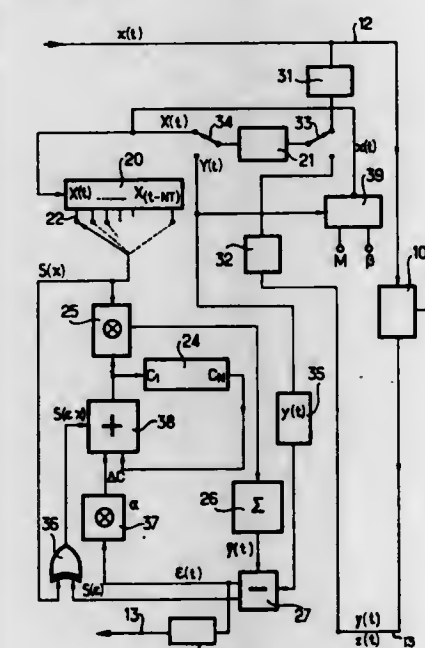
Filed May 12, 1975, Ser. No. 576,423

Claims priority, application France, May 24, 1974, 74.18115

Int. Cl. H04B 3/20

U.S. Cl. 179-170.2

5 Claims



1. Echo canceller comprising a transversal filter, to form a synthetic echo signal $\hat{y}(t)$ effecting a convolution of N samples $X(t)$ each coded on n bits of a received signal $x(t)$, recorded in a first memory and of N filtration weighting samples C obtained by correlation of the residual echo signal $\epsilon(t)$ and of the samples $X(t)$ and recorded in a second memory, a digital subtractor forming the residual echo signal $\epsilon(t)$ coded on n bits based on the true echo signal $y(t)$ and on the synthetic echo signal $\hat{y}(t)$, means for determining the absolute value of the residual echo signal, means for determining the sign of the variations of the weighting coefficients, and means including an adaptive control loop for adjusting the filtration weighting coefficients C from the absolute value of the said residual echo signal and from the correlation of the signs of N samples $X(t)$ of the received signal and of the residual echo signal determining the sign of each of the variations of the filtration weighting coefficients C , said filtration weighting coefficients C in said first memory being less than 2^n , and being recorded in the said second memory each on $n+m$ bits, said adaptive control loop including a first adder having $(n+m)$ first inputs receiving the successive filtration weighting coefficients and having $(n+m)$ second inputs receiving the residual echo signal $\epsilon(t)$ multiplied by a coefficient α close to zero and accompanied by the sign of the correlation of the signs effected, m being the minimum number of bits necessary

for representing the reverse of the coefficient α , said second adder sending out the filtration weighting coefficients to the said second memory to which it is looped.

4,007,342

INTERNAL COMBUSTION ENGINE DISTRIBUTOR HAVING OXIDIZED ELECTRODES OR TERMINALS

Takayuki Makino, Okazaki; Masahiko Nagai, Toyota; Teruo Yamanaka, Toyota, and Osamu Hori, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

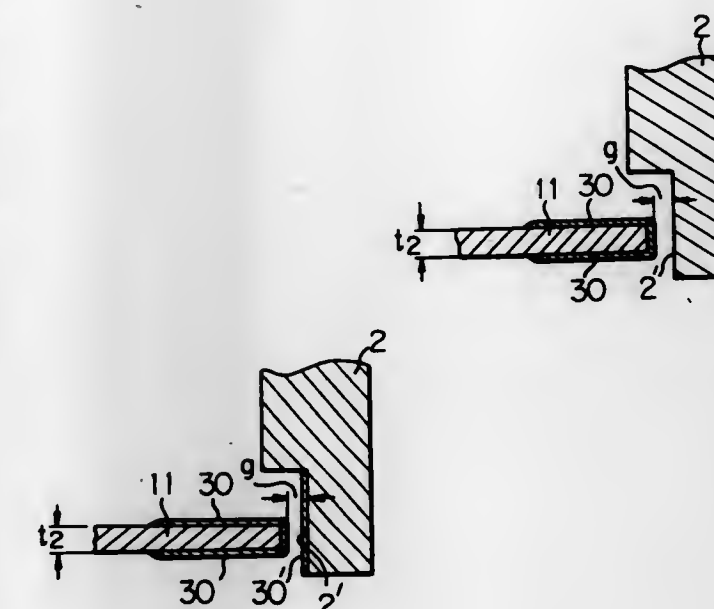
Filed Apr. 10, 1975, Ser. No. 566,935

Claims priority, application Japan, June 25, 1974, 49-72663

Int. Cl. H01H 19/00, 1/00

U.S. Cl. 200-19 R

9 Claims



1. A distributor for an internal combustion engine, containing an apparatus for suppressing noise, comprising: a distributor rotor which is electrically connected to a high voltage generator included in an ignition circuit of the internal combustion engine, said rotor comprising an electrode; a plurality of stationary terminals, each of which comprises an electrode, is electrically connected to a corresponding spark plug, and is arranged along a circular locus defined by the rotating distributor rotor with a discharging gap between the electrodes of the terminals and the electrode of the distributor rotor, and the surface of at least one of the electrodes of the distributor rotor and the stationary terminals is formed by an electrically high resistive layer of an oxide.

4,007,343

METHOD AND APPARATUS FOR SENSING FLUID PRESSURE

Ralph W. Alten, East Detroit, Mich., assignor to Dynamic Industries, Inc., Warren, Mich.

Filed Jan. 5, 1976, Ser. No. 647,258

Int. Cl. H01H 35/34

U.S. Cl. 200-83 J

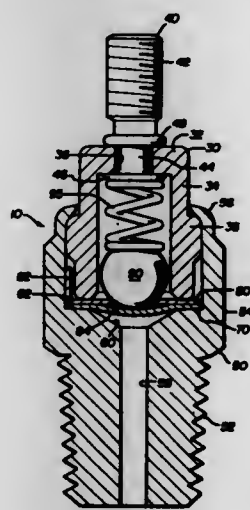
1 Claim

1. A pressure switch for use in an electrical circuit for monitoring fluid pressure, comprising: a housing comprised of first and second attached members defining an enclosed recess, the first member being comprised of steel, being electrically conductive and having (a) a threaded, essentially cylindrical base for connection to a fluid pressure source, (b) an essentially annular

collar concentric with and extending away from the base, and (c) a bore extending through the length of the base to receive fluid under pressure, the bore terminating adjacent the collar in an outwardly flared tapered region to form an annular support surface on one end of the cylindrical base in the housing recess, said first member forming a part of the electrical circuit when the pressure switch is connected to a power source;

the second member being comprised of polyester resin and being unitary, essentially cup-shaped, and being electrically non-conductive, and including (a) an essentially tubular portion received within the annular collar of the first member and terminating in an annular end surface and (b) a base at the distal end of the tubular portion with respect to the base of the first member, the base of the second member having an opening therein and receiving an electrical terminal element for connection to an electrical power source for monitoring fluid pressure;

an elastomeric, flexible diaphragm within the housing recess, interposed between the annular end surface of the second member and the annular support surface on the base of the first member to overly said bore and said tapered region, the flexible diaphragm being responsive to pressure exerted thereagainst by fluid received in said bore;

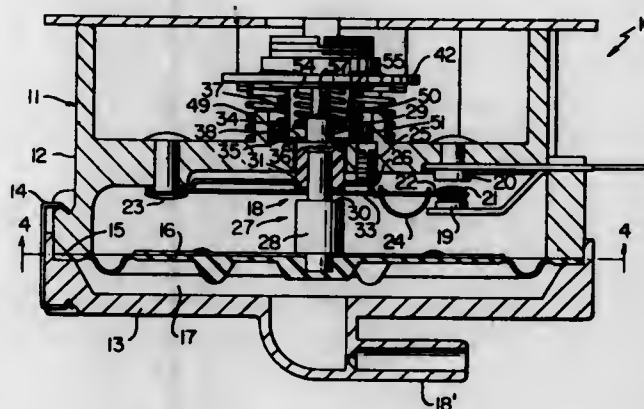


an essentially annular electrical contact element interposed between and in abutting contact with both the flexible diaphragm and the annular end surface of the second member, said annular contact element including a tab member in engagement with the first housing member to establish electrical communication therebetween;

an electrically conductive coil spring within the housing recess and being in contact with said electrical terminal element; and

an axially movable, spherical, electrically conductive metal ball interposed between and in engagement with both said coil spring and the flexible diaphragm, said metal ball being concentrically aligned with the annular contact element and having a diameter at least slightly greater than the diameter of the opening in the annular contact element to selectively establish essentially only annular line contact therebetween, the metal ball having a diameter substantially the same as but slightly less than the inner diameter of the tubular portion of the second housing member and the compression spring maintaining the metal ball in engagement with the annular contact element during low fluid pressure to establish a closed electrical circuit through the pressure switch, and the flexible diaphragm displacing the metal ball toward the base of the second housing member during relatively high fluid pressure to discontinue electrical communication between the metal ball and the annular contact element.

4,007,344
PRESSURE OPERATED ELECTRICAL SWITCH
CONSTRUCTION
George M. Hipple, Columbus, Ohio, assignor to Robertshaw Controls Company, Richmond, Va.
Filed Aug. 12, 1975, Ser. No. 604,025
Int. Cl.² H01H 35/34
U.S. Cl. 200—83 SA 39 Claims

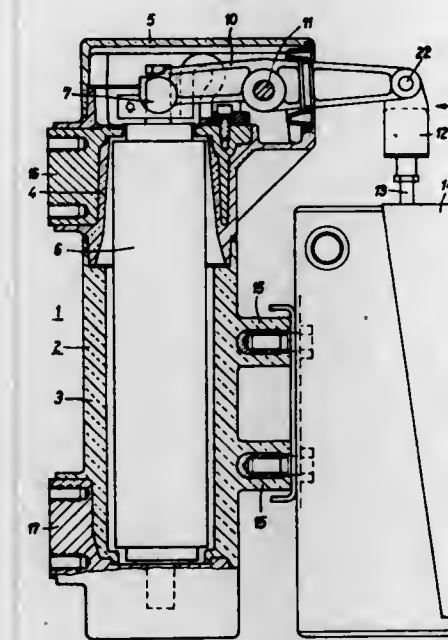


1. In a pressure operated electrical switch construction comprising a housing means, a pressure responsive actuator carried by said housing means, an electrical switch carried by said housing means and being operatively associated with said actuator so that said actuator will operate said switch from one condition thereof to another condition thereof when the sensed pressure reaches a predetermined pressure, and reset means carried by said housing means for resetting said switch from said other condition thereof back to said one condition thereof, the improvement comprising a range spring carried by said housing means for acting on said actuator to provide said predetermined pressure, and a reset spring carried by said housing means for acting on said actuator to reset said switch whereby said reset spring comprises part of said reset means, said springs being concentrically disposed with one of said springs being disposed completely inside the other of said springs to render said switch construction compact even though said switch construction has a fixed reset or a proportional reset, said actuator being concentrically disposed with said springs.

4,007,345
INDICATING ARRANGEMENT FOR INDICATING THE
CONDITION OF THE SWITCHING CONTACTS OF A
SWITCHING VESSEL IN A VACUUM-SWITCH
APPARATUS
Werner Kohler, Bentfeld, Holstein, and Norbert Steinemer, Berlin, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Jan. 23, 1975, Ser. No. 543,544
Claims priority, application Germany, Jan. 31, 1974, 2405149
Int. Cl.² H01H 33/02
U.S. Cl. 200—144 R 4 Claims

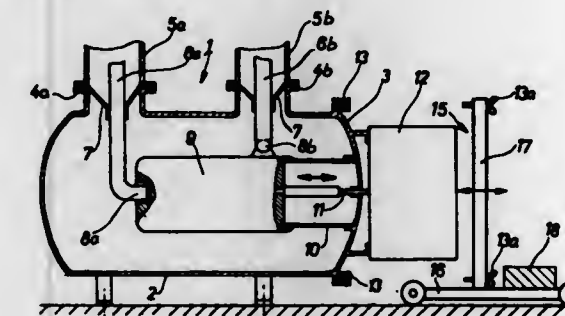
1. In an arrangement which includes a vacuum-switch having a switching vessel with switching contacts at least one of which is movable and an actuator equipped with actuating means movable between first and second positions to open and close said switching contacts respectively, the actuating means including an actuator rod coupled to the actuator and a lever for acting on the movable switching contact, an indicating arrangement comprising: a spring coacting with said actuating means for pressing said switching contacts together when the actuating means is moved to the second position, said spring having a length at said second position dependent upon the wear condition of the contacts; a coupling member arranged between the actuator rod and the lever, said coupling member including first and second parts movable relative to each other against the force of said spring and connectable to said actuating rod and said lever respectively; and,

indicating means for indicating the relative displacement of switch element protruding from the cover and carrying a said parts, said displacement being dependent upon changes coupling portion.



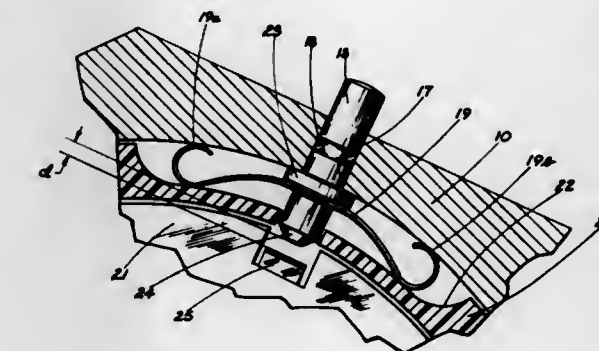
of length of said spring occurring as the switching contacts are worn from repeated switching operation.

4,007,346
ENCAPSULATED SWITCHING INSTALLATION
Wilhelm Galgg, Oberentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland
Filed Oct. 10, 1974, Ser. No. 514,032
Claims priority, application Switzerland, Nov. 27, 1973, 16648/73
Int. Cl.² H01H 33/54
U.S. Cl. 200—148 R 8 Claims



1. An encapsulated switching installation with a substantially cylindrical tank closed tight with insulating medium at both ends and a switching device in the tank and having contacts connectable to a conductor of through-passages secured at the tank and can be actuated by a drive mechanism located externally of the tank, the improvement comprising a switching device having at least one switch element mechanically fixedly connected to a structural unit with a removable cover forming a tank closure, the structural unit being insertable into a tank by movement in direction of the longitudinal axis of the tank and being removable out of the tank, the connection contacts of the switching device comprising plug connections which upon insertion of the structural unit into the tank close and upon removal of the structural unit out of the tank open, and a traveling mounting device with a support frame secured to the tank cover of the structural unit to be removed, for the movement of the structural unit, at a tank cover secured at the inside of a tank external flange there is connected insulatingly with respect to ground a two- or three-pole switch element by means of an insulating support, said switch element having a drive rod piercingly extending through the cover, the drive mechanism with a polewise driven switch element being mounted externally at the cover and together therewith, the switch element forming a structural unit, the end of the drive rod with a three pole driven

4,007,347
SIMPLIFIED ACTUATING SWITCH FOR ELECTRONIC
TIMEPIECES
Terry M. Haber, 3050 S. Bristol, No. 8C, Santa Ana, Calif. 92707
Filed July 28, 1975, Ser. No. 599,647
Int. Cl.² H01H 13/50; G04B 27/00, 37/00
U.S. Cl. 200—159 R 6 Claims

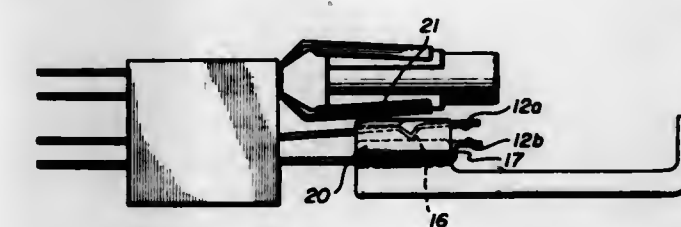


1. A switch for electrically connecting a module contact interior of the casing of an electronic time-piece to the casing comprising:

a. a pin passing through an opening in the side of said casing in a direction towards said contact; and

b. a spring conductor in the form of a band in the interior of said casing engaging said pin and having a transversely extending curved portion engaging the inner surface of said casing in a manner to bias said pin away from said contact, said spring being continuously in electrical engagement with said inner surface, whereby movement of said pin against the bias of said spring through the opening in said casing towards said contact causes the inner end of said pin to engage said contact to thereby electrically connect said contact to said casing through said pin and spring conductor.

4,007,348
SPRING CONTACT ASSEMBLY
Darryl Jay VanSon, Brookfield, and Kent Gordon Blackman, Sycamore, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Dec. 24, 1975, Ser. No. 644,361
Int. Cl.² H01H 15/02
U.S. Cl. 200—283 7 Claims



1. A spring contact assembly comprising a pair of substantially parallel spring contacts which are normally closed, at least one of said pair of spring contacts having a cam on it; and an actuator slidably supported by said pair of spring contacts, said actuator having a portion thereof disposed between said pair of spring contacts and forming a cam surface which engages said cam on said one spring contact to open said pair of spring contacts when said actuator is slidably translated longitudinally along the length of said pair of spring contacts.

4,007,349

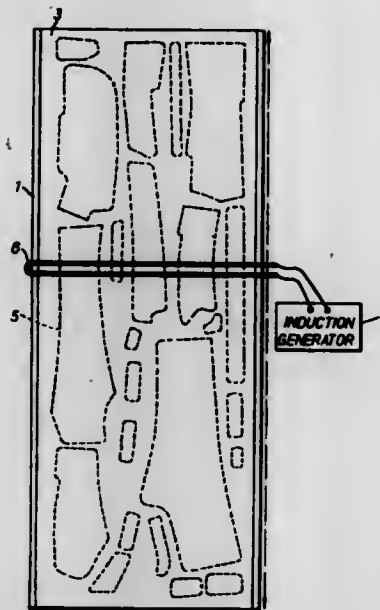
INDUCTIVE METHOD FOR CUTTING CLOTH

John Charles Burley, 47a Southwick St., Southwick, Brighton, Sussex BN4 4TH, England
Continuation-in-part of Ser. No. 442,582, Feb. 14, 1974, abandoned. This application Dec. 2, 1974, Ser. No. 529,000
Claims priority, application United Kingdom, Feb. 14, 1973, 7166/73

Int. Cl.² H05B 5/02

U.S. Cl. 219-10.43

6 Claims



1. A method of preparing garment sections for sewing together to make a garment such as a suit or coat, the method comprising the steps of:

- taking an array of electrically conductive strip elements arranged with one edge of each element lying in a common plane, each of said elements being bent into the shape of a respective garment section required in making up the garment,
- positioning adjacent the said one edges of the elements a piece of cloth of predetermined length and width at least equal to the length and width of said array,
- positioning an elongate induction heating electrode adjacent the side of said cloth remote the array, said electrode extending across the width of said array,
- supplying high frequency electrical energy to said electrode to heat the strip element edges closest thereto to a temperature sufficient to sever the cloth, and
- causing relative movement of said array and said electrode whilst maintaining the relative positions of said cloth and said array, and whilst contacting the cloth with the said heated edges to thereby sever garment sections progressively from the said piece of cloth as said relative movement is carried out.

4,007,350

PLANT FOR THE HEAT TREATMENT OF OBJECTS BY MEANS OF AN ELECTRIC FIELD

Bernard Gillet, Rosny sur Bois, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly, France

Filed Jan. 16, 1975, Ser. No. 541,391

Claims priority, application France, Jan. 23, 1974, 74.02202

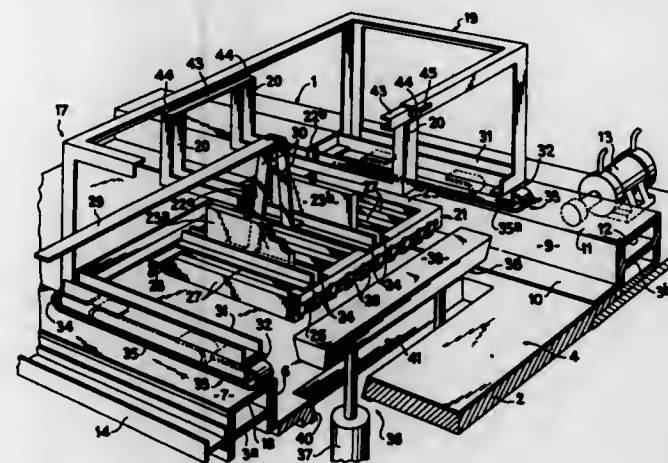
Int. Cl.² H05B 9/02

U.S. Cl. 219-10.81

16 Claims

1. A plant for the heat treatment of objects comprising: a frame having an elongated shape, a high frequency generator having a pair of terminals supplied respectively with high voltage and constant ground potential, first electrode means fixedly mounted on said base and extending longitudinally thereof, said first electrode means having a bottom portion and side wall portions defining an elongated open space

adapted to receive objects to be treated, second electrode means electrically insulated from said first electrode means and mounted on said frame so as to be movable along the length thereof, said second electrode means extending substantially in a plane located at the open side of said space so as to cover a part of the latter, a generally box-like shaped shield-



ing structure containing at least a part of said second electrode means and being connected thereto by insulating means, said structure having an open side facing said open side of said space, and slidable contact means rigid with said structure and making electrical contact with said first electrode means, whereby said first and second electrode means are respectively connected to said pair of terminals of said generator.

4,007,351

SYSTEM FOR INSTALLING HIGH STRENGTH STEEL BELTS

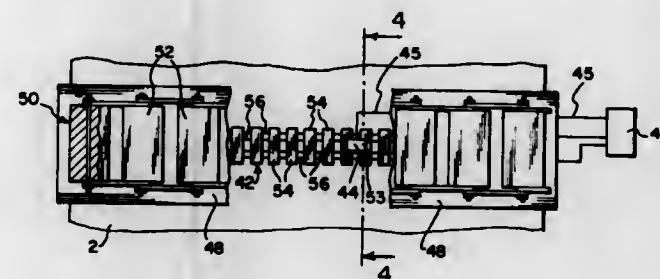
Karl Bertil Verner Annerhed, and Rolf Ingemar Hemlin, both of Sandviken, Sweden, assignors to Sandco Ltd., Ottawa, Canada

Filed Sept. 24, 1974, Ser. No. 508,752

Int. Cl.² C21D 1/18; B23K 9/00

U.S. Cl. 219-50

10 Claims



1. The method of installing an endless steel belt upon a machine for producing a product where the product is held under pressure by the belt under tension, the steps of, installing a belt and band long the path of the belt in the machine wherein the belt band is of a steel which has been precipitation hardened to a predetermined high tensile strength, positioning the ends of the belt band in substantially end-to-end abutting relationship, clamping the belt portions adjacent said ends in said relationship, welding said ends together using welding wire of steel having the same characteristics as those of the belt band to form a weld joint, heat-insulating said weld joint without removing the belt band from the machine, heating said weld joint with electric heating means to a temperature which will produce precipitation hardening of said weld joint, and controlling said heating and terminating it at the end of the period required to increase the yield strength and tensile strength of said weld to substantially the strength of the belt band.

4,007,352

THIN FILM THERMAL PRINT HEAD

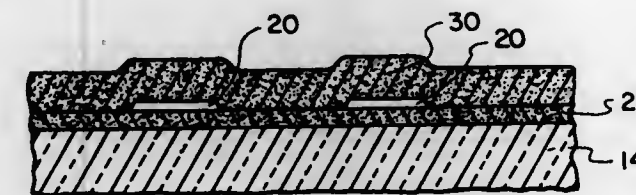
Frank Ura, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed July 31, 1975, Ser. No. 601,115

Int. Cl.² H05B 1/00

U.S. Cl. 219-216

4 Claims



WITH ALUMINUM OXIDE UNDERLAYER

1. A thin film thermal print head comprising: an aluminum oxide substrate; a layer of glass glaze covering the substrate having a plurality of mesas formed on the surface thereof; a layer of etchant-resistant material covering the layer of glass glaze including the plurality of mesas and having a high chemical resistance to photoresist materials; a layer of resistive material covering the etchant-resistant material in the area of the mesas to form resistive heater elements thereon; a plurality of electrical conductors coupled to the heater elements for connecting electrical power thereto; a layer of oxide of the resistive material covering each of heater elements; and a layer of wear-resistant material covering the layer of oxide and having a relatively high thermal conductivity.

4,007,353

ELECTRICAL IGNITING UNIT HAVING SPIRAL RESISTANCE COIL

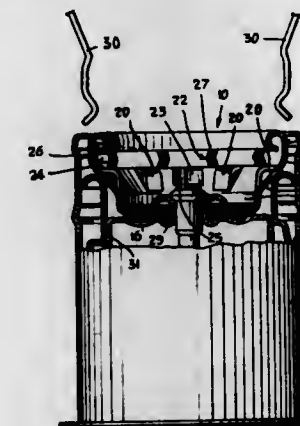
Laurence G. Horwitt, New Haven, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Aug. 17, 1976, Ser. No. 715,148

Int. Cl.² F23Q 7/22

U.S. Cl. 219-270

3 Claims



1. An electrical igniting unit for use with the holders of cigar lighters, comprising in combination:

- a. a shallow metal cup having a relatively thin annular side wall,
- b. a coiled heating resistance element disposed in said cup and having an outer end juxtaposed to and extending along the side wall thereof,
- c. the entire edge of the side wall of the cup being inwardly crimped over and firmly sandwiching said outer end of the heating element whereby said end is both permanently mechanically secured to the side wall and electrically connected thereto,
- d. means carried by the cup, providing an electrical connection to the inner end of the heating element, the outer annular wall surface of the cup being adapted for engagement with a cooperable metal electrical contact of an igniting unit holder whereby a complete circuit can be established through the heating element,
- e. said outer wall surface of the cup being nitrided by subjecting the entire cup to a low temperature nitriding process.

4,007,354

CALCULATOR AND MEDIUM WITH COMMANDS FOR CALCULATOR OPERATION

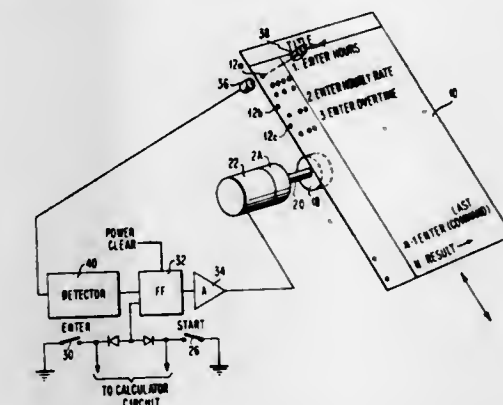
Samuel A. Schwartz, 12743 Arroyo de Arguello, Saratoga, Calif. 95070

Filed Mar. 13, 1975, Ser. No. 557,941

Int. Cl.² G06K 15/00, 21/04

U.S. Cl. 235-61.6 R

11 Claims



1. An electronic calculator apparatus having arithmetic calculating circuitry and storage registers, for cooperating with a medium including means for indicating stop positions at which said calculator is to receive input data and having coded instructions following each stop position comprising:

- a set of alphanumeric entry keys;
- an entry key;
- means for accepting said record medium, including guide means;
- drive means for engaging said medium and for stepping said medium from one stop position to the next; and
- sensing means for sensing the coded instructions following each stop position of said medium, so that the circuitry of said calculator will operate in response to said coded instructions employing the numbers entered by said numerical entry keys at such stop position.

4,007,355

DATA-TRANSFER SYSTEM

Roland Moreno, Paris, France, assignor to Societe anonyme dite: Societe Internationale pour l'Innovation, France

Filed Mar. 21, 1975, Ser. No. 560,874

Claims priority, application France, Mar. 25, 1974, 74.10191; Mar. 17, 1975, 75.08186

Int. Cl.² G06K 1/14, 19/00; G07F 7/02

U.S. Cl. 235-61.7 R

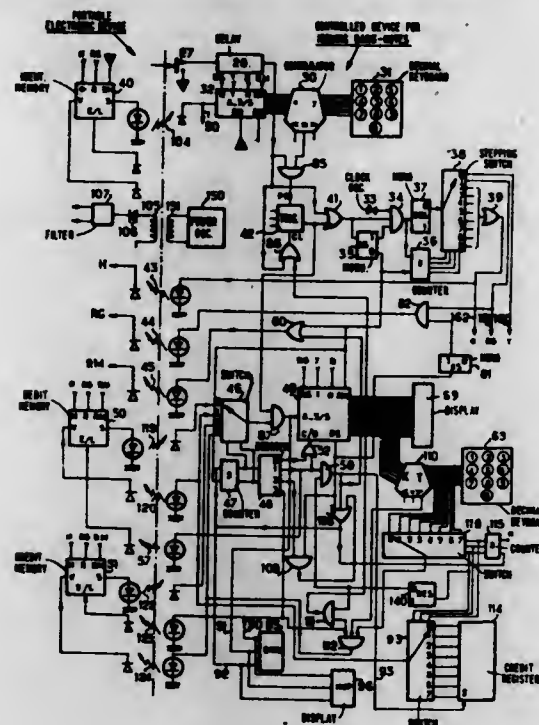
7 Claims

1. A system for data transfer between a first and a second population of persons, the persons in each of said populations being at dispersed locations, said system being characterized by including:

- a. a plurality of independent data recording devices placed at fixed locations;
- b. a plurality of first portable electronic devices each carried by a respective one of said persons, each said portable electronic devices comprising:
 - b₁. first memory means;
 - b₂. coupling means operable at will temporarily to couple said first memory means to one of said data recording devices;
 - b₃. memory control circuits coupled with said coupling

means and said memory means; said memory means and said memory control circuits being in the form of logic micro-structures;

c. each said data recording device comprising:



c₁. reading means operable to read the contents of said memory means in said portable electronic devices when said memory means is coupled to said data recording device by said coupling means;

c₂. data recording means coupled to said reading means to record data reading thereby.

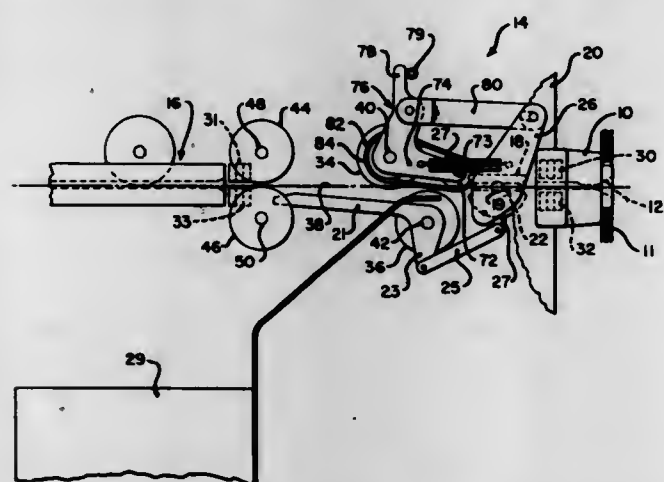
4,007,356

CARD RETRIEVAL MEANS

Arthur W. Stucke, Dayton, and Richard P. Taylor, Xenia, both of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Dec. 10, 1975, Ser. No. 639,313
Int. Cl.² G06K 13/20; B65H 5/22

U.S. Cl. 235—61.11 R

11 Claims



1. A record member transport and capture mechanism for use with a wall with an opening therein to receive a record member, comprising:

first detecting means for detecting the position of a record member partially protruding from said opening;

timing means initiated by said first detecting means for timing a predetermined period commencing with the positioning of said record member in said partially protruding position;

guide means movable between two positions, in a first of which the record member will pass thereby in a normal path of movement, and in a second of which the card will be deflected from its normal path of movement;

first driving means for driving a record member inserted through the opening to a second position, and from said second position to said partially protruding position, with the guide means in said first position;

second driving means for driving said record member from said partially protruding position to an intermediate position;

operating means for operating said second driving means to drive said record member to said intermediate position in response to said record member remaining in said partially protruding position without being removed by a customer for a time in excess of said predetermined period, and also for positioning said guide means so that the record member is driven in its normal path of movement;

second detecting means for detecting when said record member has been driven into said intermediate position; and means responsive to said second detecting means for operating said first drive means to drive said record member toward said guide means and for causing said operating means to position said guide means to cause said record member to be deflected from its normal path of movement.

4,007,357

CIRCUIT FOR DETECTING RELATIVE ANGULAR DISPLACEMENT OF A STEERING WHEEL

Takayuki Yanagishima, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

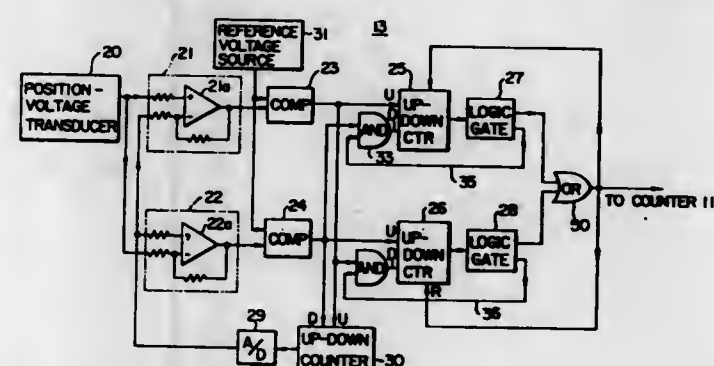
Filed July 31, 1975, Ser. No. 600,925

Claims priority, application Japan, Aug. 2, 1974, 49-88709

Int. Cl.² G08B 21/00; G06M 3/02, 3/14

U.S. Cl. 235—92 EV

14 Claims



1. A circuit for detecting the relative angular displacement of the steering wheel of a motor vehicle, comprising:

means for translating the angular position of said steering wheel into a corresponding electrical signal:

a first comparator which compares said electrical signal with a controlled variable to provide a first output when the former is greater than the latter, said output representing the difference therebetween;

a second comparator which compares said electrical signal with said controlled variable to provide a second output when the former is smaller than the latter, said second output representing the difference therebetween;

a third comparator which compares said first output with a reference value to provide a third output;

a fourth comparator which compares said second output with said reference value to provide a fourth output;

feedback circuit means for controlling said variable to decrease the magnitude of said first and second outputs to a value smaller than said reference value;

a first up-down counter operable in count-up mode in response to said third output and in count-down mode in response to said fourth output;

a second up-down counter operable in count-up mode in response to said fourth output and in count-down mode in response to said third output; and

means coupled to the output of each of said first and second

up-down counters to provide an output when a predetermined count is reached.

4,007,358

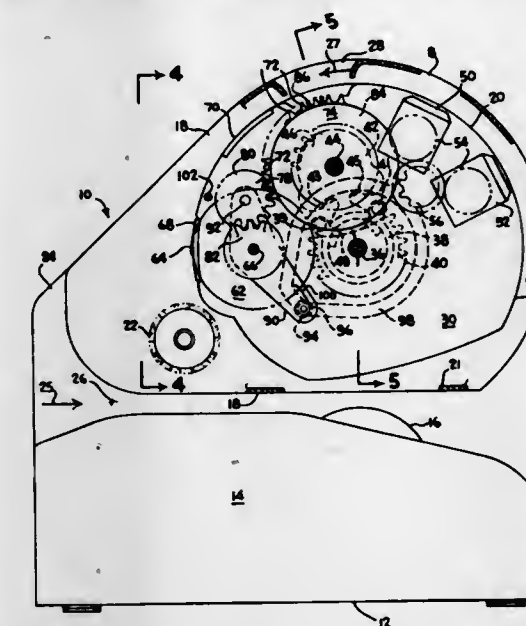
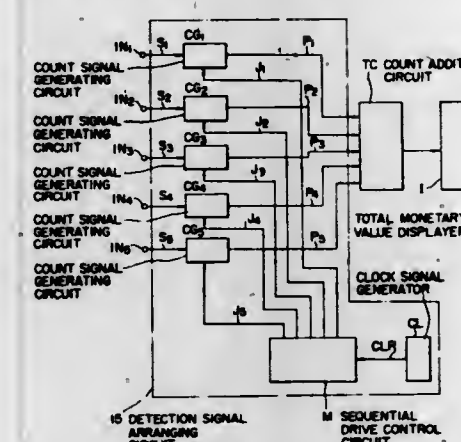
COUNT CONTROL SYSTEM FOR COIN COUNTING MACHINE

Masayuki Iguchi, and Toshihisa Kosaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan
Continuation of Ser. No. 455,727, March 28, 1976, abandoned. This application Nov. 11, 1975, Ser. No. 630,887
Claims priority, application Japan, Apr. 5, 1973, 48-38248; Apr. 6, 1973, 48-39335

Int. Cl.² G06M 3/08; G07D 9/00

U.S. Cl. 235—92 CN

1 Claim



1. A count signal arranging circuit for a control system for rearranging detection signals from a plurality of coin detectors into count signals with predetermined timing so that said counting signals can be totaled by a count addition circuit said count signal arranging circuit comprising:

a. a clock signal generator for generating clock signals;

b. a sequential drive signal forming circuit coupled to said clock signal generator for forming sequential drive signals each made up of a set of clock signals generated by said clock signal generator, and for sequentially and cyclically producing the sequential drive signals respectively at different times for the respective coin detectors; and

c. a count signal generating circuit for each coin detector coupled to said sequential drive signal forming circuit and said clock signal generator for forming, when a detection signal produced by said coin detector is applied thereto, a predetermined pulse signal from clock signals of the sequential drive signal, which pulse signal is a count signal for the corresponding coin detector, each count signal generating circuit comprising: an input signal detection circuit for the corresponding coin detector, which, at the occurrence of a clock signal on the leading edge of the sequential drive signal, detects the presence or absence of a detection signal from the corresponding coin detector, and thereafter memorizes the presence or absence of the detection signal until the end of the sequential drive signal; and

a count pulse generating circuit coupled to said input signal detection circuit for forming, at the occurrence of the clock signal on the trailing edge of the sequential drive signal, a predetermined pulse signal which is a count signal based on the memory content of said input signal detection circuit which has been stored therein.

4,007,359

POSTAGE METER

Frederick L. Ford, Bradenton, Fla., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 14, 1975, Ser. No. 604,724

Int. Cl.² G07G 1/00

U.S. Cl. 235—101

19 Claims

1. A postage meter having a drum support and a rotatable

drum carried for rotation upon said support, said rotatable drum comprising a directly accessible, hand manipulative postage value selector means supported by, an rotatable with said drum for manually setting a postage value to be printed, a variable postage value printing means supported by said drum for rotation therewith and operatively connected to said selector means, said printing means printing an amount of postage in accordance with the amount set by said selector means, and a postage registering means supported by said

drum for rotation therewith and operatively engageable with said selector means for accounting for postage which is set and printed, said printing means and said registering means being operative only when said drum is caused to rotate from a rest position through a postage metering cycle, said postage printing means comprising at least one rotatable die wheel having a plurality of postage values upon a periphery thereof, the die wheel being rotatably movable between an offset print position and a properly aligned print position upon rotation of said drum from the rest position through said metering cycle.

4,007,360

METHOD AND APPARATUS FOR REMOTE TRANSMISSION OF SIGNALS

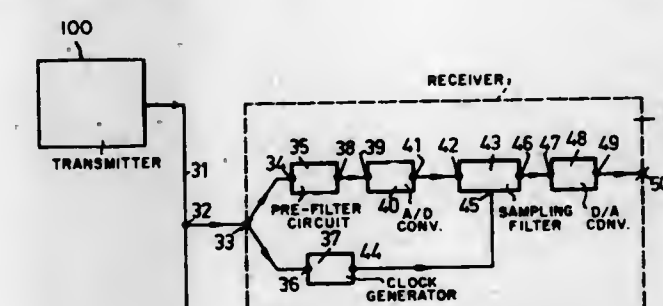
Roger Kniel, Uster, and Hans de Vries, Illnau, both of Switzerland, assignors to Zellweger AG, Uster, Switzerland
Filed Dec. 3, 1973, Ser. No. 421,086

Claims priority, application Switzerland, Dec. 28, 1972, 18981/72

Int. Cl.² G06F 15/30; G01R 27/02

U.S. Cl. 235—152

10 Claims



1. In an apparatus for the reception of remotely transmitted signals, which signals are transmitted via a conductor, especially via an electrical energy supply network, wherein there is provided a transmitter controlled by a first auxiliary frequency for generating a signal frequency which is in a first predetermined relationship to said first auxiliary frequency; a receiver; transmission channel means interposed between said transmitter and receiver for transmitting a signal characteristic of the first auxiliary frequency and for further transmitting the signal frequency between the transmitter and the receiver;

the improvement comprising:

- the receiver incorporating at least one digital sampling filter, said digital sampling filter having a first input to which there is delivered a signal as sampling pulses possessing a predetermined repetition frequency and further having a second input to which there is delivered the signal frequency as the received signal, the signal serving as the sampling pulses being defined by the auxiliary frequency; and
- wherein the response frequency of the digital sampling filter can be controlled by means of said repetition frequency of said sampling pulses.

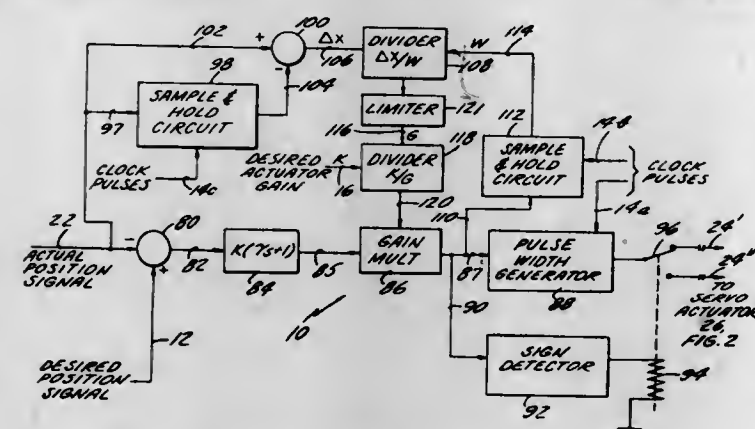
4,007,361

ADAPTIVE CONTROL SYSTEM USING POSITION FEEDBACK

Anthony Newman Martin, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed June 11, 1975, Ser. No. 586,010
Int. Cl.² G05B 13/00

U.S. Cl. 235-150.1

12 Claims



1. An adaptive control system for positioning a controlled device in response to desired position signals and desired gain signals provided by a signal source, comprising means for producing a signal indicative of the actual position of said controlled device, means for summing said actual position signal with said desired position signal and producing a position error signal proportional to the difference therebetween, multiplier means for applying a gain to said error signal to produce therefrom a control signal, servo means responsive to said control signal for varying the position of said controlled device, means responsive to the change in position of said controlled device produced by said control signal for generating an actual gain signal, and means for varying the gain of said multiplier means as a function of said actual gain signal.

4,007,362

METHOD OF INFORMATION PROCESSING FOR THE PRODUCTION OF A PRINTING FORM AND A SYSTEM FOR PERFORMING SAID METHOD

Wolfgang Sindermann, Willinghausen, Germany, assignor to Gruner & Jafr AG & Co., Germany
Filed June 23, 1975, Ser. No. 589,782

Claims priority, application Germany, June 26, 1974, 2430762

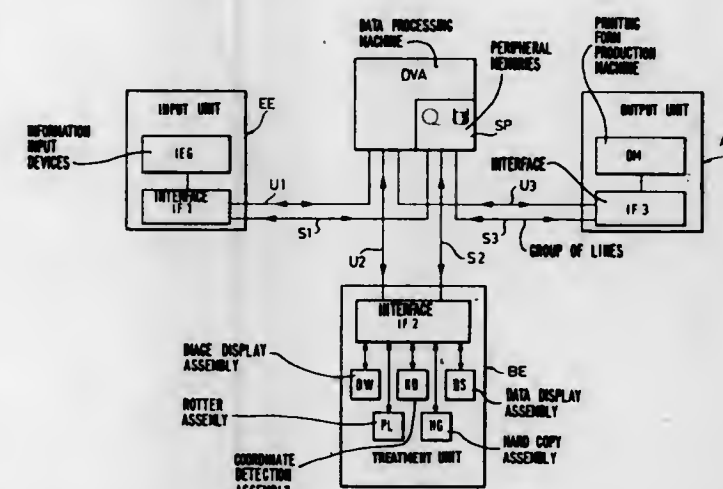
Int. Cl.² H04N 1/06; G06F 3/14

U.S. Cl. 235-151

30 Claims

15. A system for information processing for the production of a printing form for the printing of an original, comprising an input unit including at least a scanner for scanning an original with a driven scanning head producing electrical image signals, control means for the drive means of said scanning head, which control means allows the free selection of the scanning point sequence of the scanning head, information forming means for digitalizing said image signals; a data processing

machine connected to said input unit and including memory means and a central processing unit; a treatment unit connected to said memory means and said central processing unit, which treatment unit in turn includes at least an assembly for



displaying the stored information, as assembly for detecting the coordinates of portions of the displayed information and an assembly for the manual input of data processing commands; and an output unit connected to said data processing machine and including a printing form production machine.

4,007,363

ELECTRIC CONTROL DEVICE USING FREQUENCY-ANALOG CONTROL

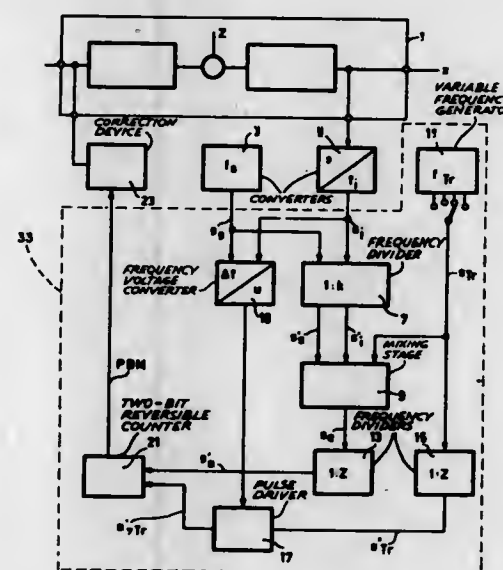
Jürgen Lemmrich, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 10, 1975, Ser. No. 540,175

Claims priority, application Germany, Jan. 30, 1974, 2404255

Int. Cl.² G05B 11/26

U.S. Cl. 235-151.1

25 Claims



1. An electrical control device for deriving a correction signal from a frequency-analog actual-value signal and a frequency-analog desired-value signal comprising, a subtractor stage, means for applying to the subtractor stage a frequency-analog actual-value signal and a desired-value signal, said subtractor stage producing at its output a differential pulse train of a frequency which equals the difference between the frequencies of the actual-value signal and the desired-value signal, an adder stage, a source of carrier pulses, means for applying the differential pulse train and the carrier pulse train to the adder stage which adds the differential pulse train to the carrier pulse train and produces an output pulse train having a frequency which is equal to the sum of the frequencies of the differential and carrier pulse trains, a 2-bit reversible counter

having a counting input for the forward counting direction and a counting input for the reverse counting direction and with overflow inhibition, means for applying the output train to the counting input for one counting direction and the carrier pulse train to the counting input for the other counting direction, and means for taking the output of the second stage of the counter which supplies a control signal in pulse-width modulated form for the formation of the correction signal.

4,007,364

WRITING INSTRUMENT WITH CALCULATOR

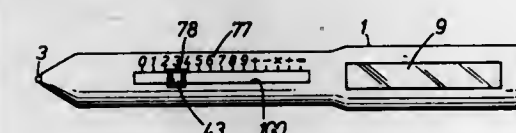
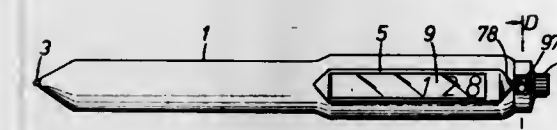
Shin Ojima; Kazuhiko Ohgami; Kazutaka Watanabe; Tohru Yoshimura; Masaya Katou, and Nozomu Matsuoka, all of Yao, Japan, assignors to Hoshidenki-Seizo Kabushiki Kaisha, Osaka, Japan
Filed Apr. 28, 1975, Ser. No. 572,561

Claims priority, application Japan, May 2, 1974, 49-50998[U]; June 6, 1974, 49-65626[U]; July 8, 1974, 49-80499[U]

Int. Cl.² G06F 3/02

U.S. Cl. 235-152

10 Claims



1. A writing instrument provided with a miniature electronic calculator, comprising: an elongated case; a pen member housed in said case adjacent one end thereof; an input structure mounted in said case for selectively generating information in the form of an electrical signal; an arithmetic unit housed in said case and comprising means responsive to said information from said input structure to perform an arithmetic operation; display means coupled to said arithmetic unit and visible from the exterior of said case for displaying the result of said arithmetic operation; and a power source housed in said case for energizing said arithmetic unit and said display means; said input structure including: a key manually manipulable from the exterior of said case at the end of said case opposite to said pen member, said key being mounted for rotation about an axis parallel to the longitudinal axis of said case, and said key also being movable along its said axis of rotation; said key including a shank extending along said axis of rotation; an operator mounted on the shank of said key and extending in the radial direction thereof, whereby rotation of said key causes said operator to move along a circular path; switching means comprising a plurality of switches disposed about the shank of said key in opposing relationship to the circular path of movement of said operator, different ones of said plurality of switches being selectively brought into alignment with said operator in accordance with the

rotational angular position of said key whereby subsequent movement of said key along its axis of rotation controls a selected one of said switches to input information corresponding to said selected one of said switches into said arithmetic unit; means for biasing said key in a direction away from said switches; said key input structure including information indicating means having indicia indicative of the information which is to be inputted by said plurality of switches, said indicia being positioned in corresponding relation to the respective rotational angular positions of said key.

4,007,365

LIGHTING FIXTURE WITH TILTABLE REFLECTOR ELEMENTS

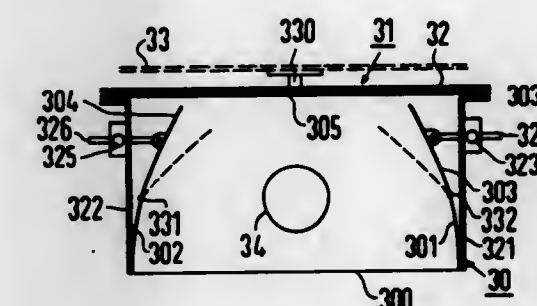
Hans Stempfle, and Werner Rothe, both of Traunreut, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Apr. 9, 1975, Ser. No. 566,316

Claims priority, application Germany, Apr. 10, 1974, 2417605

Int. Cl.² F21V 7/00

U.S. Cl. 240-41.35 F

10 Claims



1. In a wide beam lighting fixture having a reflector arrangement in which two opposed bowl shaped lateral reflectors bounding the downwardly directed light egress opening and enclosing a horizontally arranged lamp between them are fixedly mounted on a support with an angle of inclination which can be changed relative to the plane of light egress opening, the improvement comprising means for permitting adjustment of the light distribution curve including an additional reflector element above each lateral reflector supported so that it can be controllably tilted toward the stationary lamp.

4,007,366

RADIOACTIVE TRACER PROFILING SYSTEM AND APPARATUS

Ralph Wiley, Tulsa, Okla., and Charley L. Veach, Alvord, Tex., assignors to The Western Company of North America, Fort Worth, Tex.
Filed Nov. 21, 1975, Ser. No. 634,241

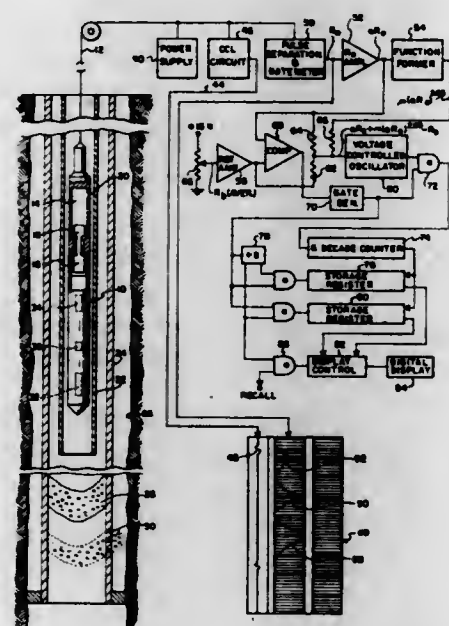
Int. Cl.² G01V 5/00

U.S. Cl. 250-260

22 Claims

1. In a system for obtaining the radioactive tracer profile of a borehole, the combination of, a subsurface unit, a cable connected to said unit for moving the same through the borehole, means in said unit for injecting a charge of material into the borehole which contains a radioactive tracer element, radiation detector means in said unit responsive to the radioactive tracer of said charge and arranged to develop a stream of pulses at a rate corresponding to the intensity of said tracer as said detector is moved through said charge, said detector having a predetermined dead time, means for transmitting said stream of pulses to the surface, linear counting rate meter means for developing a first analog signal having an amplitude proportional to the counting rate of said pulse stream at any given instant, means controlled by said first analog signal for generating a second analog signal which is corrected for said

dead time of said detector means, a voltage controlled oscillator having an input to which said second analog voltage is supplied and operative to develop control pulses at a frequency which is proportional to the amplitude of said second analog signal; and pulse counter means controlled by said



control pulses and operative to count the total number thereof as said unit is moved through said charge in the borehole, thereby to provide an indication of the total amount of said radioactive tracer remaining in said charge as said unit is moved therethrough.

4,007,367

SEMEN THAW SYSTEM

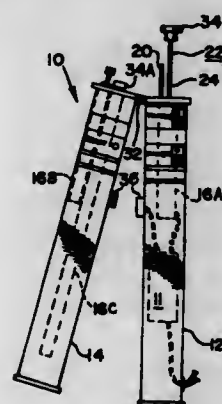
Robert K. Rustberg, R.R. 2, P.O. Box 153 Algonquin Road, Barrington Hills, Ill. 60010, and Robert J. Froehlich, 210 S. Louis, Mount Prospect, Ill. 60056

Filed Feb. 2, 1976, Ser. No. 654,539

Int. Cl.² F27D 11/00

U.S. Cl. 219—385

3 Claims



1. A system connectable to a source of electrical power for controllably thawing frozen semen contained in semen straws for use in artificial insemination of animals comprising, in combination, a first casing having a container for receiving the straws of frozen semen, electrical heating means for said container and connectable to said source for controllably heating the containers from a first temperature to an elevated temperature for causing the semen to pass from its crystalline to a liquid state in a preselected time of relatively few seconds, presettable electronic timer means for timing the heating period, electrical switch means having first and second operating positions, said switch means being operable to its first position to electrically connect the heating means to the source, said switch means in its first position concurrently

causing the electronic timer means to be activated, indicating means operable in response to said electrical timer means for indicating the completion of the preset heating time period, and said switch means being selectively operable to its second position to electrically disconnect the heating means from the source, whereby the semen may be controllably heated through the critical transition stage from its crystalline to its liquid state within a preselected time to thereby retain maximum cell yield by minimizing loss of semen activity.

4,007,368

HEATING APPARATUS

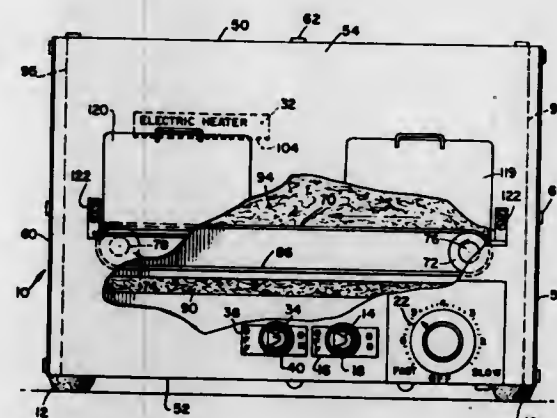
Robert A. Jensen, Hazel Crest; John A. Tesk, Woodridge, and Daniel Odullo, Chicago, all of Ill., assignors to Howmedica, Inc.

Filed Jan. 10, 1975, Ser. No. 540,178

Int. Cl.² F27B 9/06

U.S. Cl. 219—388

4 Claims



1. Apparatus for preheating and reducing the moisture content of dental products before a firing heating comprising a housing having a chamber therein, an endless conveyor track and means for supporting said conveyor track within said housing whereby the run of said conveyor track is substantially from one side of said chamber to the other, drive means and means coupling the output of said drive means to said conveyor track support means for moving said dental products on said conveyor track from said one side of said chamber to said other side, door means in said housing providing access to said chamber within the region adjacent said sides whereby dental products may be located on said conveyor track at said one side of said chamber and removed from said conveyor track at said other side of said chamber, insulating means for said chamber, said insulating means including an insulating layer below said conveyor track dividing said chamber into a heating and a control portion, heating means disposed within said heating portion of said chamber, said heating means having a heat emanating surface within the region of said chamber other side throughout at least a major portion of the width and along a portion of the length of said endless conveyor track, control means supported within said control portion of said chamber, said control means comprising means for connection to an electrical power source and circuit means including said drive means and electrical heating means in parallel connection across said connection means and power source, said circuit means including a first switch means for providing primary control of said drive and heating means, second switch means in said circuit secondarily controlling said drive means; and means within said chamber at said other side for physically impeding forward movement of said dental products as said conveyor track is driven by said drive means, said impeding means being movable slightly upon contact of said dental products whereby said impeding means is adapted to activate a switch which enables operation of an alarm whereby an operator will be advised that said dental products have been conveyed to said other side of said chamber.

4,007,369

TUBULAR OVEN

Wolfgang Dietze, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

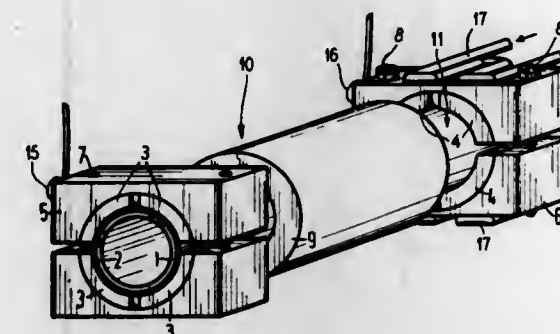
Filed Apr. 13, 1976, Ser. No. 676,618

Claims priority, application Germany, Apr. 23, 1975, 2518045; June 23, 1975, 2527927

Int. Cl.² F27D 11/02

U.S. Cl. 219—390

5 Claims



1. An oven comprising
 - A. a tubular member having an interior layer comprised of polycrystalline silicon and an integral exterior layer comprised of phosphorous doped silicon having a specific resistance ranging from about 2 through 200 microhm centimeters,
 - B. a pair of electrical contact means, each such contact means being in contact with a different opposed end region of said tubular member, each such contact means having
 1. a plurality of circumferentially spaced adjacent graphite support members in face-to-face engagement radially with exterior layer portions of said tubular member,
 2. a plurality of circumferentially spaced electrically conductive metal blocks in face-to-face engagement with radially outer surface portions of said graphite support members, and
 3. clamping means securing said support members and said blocks together at and about said opposed end regions
 - C. a thermally insulative layer circumferentially extending around said tubular member between said pair of electrical contact means but in axially spaced, adjacent relationship thereto, and
 - D. means for cooling said pair of electrical contact means, said means for cooling comprising tubing adapted for conveying a cooling fluid in heat-exchange relationship to said metal blocks.

4,007,370

DEVICE FOR HEATING THERMOPLASTIC EYEGLASS FRAMES

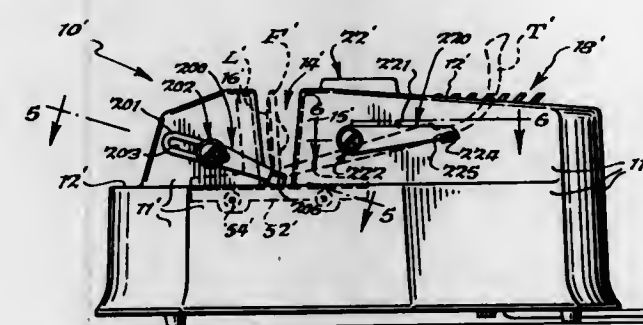
Edward A. Ebert, 203 Huxley Drive, Snyder, N.Y. 14226

Filed June 3, 1974, Ser. No. 475,651

Int. Cl.² H05B 3/06

U.S. Cl. 219—521

11 Claims



1. A radiant type heater for heating an ophthalmic frame having a frontal lens holding portion and a temple portion comprising a housing, electrical heating means and heat trans-

fer means for transferring heat to first and second opposed heat radiating surfaces on said housing for receiving said frontal lens holding portion therebetween support means on said housing to hold said frontal lens holding portion of said ophthalmic frame between said first and second heat radiating surfaces and in spaced relation thereto, said first heat radiating surface having opposite extreme outer ends with at least one extreme outer end being of a configuration to extend one radiation beyond said one extreme outer end to meet radiation from said second heat radiating surface, said first heat radiating surface being of a dimension to permit said temple portions to be placed outside of said extreme outer ends of said first heat radiating surface and to also permit a portion of said frontal lens holding portion to be placed outside of said one extreme outer end of said first heat radiating surface, whereby said one extreme outer end will heat said portion of said frontal lens holding portion which extends beyond said one extreme outer end of said first radiating surface.

4,007,371

ELECTRIC IMMERSION HEATER FOR STOCK TANKS

Lester B. Njos, and Gordon L. Lamb, both of Rhame, N. Dak. 58651

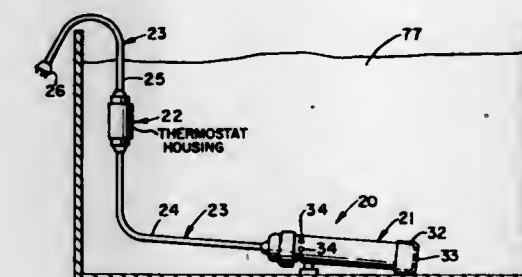
Continuation of Ser. No. 385,109, Aug. 2, 1973, abandoned.

This application Dec. 3, 1974, Ser. No. 529,044

Int. Cl.² H05B 1/02, 3/80; A01K 7/00; F24H 1/22

U.S. Cl. 219—523

1 Claim



1. A tank heater device comprising a heating cylinder means, said heating cylinder means comprising an elongated hollow cylinder adapted to be placed immersed in the bottom of a water tank, means for supporting said cylinder on the floor of said tank at a small acute angle with one end slightly higher than horizontal to the other end, said heating cylinder means having an electric heating element inside of said cylinder, said upper end of said cylinder having radially directed outlet hole means directing the water from within the cylinder out of the cylinder and back into the water in the tank in at least three different directions, which directions are laterally outward from the longitudinal axis of the cylinder at approximately 90° intervals to one another, said upper end of said cylinder having closure means to cause the water within the upper end of the cylinder to be directed out through the radially directed water outlet hole means, said lower end of said cylinder having water inlet hole means, said water inlet hole means and said water outlet hole means communicating directly with the water in the tank with said cylinder impermeate between said inlet and outlet hole means, wherein water in the tank may travel into the water inlet hole means at the lower end of the cylinder past the heating element to be heated by said element and travel out of said cylinder through the radially directed water outlet hole means after being heated in different directions radially, at least a three wire electric waterproof cord having a pair of current wires connected to the heating element and extending to the surface to energize the heating element, a thermostatic switch along and in the path of said electric cord spaced away from said heating cylinder and near the surface of the water in the tank, and connected to at least one of said current wires of said electric cord to control the energization of the heating element, said electric cord also including a ground wire, said heating cylinder means having metallic portions, said ground wire being

connected to said metallic portions at its one end and adapted to be connected to a ground at its other end to provide a ground for said heating cylinder means, said thermostatic switch and said at least one current wire where connected to said thermostatic switch being closed in a waterproof enclosure so as to be submersible in the water in the tank, said elongated cylinder having a wall adjacent one end of said cylinder dividing said cylinder into a small chamber and a relatively large main chamber, with said water inlet means and outlet means being located in said main chamber, a detachable cap means covering said one end of said cylinder, said wall having an opening, said heating element having an elongated heating rod with electrical connections to said heating rod being mounted in a plug at one end of said rod, said rod of said heating element projecting into said main chamber through said wall opening with said plug attached to said wall to form a watertight seal in the wall and with said electrical connections for said rod being located in said small chamber, said detachable cap means covering said one end of said cylinder to cover said electrical connections in said small chamber in watertight relation, said cap having an opening therethrough with said cord passing through said opening for electrical connections of its wires to said electrical connections of said heating element, means providing a watertight seal between said cord and said detachable cap means in the opening into said cap.

4,007,372

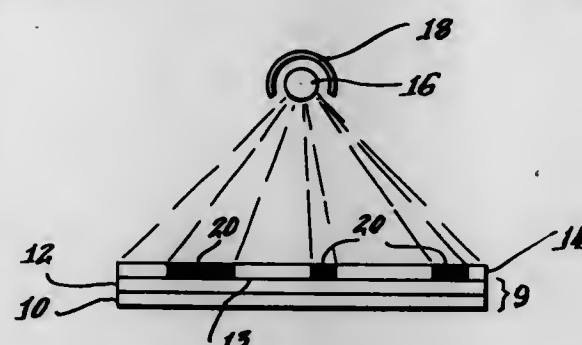
METHOD AND ARTICLE FOR IMAGE REPRODUCTION
Myron J. Lenhard, Penfield, and Richard F. Selig, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,321

Int. Cl.² G03C 5/16

U.S. Cl. 250—317

24 Claims



1. A reproduction master comprising: an image transfer body having a surface thereof which is adapted to be tackified in image configuration; and, a developer material adhering to said tackified surface, said developer comprising heat absorbent developer bodies, a sublimable dye coated on a surface of said heat absorbent developer bodies whereby heating of said dye causes sublimation of said dye.

4,007,373

RADIOGRAPHIC APPARATUS

Roger Torquet, and Michel Frechede, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sept. 23, 1975, Ser. No. 616,010

Claims priority, application France, Sept. 27, 1974, 74.32653

Int. Cl.² A61B 6/00; H05G 1/46

U.S. Cl. 250—355

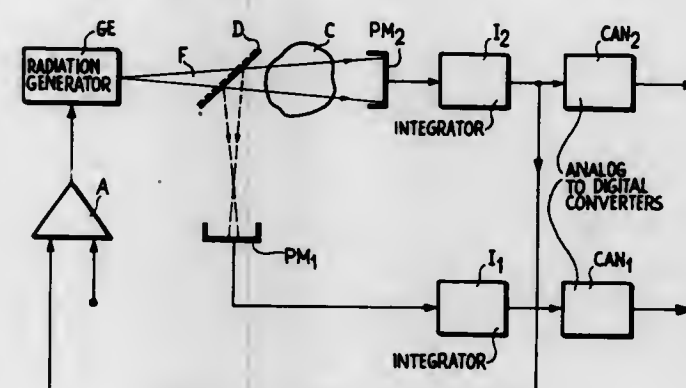
6 Claims

1. A radiographic observation apparatus comprising: an X-ray beam generating source for producing an X-ray beam for irradiating a predetermined portion of a body, and having an input for varying the energy of said beam as a function of an applied electrical signal; first electrical transducer means for receiving said beam

after passage through said body and producing at an output an electrical signal which varies as a function thereof;

means disposed over the beam trajectory for receiving said beam prior to passage through said body and for scattering a predetermined fraction of said beam energy;

second electrical transducer means for receiving said scattered energy fraction and producing at an output an electrical signal which varies as a function thereof;



means defining a feedback loop connected between said first transducer means output and said source input for applying said signal at the output of said first transducer means to said input;

means for transducing into first and second sets of digital data the electrical signals respectively produced by said first and second transducer means, said first set of data indicating the absorption coefficient of said body, and of said radiation energy and said second set of data indicating the radiated energy.

4,007,374

IONIZATION DETECTOR WITH IMPROVED RADIATION SOURCE

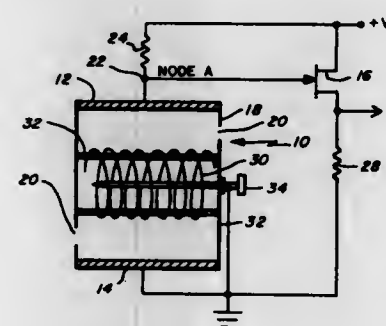
Elias F. Solomon, Duxbury, Mass., assignor to Gulf & Western Manufacturing Company (Systems), New York, N.Y.

Continuation-in-part of Ser. No. 593,704, July 7, 1975. This application Sept. 11, 1975, Ser. No. 612,350

Int. Cl.² G01T 1/18

U.S. Cl. 250—384

13 Claims



1. An ionization detector comprising: means defining an ionization chamber having at least two spaced plates, means for biasing the plates to establish a predetermined ionization current in the chamber, a source of radiation disposed in the ionization chamber and being in the form of a wound ribbon means extending over an area of the chamber, and means supporting the source of radiation including a core about which the ribbon means is wound.

4,007,375

MULTI-TARGET X-RAY SOURCE

Richard D. Albert, 317 Hartford Road, Danville, Calif. 94526

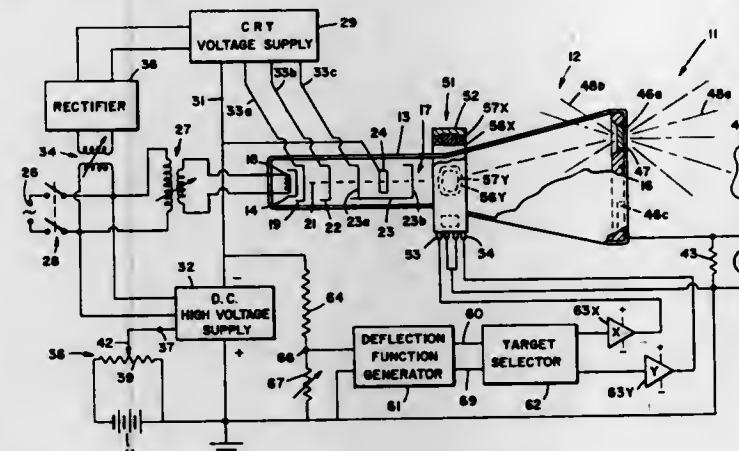
Filed July 14, 1975, Ser. No. 595,388

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.² G01J 1/00; G01N 23/20; G21K 1/00; H05G 1/30

U.S. Cl. 250—404

17 Claims



1. A multi-target X-ray source comprising: an evacuated envelope, anode means within said envelope supporting a plurality of spaced-apart targets for producing X-rays in response to electron bombardment of any selected one of said targets, an electron gun disposed within said envelope and spaced apart from said targets, said electron gun having an electron emissive cathode and means for forming an electron beam, a high-voltage supply having a positive terminal connected to said anode means and a negative terminal connected to said electron gun to establish a voltage difference between said cathode and said anode means for accelerating said electron beam, deflector means for deflecting said electron beam in response to deflection signals, a target selector having means coupled to said deflector means for transmitting any selected one of a plurality of different target selection deflection signals thereto to direct said electron beam to any selected one of said targets, and a beam position stabilizing circuit responsive to variations of said voltage difference and having means for increasing said target selection deflection signals in response to increases of said accelerating voltage and for decreasing said target selection deflection signals in response to decreases of said accelerating voltage.

4,007,376

VIDEO X-RAY IMAGING SYSTEM AND METHOD
Samuel Morton Zimmerman, 3530 Forest Lane, Suite 98, Dallas, Tex. 75234

Filed Aug. 7, 1975, Ser. No. 602,811

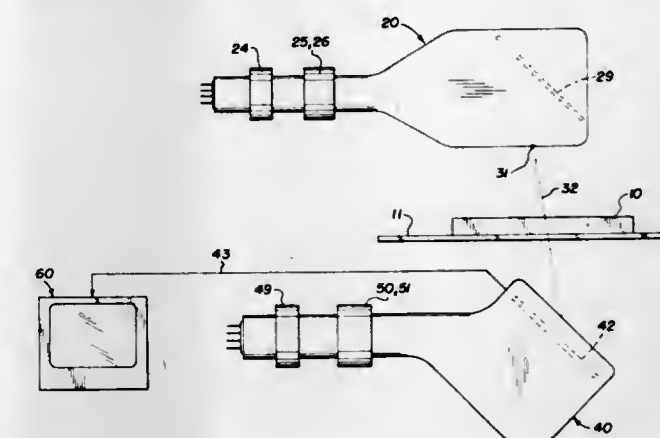
Int. Cl.² H05G 1/30

U.S. Cl. 250—416 TV

17 Claims

1. A system for producing a video image of an x-ray irradiated subject comprising, in combination an x-ray generating tube including: an envelope; means for producing a focused high energy electron beam; an anode presenting an enlarged face disposed to be impinged by said electron beam; means for deflecting said electron beam to sweep said anode face, producing a moving focal spot; means defining a point-source window in said tube envelope; said anode face being oriented, relative to the produced electron beam and to said window, to direct generated x-rays from the moving focal spot to said window, thereby radiating a narrow sweeping beam of x-rays from said window; a pickup tube, for detecting x-radiation, including: a face plate having a mosaic of x-ray sensitive globules respon-

sive to x-radiation to produce an electric image corresponding to the density of x-rays passing through an irradiated subject; means for producing a focused electron beam directed to said face plate; means for deflecting said electron beam to sweep said face plate;



circuit means including means for synchronizing the sweep of the pickup tube electron beam with the sweep of the x-ray generating tube electron beam, and therefore with the sweep of said x-ray beam, whereby said pickup tube produces a video output signal for feeding to a video monitor to produce an x-ray picture.

4,007,377

OPTICAL SCANNING SYSTEM FOR UNIVERSAL PRODUCT CODE

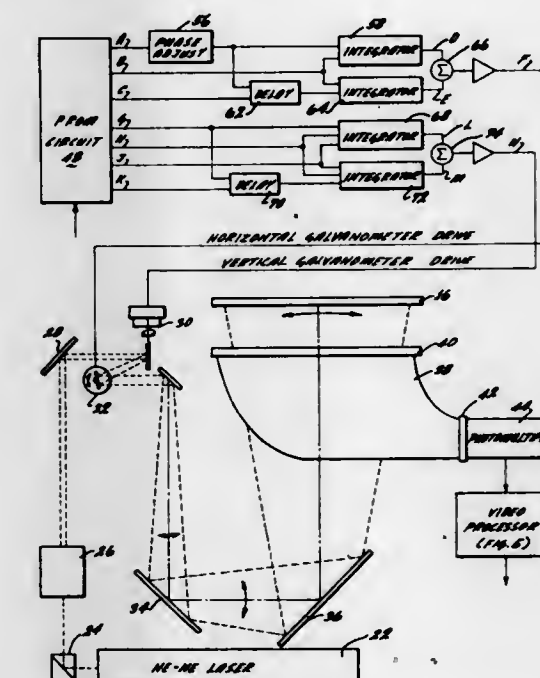
Donald R. Simon, Wayne, N.J.; Anil Vasudeva, San Jose, Calif., and John J. Zukatus, Jr., Nutley, N.J., assignors to The Singer Company, New York, N.Y.

Filed Sept. 8, 1975, Ser. No. 611,362

Int. Cl.² G06K 7/10

U.S. Cl. 250—566

9 Claims



1. An optical scanner comprising: means for generating a pencil of substantially monochromatic light; first means interposed in the path of said pencil for selectively deflecting said pencil in a first plane; second means interposed in the deflected path of said pencil for selectively deflecting said pencil in a second plane at right angles to said first plane; and for projecting said deflected pencil to a scan window; reading means positioned to detect the light reflected from an object at said scan window; and circuit means coupled to said first and said second means

for controlling the amplitude and deflection rates thereof, said circuit means including circuitry for producing deflection drive signals having linear slopes with horizontal portions at each slope reversal to enable the deflecting means to follow said deflection drive signals.

4,007,378

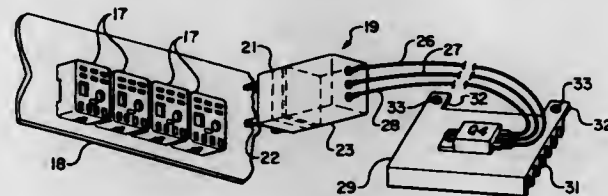
SOLID STATE REPLACEMENT FOR A MECHANICAL RELAY

Anthony Ross Lazzara, Portola Valley, Calif., assignor to Scientific Technology Incorporated, Mountain View, Calif.
Filed May 23, 1975, Ser. No. 580,417

Int. Cl.² H03K 19/12

U.S. Cl. 307-112

10 Claims



1. A mechanical relay replacement for insertion into a mechanical relay receptacle in which is provided a predetermined socket pattern comprising a relay base, a plurality of electrical base pins formed to fit the sockets and mounted on a first side of said relay base and having a pin pattern matching the socket pattern, a control circuit for receiving a control input signal, said control circuit being mounted on a second side of said relay base and connected to said base pins, an enclosure attached to said relay base enclosing said control circuit, a heat sink for remote mounting from said relay base and receptacle, means for switching a high current level mounted on said heat sink, said last named means having a control terminal and first and second current terminals, whereby standard size is maintained for said relay base and enclosure for high heat dissipation due to high current switching, said control circuit operating to provide a trigger output responsive to said control input signal, and means for coupling said trigger output to said control terminal, whereby a current between said first and second current terminals is commanded by said control input signal to assume a level determined by a load voltage therebetween and heat resulting from said current through said means for switching is dissipated remotely from said relay base.

4,007,379

OPERATING CIRCUIT FOR MACHINES

Thomas F. Whittaker, West Scarborough, Maine, assignor to Safety Engineering, Inc., Gray, Maine

Filed Nov. 6, 1975, Ser. No. 629,507

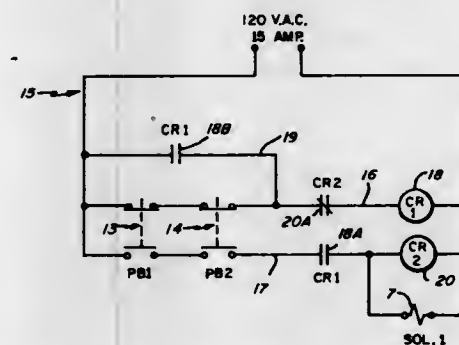
Int. Cl.² H01H 47/04

U.S. Cl. 307-115

2 Claims

1. A circuit for apparatus including an element having a reciprocable work stroke relative to a work support and an electrically operated device in control of the work stroke, said circuit including first and second parallel leads, two switches, one for each hand of the operator and both in control of both leads and both normally closed with respect to the first lead, and means rendering the circuit inoperative after a work stroke until both switches are again in their normally closed positions, said second lead including said device, said means including a relay in the first lead, a holding lead for said relay bypassing said first lead switches, said relay including two normally open switches, one in the holding lead and one in the

second lead, and said second lead including a relay in parallel with said device and provided with a normally closed switch in



said first lead between the first lead relay and the holding lead switch therefor.

4,007,380

CONTROL OF CHOKES

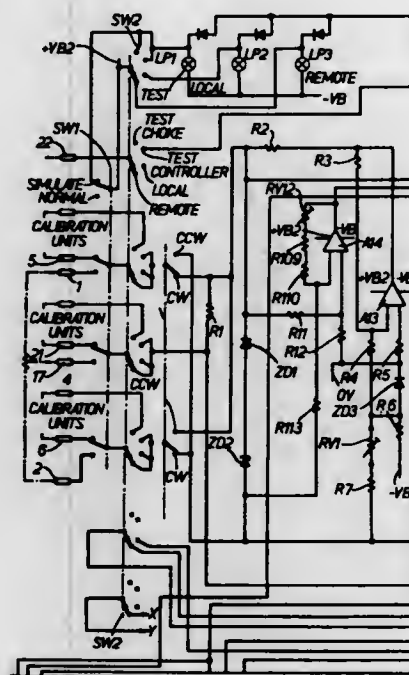
Garry Thurgood, Bagshot, England, assignor to The British Petroleum Company Limited, London, England
Filed Apr. 25, 1975, Ser. No. 571,696

Claims priority, application United Kingdom, Apr. 29, 1974, 18663/74

Int. Cl.² G08B 21/00

U.S. Cl. 307-149

8 Claims



1. A well choke control apparatus comprising:
a. means for producing a first electrical signal indicative of a required position of the choke;
b. means for deriving a second electrical signal indicative of the actual position of the choke;
c. first comparator means, the first comparator means being arranged to be fed with said first and second electrical signals and to control actuation of the choke in the required direction to equalize said electrical signals;
d. second comparator means;
e. means settable to produce a third electrical signal indicative of a predetermined closed position of the choke; and
f. override control means;
the second electrical signal indicative of the actual position of the choke is also arranged to be fed as one input to the second comparator means, a further input of which is connected to the means settable to produce the third electrical signal, the output of the second comparator means being connected to said override control means which is arranged to prevent further actuation of the choke when said second and third signals are equal.

4,007,381

BALANCED REGENERATIVE CHARGE DETECTION CIRCUIT FOR SEMICONDUCTOR CHARGE TRANSFER DEVICES

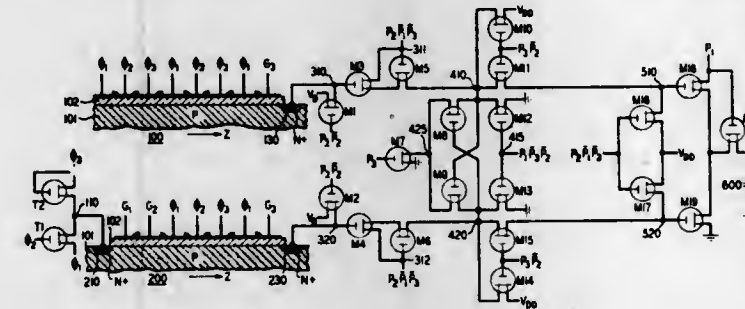
Amr Mohamed Mohsen, North Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1975, Ser. No. 569,581

Int. Cl.² H03K 5/20, 3/353; G11C 19/28; H01L 27/10

U.S. Cl. 307-235 F

8 Claims



1. Semiconductor apparatus which comprises
a. a main charge transfer device section containing a first plurality of transfer stages for providing an output stream of essentially binary level charge packet bits, each such charge packet arriving at a first output terminal of said main charge transfer device section;
b. an auxiliary charge transfer device section, containing a second plurality of transfer stages that is substantially less than the first plurality, for providing an output stream of unilevel charge packet bits to a second output terminal, each and every said unilevel charge packet being substantially midway in charge level between the output levels of the binary charge packet bits;
c. amplifying means coupled to receive outputs from the first and second output terminals for delivering to a third output terminal a signal stream characterized in that said stream is at a first level corresponding to a charge packet arriving at the first terminal greater than the charge packet arriving simultaneously at the second terminal and is at a second level corresponding to a charge packet arriving at the first terminal less than the charge packet arriving simultaneously at the second terminal; said amplifying means including a flip-flop amplifier fed by a pair of preamplifiers, each said preamplifier having a first insulated gate field effect transistor whose gate electrode is connected to a different one of the first and second output terminals of the said charge transfer device sections.

4,007,382

BIPOLAR SIGNAL PROCESSING CIRCUIT

John Martin Warberg, Oakville, Canada, assignor to Canadian National Railway Company, Montreal, Canada

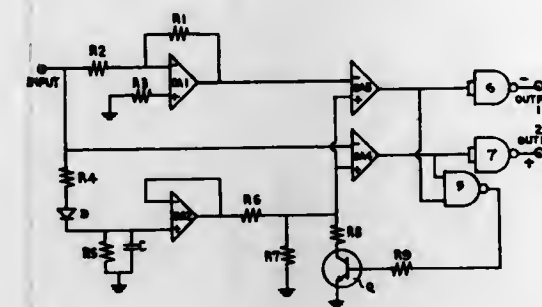
Filed June 27, 1975, Ser. No. 590,828

Claims priority, application Canada, Feb. 12, 1975, 219887

Int. Cl.² H03K 5/20

U.S. Cl. 307-236

5 Claims



1. A bipolar signal processing circuit for recovering and processing a bipolar signal that could be degraded and for separately representing the positive and the negative portions

of said bipolar signal, comprising: input means for receiving a bipolar signal, an inverter circuit coupled to said input means for inverting the bipolar signal, a first comparator circuit having a reference input and having a signal input coupled to the output of said inverter circuit for producing a first output signal when the instantaneous value of the signal at its signal input exceeds the instantaneous value of the signal at its reference input, a second comparator circuit having a reference input and having a signal input coupled to said input means for producing a second output signal when the instantaneous value of the signal at its signal input exceeds the instantaneous value of the signal at its reference input, a peak voltage generator circuit connected to said input means for producing a reference voltage whose amplitude approaches the peak voltage of said bipolar signal, a grounded potential divider connected to the output of said peak voltage generator and having its junction connected to said reference inputs, an electronic switch connected across the grounded leg of said potential divider for substantially reducing the impedance of said potential divider whenever said switch is conductive, and an OR-gate circuit connected to said switch for maintaining said switch conductive during the presence of one of said first and second output signals, whereby said first output signal represents one of said positive and said negative portions of said bipolar signal and whereas said second output signal represents the other one of said portions of said bipolar signal.

4,007,383

POSITION DETERMINING DEVICE

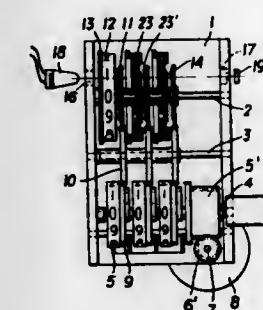
Harald Wessner, Neunkirchen, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria
Filed Jan. 26, 1976, Ser. No. 652,045

Claims priority, application Austria, Jan. 27, 1975, 566/75

Int. Cl.² H01J 3/14

U.S. Cl. 250-237 G

4 Claims



1. A position determining device comprising, in combination, at least one pair of objects arranged for relative movement in a pre-set counter train, an optical element on each of said objects, a transmitter for generating an energy beam and for directing said beam in a predetermined path, a receiver for receiving said energy beam, said optical elements being disposed in the path of said energy beam for transmission of said beam to said receiver in an aligned position of said optical elements, said optical elements being arranged to deflect said energy beam in a non-aligned position, one of the objects comprising a rotatably mounted dial movable into a pre-set position, the other object being movable to position the optical element on said other object into said aligned position with the optical element on said one object in said pre-set position for transmission of said energy beam in said predetermined path to said receiver.

4,007,384

NONINVERTING CURRENT-MODE LOGIC GATE

Richard Donald Brooks, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1975, Ser. No. 638,816

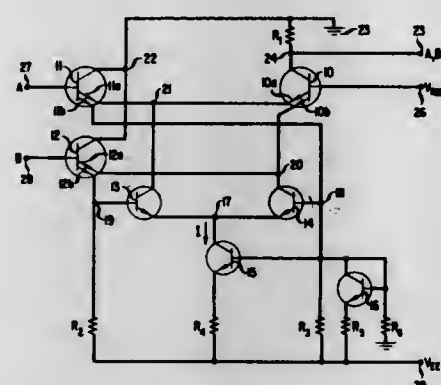
Int. Cl.² H03K 17/00

U.S. Cl. 307-218

3 Claims

1. A noninverting current-mode logic AND gate comprising:

1. a pair of input terminals,
2. an output terminal,
3. a source of substantially constant current, including a supply terminal adapted for connection to a source of voltage,
4. a pair of differentially-connected, emitter-coupled, current steering transistors connected to said current source,
5. a first input transistor having its base connected to one of said input terminals,
6. a second input transistor having its base connected to the other input terminal,
7. said input transistors having dual emitters,
8. a reference transistor having its collector connected to said output terminal and having dual emitters,



9. first means connecting one emitter of said first input transistor to one emitter of said reference transistor and to the collector of one of said current steering transistors,
10. second means connecting one emitter of said second input transistor to the other emitter of said reference transistor and the other collector of the other of said current steering transistors,
11. third means connecting the other emitter of said first input transistor to the base electrode of the other of said current steering transistors, and
12. fourth means connecting the other emitter of said second input transistor to the base electrode of said one of the current steering transistors.

4,007,385

SERIALLY-CONNECTED CIRCUIT GROUPS FOR INTEGRATED INJECTION LOGIC

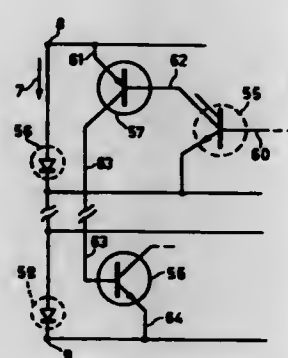
Claude Chapron, Caen, France, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 504,911

Claims priority, application France, Sept. 13, 1973, 73.32916

Int. Cl.² H03K 19/08; H01L 27/02, 27/04
U.S. Cl. 307-296

7 Claims



1. An integrated injection logic circuit comprising controlling and controlled transistors having bases and collectors and connected to at least some of said transistors to bias same associated biasing current injectors each having at least first, second and third zones with the first and second zones forming a first rectifying junction and the second and third zones

forming a second rectifying junction, means connecting the controlling transistor collectors to the controlled transistor bases, the transistors and associated current injectors forming plural elementary groups which require substantially the same supply current and each with a current injector, two terminals for connection to a current supply source, means connecting the plural groups in series across the two terminals for the current supply source so as to include a first in the series defined as the highest storey, a last in the series defined as the lowest storey, higher and lower stories being defined as the higher storey being closer in the series to the beginning than a lower storey, said series connecting means including means connecting the current injector first zone of the group of transistors in the highest storey, without the interconnection of further storeys, to a supply source terminal for biasing the first rectifying junction in the forward direction, means connecting the current injector second zone of the group of transistors in said lowest storey, without the interposition of further storeys, to the other supply source terminal, means connecting the current injector second zone of the highest storey to the current injector first zone of the next lower storey, and means providing a signal connection between a controlling transistor collector of a higher storey and a controlled transistor base of a lower storey, said means providing said signal connection including an auxiliary transistor having emitter, base and collector, means connecting the auxiliary transistor collector to the controlled transistor base, means connecting the auxiliary transistor emitter to the current injector first zone of said higher storey, and means connecting the auxiliary transistor base to the controlling transistor collector.

4,007,386

ELECTRIC INDUCTION DRIVE ASSEMBLIES

Romuald Zdzislaw Rustecki, 99 Chertsey Lane, Staines, Middlesex, England

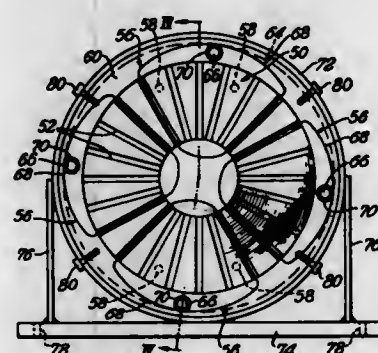
Continuation of Ser. No. 425,738, Dec. 18, 1973, abandoned.

This application May 16, 1975, Ser. No. 578,095

Int. Cl.² H02K 15/14

U.S. Cl. 310-42

10 Claims



1. An electric induction drive assembly for driving a rotatably supported load shaft as distinguished from a self contained independent motor comprising a rotor including an annular core of magnetic material having an end face, radially inner and outer shorting rings between which said core extends, a plurality of rotor bars each extending generally radially between said inner and outer shorting rings and means for mounting the rotor directly to a rotatably supported load shaft to be supported by the shaft for driving the shaft, stator means comprising an annular core of magnetic material having an end face and windings arranged on said core to produce a magnetic field extending axially from said end face of the core, a structure supporting said stator means for movement independently of said rotor so that, by appropriate positioning of the structure with respect to said load shaft said drive assembly may be made operable to drive said load shaft with the stator core having said end face thereof confronting said end face of said rotor core, said stator means and said support structure, on the one hand, and said rotor, on the other hand, being entirely discrete components having no direct mechanical connections therebetween, and said stator support structure having means fixedly securing the stator means to the support structure and means defining an opening within the support structure of sufficient size to permit the stator means to be removed from and replaced on said support structure when the assembly is arranged in the operable condition, without movement of the support structure.

cal connections therebetween, and said stator support structure having means fixedly securing the stator means to the support structure and means defining an opening within the support structure of sufficient size to permit the stator means to be removed from and replaced on said support structure when the assembly is arranged in the operable condition, without movement of the support structure.

4,007,387

ELECTRICAL SYNCHRONOUS MACHINES

Romuald Zdzislaw Rustecki, 99 Chertsey Lane, Staines, Middlesex, England

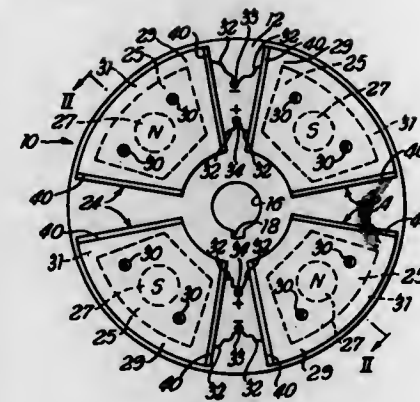
Continuation of Ser. No. 425,739, Dec. 18, 1973, abandoned.

This application May 14, 1975, Ser. No. 577,450

Int. Cl.² H02K 15/00

U.S. Cl. 310-42

12 Claims



1. An electrical synchronous machine comprising a rotor having a plurality of field coils of alternating polarities arranged on core elements of magnetic material and disposed around the axis of rotation of the rotor to produce a magnetic field extending away from the core elements and axially of the rotor; means mounting said rotor to a shaft of a device independent of the machine; a stator having a plurality of windings arranged on an annular core of a magnetic material and disposed around an axis of the stator so that parts of the windings lie adjacent a surface of the core; and a structure supporting said stator; said rotor, on the one hand, and the combination of said stator and support structure, on the other hand, being constructed as entirely discrete elements whereby said machine may be made operable by positioning said support structure with respect to the rotor mounted on said shaft so that the rotor and the stator core are substantially coaxial and so that the rotor core elements confront said surface of the stator core, the core elements for the field coils comprise like, individual pole yokes for each coil, further comprising a substantially circular and plate-like support member and means securing the yokes each at one end to a surface of said support member, which surface is normal to the axis of rotation of the rotor, the yokes extending axially away from the support surface and being equally spaced around the axis of rotation, the core elements further comprise a plurality of flat pole shoes, a respective, pole shoe being secured to the other end of each pole yoke, the surfaces of the shoes remote from the support member lying in a common plane normal to the axis of rotation of the rotor.

4,007,388

DYNAMOELECTRIC MACHINE LOAD PACKAGE HAVING AN ACOUSTICALLY ISOLATED ENCLOSURE

John F. Lawyer, Albany, N.Y., and Vincent G. Terry, Beverly, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed June 19, 1975, Ser. No. 588,514

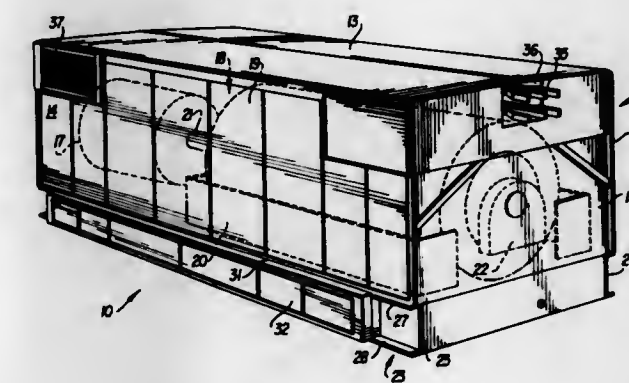
Int. Cl.² H02K 5/24

U.S. Cl. 310-51

6 Claims

1. A dynamoelectric machine load package including an acoustically isolated enclosure, said load package comprising:

- a. a load package base, said load package base further comprising:
 - i. a base plate, and
 - ii. I-beams for supporting said base plate, said I-beams positioned around the periphery of said base plate and having upper and lower I-beam rails,
- b. a dynamoelectric machine including a stator and a frame for said stator;
- c. a plurality of resilient isolation pads for resiliently supporting said stator frame on said upper I-beam rails;
- d. a reduction gear for driving said rotor, said reduction gear firmly mounted in vibration-transmitting relationship to said base plate;
- e. bearing pedestals for supporting a rotor shaft of said dynamoelectric machine, said pedestals firmly mounted in vibration-transmitting relationship to said base plate;
- f. an enclosure, said enclosure further comprising:
 - i. an enclosure side rail along each side of said enclosure,
 - ii. an upper main part having a top, two sides and an end, said upper main part firmly attached to said enclosure side rail, and
 - iii. lower base skirt panels firmly attached to and extending



- ing downwardly from said enclosure side rails so as to form a lower extension of sides of said upper main part;
 - g. a first plurality of isolation mounts each arranged between one of said enclosure side rails and a corresponding one of said upper I-beam rails to support said enclosure side rail on said load package base;
 - h. a second plurality of isolation mounts each arranged between a lower edge of one of said base skirt panels and a corresponding one of said lower I-beam rails;
 - i. resilient seals between each enclosure side rail and a corresponding one of said upper I-beam rails to permit relative movement of the enclosure and said load package base while preventing air flow and transmission of air-borne noise between an upper main generator cavity and a lower base skirt cavity; and,
 - j. resilient seals between the lower edges of said base skirt panels and the corresponding lower I-beam rails to permit relative movement of said enclosure and said base while preventing air flow and transmission of air-borne noise between said lower base skirt cavity and the surrounding environment;
- whereby air-borne noise and vibration transmitted to the surrounding environment is reduced.

4,007,389

ROTATING RECTIFIER ASSEMBLY FOR ELECTRIC MACHINES

Heinrich Küter, Wattenscheid, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed July 10, 1975, Ser. No. 594,750

Claims priority, application Germany, July 15, 1974, 2433955

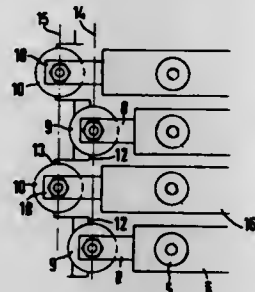
Int. Cl.² H02K 11/00

U.S. Cl. 310-68 D

4 Claims

1. In a multiphase bridge circuit for electric machines, a rotating rectifier assembly comprising cooling members, recti-

fier cells and fuses, and including a carrier wheel having a radially outer annular flange extending therefrom, said rectifier cells being radially outwardly braced at the inner side of said annular flange, said cooling members being current-conductive and being interposed between said rectifier cells and said inner side of said annular flange, said cooling members being electrically connected with said rectifier cells and being insulated from said carrier wheel, and said fuses being directly



braced at said annular flange, one of said fuses, respectively, being serially connected with each of said cooling members, said outer annular flange having a free side spaced from said carrier wheel, said fuses being fastened at said free side of said outer annular flange at locations thereof alternately offset from one another in axial direction of said carrier wheel, said outer annular flange being formed, at said free side thereof, with an axial projection for every second one of said fuses.

4,007,390 BRUSHLESS D-C MOTOR

Rolf Muller; Georg Friedrich Papst, and Volker Schlicker, all of St. Georgen, Germany, assignors to Papst-Motoren KG, Germany

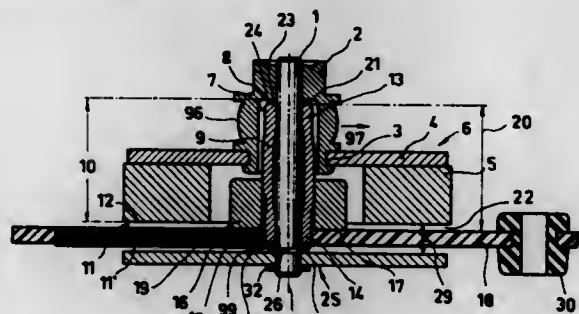
Filed July 26, 1974, Ser. No. 492,146

Claims priority, application Luxembourg, July 26, 1973, 68101

Int. Cl.² H02K 5/16

U.S. Cl. 310-90

13 Claims



1. Brushless D-C motor comprising: rigid flat stator plate, flat motor coils arranged on said stator plate, bearing tube, said stator plate being coaxial on said bearing tube, rotor shaft rotatably supported in said bearing tube by radial bearings at respective ends of said bearing tube, first and second rotor discs fixed to said rotor shaft at each end of said bearing tube, said first and second rotor discs being spaced to provide an air gap, said stator plate and motor coils extending into said air gap, at least one hub for rotatably supporting at least one of said first and second rotor discs, said hub including a bearing face for bearing against a first respective end of said bearing tube adjacent said one rotor disc, an axially magnetized permanent magnet fixed to at least one of said first and second rotor discs, and means connected at a predetermined axial position on said bearing tube for fixing said stator plate and motor coils to said bearing tube at said axial position within said air gap, said means having a portion secured to said stator plate, wherein said means for fixing said stator plate and motor

coils is a member having axial and radial thicknesses, said member having an aperture for insertion of said member onto said bearing tube, said portion securing said stator plate being a radial surface of said member, wherein said member is connected to said bearing tube by means of a press fit, and wherein said stator plate is secured to said radial surface of said member by means of rivets extending through said stator plate and said member in the axial direction.

4,007,391 IGNITERS

Peter D. Baker, Basingstoke, England, assignor to Smiths Industries Limited, London, England

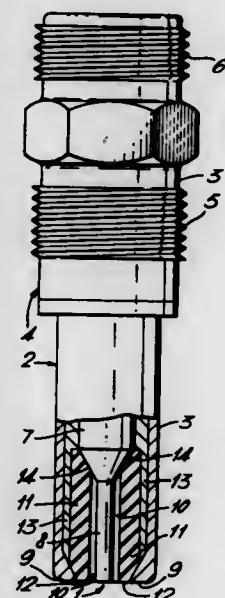
Filed Nov. 4, 1975, Ser. No. 628,639

Claims priority, application United Kingdom, Nov. 4, 1974, 47661/74

Int. Cl.² H01T 13/02

U.S. Cl. 313-131 A

12 Claims



1. In an igniter in which semiconductive material is interposed between two electrodes to provide at the operative tip of the igniter an exposed semiconductive surface across which electrical discharge between the electrodes takes place in operation, the improvement wherein one of the electrodes is separated by a gap from the semiconductive surface, and said one electrode is connected to the semiconductive material at the bottom of the gap away from said tip.

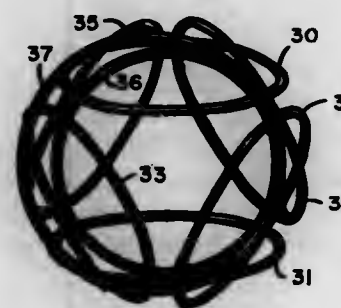
4,007,392
MAGNETIC WELL FOR PLASMA CONFINEMENT
August Valfells, Ames, Iowa, and Ya-Chang Chiu, Madison, Wis., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Apr. 16, 1974, Ser. No. 461,345

Int. Cl.² H01J 1/50; G21B 1/00

U.S. Cl. 313-154

16 Claims



1. Apparatus for forming a magnetic well for plasma confinement comprising a plurality of at least four current-carry-

ing loops arranged such that each loop lies in a plane corresponding generally to one facet of a substantially regular polyhedron, the magnitude and direction of current flow in said loops being such as to minimize the magnetic field at the center of said polyhedron when all current loops are energized.

4,007,393 BARIUM-ALUMINUM-SCANDATE DISPENSER CATHODE

Antonius Johannes Albertus van Stratum; Johannes Gerardus van Os; Johannes Reinier Blatter, and Pieter Zalm, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

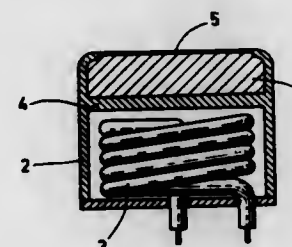
Filed Dec. 2, 1975, Ser. No. 636,931

Claims priority, application Netherlands, Feb. 21, 1975, 7502052

Int. Cl.² H01J 1/14, 19/06

U.S. Cl. 313-346 R

8 Claims



1. A dispenser cathode comprising a porous metal body which has an emissive surface and the pores of which contain compounds for dispensing when heated at least barium and scandium to the emissive surface, said compounds comprising at least barium oxide, scandium oxide and aluminum oxide wherein the total quantity of rare earth oxides present including scandium oxide being less than 10% by weight of the overall quantity of the dispensing compounds.

4,007,394
ALKALI METAL ALKALINE EARTH METAL SULFATE
PHOSPHOR ACTIVATED WITH CERIUM AND TERBIUM
AND LAMP CONTAINING SAME

Jacob G. Rabatn, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,643

Int. Cl.² C09K 11/46; H01J 61/44

U.S. Cl. 313-486

6 Claims

1. A luminescent material comprising crystals of:

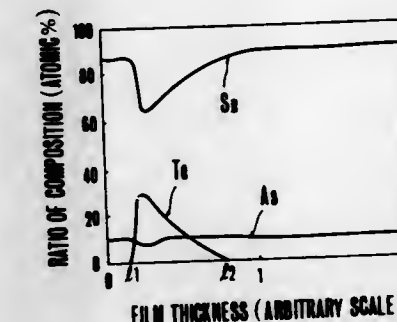


wherein M = Lithium or sodium

$$\begin{aligned} w &= y + z \\ x &= 1 - (w + y + z) > 0.3 \\ y &= 0.05 \text{ to } 0.25 \\ z &= 0.05 \text{ to } 0.20 \end{aligned}$$

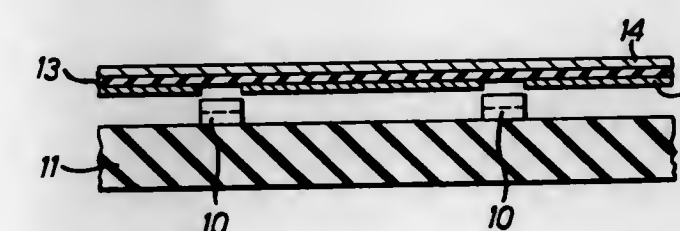
said material exhibiting relatively high quantum efficiencies for emissions in the visible green spectral region, when excited by 2537A radiation

4,007,395
TARGET STRUCTURE FOR USE IN
PHOTOCONDUCTIVE IMAGE PICKUP TUBES
Yasuhiko Nonaka, Mobara; Naohiro Goto, Machida, and Keiichi Shidara, Tama, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan
Filed May 23, 1975, Ser. No. 580,473
Claims priority, application Japan, June 21, 1974, 49-70214
Int. Cl.² H01J 29/45, 31/38
U.S. Cl. 313-386
14 Claims



1. In a target structure for use in a photoconductive image pickup tube of the type comprising a transparent substrate, an N-type transparent conductive film deposited on the rear side of said substrate, and a P-type photoconductive film deposited on the rear side of said N-type transparent conductive film via heterogeneous junction surface and containing at least selenium and tellurium as an intensifier, the improvement wherein the thickness of the intensifier containing portion of said P-type photoconductive film is made to be within a predetermined range between 500 to 5000 Å, said range smaller than the total thickness of said P-type photoconductive film and the starting point of said intensifier containing portion is positioned in a prescribed range of 80 to 1500 Å as measured in the direction of thickness of said P-type photoconductive film from said heterogeneous junction surface between said P-type photoconductive film and said N-type conductive film.

4,007,396
LIGHT EMISSIVE DIODE DISPLAYS
Philip Henry Wisbey, Colchester, and Paul Kevin Kimber, Bishop's Stortford, both of England, assignors to The Marconi Company Limited, Chelmsford, England
Filed Nov. 3, 1975, Ser. No. 628,224
Claims priority, application United Kingdom, Nov. 6, 1974, 47930/74
Int. Cl.² A47B 88/00, 95/00
U.S. Cl. 313-500
8 Claims



1. A light emissive diode display comprising, in combination: a base having a plurality of light emissive diodes carried thereby; a mirror finished conductive layer covering most of the area surrounding said light emissive diodes; and circular polarizer means overlying said base for allowing light emitted by said diodes to pass therethrough for viewing; said conductive layer having the characteristic of reversing the handedness of light reflected therefrom whereby light passing through said circular polarizer means and having

one handedness imparted thereto will upon reflection by said conductive layer have a handedness opposite to said one handedness such that the reflected light will not pass back through the circular polarizer means.

4,007,397

ARC DISCHARGE LAMP WITH STARTER ELECTRODE VOLTAGE DOUBLING

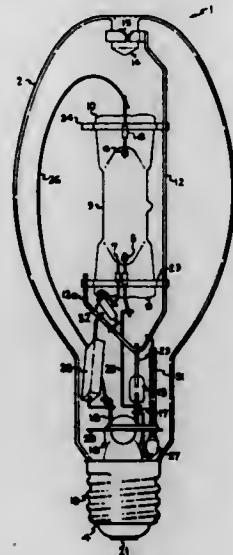
William H. Lake, Novelty, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,505

Int. Cl.² H05B 41/22

U.S. Cl. 315-51

11 Claims



1. A high intensity arc discharge lamp comprising:
 - a vitreous arc tube containing an ionizable medium and having main electrodes sealed into opposite ends plus a starter electrode adjacent to the main electrode at one end;
 - an outer envelope enclosing said arc tube and having a stem at one end with inleads sealed therethrough;
 - a base attached to said outer envelope and having input terminals, said inleads being connected exteriorly to said input terminals and interiorly to said main electrodes;
 - a mount comprising at least one conductor extending through said envelope, said mount having attachments to said arc tube for supporting it;
 - a voltage doubling circuit comprising a diode and a capacitor connected in series across said input terminals and having their junction connected to said mount conductor;
 - said diode being poled to generate a positive potential at mount conductor member whereby to oppose positive ion electrolysis through the walls of said arc tube;
 - and a connection between said junction and said starter electrode serving to apply a positive bias thereto to facilitate starting.

4,007,398

AUTOMATIC CONTROL DEVICE FOR AN ELECTRONIC FLASH APPARATUS

Zenzo Nakamura, Urawa; Shobei Ohtaki, Machida; Takashi Uchiyama, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 604,954

Claims priority, application Japan, Aug. 27, 1974, 49-98657

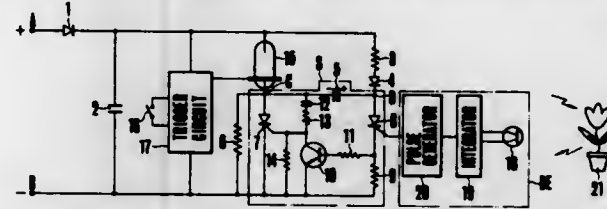
Int. Cl.² H05B 41/32

U.S. Cl. 315-151

15 Claims

1. An automatic control device for an electronic flash apparatus comprising:
 - a. detecting means including photosensitive means and producing a first control signal in response to a predetermined amount of light incident on said photosensitive means;
 - b. storage capacitor means;

- c. first switching means including a control electrode and two main current carrying electrodes having an anode electrode and a cathode electrode;
- d. a flash tube connected in series to said first switching means, said flash tube and first switching means constituting a circuit which is connected to said storage capacitor;
- e. means for firing said flash tube;
- f. a reverse voltage circuit including commutation capacitor means and second switching means being actuable to a closed condition in response to said first control signal and connected in series to said commutation capacitor



means across the main electrodes of said first switching means, the reverse voltage circuit applying a reverse voltage between the main electrodes of said first switching means;

- g. voltage generating means connected to said reverse voltage circuit and producing a second control signal in response to the closing of said second switching means; and
- h. shunt circuit means having an input terminal connected to said voltage generating means and responsive to said second control signal for short-circuiting the control electrode and cathode of said first switching means.

4,007,399

FLASHING CIRCUITRY

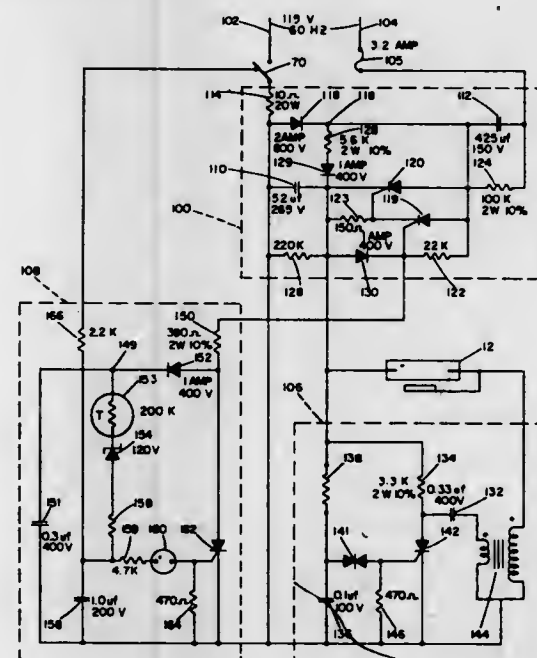
Roby B. White, Cumberland, R.I., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed June 5, 1975, Ser. No. 584,041

Int. Cl.² H05B 41/34

U.S. Cl. 315-241 R

4 Claims



1. A circuit for operation in conjunction with a source of alternating current to deliver a pulse rich in ultraviolet light relative to the total energy of the pulse, comprising:

- a first, larger, capacitor;
 - a second, smaller, capacitor;
 - a flash tube having an extinction voltage;
 - a third, trigger, capacitor;
 - timing means;
 - switching means; and
 - a reference junction;
- said first capacitor being connected to be charged by said

source during a first portion of a cycle thereof, and to discharge into said second and third capacitors; said second capacitor being connected to be charged also by said source during a second portion of a cycle thereof, and to discharge through said tube upon triggering thereof;

said trigger capacitor being discharged by said timing means, to fire said flash tube;

said reference junction having a voltage the instantaneous sum of line and that across said first capacitor;

said switching means connecting said first and second capacitors when the voltage at said reference junction exceeds the voltage at said second capacitor; and

said timing electronically reacting to discharge said trigger capacitor at a time when said reference junction has a voltage low relative to said extinction voltage.

4,007,400

DEFLECTION SYSTEM FOR CATHODE RAY OSCILLOSCOPE

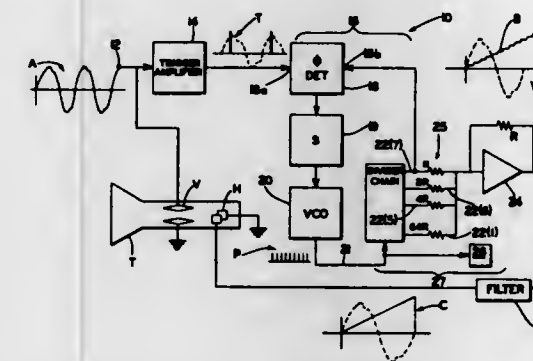
John F. Sutton, 4412 Greenwood Road, Beltsville, Md. 20705

Filed Mar. 11, 1975, Ser. No. 557,439

Int. Cl.² H01J 29/70, 29/72

U.S. Cl. 315-364

7 Claims



1. Automatic self-adjusting deflection system for displaying an integral number of cycles of an external input signal, independent of the frequency of the external input signal comprising:

- an x-y display means having a first deflection input responsive to the external input signal for displaying the external input signal on said display means;
- means synchronized to a particular recurring portion of the external input signal for generating trigger pulses;
- phase locked loop means synchronized to the trigger pulses, including binary divider means for causing said loop means to generate pulses having a repetition rate that is an integral multiple of a repetition rate of the trigger pulses;
- means for converting the loop generated pulses to a constant maximum amplitude and uniform staircase signal having a period equal to a duration of the displayed number of cycles of the external input signal, said converting means including a ripple counter having an R-2R ladder circuit connected to an output of said binary divider means; and
- means for supplying said uniform staircase signal to a second deflection input of said display means.

4,007,401

CURRENT SENSITIVE CIRCUIT PROTECTION SYSTEM

Donald S. Kimmel, Monroeville; Wardell Gary, and Glenn R. Taylor, both of Beaver, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

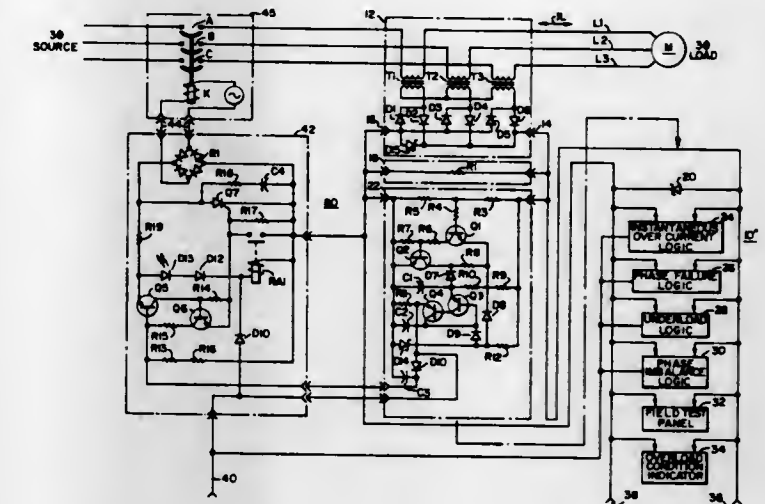
Filed Sept. 9, 1974, Ser. No. 504,405

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² H02H 3/08, 7/08

U.S. Cl. 317-36 TD

11 Claims



1. An electrical circuit protecting device, comprising:
 - sensor means for sensing circuit current in an electrical circuit, said sensor means having an output for providing an output current related to said circuit current;
 - replaceable load resistor means connected to said output of said sensor means for converting said output current into a voltage the value of which is variable within a predetermined voltage range for a predetermined range of said circuit current;
 - a replaceable module connected in parallel circuit relationship with said load resistor means, said module being capable of initiating a circuit breaker trip function, said module being operable over said predetermined range of said voltage; and
 - circuit breaker trip means connected to said module for opening said electrical circuit when said trip function occurs in said module.

4,007,402

THREE PHASE FULL WAVE RECTIFIER ASSEMBLY

Maurice James Allport, West Midlands, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

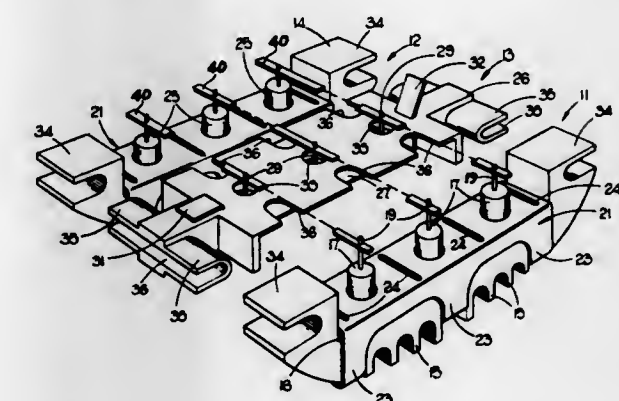
Filed May 29, 1975, Ser. No. 581,882

Claims priority, application United Kingdom, June 8, 1974, 25550/74

Int. Cl.² H01L 23/40

U.S. Cl. 317-100

2 Claims



1. A three phase full wave rectifier assembly including first and second sub-assemblies each including three semi-conduc-

tor diodes and an electrically conductive heat sink, the three diodes of the first sub-assembly being secured to the first heat sink with, their anodes electrically connected thereto, by means of a common clip which engages the heat sink, there being resilient means acting between the clip and the diodes to urge the diodes firmly into contact with the heat sink, the second sub-assembly being constructed in a manner similar to said first sub-assembly but with the cathodes of the diodes thereof electrically connected to the heat sink, and three phase connectors, each connector being electrically connected to a cathode of a diode of the first sub-assembly and an anode of a diode of the second sub-assembly.

4,007,403 CIRCUIT CARD GUIDE

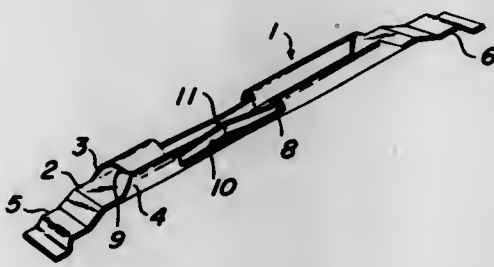
L. Gail Fiege, c/o Trio Metal Co., Falls & Clarkview Roads, Baltimore, Md. 21209

Filed Dec. 15, 1975, Ser. No. 640,709

Int. Cl.² H02B 1/02

U.S. Cl. 317-101 DH

8 Claims



1. A circuit card guide comprising an elongated channel-shaped member, the channel being defined in part by a base and by an upstanding sidewall extending substantially perpendicularly from said base, the upper reach of said sidewall remote from said base extending inwardly over said base in a reentrant bend, a downwardly disposed lip extending from said reentrant bend toward and terminating in spaced relationship from said base, said lip defining one side of a track for receiving a circuit card, at least one portion of said reentrant bend being cut away, the portion of said lip which is contiguous to said cut away portion of said reentrant bend being continuous and having a portion displaced inwardly of said track to form a leaf spring having a surface for resilient engagement with a circuit card disposed in said track.

4,007,404

HIGH GAIN RELAYS AND SYSTEMS

Ernest M. Jost, Plainville; Lyle E. McBride, Jr., Norton, and Teuvo J. Santala, Attleboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 431,539, Jan. 7, 1974, which is a division of Ser. No. 351,683, April 16, 1973. This application Apr. 11, 1975, Ser. No. 567,152

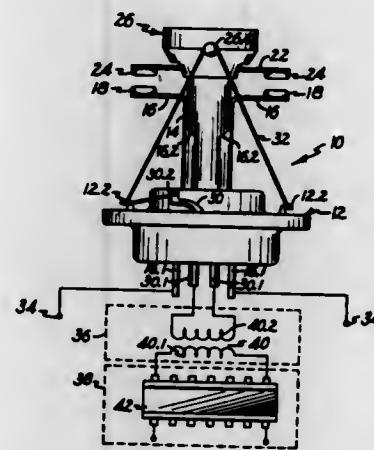
Int. Cl.² H01H 47/00

U.S. Cl. 317-123

3 Claims

1. A relay system comprising a relay operable at the low power levels used in energizing integrated circuits having an insulating base, stationary contact means mounted on said base, movable contact means mounted on said base for movement between a closed circuit position engaging said stationary contact means and an open circuit position spaced from said stationary contact means, spring means mounted on said base biasing said movable contact means from one of said positions to the other of said positions, and a metal wire secured between said movable contact means and said base, said wire being of a selected metal alloy to be deformed from an original length to a second length by said spring bias as said movable contact means is moved from said one position to said other position by said spring bias while said alloy displays a relatively low modulus of elasticity below a transition temperature and to abruptly return to said original length and to

display a relatively higher modulus of elasticity to move said movable contact means back to said one position against said spring bias with a force of at least 15 grams when said wire is heated to said transition temperature, said wire having a selected cross-sectional size and length to be heated from room temperature to said transition temperature by passing electric



cal current through said wire with a power input of less than about 2 watts for permitting operation of said relay with a gain of at least about 500 to 1 at power levels used in energizing integrated circuits; a power source for directing relay energizing electrical current through said relay wire; and means matching the impedance of said power source and relay wire.

4,007,405

VENT FOR ELECTROLYTIC CAPACITOR HOUSING
Andries Cornelis Mijers, Eindhoven, and Hendrik Voeten, Zwolle, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 511,663, Oct. 3, 1974, abandoned.

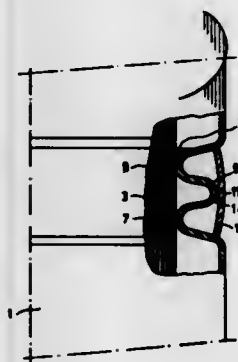
This application Jan. 2, 1976, Ser. No. 645,934

Claims priority, application Netherlands, Oct. 15, 1973, 7314130

Int. Cl.² H01G 9/00, 9/16; B01J 17/00

U.S. Cl. 317-230

1 Claim



1. In a capacitor the combination comprising:
a capacitor element;

a metal housing of said capacitor element including two parallel rills extending peripherally around at least a first portion of said housing and formed in a direction interior of said housing, thereby forming two troughs with respect to the exterior of said housing, and a ridge extending circumferentially around at least a second portion of said housing intermediate said two rills and extending in a direction substantially radial to said housing to a point not greater than the extended cylindrical surface of said housing, said ridge being provided with openings therein at the apex of said ridge and spaced apart from said capacitor element for preventing closing of said openings by said capacitor element; and

an elastic band extending peripherally around said housing for sealing said openings, said band having a width exceeding the distance between said two troughs formed by

said two parallel rills, and having a concave cross-section with respect to said capacitor element.

4,007,406

HIGH PRESSURE, GAS FILLED, VARIABLE ELECTRICAL PARAMETER DEVICE

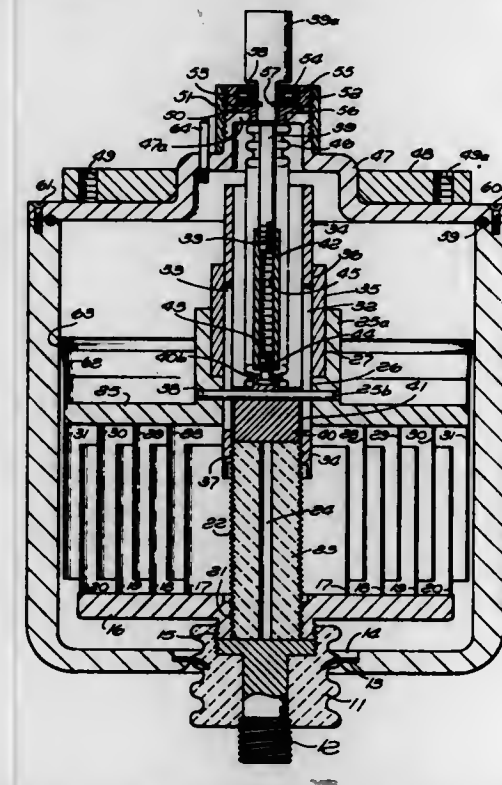
Marvin A. Weisbrod, Santa Clara, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,970

Int. Cl.² H01G 5/14

U.S. Cl. 317-245

10 Claims



1. An enclosed, gas-filled, variable capacitor of generally cylindrical shape and including a set of fixed capacitor plates and a set of movable plates interleaving said fixed plates, and first means for varying the amount of said interleaving to vary the capacitance thereof, comprising:

a metallic enclosure having said generally cylindrical shape and first and second end faces;

an extendable and compressible metallic bellows extending from said enclosure first end internally within said enclosure and being connected at its internal end to said movable plate set, said first means being arranged to operate within said bellows to effect variation in the interleaving of said plate sets while maintaining said enclosure sealed; sliding contact means operative over at least a portion of the inside surface of said enclosure in cooperation with said movable plate set to provide a substantially continuous electrical continuity between said enclosure and said movable plates;

and second means at said second enclosure end for insulatingly mounting said fixed plate set, said second means including a feed-through insulator having a metallic stud passing through and sealed into the body of said insulator to provide fixed mechanical support for said second plate set and external electrical connection thereto insulated from said enclosure, said insulator body and said stud projecting partly within said enclosure and partly without.

4,007,407

TURBO-ELECTRIC MARINE POWER PLANT AND METHOD OF REGULATING THE SAME

Klaus Kranert, Hamburg, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

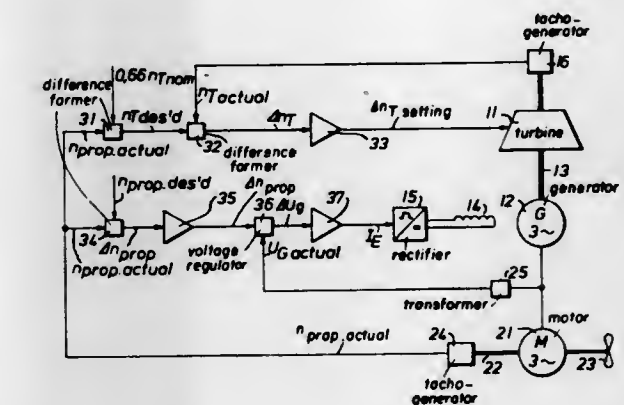
Filed Oct. 24, 1974, Ser. No. 517,651

Claims priority, application Germany, Oct. 27, 1973, 2353974

Int. Cl.² H02P 9/00

U.S. Cl. 318-147

12 Claims



7. A control circuit for a turbo-electric marine power plant which has an rpm-regulatable heavy gas turbine constituting the prime mover of the power plant; a propulsion generator mechanically connected to the turbine and having a field winding; a propulsion motor electrically connected to the propulsion generator; a propeller shaft driven by the propulsion motor; and a fixed propeller affixed to the propeller shaft; comprising in combination:

- a first sensor means operatively connected to said turbine for responding to the actual turbine rpm and for emitting a first signal representing the actual turbine rpm;
- a second sensor means operatively connected to said propeller shaft for responding to the actual propeller rpm and for emitting a second signal representing the actual propeller rpm;
- a first regulator means operatively connected to said second sensor means for receiving said second signal and for emitting a third signal as a function of said second signal, said third signal representing the desired turbine rpm; and
- a second regulator means operatively connected to said first sensor means and to said first regulator means for receiving said first and third signals, respectively; said second regulator means emitting a fourth signal as a function of said first and third signals, said fourth signal representing the turbine rpm regulating signal; said second regulator means being operatively connected to said turbine for regulating the turbine rpm as a function of said fourth signal.

4,007,408

APPARATUS FOR SYNCHRONIZATION OF A MOTOR
Jean-Claude Berney, 3, Chemin des Crolx-Rouges, Lausanne, Switzerland

Filed Feb. 4, 1975, Ser. No. 546,889

Claims priority, application Switzerland, Feb. 13, 1974, 1990/74

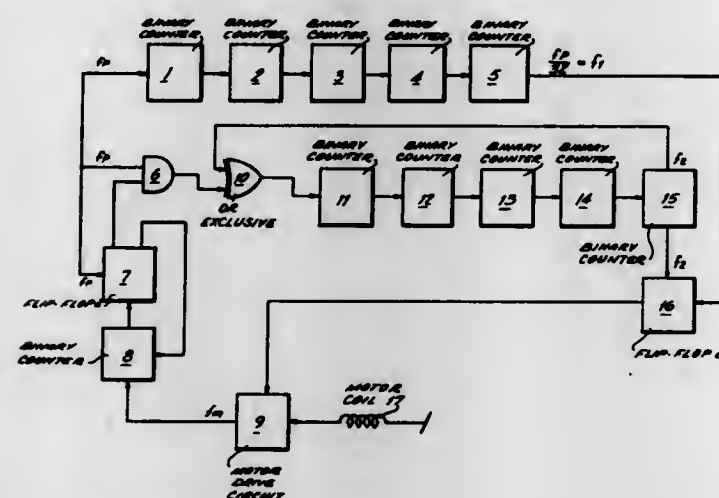
Int. Cl.² H02P 7/36

U.S. Cl. 318-314

10 Claims

1. Apparatus for synchronizing the speed of a motor to a given precise frequency f_p , the motor having a drive circuit which furnishes the motor with the necessary energy for its rotation, the motor delivering a frequency f_m proportional to its speed, said apparatus comprising a divider by x having an input receiving a signal of frequency f_p and an output at which is produced a signal with a frequency f_p/x , a second divider of $x + \alpha$ having an input receiving signals of frequency $f_m + \alpha y$, said second divider having an output at which is produced a signal with a frequency $f/2$, a phase comparator having two states, one of coincidence, the other of non-coincidence, said phase comparator having a first input connected to the output

of the first divider and a second input connected to the output of the second divider, said phase comparator having an output connected to the motor drive circuit to interrupt or re-establish the distribution of energy to the motor according to



whether the output of the phase comparator is in one state or the other to maintain f_2 equal and in phase with f_1 and synchronizing f_m to a mean value of f_p/xy , wherein α , x , and y are whole numbers.

4,007,409

METHOD OF AND DEVICE FOR CONTROLLING A D.C. WASHING MACHINE MOTOR

Yves Albert Thibaut, Amiens, France, assignor to U.S. Philips Corporation, New York, N.Y.

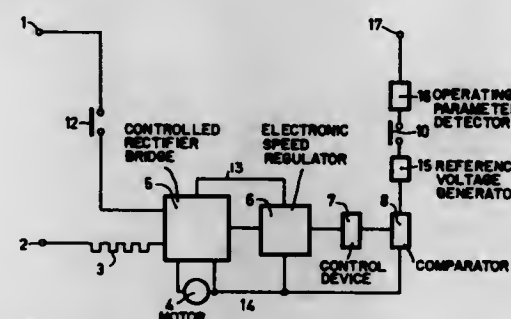
Filed Dec. 6, 1974, Ser. No. 530,168

Claims priority, application France, Dec. 10, 1973, 73.43905

Int. Cl.² G05B 1/00

U.S. Cl. 318-459

6 Claims



1. A method of controlling a d.c. motor of a washing machine in dependence on motor speed and at least one other parameter, by energizing a motor from a controlled rectifying bridge circuit supplied from an alternating current source; supplying a control signal to said bridge circuit from an electronic speed regulator; generating a motor stop signal in a comparator by comparing a back-e.m.f. signal from the motor with a reference voltage from a reference voltage generator; and applying a motor de-energize signal to said regulator in response to a low speed condition and in response to a given other condition; wherein said step of applying a de-energizing signal in response to a given other condition comprises detecting said given other condition and controlling a switch contact responsive to said given condition, and supplying alternating current power to said reference voltage generator from said alternating current source through said switch contact.

4,007,410 NUMERICAL CONTROL PULSE DISTRIBUTION SYSTEM

Yoshihiro Hashimoto, Yokohama, and Kengo Kobayashi, Kawasaki, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

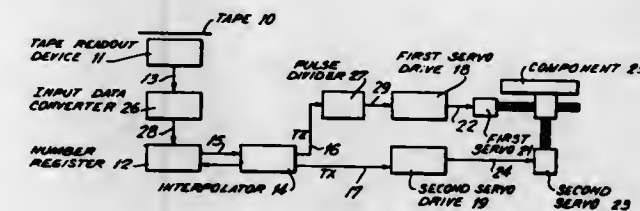
Continuation of Ser. No. 113,091, Feb. 5, 1971, abandoned.

This application Sept. 26, 1972, Ser. No. 291,047

Int. Cl.² G05B 19/24

U.S. Cl. 318-571

4 Claims



1. A numerical control pulse distribution system for moving a component in directions of first and second axes in accordance with first and second numerical data comprising a source of instructions for moving the component in direction of both axes with first and second numerical data indicated by a desired number of pulses; converting means connected to said source for converting the first and second numerical data to third and fourth numerical data indicated by a number of pulses based upon minor resolution; interpolator means coupled to said converting means and having first and second channels corresponding to the first and second axes, respectively, for distributing pulses depending upon the third and fourth numerical data thereon; first feeding means for displacing the component in a direction of the first axis by constant major resolution; second feeding means for displacing the component in a direction of the second axis by minor resolution, the constant minor resolution having a predetermined ratio to the major resolution; a first pulse operated motor included in the first feeding means connected to the first channel of the interpolator means for rotating the first feeding means a predetermined angle per pulse; dividing means coupled between the first channel of the interpolator means and the first pulse operated motor for reconverting the number of pulses distributed on the first channel of the interpolator means to a lesser number of pulses; and a second pulse operated motor included in the second feeding means coupled to the second channel of the interpolator means for moving said component in directions of the second axis in minor resolution.

4,007,411

CUTTING FEED STARTING POSITION CONTROL DEVICE FOR MACHINE

Kojiro Saito, Showa, Japan, assignor to Yutaka Seimitsu Kogyo Ltd., Yono and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

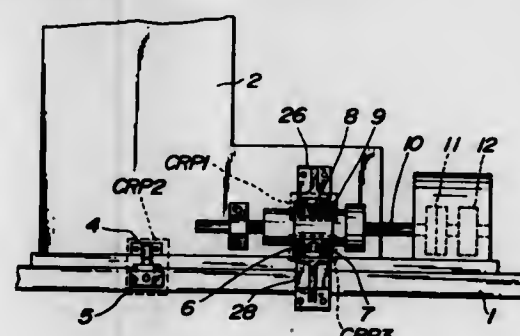
Filed Sept. 19, 1974, Ser. No. 507,552

Claims priority, application Japan, Sept. 19, 1973, 48-105565; Sept. 19, 1973, 48-105566

Int. Cl.² G05B 11/01

U.S. Cl. 318-630

2 Claims



1. A cutting feed starting position control device for numerically controlled machine tools comprising a stationary bed, a

tool carrying column movable thereon, means for dressing said tool after it has become blunt, a movable original position mechanism which can keep its moved position in a constant positional relation to said column to compensate the dimensional difference resulting from said dressing, a magnetic switch means consisting of a first and second part such as a magnetic body and a sensor, said first part mounted on said mechanism and the second part mounted on said column whereby said column can be returned to the position of said mechanism by utilizing a difference between output voltage curves of said switch means resulting from a difference in direction of movement of said column due to hysteresis of said switch means to cancel back-lash between moving parts, second magnetic switch means consisting of a third and fourth part such as a magnetic body and a sensor, said third part mounted on said bed and the fourth part mounted on said mechanism whereby said mechanism can be returned to the position of said third part, and third magnetic switch means consisting of a fifth and sixth part such as a magnetic body and a sensor, said fifth part mounted on said bed and the sixth part mounted on said column whereby after said column has been returned over said fifth part and said mechanism located in the position of said fifth part, said column can be moved forwardly with said mechanism and then can be stopped at the feed starting original position.

4,007,412

COMBINED MEANS FOR SENSING AN INERTIAL CONDITION AND FOR PROVIDING TORQUING AND DAMPING FUNCTIONS

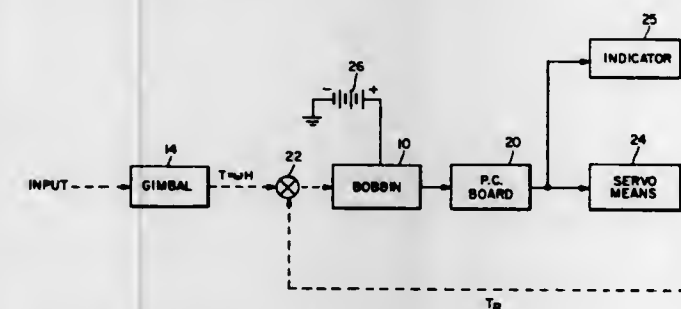
Gunnar J. Vold, Mahwah, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 25, 1974, Ser. No. 454,335

Int. Cl.² G05B 11/01

U.S. Cl. 318-676

6 Claims



1. For use with an inertial sensing device, combined means for providing sensing, torquing and damping functions, comprising:

means coupled to the sensing device and displaced about an axis in response to a sensed condition; circuit means arranged in capacitance relation to the displaced means, and displacement of the displaced means relative to the circuit means changing the capacitance as a function of the sensed condition; first magnet means; second magnet means carried by the displaced means and interacting with the first magnet means for providing a force which displaces the displaced means relative to the first magnet means to develop a restoring torque about the axis; the displacement of the displaced means relative to the first magnet means providing a damping effect; the means coupled to the sensing device and displaced about an axis in response to a sensed condition includes an arm coupled to the sensing device and a cap shaped member supported at the end of the arm; the circuit means is supported in spaced relation to the cap shaped member; the first magnet means includes a permanent magnet, with the cap shaped member surrounding in spaced relation at least a part of the permanent magnet; and

the second magnet means includes a coil wound on the cap shaped member and means for energizing the coil.

4,007,413

CONVERTER UTILIZING LEAKAGE INDUCTANCE TO CONTROL ENERGY FLOW AND IMPROVE SIGNAL WAVEFORMS

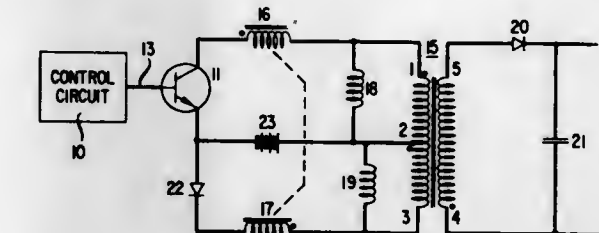
Phil Dewey Fisher, Millington, and Richard Howard Hock, Landing, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1975, Ser. No. 638,315

Int. Cl.² H02M 3/335

U.S. Cl. 321-2

9 Claims



1. A converter circuit comprising:

a power transformer being constructed to have significant leakage inductance between a primary and a secondary winding, said leakage inductance having a reactance magnitude at least one-half the reactance of said primary winding, means for accepting a voltage source, a switching device to couple said means for accepting a voltage source to said primary winding, a unidirectional conducting device connected to said secondary winding and poled to conduct in response to conduction in said switching device, and means for periodically resetting said leakage inductance comprising a second primary winding tightly coupled to said primary winding and connected to a second unidirectional conducting device poled to conduct in response to a termination of conduction in said switching device whereby current continues to flow in said first unidirectional conducting device in response to conduction in said second unidirectional conducting device in order to control a slope of decay of current in said secondary winding when said switching device ceases conduction.

4,007,414

CURRENT TRANSDUCER ARRANGEMENT

Selya Shima, Katsuta, and Korefumi Tashiro, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed July 9, 1975, Ser. No. 594,252

Claims priority, application Japan, July 12, 1974, 49-79181

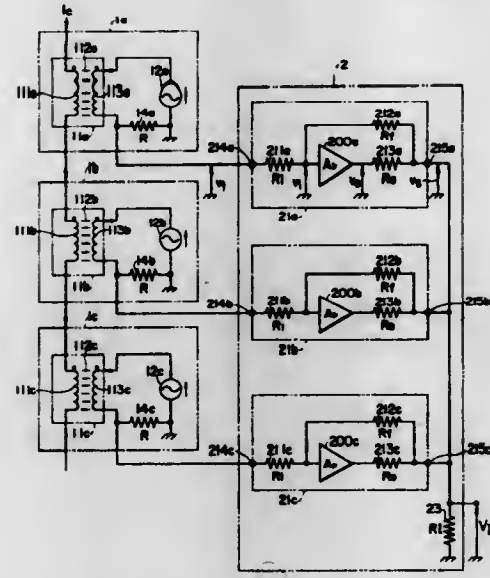
Int. Cl.² G01R 19/00

U.S. Cl. 323-6

13 Claims

1. A current transducer arrangement for detecting the magnitude and polarity of a large current, comprising: at least three current transducers each of which includes a. a reactor having a saturable core, and b. means for supplying an alternating voltage to said reactor; and

a majority circuit which outputs a voltage proportional to a



4,007,415

CONSTANT VOLTAGE GENERATING CIRCUIT

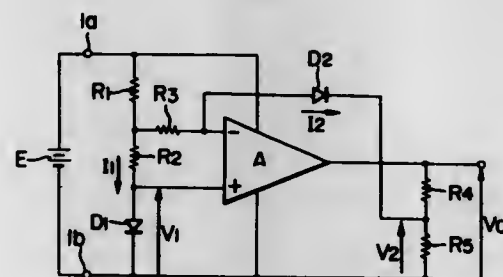
Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,532

Claims priority, application Japan, Dec. 26, 1974, 49-148387

Int. Cl.² G05F 1/46

U.S. Cl. 323-19



1. In a constant voltage generating circuit which converts power source voltage to a constant voltage, the improvement comprising:

- a pair of first and second input terminals, to which power source voltage is applied
- an operational amplifier (OP hereafter) having an output terminal supplying the constant output of the constant voltage generating circuit and two input terminals;
- a first resistor element connected between the first input terminal and one input terminal of OP;
- a second resistor element connected between the first input terminal and the other input terminal of OP; and
- a pair of first and second logarithmic conversion elements generating voltage which is logarithmically proportional to current flowing in itself, the first logarithmic conversion element being connected between the first input terminal of OP and output terminal of OP and the second logarithmic conversion element being connected between the other input terminal and second input terminal of constant voltage generating circuit.

VOLTAGE REGULATING TRANSFORMER

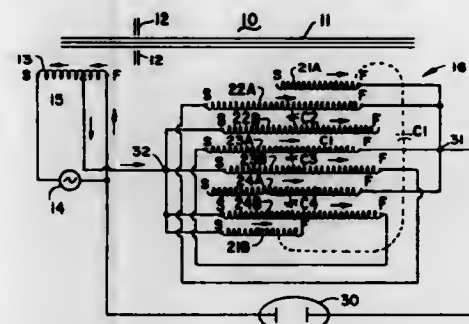
Gabor Szatmari, 203 W. 16th St., Lumberton, N.C. 28358

Filed Aug. 6, 1975, Ser. No. 602,265

Int. Cl.² H01F 15/14; H05B 41/04

U.S. Cl. 323-60

18 Claims



1. A voltage regulating transformer having load terminals for transferring power from an alternating current source to a load, comprising in combination:
 - a magnetic core;
 - a primary winding connectable to the alternating current source and wound about said magnetic core for inducing an alternating magnetic flux therein;
 - a secondary winding comprising a plurality of paired sectioned windings being wound around and responsive to said magnetic flux in said magnetic core;
 - means establishing capacitance between said plurality of paired sectioned windings;
 - means connecting said secondary winding to the load terminals;
 - and means for modifying said alternating magnetic flux in said magnetic core by harmonic magnetic flux to reinforce the magnetic flux therein at least during a portion of each cycle producing a greater output voltage to the load terminals.

4,007,417

THIN FILM MAGNETOMETER USING AN ORTHOGONAL FLUX GATE

Shinjiro Takeuchi; Satoshi Ichioke; Masaki Shirotsuka, all of Toda, and Tadashi Inoue, Tokyo, all of Japan, assignors to Mishima Kosen Co., Ltd., Kitakyushu, Japan

Continuation-in-part of Ser. No. 319,707, Dec. 29, 1972, abandoned. This application June 14, 1974, Ser. No. 479,573

Claims priority, application Japan, Oct. 2, 1972, 47-98833

Int. Cl.² G01R 33/04

U.S. Cl. 324-43 R

1 Claim

1. A thin film magnetometer utilizing an orthogonal flux gate and a rotation magnetization mechanism, comprising:
 - an orthogonol flux gate comprised of a plated wire having a ferromagnetic material thin film having thereon a multi-magnetic domain structure with the easy magnetization axis of the respective magnetic domains in a Gaussian distribution within a range of several degrees around the mean easy magnetization axis and a sensing coil wound on said plated wire, said plated wire and said coil being a magnetic sensing element;
 - a current source having a sine waveform and coupled to the ends of said plated wire for exciting the ferromagnetic thin film thereon;
 - an amplitude difference detection circuit means coupled to the said sensing coil for detecting an difference between the positive and negative peak voltage values of the output of said sensing coil and producing an output indicative thereof;
 - control means operatively connected to the output of said amplitude difference detecting circuit means for producing an erasing current sufficient to erase the magnetic field at said flux gate; a feedback circuit having one end thereof coupled to the output of said control means for feeding back the output of said detection circuit means to said sensing coil;

indicating means consisting of a phase locked amplifier and an ammeter and coupled to the output of said control means and producing an indication of a sensed magnetic field, and

a DC current source connected to said flux gate for generating a magnetic field for erasing an external magnetic field unnecessary for measurement, whereby a micromagnetic field superimposed on an external magnetic field can be measured.

4,007,418

PERSONAL ELECTROSTATIC SAFETY MONITOR WITH INDUCTION PLATE SENSING MEANS

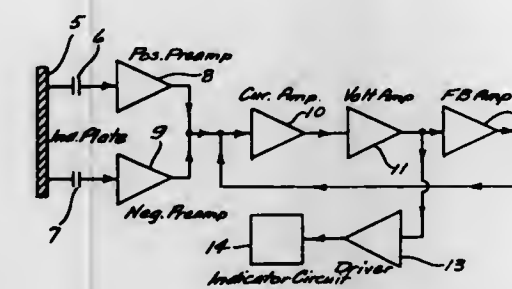
Harry A. Hanna, 3727 University, Apt. No. 2, Des Moines, Iowa 50311

Continuation-in-part of Ser. No. 250,736, May 5, 1972, Pat. No. 3,878,459. This application Apr. 11, 1975, Ser. No. 567,359

Int. Cl.² G01R 31/02, 19/16, 29/12; H05F 3/00

U.S. Cl. 324-72

1 Claim



1. A personal safety monitor for detecting the presence of an electrostatic field and for detecting the rate of transfer of said field from one object to another field, comprising,
 - an insulating housing and within said housing,
 - an induction plate means,
 - a positive charge transistor,
 - a negative charge transistor,
 - a first capacitor coupling said induction plate means with said positive charge transistor,
 - a second capacitor coupling said induction plate means with said negative charge transistor,
 - a current amplifier comprising a transistor coupled in Darlington fashion to said positive and negative charge transistors,
 - a voltage amplifier coupled to said current amplifier,
 - a feed-back amplifier coupled to said voltage amplifier, said feed-back amplifier also being coupled to the input of said current amplifier,
 - a driver stage coupled to said voltage amplifier, and in indicator circuit coupled to said driver stage and comprising a signal means which is energized upon said induction plate means being exposed to an electrostatic field above a predetermined threshold hazard value, the degree of capacitive coupling of said first and second capacitors to said induction plate means and the size and position of said induction plate means with respect to the remainder of said circuit, being such that the circuit is activated only above said predetermined threshold hazard value.

4,007,419

DIGITAL BICYCLE SPEEDOMETER-ODOMETER

Richard Jasmine, 3320 Delmonte Blvd., Space 43, Marina, Calif. 93933

Filed Oct. 2, 1975, Ser. No. 618,810

Int. Cl.² G01P 3/48

U.S. Cl. 324-166

10 Claims

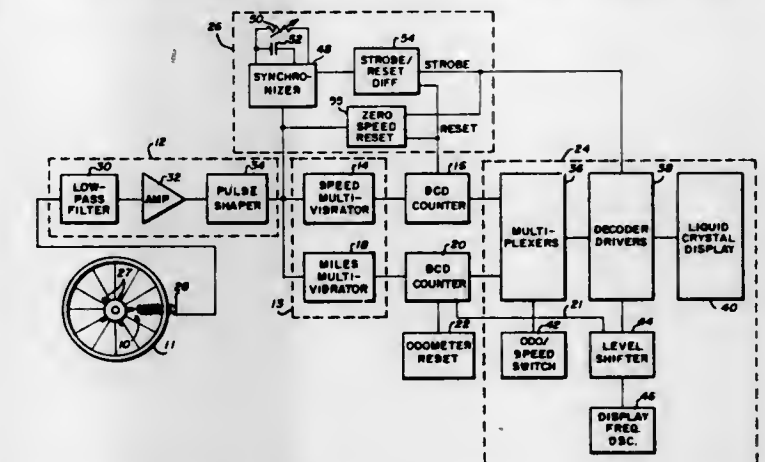
1. A combination speedometer/odometer apparatus for displaying the speed of a vehicle and the distance the vehicle has traveled comprising:

speed pick-up means for detecting the speed of the vehicle and for developing a first voltage signal including voltage spikes, said voltage spikes occurring at a frequency proportional to the speed of the vehicle;

pulse generating means responsive to said voltage spikes and operative to develop a voltage pulse time-coincident with each said spike, said pulses having a predetermined duration;

signal generating means responsive to said pulses and operative to develop a speed signal having a first plurality of bursts with a first plurality of voltage impulses, the number of said first bursts being proportional to the speed of the vehicle, and a distance signal having a second plurality of bursts with a second plurality of voltage impulses, the number of said second bursts being proportional to the total distance the vehicle has traveled;

gate means having a first input for receiving said pulses, a second input and an output, said gate means being operative to block said voltage pulse at said first input whenever a timing signal is present at said second input, and to



- pass said voltage pulse to said output in the absence of said timing signal;
- timing signal generating means responsive to the voltage pulse passed through said gate means and operative to develop said timing signal, said timing signal having a leading edge, a predetermined duration and a trailing edge;
- signal differentiator means responsive to said timing signal and operative to develop a reset signal coincident with said leading edge and a strobe signal coincident with said trailing edge;
- first counter means responsive to said reset signal and operative to count said first impulses;
- second counter means for counting said second impulses; and
- display means responsive to said strobe signal and operative to alternatively display the count outputs of said first and second counter means, the output of said first counter means being indicative of the speed of the vehicle and the output of said second counter means being indicative of the distance the vehicle has traveled.

4,007,420

DEVICE FOR MEASURING A NOCICEPTIVE REACTION OF LABORATORY ANIMALS

Jan Halek, and Jaroslav Jezdinsky, both of Olomouc, Czechoslovakia, assignors to Rektorat University Palackeho v Olomouci, Olomouc, Czechoslovakia

Filed May 8, 1975, Ser. No. 575,502

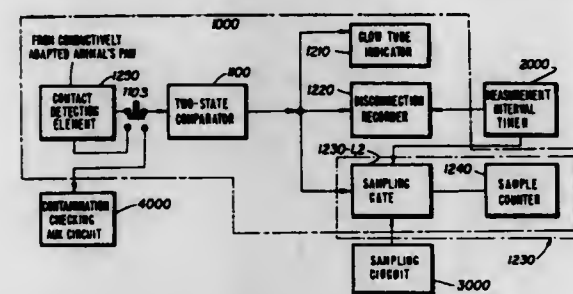
Int. Cl.² G04F 8/00

U.S. Cl. 324-181

4 Claims

1. In an apparatus for objectively determining a nociceptive reaction of a caged laboratory animal to an irritating stimulus applied to a first paw of the animal, wherein the reaction is manifested by lifting of the first paw from the base of the cage, the improvement wherein substantially the entire floor of the cage is formed from a planar array which comprises, in combi-

nation, a plurality of parallel, dielectrically spaced elongated conductors, the spacing between adjacent ones of the conductors being selected to provide contact between the paw and a pair of adjacent conductors except when the paw is lifted from the floor, first and second mutually insulated bus bars, means for connecting alternate ones of the conductors to the first bus bar, and means for connecting the remaining conductors to the second bus bar; wherein an electroconductive layer is applied over the plantar surface of the first paw whereby the contact of the first paw with the floor normally connects the first and second bus bars through a high-conductivity path, the first and second bus bars being disconnected from each other



when the first paw is lifted from the floor; and wherein the apparatus further comprises, in combination, two-state comparator means having an output normally in a first state and operable into a second state upon a prescribed change of state at its input, means for coupling the first and second bus bars to the input of the comparator means for operating the comparator means from its first state to its second state when the first and second bus bars are disconnected, the comparator means reverting to its first state when the bus bars are reconnected, and first means operable over a selected first interval and coupled to the output of the comparator means for measuring the total time over which the comparator means output is in its first state over the first interval.

4,007,421

CIRCUIT FOR ENCODING AN ASYNCHRONOUS BINARY SIGNAL INTO A SYNCHRONOUS CODED SIGNAL

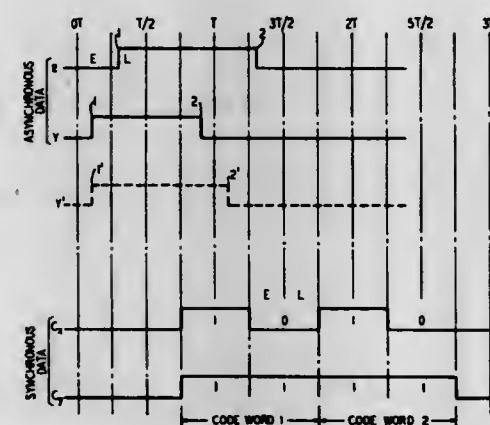
Monte Deh Lien, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1975, Ser. No. 607,456

Int. Cl.² H04L 27/02

U.S. Cl. 325—38 R

10 Claims



1. In a circuit for encoding transitions in an asynchronous binary signal into synchronous code words, means for examining successive intervals of the asynchronous binary signal for the occurrence of transitions, and means responsive to the occurrence of a first transition within an interval for generating a first code word to indicate the occurrence of the first transition within the interval of actual occurrence, characterized in that the generating means further includes, means responsive to the occurrence of a second transition within the same interval for generating a second code

word to indicate the occurrence of the second transition within an interval immediately subsequent to the interval in which the second transition actually occurred.

4,007,422

METHOD AND APPARATUS FOR CALLING A GROUND STATION BY AN AIRCRAFT

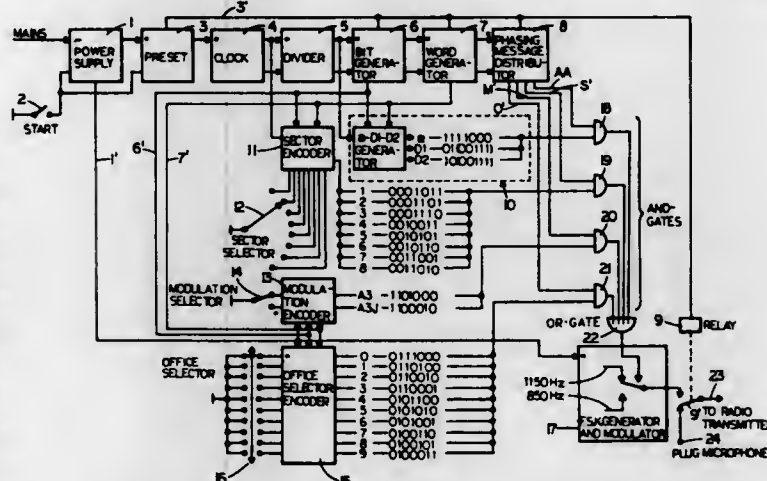
Herman da Silva, Voorburg, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posten, Telegrafie en Telefonie, The Hague, Netherlands

Continuation-in-part of Ser. No. 443,499, Feb. 19, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,225
Claims priority; application Netherlands, Sept. 4, 1973, 7312158

Int. Cl.² H04B 1/00

U.S. Cl. 325—55

17 Claims



1. A method for calling a receiving station by a mobile transmitting station comprising:

- generating multi-bit binary first calling code signals (α , D1, D2) indicating idle time signals and call number signals corresponding to numbered receiving stations,
- alternately transmitting for a predetermined number of cycles said idle time signals in one phase between alternate ones of said call number signals, said call number signals being transmitted in another phase,
- then generating multi-bit binary second message code signals (S, M, O) of the same number of bits per signal as said first code signals indicating the location of the mobile transmitting station, the mode of modulation of signals to be transmitted later and the call number of the receiving station, and
- transmitting each of the second code signals twice in succession but in alternate phases and at least twice in each phase.

4,007,423

SYSTEM AND APPARATUS FOR ELECTRONIC SPECTRAL ANALYSIS

Robert V. C. Dickinson, Berkeley Heights, N.J., assignor to Intech Laboratories, Inc., Ronkonkoma, N.Y.

Filed Dec. 9, 1974, Ser. No. 531,049

Int. Cl.² H04B 17/00

U.S. Cl. 325—67

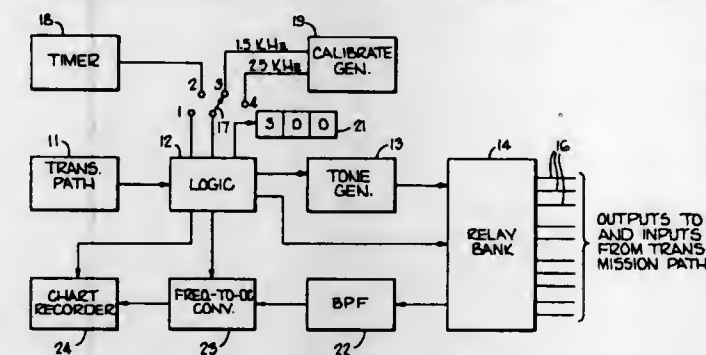
9 Claims

1. In a system in which signals are transmitted along a first transmission path and such signals are within a predetermined wide frequency band and have a predetermined amplitude relationship with respect to each other, a spectral analysis system for analyzing the amplitude versus frequency characteristics of said path, the system comprising:

- tunable receiving means at a location on said path, said receiving means having a relatively narrow pass band tunable over said frequency band;
- amplitude responsive means connected to said receiving means to receive the output signal therefrom and having a predetermined transfer characteristic to produce an

output signal having a predetermined amplitude relationship with respect to the amplitude of the signals received at said location within the pass band of said receiving means at any predetermined time;

- a voltage controlled oscillator connected to said amplitude responsive means to be controlled by the output signal therefrom to cause the instantaneous frequency of oscillations of said oscillator to have a predetermined relationship to the amplitude of signals received at said location at that instant within the pass band of said receiving means, the frequency of oscillations of said oscillator



being much lower than frequencies in said frequency band and being included within a relatively narrow band compared to said predetermined band;

- a frequency-to-amplitude converter connected to said voltage controlled-oscillator to translate the instantaneous frequency thereof to a voltage having an amplitude that is a function of such frequency;
- a second transmission path connecting said oscillator to said converter; and
- visual indicating means connected to said converter to display the instantaneous amplitude of the output signal of said converter.

4,007,424

TRANSISTOR SWITCHES FOR SELECTING PROGRAM SIGNALS IN A WIRED BROADCASTING SYSTEM

Eric John Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England

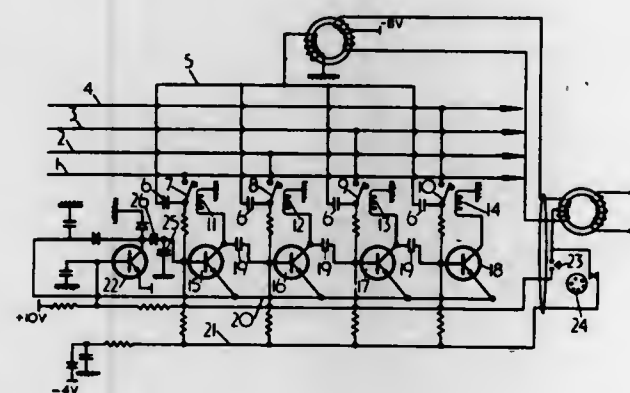
Filed Sept. 17, 1975, Ser. No. 613,980

Claims priority, application United Kingdom, Sept. 21, 1974, 41195/74; Oct. 30, 1974, 47066/74

Int. Cl.² H04N 7/10

U.S. Cl. 325—309

5 Claims



1. A wired broadcasting system comprising a plurality of programme signal sources, and switch means for making a connection between a signal cable extending to a subscriber and any desired one of said programme signal sources, the switch means comprising a plurality of electro-magnetically operable contacts connected between respective ones of the signal sources and the signal cable, an operating coil in respect of each contact, and a semi-conductor switch in respect of each operating coil comprising a series of transistors with bases, the subscriber being provided with means for control-

ling the semi-conductor switches to close any one of the contacts and thereby select a programme signal source, each of the programme signal sources providing a voltage signal which, once that programme signal source has been selected, is applied to the respective semi-conductor switch so as to maintain the selection wherein the base of each transistor in the series is connected to a respective operating coil and the transistor has a circuit arranged such that the respective contacts are closed by its conduction and, once the contacts are closed, the said voltage signal maintains the transistor in its conductive state wherein adjacent transistors in the series are connected by capacitive circuits such that when any transistor in the series is turned off the capacitive circuit connecting it to a subsequent transistor in the series is charged, the charge on the capacitive circuit causing the said subsequent transistor to conduct.

4,007,425

TEMPERATURE SENSOR USING PULSE WIDTH MODULATOR FOR DUTY CYCLE CONTROL

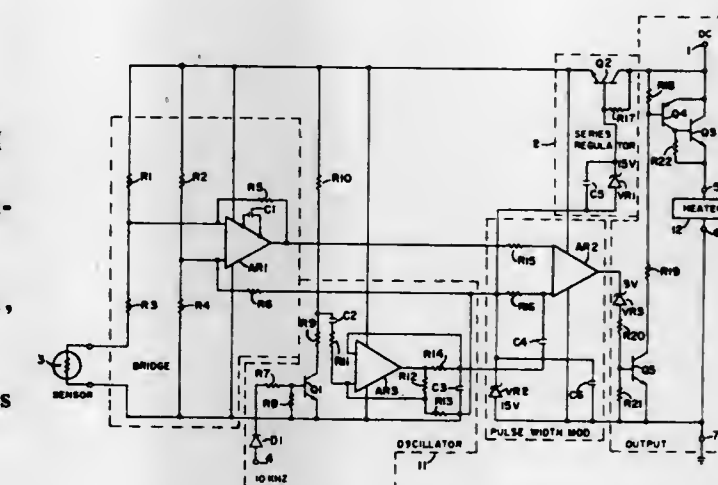
Leroy J. Salisbury, Westford, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,614

Int. Cl.² G01K 7/00

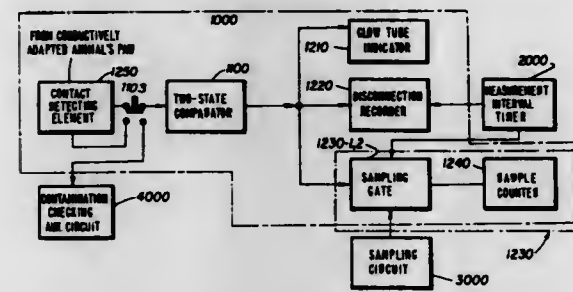
U.S. Cl. 328—3

1 Claim



1. A system comprising sensing means having an input and an output for detecting an input signal and presenting it to its output; a freerunning oscillator having a triangular waveform output; pulse width modulating device having inputs connected to the outputs of said sensing means and said oscillator so that the duty cycle output of said pulse width modulator device is varied in accordance with the signal input to said sensing means; said pulse width modulator device is connected to a ground connection; said sensing means and oscillator being maintained at a predetermined voltage above ground; a bridge circuit having outputs connected to said sensing means; one leg of said bridge circuit being fed said signal input; said bridge circuit being a symmetrical bridge circuit; said sensing means being an amplifier having two input terminals connected across said bridge circuit; an amplifier device connected to the input of said oscillator so as to cause said oscillator to operate at the output of the amplifier's oscillations when said amplifier has an input fed to it; said pulse width modulating device being a differential amplifier having first and second inputs; and said first input being connected to the output of said sensing means and said second input being connected to the output of said oscillator.

nation, a plurality of parallel, dielectrically spaced elongated conductors, the spacing between adjacent ones of the conductors being selected to provide contact between the paw and a pair of adjacent conductors except when the paw is lifted from the floor, first and second mutually insulated bus bars, means for connecting alternate ones of the conductors to the first bus bar, and means for connecting the remaining conductors to the second bus bar; wherein an electroconductive layer is applied over the plantar surface of the first paw whereby the contact of the first paw with the floor normally connects the first and second bus bars through a high-conductivity path, the first and second bus bars being disconnected from each other



when the first paw is lifted from the floor; and wherein the apparatus further comprises, in combination, two-state comparator means having an output normally in a first state and operable into a second state upon a prescribed change of state at its input, means for coupling the first and second bus bars to the input of the comparator means for operating the comparator means from its first state to its second state when the first and second bus bars are disconnected, the comparator means reverting to its first state when the bus bars are reconnected, and first means operable over a selected first interval and coupled to the output of the comparator means for measuring the total time over which the comparator means output is in its first state over the first interval.

4,007,421

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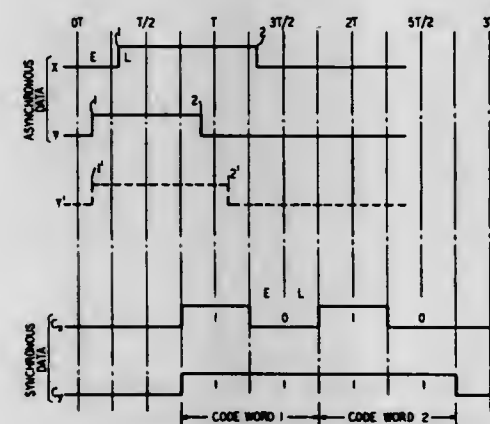
Monte Deh Lien, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

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Int. Cl.² H04L 27/02

U.S. Cl. 325—38 R

10 Claims



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4,007,422

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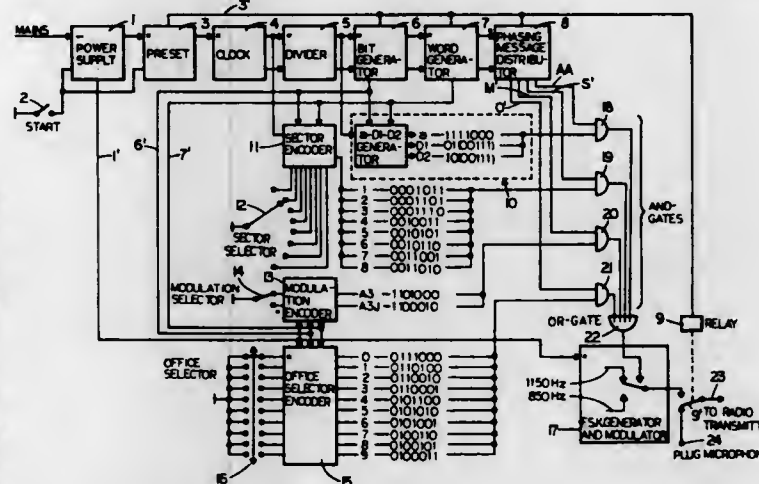
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Int. Cl.² H04B 1/00

U.S. Cl. 325—55

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- then generating multi-bit binary second message code signals (S, M, O) of the same number of bits per signal as said first code signals indicating the location of the mobile transmitting station, the mode of modulation of signals to be transmitted later and the call number of the receiving station, and
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4,007,423

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Filed Dec. 9, 1974, Ser. No. 531,049

Int. Cl.² H04B 17/00

U.S. Cl. 325—67

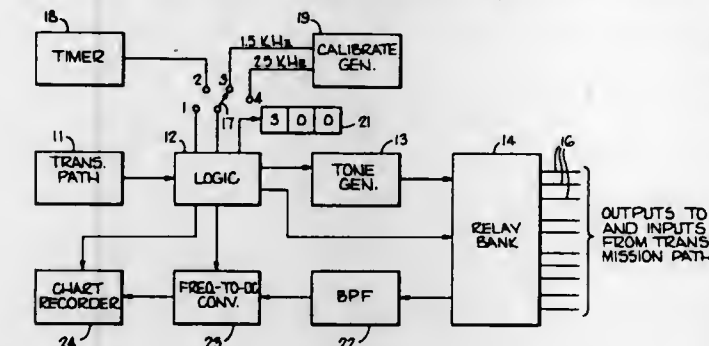
9 Claims

1. In a system in which signals are transmitted along a first transmission path and such signals are within a predetermined wide frequency band and have a predetermined amplitude relationship with respect to each other, a spectral analysis system for analyzing the amplitude versus frequency characteristics of said path, the system comprising:

- tunable receiving means at a location on said path, said receiving means having a relatively narrow pass band tunable over said frequency band;
- amplitude responsive means connected to said receiving means to receive the output signal therefrom and having a predetermined transfer characteristic to produce an

output signal having a predetermined amplitude relationship with respect to the amplitude of the signals received at said location within the pass band of said receiving means at any predetermined time;

- a voltage controlled oscillator connected to said amplitude responsive means to be controlled by the output signal therefrom to cause the instantaneous frequency of oscillations of said oscillator to have a predetermined relationship to the amplitude of signals received at said location at that instant within the pass band of said receiving means, the frequency of oscillations of said oscillator



being much lower than frequencies in said frequency band and being included within a relatively narrow band compared to said predetermined band;

- a frequency-to-amplitude converter connected to said voltage controlled-oscillator to translate the instantaneous frequency thereof to a voltage having an amplitude that is a function of such frequency;
- a second transmission path connecting said oscillator to said converter; and
- visual indicating means connected to said converter to display the instantaneous amplitude of the output signal of said converter.

4,007,424

TRANSISTOR SWITCHES FOR SELECTING PROGRAM SIGNALS IN A WIRED BROADCASTING SYSTEM

Eric John Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England

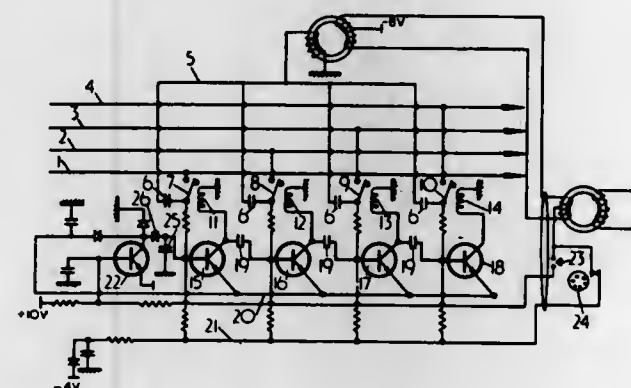
Filed Sept. 17, 1975, Ser. No. 613,980

Claims priority, application United Kingdom, Sept. 21, 1974, 41195/74; Oct. 30, 1974, 47066/74

Int. Cl.² H04N 7/10

U.S. Cl. 325—309

5 Claims



1. A wired broadcasting system comprising a plurality of programme signal sources, and switch means for making a connection between a signal cable extending to a subscriber and any desired one of said programme signal sources, the switch means comprising a plurality of electro-magnetically operable contacts connected between respective ones of the signal sources and the signal cable, an operating coil in respect of each contact, and a semi-conductor switch in respect of each operating coil comprising a series of transistors with bases, the subscriber being provided with means for control-

ling the semi-conductor switches to close any one of the contacts and thereby select a programme signal source, each of the programme signal sources providing a voltage signal which, once that programme signal source has been selected, is applied to the respective semi-conductor switch so as to maintain the selection wherein the base of each transistor in the series is connected to a respective operating coil and the transistor has a circuit arranged such that the respective contacts are closed by its conduction and, once the contacts are closed, the said voltage signal maintains the transistor in its conductive state wherein adjacent transistors in the series are connected by capacitive circuits such that when any transistor in the series is turned off the capacitive circuit connecting it to a subsequent transistor in the series is charged, the charge on the capacitive circuit causing the said subsequent transistor to conduct.

4,007,425

TEMPERATURE SENSOR USING PULSE WIDTH MODULATOR FOR DUTY CYCLE CONTROL

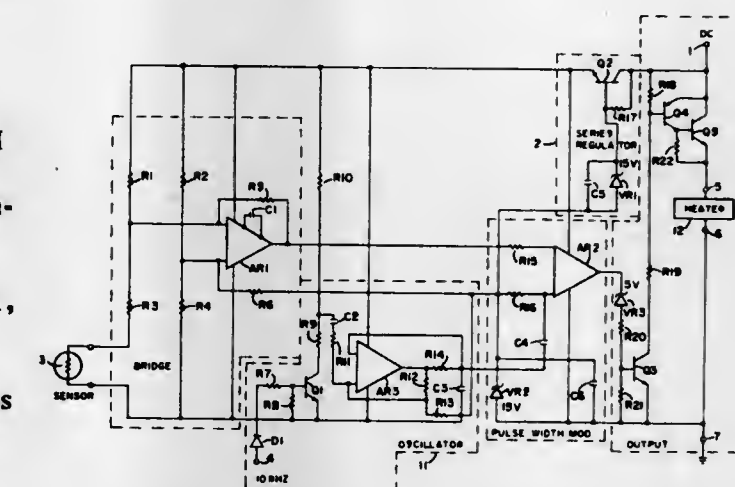
Leroy J. Salisbury, Westford, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,614

Int. Cl.² G01K 7/00

U.S. Cl. 328—3

1 Claim



1. A system comprising sensing means having an input and an output for detecting an input signal and presenting it to its output; a freerunning oscillator having a triangular waveform output; pulse width modulating device having inputs connected to the outputs of said sensing means and said oscillator so that the duty cycle output of said pulse width modulator device is varied in accordance with the signal input to said sensing means; said pulse width modulator device is connected to a ground connection; said sensing means and oscillator being maintained at a predetermined voltage above ground; a bridge circuit having outputs connected to said sensing means; one leg of said bridge circuit being fed said signal input; said bridge circuit being a symmetrical bridge circuit; said sensing means being an amplifier having two input terminals connected across said bridge circuit; an amplifier device connected to the input of said oscillator so as to cause said oscillator to operate at the output of the amplifier's oscillations when said amplifier has an input fed to it; said pulse width modulating device being a differential amplifier having first and second inputs; and said first input being connected to the output of said sensing means and said second input being connected to the output of said oscillator.

4,007,426

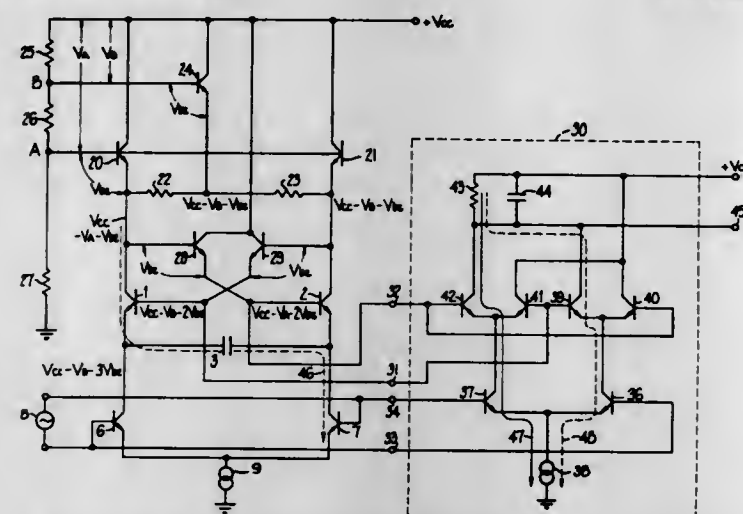
F-M DEMODULATOR CIRCUIT

Kimitate Utsunomiya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 427,317, Dec. 21, 1973, abandoned. This application June 13, 1975, Ser. No. 586,730
Claims priority, application Japan, Dec. 21, 1972, 47-128446

Int. Cl.² H03D 3/14

U.S. Cl. 329-103

8 Claims



1. An F-M demodulator circuit comprising:
 - a multivibrator circuit for producing an oscillating signal and comprising first and second current switching devices each having an input electrode and output electrodes, the input electrode of at least one of said devices being connected to one of the output electrodes of the other of said devices, and a capacitor interconnecting the remaining output electrodes of said first and second devices;
 - first and second transistors connected in series with the output electrodes of said first and second switching devices, respectively;
 - a third transistor;
 - first and second impedances connecting the emitter of said third transistor to the emitters of said first and second transistors, respectively, the collector of said third transistor being connected to a source of operating voltage;
 - bias voltage means supplying a first bias voltage to the base of said third transistor and a second bias voltage in common to the bases of said first and second transistors;
 - a differential amplifier comprising a pair of output terminals and a pair of input terminals, said pair of output terminals being connected to said remaining output electrodes of said first and second current switching devices, and said pair of input terminals receiving a frequency modulated signal differentially applied thereto; and
 - means connected with said multivibrator circuit and said differential amplifier for providing a demodulated output signal having an amplitude proportional to the phase difference between said frequency modulated signal and said oscillating signal, and hence, linearly related to the modulating frequency of said frequency modulated signal.

4,007,427

CASCADED TRANSISTOR AMPLIFIER STAGES

Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,506

Int. Cl.² H03F 3/45

U.S. Cl. 330-20

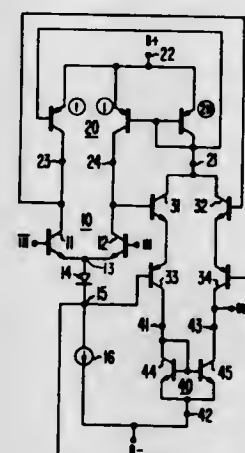
11 Claims

1. In combination:
 - first, second, third and fourth transistors of a first conductivity type, each having base and emitter and collector electrodes;
 - first and second input terminals at the base electrodes of said first and said second transistors, respectively;

means for connecting said first and said second transistors in long-tailed pair configuration including means for maintaining constant-current flow to an interconnection between the emitter electrodes of said first and said second transistors;

means for regulating the emitter-to-collector potentials of said first and said second transistors including:

means direct coupling the collector electrode of said first transistor and the base electrode of said third transistor;



- means direct coupling the collector electrode of said second transistor and the base electrode of said fourth transistor; and
- potential follower means for applying potentials to the emitter electrodes of said third and said fourth transistors that follow the potential at the interconnection between the emitter electrodes of said first and said second transistors; and
- means biasing the collector electrodes of said third and said fourth transistors for normal transistor operation.

4,007,428

AUTOMATIC GAIN CONTROL OF PULSES

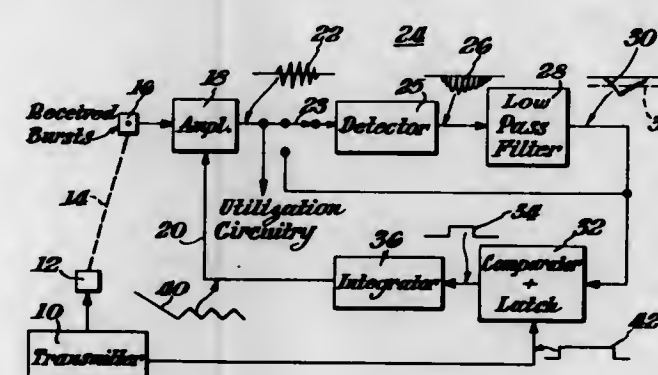
Alvin E. Brown, Claremont, Calif., and Willy J. Fick, Sønderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Aug. 7, 1975, Ser. No. 602,884

Int. Cl.² H03G 3/20

U.S. Cl. 330-129

5 Claims



1. An automatic gain control for maintaining the received burst signal amplitude derived from transmitted bursts of energy constant comprising, in combination,
 - an amplifier for amplifying the received signal,
 - means for varying the gain of said amplifier in accordance with a gain control signal,
 - latching means for providing a constant amplitude output pulse when said received signal exceeds a predetermined amplitude, and
 - an integrator coupled to said latching means responsive to said output pulse for generating said gain control signal to decrease the gain of said amplifier at a predetermined rate in the presence of said output pulse and to increase

the gain of said amplifier at a predetermined rate in the absence of said output pulse.

4,007,429

PHASE-LOCKED LOOP HAVING A SWITCHED LOWPASS FILTER

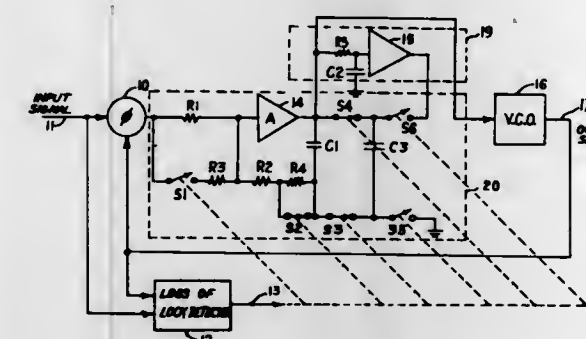
Fulvio Cadalora, Mac Mahon, and Pietro Ferrari, Col Moschin, both of Italy, assignors to GTE International Incorporated, Stamford, Conn.

Filed Jan. 19, 1976, Ser. No. 650,057

Int. Cl.² H03B 3/04

U.S. Cl. 331-17

3 Claims



1. A phase-locked loop comprising:
 - a phase comparator, having first and second inputs and an output, for generating an error signal proportional to the phase difference between the signals applied to said inputs, said comparator receiving an input signal at the first input;
 - filter means having an output and an input, said input connected to the output of said comparator and receiving said error signal, said filter means also having first and second mutually exclusive bandwidth states, said first bandwidth state operative during tracking periods and said second bandwidth state operative during acquisition periods, said filter means further having a control connection to which a control signal can be applied, and the filter bandwidth state determined by said control signal;
 - a voltage controlled oscillator having an input and output, said output coupled to said second comparator input, said voltage controlled oscillator generating at its output an output signal whose frequency is responsive to a signal applied to said input;
 - a loss of lock detector having first and second inputs connected respectively to said first and second comparator inputs, said detector further having an output to said filter control connection and generating a control signal;
 - charging means coupled to said filter means, for charging all energy storage components in said filter means used only during said first bandwidth state, thereby preventing voltage and current transients when said energy storage components are operatively connected for said first filter bandwidth state.

4,007,430

CONTINUOUS PLASMA LASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Willard F. Libby, Los Angeles, Calif.; Carl A. Jensen, Davis, Calif., and Lowell L. Wood, Simi, Calif.

Division of Ser. No. 866,442, Oct. 14, 1969, Pat. No. 3,617,804, which is a continuation of Ser. No. 479,357, Aug. 12, 1965, abandoned. This application Aug. 10, 1971, Ser. No. 170,544

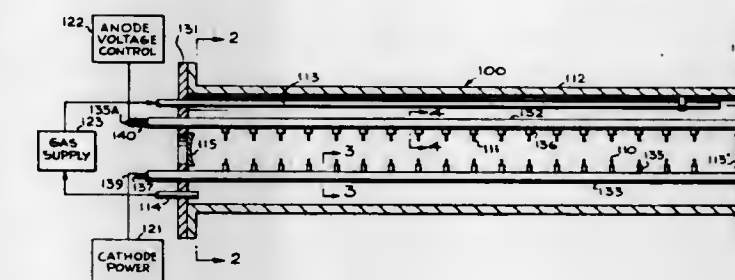
Int. Cl.² H01S 3/00

U.S. Cl. 331-94.5 D

11 Claims

1. The method of producing intense monochromatic light from a continuous plasma comprising the steps of:
 - a. confining a gas at a controlled predetermined reduced pressure of at least 50 microns but below atmospheric pressure;

- b. independently controlling the temperature of an electron emitting cathode positioned in said gas to a constant temperature of at least 2500° K to produce an abundant supply of low-energy electrons;
- c. applying a predetermined controlled low voltage of from 20 volts to 100 volts to an anode positioned in said gas in an electrical circuit relation with said cathode in which the internal resistance of the circuit is positive so as to draw an intermediate mode current of from 0.1 amperes to less than 100 amperes from said cathode without arc-



- ing in order to produce in said confined gas a region having a high density of metastable atomic states and to thus produce from them a low temperature, high density plasma in said region, said intense monochromatic light being emitted as a result of the recombination of ions and electrons in said plasma; and
- d. establishing a preferred optical direction for light emission and output from said plasma to produce stimulation of emission of radiation in order to obtain laser action and thus produce coherent light.

4,007,431

CATHODE CONSTRUCTION FOR LONG LIFE LASERS

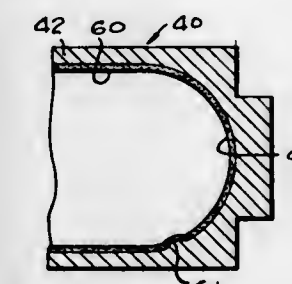
Henry C. Abbink, Westlake Village, and James W. Hostetter, Thousand Oaks, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 3, 1975, Ser. No. 546,389

Int. Cl.² H01S 3/22

U.S. Cl. 331-94.5 PE

7 Claims



1. A cathode for a laser comprising:
 - a housing having a hollow interior made of a metal forming an electron emitting surface; and
 - a layer of oxide formed on said electron emitting surface by means of plasma anodization said cathode being the anode for plasma anodization purposes, said oxide layer being thicker at the high field areas of said electron emitting surface.

4,007,432

ELECTRO-MECHANICAL FILTER HAVING A PLURALITY OF TUNING FORKS

Junpei Nakamura, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 28, 1975, Ser. No. 608,689

Claims priority, application Japan, Aug. 29, 1974, 49-103673[U]

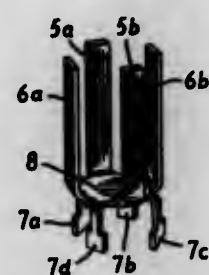
Int. Cl.² H03H 9/04, 9/26

U.S. Cl. 333-71

8 Claims

1. An electro-mechanical filter comprising: a single thin

metal sheet configured into a filter having a base portion, at least four vibratory tines connected in circumferentially spaced relationship around said base portion and extending



outwardly therefrom in a direction parallel to a given directional axis, and a plurality of supporting members connected to said base portion and extending outwardly therefrom in a direction parallel to said given directional axis.

4,007,433

ELASTIC SURFACE WAVE FILTER

Kouji Houkawa, Kodaira, and Fujio Ishihara, Mito, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

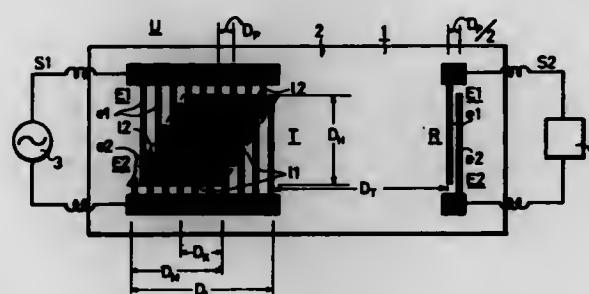
Filed July 9, 1975, Ser. No. 594,523

Claims priority, application Japan, July 15, 1974, 49-80893

Int. Cl.² H03H 9/04, 9/26, 9/32; H01L 41/10

U.S. Cl. 333-72

3 Claims



1. An elastic surface wave filter comprising at least a substrate for the propagation thereon of elastic surface waves, a transmitting and a first receiving transducer disposed on one major surface of said substrate in a predetermined spaced relation to each other, at least one of said transmitting and first receiving transducers comprising first and second comb-shaped electrodes, and said first and second comb-shaped electrodes being disposed with each electrode element of said second comb-shaped electrode extending between adjacent ones of electrode elements of said first comb-shaped electrode, in which the electrode elements of at least said first comb-shaped electrode are weighted in terms of length and a region formed by an envelope defined by tips of the electrode elements of said first and second comb-shaped electrodes has such a configuration that the extent of the region as measured along a line perpendicular to the lengthwise direction of the electrode elements, as a function of the distance lengthwise along the electrode elements, is substantially constant.

4,007,434

NOTCH FILTER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Glenn B. Shelton, Huntsville, Ala.

Filed Apr. 14, 1976, Ser. No. 676,957

Int. Cl.² H03H 7/10, 7/14, 13/00

U.S. Cl. 333-75

5 Claims

2. A notch filter comprising:

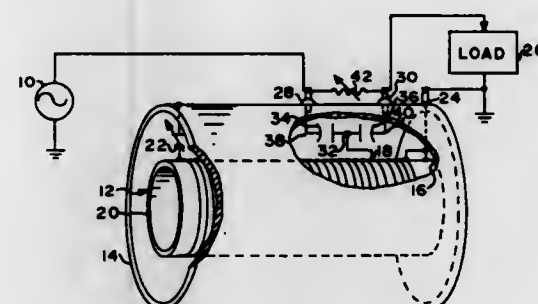
a metal cylinder;

a helical coil positioned within said cylinder about an axis concentric with and spaced from said cylinder;

a first variable capacitor connecting one end of said coil to an adjacent end of said cylinder, and the opposite end of said coil being connected to an adjacent end of said cylinder;

a resistor having a first, input, terminal and a second, output, terminal;

a second capacitor connected between a tap on said coil spaced from said opposite end of said coil and said input terminal;



a third capacitor equal in value to said second capacitor connected between said tap and said output terminal; and a signal source providing signal frequencies including a frequency f_0 connected between said input terminal and said cylinder and an output load connected between said output terminal and said cylinder and wherein the impedance of said coil between said tap and said opposite end, the impedance of said source, and the impedance of said load are all equal at said f_0 frequency.

4,007,435

SENSOR DEVICE AND METHOD OF MANUFACTURING SAME

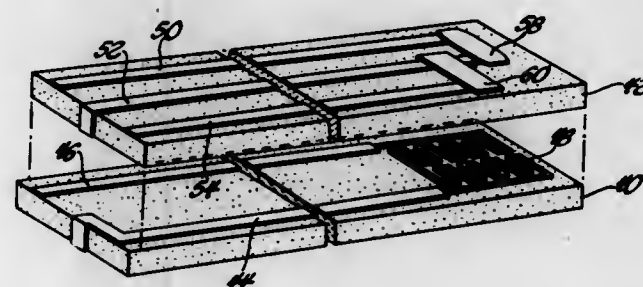
Tseng-Ying Tien, 660 Archwood Drive, Ann Arbor, Mich. 48103

Continuation-in-part of Ser. No. 384,029, July 30, 1973, abandoned. This application Apr. 25, 1974, Ser. No. 464,019

Int. Cl.² G01N 27/12

U.S. Cl. 338-34

20 Claims



1. An oxygen sensing device particularly suited as a sensor for the exhaust gases of an internal combustion engine, said sensing device comprising an electrically insulative ceramic element having bonded on a surface thereof a layer of an oxygen sensing metal oxide, electrical leads for the oxygen sensing metal oxide, a thin layer of electrical resistance heating material adjacent the layer of oxygen sensing metal oxide but separated from said layer of oxygen sensing metal oxide by a layer of the electrical insulative ceramic, electrical leads for the electrical resistance heating material, and a layer of ceramic covering the layer of electrical resistance material, said device also including a layer of thermistor material bonded to a surface of said ceramic element adjacent said layer of oxygen sensing metal oxide and electrical leads for said thermistor material.

4,007,436

SELF-DEPLOYING INSTRUMENT ASSEMBLY

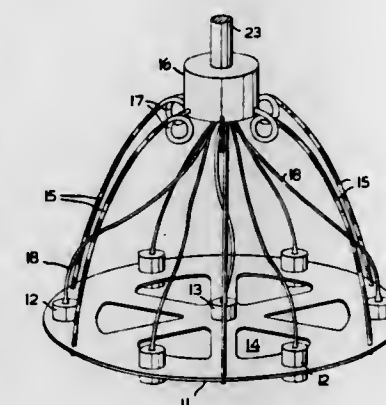
Garfield W. McMahon, Dartmouth, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defense, Ottawa, Canada

Filed July 7, 1975, Ser. No. 593,232

Int. Cl.² H04B 13/00

U.S. Cl. 340-8 S

6 Claims



1. A self-deploying hydrophone assembly including a plurality of hydrophones mounted on a flexible sheet, and a series of resilient rods extending from one side of the sheet from positions spaced around the periphery thereof to a hub for stretching the sheet to an operative position and locating the hydrophones at predetermined spacing, the resilient rods being deflectable laterally inwardly whereby the sheet can be folded, placing the assembly in a storable configuration diametrically smaller than its normal operative configuration.

6. A combination of a container and a self-deploying hydrophone assembly, the hydrophone assembly including a plurality of hydrophones mounted on a flexible sheet, and a series of resilient rods extending from one side of the sheet from positions spaced around the periphery thereof to a hub, the container having a longitudinally split body formed by a plurality of separate segments held together by removable end caps at opposite ends of the segments, the interior width of the body being less than the distance between the opposite rod positions on the sheet, the hydrophone assembly being located within the container with the rods in a laterally-inwardly deflected condition bearing against the interior of the segments, whereby, upon removal of at least one of the end caps the body is forced outwardly by said rods and said assembly deployed.

4,007,437

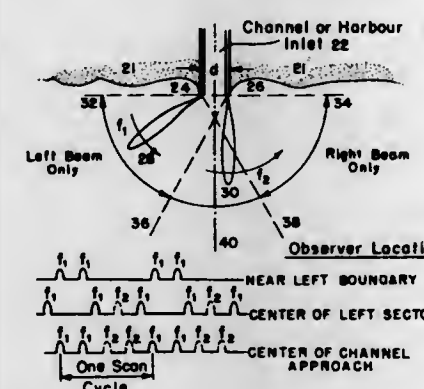
ACOUSTIC FOGHORN FOR DIRECTIONAL SIGNALING
Maurice Ward Widener, Austin, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 20, 1975, Ser. No. 606,045

Int. Cl.² G01S 1/72

U.S. Cl. 340-16 R

2 Claims



1. A method of providing bearing information to an operator of a boat or ship located near a channel the entrance having a first and second side thereto comprising:

- positioning a first non-linear rotatable acoustic source having a narrow beamwidth and being capable of generating frequencies within the audible range of the human ear at the first side of the entrance to said channel;
- positioning a second non-linear rotatable acoustic source having a narrow beamwidth and being capable of generating frequencies within the audible range of the human ear at the second side of the entrance to said channel;
- generating a first acoustic tone from said first acoustic source; and
- rotating said first acoustic source at a predetermined rate thru a predetermined first sector of the water; then
- generating a second acoustic tone from said second acoustic source; and
- rotating said second acoustic source at a predetermined rate thru a predetermined second sector of the water;
- continuing the rotation of the first and second acoustic source thru their respective sectors so that any tone received by a boat operator is indicative of his bearing.

4,007,438

SPEED MONITORING AND TICKETING SYSTEM FOR A MOTOR VEHICLE

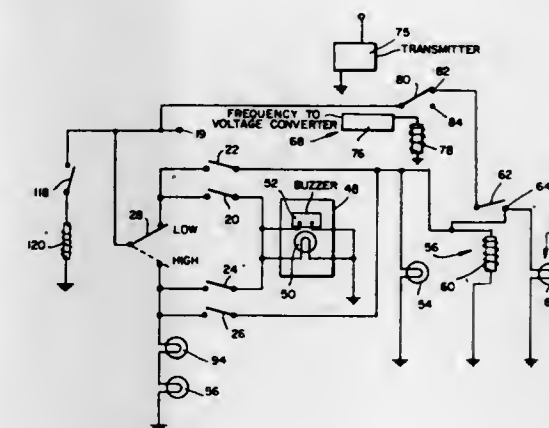
Peter N. Protonantis, 2164 Hendrison St., Brooklyn, N.Y. 11234

Filed Aug. 15, 1975, Ser. No. 604,912

Int. Cl.² B60Q 1/54

U.S. Cl. 340-62

11 Claims



1. A speed monitoring system for a motor vehicle comprising:

- a speedometer fixedly mounted within said motor vehicle having a calibrated scale and a movable indicator adapted to visually indicate the speed of said motor vehicle by changing its position on said scale;
- a source of electrical energy within said motor vehicle;
- a first circuit closing element adapted to be opened and closed by said movable indicator;
- a second circuit closing element adapted to be opened and closed by said movable indicator, said first and second circuit closing elements forming a first group;
- a third circuit closing element adapted to be opened and closed by said movable indicator;
- a fourth circuit closing element adapted to be opened and closed by said movable indicator, said third and fourth circuit closing elements forming a second group, said first group being associated with a low speed limit and said second group being associated with a high speed limit;
- a warning circuit energized by said source of electrical energy when said first or said third circuit closing element is closed;
- a violation indicator mounted externally on said motor vehicle adapted to give an external indication of a speed limit violation;
- means for energizing said violation indicator by said source of electrical energy in response to the closing of said second or said fourth circuit closing elements; said means remaining energized when said circuit closing elements are therewith opened;

4,007,449
CONTROL DEVICE FOR LOCAL CONNECTION OF A PERIPHERAL UNIT THROUGH A MODEM INTERFACE FOR REMOTE CONNECTION

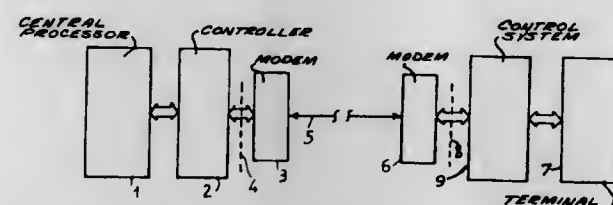
Giacomo Vercesi, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Oct. 11, 1974, Ser. No. 514,144

Claims priority, application Italy, Nov. 9, 1973, 31096/73
 Int. Cl.² G06F 3/04, 3/12

U.S. Cl. 340—172.5

6 Claims



1. An electronic control system for locally connecting a peripheral device to a control unit adapted to control the transmission of information signals to a remote terminal, said control system comprising:

means connecting said control system to said peripheral device, a standard modem interface including a plurality of leads coupling said control system to said control unit and adapted for remote signal transmission, said interface further including a special lead;

and circuit means coupled to said special lead and to said peripheral device, said circuit means being responsive to signals representative of the operating conditions of said peripheral device to provide one of two distinct electrical signal levels on said special lead for signaling to said control unit the state of readiness of said peripheral device to receive said information signals.

4,007,450

DATA SHARING COMPUTER NETWORK

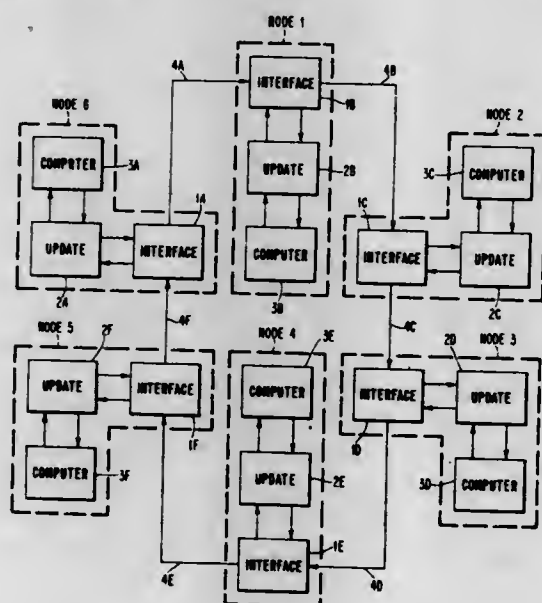
Luther Harold Halbt, Katonah, and Alvin Paul Mullery, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,993

Int. Cl.² G06F 15/16

U.S. Cl. 340—172.5

13 Claims



1. In a network having a plurality of independently operating data processing units disposed at a plurality of discrete nodal positions and interconnected by a data communication link, each said unit having a memory storing a plurality of data sets, predetermined ones of which are stored at a plurality of units in the network for local independent use thereat, the improvement comprising:

a. means at each of said nodal locations for storing indicia

manifestive of the nodal storage locations of each respective multiply-stored data set;

b. means at each of said nodal locations operated responsive to a locally generated update signal for a given data set, and under control of said stored indicia, for initiating and transmitting updating orders to all other nodal units storing the given data set; and

c. means at each of said nodal locations operated responsive to updating orders addressed to it for updating the given data set in its own associated memory.

4,007,451

METHOD AND CIRCUIT ARRANGEMENT FOR OPERATING A HIGHLY INTEGRATED MONOLITHIC INFORMATION STORE

Klaus Heuber, Boeblingen; Wilfried Klein, Holzgerlingen; Knut Najmann, Gaertringen; Rolf Remshardt, Boeblingen, and Siegfried K. Wiedmann, Stuttgart, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

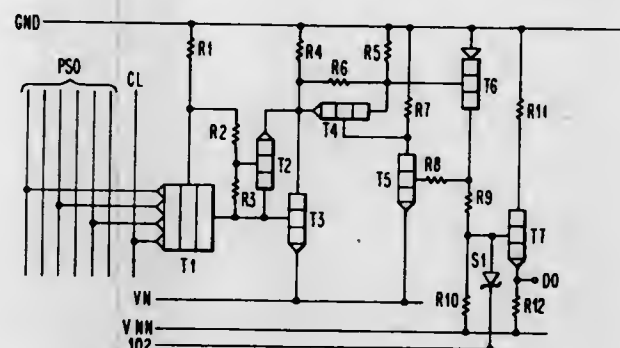
Filed Nov. 20, 1975, Ser. No. 633,733

Claims priority, application Germany, May 30, 1975, 2523853

Int. Cl.² G11C 11/23, 7/00

U.S. Cl. 340—173 R

20 Claims



1. A method of operating an information store, in particular a monolithic information store, whose storage cells and address circuits comprise bipolar transistors which are not continuously subjected to full power, characterized in that the address circuits, in particular the decoders, are subjected to full voltage both in the selected and the non-selected state, that at the beginning of a selection phase the current (ICT3) in the selected decoders (BD and ED) increases disproportionately as a result of control signals (102) controlled by the clock (CL), subsequently dropping to a residual current (IR), in order to keep the selected decoders (BD or ED) in the selected state, and that at the end of a selection cycle the decoders (BD and ED) are immediately controlled into their non-selected state as a function of the drop in the control signal (102).

4,007,452

WAFER SCALE INTEGRATION SYSTEM

Marclan E. Hoff, Jr., Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed July 28, 1975, Ser. No. 599,709

Int. Cl.² G11C 17/00

U.S. Cl. 340—173 R

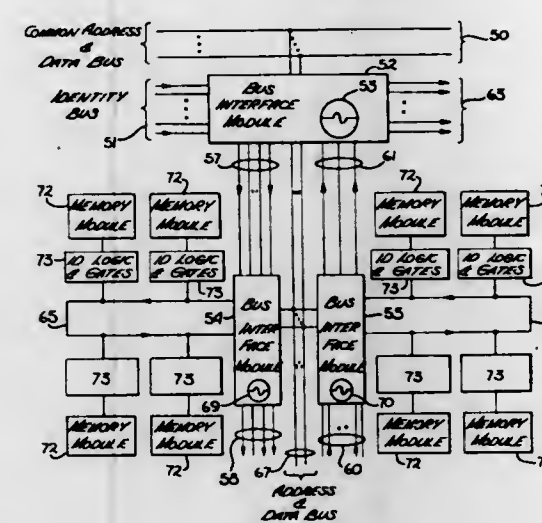
20 Claims

1. In a semiconductor wafer which includes a plurality of circuit units fabricated on said wafer and a first bus for communicating with said devices an improvement comprising:

a second bus disposed on said wafer for transmitting an identification signal to said units;

circuit means disposed on said wafer and coupled to said

second bus for selectively altering said identification signal along said second bus;



whereby said circuit means may provide an identification signal to each useable circuit unit on said wafer.

4,007,453

MAGNETIC BUBBLE MEMORY ORGANIZATION

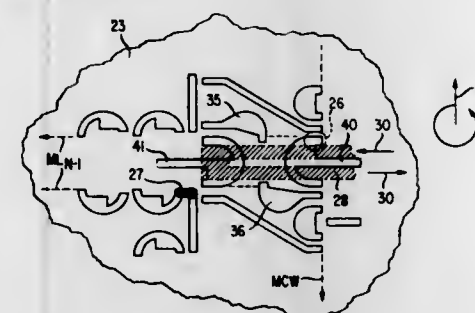
Peter Istvan Bonyhard, Edison; Yu-Ssu Chen, New Providence, and James Lanson Smith, Bedminster, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1975, Ser. No. 563,664

Int. Cl.² G11C 11/14

U.S. Cl. 340—174 TF

18 Claims



1. A magnetic arrangement comprising a layer of material in which single wall domains representative of data can be moved, a pattern of elements responsive to a magnetic field reorienting cyclically through at least first and second consecutive half cycles in the plane of said layer for moving said domains, said pattern defining a first pair of associated first and second channels and a first exchange position therebetween, said exchange position including ones of said elements in each of said associated channels, said ones of said elements in each of said channels being operative in response to said field for moving a domain from a first position to a second position in said channel, and a conductor arrangement operative when pulsed to move data from said first positions in said first and second channels to said second positions in said second and first channels, respectively.

4,007,454

APPARATUS FOR REMOTELY DETERMINING THE ANGULAR ORIENTATION, SPEED, AND/OR DIRECTION OF ROTATION OF OBJECTS

Charles Cain, Greenville, and Arthur T. Shankle, Raleigh, both of N.C., assignors to Charles J. Cain, Greenville, N.C.

Filed Sept. 12, 1975, Ser. No. 612,684

Int. Cl.² G08C 19/10

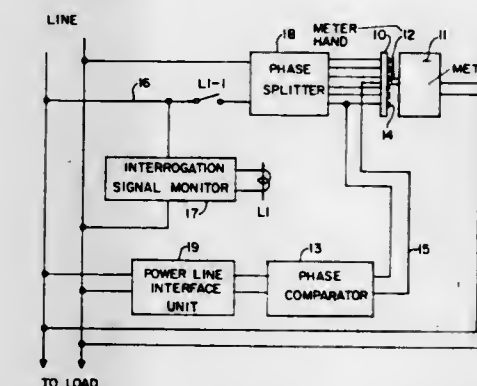
U.S. Cl. 340—200

16 Claims

1. An apparatus for remotely monitoring the angular position, speed, and/or direction of rotation of a member as it rotates about an axis of rotation and defines a circumferential path comprising:

a. means for generating a rotating electric field which defines a path parallel to said circumferential path of the rotating member and includes said circumferential path therein;

b. a reading electrode means fixedly positioned within said electric field and symmetrically placed with respect to said axis of rotation for sensing a voltage change responsive to the crossing of said rotating member by said rotat-



ing electric field and emitting an output signal responsive to said voltage change; and

c. said means for generating the rotating electric field and said reading electrode both being positioned in confronting, spaced relation to, but in no way mechanically or electrically connected to said rotating member other than that a portion of said rotating member is within the path of said rotating electric field.

4,007,455

ENERGY CONSERVING PULSE KEYING TECHNIQUE FOR A RADIO CONTROL SYSTEM

Kenichi Mabuchi, and Kozuro Komatsu, both of Tokyo, Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

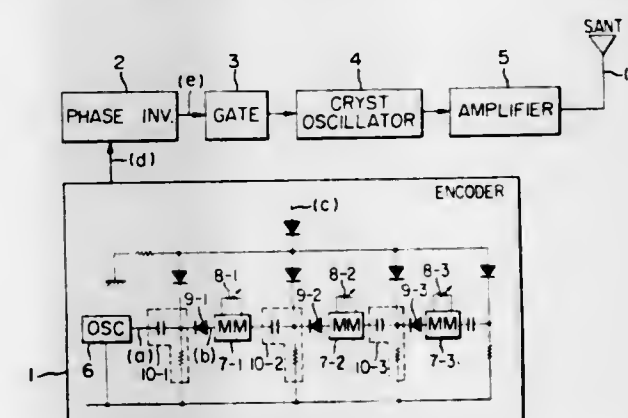
Filed July 2, 1975, Ser. No. 592,558

Claims priority, application Japan, July 20, 1974, 49-83373

Int. Cl.² H04B 7/00

U.S. Cl. 343—225

11 Claims



1. In a radio control system which includes a transmitter having an encoder for generating control pulses of variable widths and a timing pulse, means for generating a carrier wave, and a transmitting antenna; a receiver having a receiving antenna and a decoder; and servomechanisms which are fed with the decoded signals from the decoder and are controlled in response to the widths of the control pulses, the improvement comprising means for restricting the carrier wave to be present throughout the time interval between the trailing edge of each control pulse and the leading edge of the next control pulse, to be present throughout the time interval between the trailing edge of the timing pulse and the leading edge of the first control pulse, and to be present throughout the time interval between the leading edge of the timing pulse and the trailing edge of the last control pulse, all of said time intervals being equal to each other, and wherein the control system responds to control signals having high and low levels

and including said restricted carrier wave, said control signals comprising the aforesaid control pulses.

4,007,456

GAS DETECTING AND WARNING SYSTEM

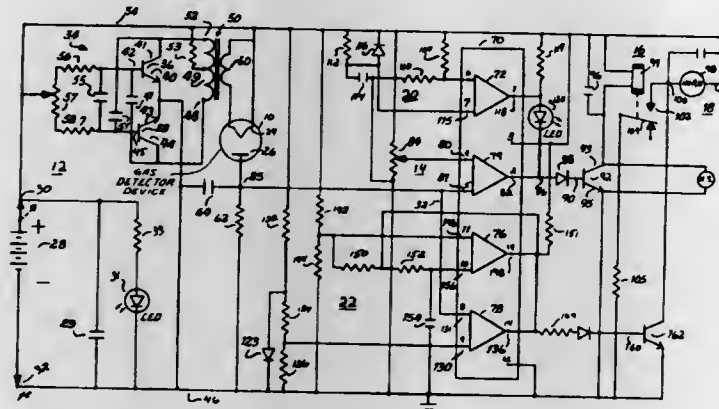
Roy C. Paige, Ravena, and Jonathan B. Wright, Schenectady, both of N.Y., assignors to Crafco Inc., Albany, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,537

Int. Cl.² G08B 17/10, 19/00

U.S. Cl. 340—237 R

19 Claims



1. A gas detecting and warning system comprising;
 - a. A gas detector device of the type comprising a semiconductive body adapted to be thermally activated and exhibiting a resistance characteristic which changes in the presence of a contaminating gas in the ambient environment, said device having a first electrode means arranged for thermally activating said body and a second electrode means operatively associated with said body and spaced from said first electrode means;
 - b. a direct current source;
 - c. a load resistance means;
 - d. means connecting said load resistance means in series circuit relationship with said first and second electrode means and said direct current source operative to produce a current flow through said gas detector device and said load resistance means whereby a decrease in the resistance of the gas detector device which occurs when a contaminating gas is present in the ambient environment results in an increase in the voltage developed across said load resistance means;
 - e. a source of alternating current of preselected frequency and voltage coupled across the first electrode means of said gas detector device for supplying the power for thermally activating said gas detector device;
 - f. a quad comparator integrated circuit means having four independent comparator sections, each of which having first and second input means and an output means;
 - g. Sensing circuit means including a first one of said comparator sections arranged to cause said first comparator section to produce an output whenever the voltage developed across said load resistance means equals or exceeds a preselected value;
 - h. time delay means including a second one of said comparator sections and a series resistance-capacitance combination arranged to cause said second comparator section to produce an output after said capacitance is charged to a preselected level so that said second comparator section output is produced a predetermined time after energization of the system;
 - i. a warning alarm means;
 - j. coincidence means responsive to the outputs of said first and second comparator sections, said coincidence means being also arranged so that the output thereof causes energization of said warning alarm means; and
 - k. failure detecting and warning means operative to cause an intermittent operation of said warning alarm means as a distinctive warning of a failure or malfunction of said gas detector device and/or its associated circuitry, said

failure detecting and warning means comprising said third and fourth comparator sections, means arranging said third comparator section for operation as a free running square-wave oscillator, means including said fourth comparator section for inhibiting operation of said square-wave oscillator so long as the voltage developed across said load resistance means exceeds a predetermined value, and means arranging the output of said square-wave oscillator to cause intermittent operation of said warning alarm means.

4,007,457

METHOD OF AND APPARATUS FOR DETECTING FAULTS IN THE OPERATION OF OPEN-END SPINNING MACHINES

Kurt Aepli, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

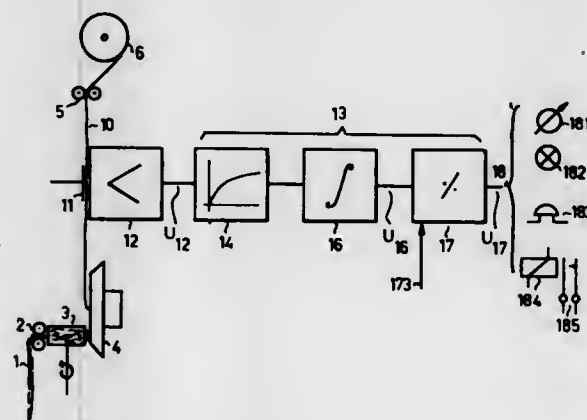
Filed Jan. 24, 1975, Ser. No. 544,005

Claims priority, application Switzerland, Feb. 8, 1974, 1739/74

Int. Cl.² G08B 21/00

U.S. Cl. 340—259

38 Claims



7. A method of detecting the defective operation of spinning units in open-end spinning machines comprising the steps of
 - measuring the cross-section or diameter of yarn leaving at least one spinning unit,
 - converting the measurement into an electrical signal, and processing said electrical signal in a discriminator to detect irregularities in said measurement by
 - applying a non-linear characteristic to said electrical signal with a correcting device receiving said electrical signal to provide a corrected signal which emphasizes larger deviations of said cross-section or diameter of said yarn over smaller deviations thereof,
 - integrating said corrected signal in an integrator connected to said correcting device to determine the frequency of occurrence of said larger deviations of said yarn, and
 - comparing the integrated signal with a predetermined reference signal in a comparator connected to said integrator,
- thereby generating a control signal upon the occurrence of predetermined deviations of said cross-section or diameter of said yarn.

4,007,458

DIGITAL TWO-WIRE IRRIGATION CONTROL SYSTEM

Michael D. Hollabaugh, San Jose, Calif., assignor to Clemar Manufacturing Corporation, Azusa, Calif.

Filed Dec. 29, 1975, Ser. No. 644,617

Int. Cl.² H04M 11/04

U.S. Cl. 340—310 R

12 Claims

1. Decoding apparatus for use in an irrigation control system in which both power and control signals are transmitted from a central location along a single pair of conductors, said apparatus comprising:
 - a. a failure detecting and warning means comprising said third and fourth comparator sections, means arranging said third comparator section for operation as a free running square-wave oscillator, means including said fourth comparator section for inhibiting operation of said square-wave oscillator so long as the voltage developed across said load resistance means exceeds a predetermined value, and means arranging the output of said square-wave oscillator to cause intermittent operation of said warning alarm means.

4,007,460

PHASED ARRAY ELEMENT RETENTION

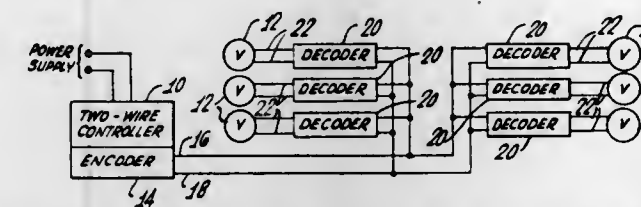
Jerome D. Hanfling, Framingham, and Karl L. Mengoli, Weston, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1975, Ser. No. 636,002

Int. Cl.² H01Q 13/02

U.S. Cl. 343—776

2 Claims



- signal from said rectifier means to at least one valve solenoid;
- means for identifying said decoding apparatus; and
- digital logic means utilizing complementary metal-oxide-semiconductor logic for deriving sets of control signals and decoder addresses from said first signal, and for operating said electronic switch means in accordance with those of said control signals accompanied by a decoder address equivalent to said means for identifying said decoding apparatus.

4,007,459

MULTITONE PUSHBUTTON DIAL PHASE SHIFT SCANNING CIRCUITRY

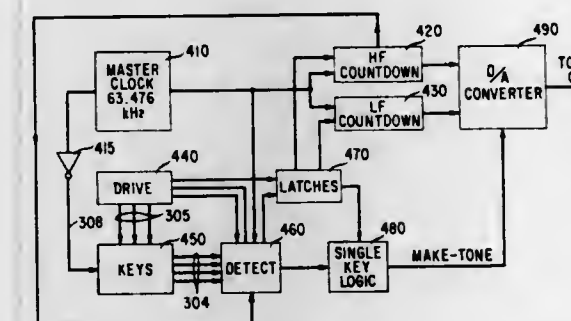
David William Hagelbarger, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 10, 1975, Ser. No. 594,819

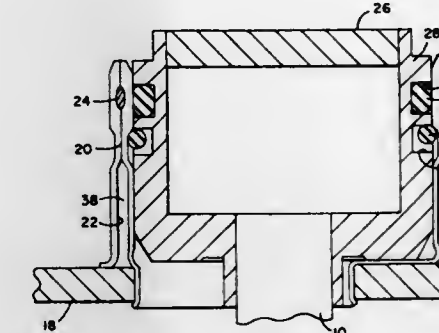
Int. Cl.² G08C 1/00

U.S. Cl. 340—365 S

25 Claims



25. In an arrangement for identifying an actuated switch in a matrix array of such switches wherein plural intersecting row and column circuits have a different one of said switches coupled between the intersecting row and column circuit at each matrix circuit intersection, the improvement comprising means for coupling first signals having a first phase through a predetermined impedance to all of said row circuits, said impedance being much smaller than a switchopen impedance of one of said switches and much larger than a switch-closed impedance of such switch,
- means for coupling second signals having a second phase opposite to said first phase to each of said column circuits in recurring sequence, the latter signals being of sufficient amplitude after coupling through a closed one of said switches to appear on the coupled row circuit with substantially greater amplitude than do the first signals,
- means for sampling row circuit signals in a recurrent sequence of said row circuits,
- means for detecting a phase difference between a row circuit signal sample and said first signals, such phase difference indicating an actuated one of said switches, and
- means responsive to said second signal coupling means, said sampling means, and said detecting means for producing a signal identifying said actuated switch.



1. In a phased array structure having a plurality of radar elements disposed in parallel retained relation; each of said elements having an outer connecting end including a radiating face at its outer extremity and provided with an upper annular recess and a lower annular recess, a radial conductive O-ring seal disposed in said upper recess and a snap ring disposed in said lower recess; a retention cup carried by said structure and disposed around the element connecting end, said retention cup being provided with an annular land for sealing cooperation with said O-ring and being provided with an annular groove wherein said snap ring expands when said element is placed for retention in said cup to lock the element to the cup.

4,007,461

ANTENNA SYSTEM FOR DERIVING CARDIOD PATTERNS

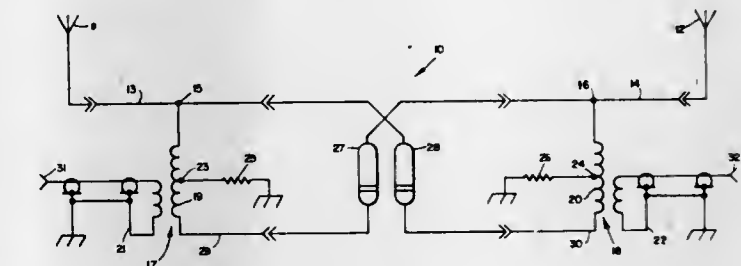
Arthur Luedtke, Marietta, and William L. Kilpatrick, Austell, both of Ga., assignors to Field Operations Bureau of the Federal Communications Commission, Washington, D.C.

Filed Sept. 5, 1975, Ser. No. 610,717

Int. Cl.² H01Q 21/06

U.S. Cl. 343—844

5 Claims



4,007,462

LIGHT ABSORPTION PRINTING PROCESS

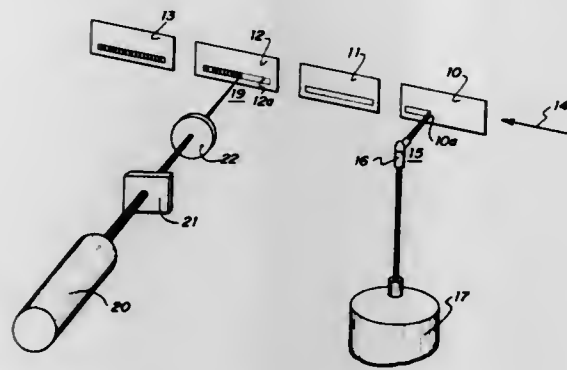
Grover C. Wetsel, Jr., Richardson, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Dec. 24, 1975, Ser. No. 644,104

Int. Cl.² G01D 15/34

U.S. Cl. 346—1

10 Claims



1. A method of recording information on a document surface, which comprises:

- applying a continuous coat over a field on said document of a fluorescent dye which will undergo a permanent phototransformation of the light emitting properties thereof by intense light radiation thereon; and
- irradiating limited information dependent locations within said field with a light beam of intensity and wavelength required to permanently change said light emitting properties of only said dye at said locations.

4,007,463

STATE DETECTION ARRANGEMENT FOR INK JET SYSTEM PRINTER

Isao Fujimoto, Kunitachi; Takeshi Kasubuchi, and Masahiko Aiba, both of Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of Japan

Filed Mar. 12, 1974, Ser. No. 450,413

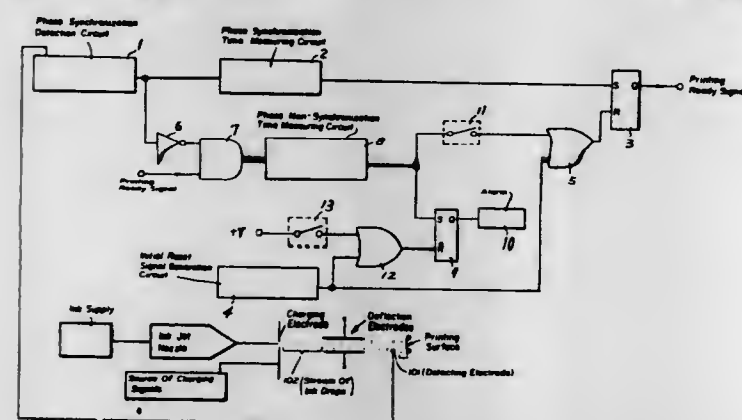
Claims priority, application Japan, Mar. 12, 1973, 48-28688

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² G01D 18/00

U.S. Cl. 346—75

10 Claims



1. A state detection arrangement used for an ink jet system printer for making a record on a writing medium by means of ink drops charged by charging signals, said arrangement comprising means for generating phase OK signals when an ink drop separating rhythm is synchronized with the phase of the charging signals, means for determining whether the phase OK signals are generated in succession for a predetermined period of time initiated upon the occurrence of a first phase OK signal, and means responsive to said determining means for generating printing ready signals when the phase OK signals are successively generated for said predetermined period; wherein the printing ready signal generating means com-

prises bistable switching means having input and output terminals which receives at said input terminal outputs from said determining means and produces at said output terminal the printing ready signals.

4,007,464

INK JET NOZZLE

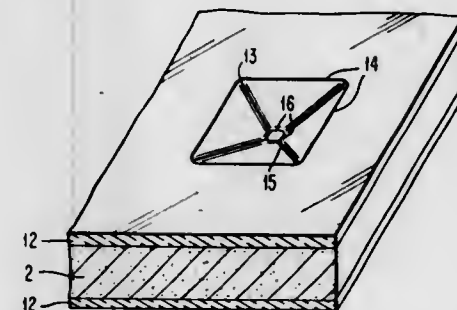
Ernest Bassous, Riverdale; Lawrence Kuhn, Ossining; Arnold Reisman, Yorktown Heights, and Howard H. Taub, Mount Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,600

Int. Cl.² G01D 15/18

U.S. Cl. 346—75

20 Claims



1. In an ink jet printing system, the combination comprising: a source of pressurized ink; a manifold means communicating with said sources; means for perturbing the ink at a substantially uniform frequency; and a substrate having at least one nozzle formed therein, with said one nozzle having walls formed in said substrate in the shape of a truncated pyramid, wherein the entrance and exit apertures of said one nozzle each have a rectangular cross-section coextensive with the respective faces of said substrate, with said walls each having a continuous taper extending from one face to the other face of said substrate, with said entrance aperture communicating with said manifold means for receiving ink under pressure, and with said exit aperture emitting a stream of ink which then breaks up to form ink droplets.

4,007,465

SYSTEM FOR SELF-CLEANING INK JET HEAD

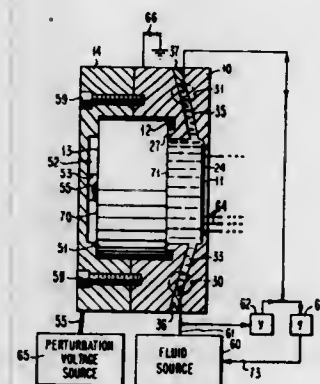
Kailash Chandra Chaudhary, Los Angeles, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,534

Int. Cl.² G01D 15/18

U.S. Cl. 346—140 R

9 Claims



1. A self-cleaning ink jet head system comprising: a reservoir of pressurized fluid, an orifice plate having at least one orifice therein, a fluid dispensing manifold communicating with said fluid reservoir and with said orifice plate, said manifold having at least two ports spaced apart,

4,007,467

EXPOSURE CONTROL CIRCUIT

Eduard Wagensohn; Kurt Borowski, both of Aschheim, and Dieter Knauer, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

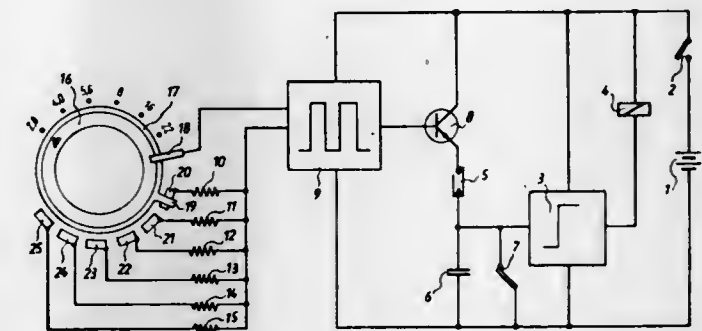
Filed July 15, 1975, Ser. No. 596,054

Claims priority, application Germany, July 20, 1974, 2434995

Int. Cl.² G03B 7/08

U.S. Cl. 354—51

6 Claims



1. In a camera having a automatic exposure control circuit operative under a plurality of exposure factors, comprising in combination, a light-sensitive element; a capacitor; first circuit means connected to said capacitor and responsive to a start signal for changing the voltage across said capacitor from a first to a second predetermined value at a rate varying as a function of light falling on said light-sensitive element; means for furnishing said start signal at the start of the exposure time; second circuit means connected to said first circuit means for periodically interrupting the operation of the latter for a selected off-time interval corresponding to the selected one of said plurality of exposure factor, whereby the rate of change of voltage across said capacitor varies also in dependence upon said selected one of said exposure factors, said second circuit means comprise an electronic switch having a first and second stable state connected to said first circuit means for interrupting the operation thereof when in said first stable state, and pulse furnishing means connected to said electronic switch means for applying a sequence of pulses, each for switching said electronic switch means to said first stable state, to said electronic switch means, and means for changing the pulse width of the pulses in said pulse sequence to correspond to said selected one of said plurality of exposure factors; and terminating means connected to said capacitor for terminating the exposure when the voltage across said capacitor has said second predetermined value.

4,007,468

TRIM CONTROL APPARATUS FOR PHOTOGRAPHIC EXPOSURE CONTROL SYSTEM

Igor Blinow, Mills; Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,927

Int. Cl.² G03B 7/00

U.S. Cl. 354—59

20 Claims

1. An optical trim mechanism for a photographic apparatus of the type having a light responsive exposure control system including scene light sensing means comprising: a mounting plate; means for fixedly stationing said mounting plate with respect to the photographic apparatus; a manually adjustable member disposed for rotation with respect to said mounting plate; and a trim member having a light transmissive portion of varying light transmissive characteristics movable in scene light intercepting relation with respect to the scene light sensing means, said trim member being disposed for rotation with respect to said mounting plate while having a portion in engagement by a portion of said manually adjustable

a fluid conduit directly connected between said reservoir of fluid and one of said manifold ports, a fluid flow controlling valve, another fluid conduit connected in series with said valve between the other of said manifold ports, and said reservoir of fluid, thereby urging a flow of fluid into said manifold through both of said ports when said valve is open, another fluid flow controlling valve, and a further fluid conduit connected in series with said other valve between said other of said conduits as connected to said other of said manifold ports and said reservoir of fluid, thereby accepting a flow of fluid from said manifold through said other of said ports and into said reservoir when said other valve is open.

4,007,466

ELECTRICAL SYSTEM HAVING A PHOTOELECTRIC CONVERTER TO BE USED IN PHOTOGRAPHY

Seinan Miyakawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

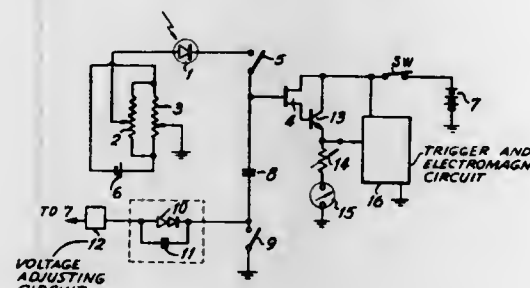
Filed Feb. 3, 1975, Ser. No. 546,563

Claims priority, application Japan, Feb. 4, 1974, 49-13656

Int. Cl.² G03B 7/08

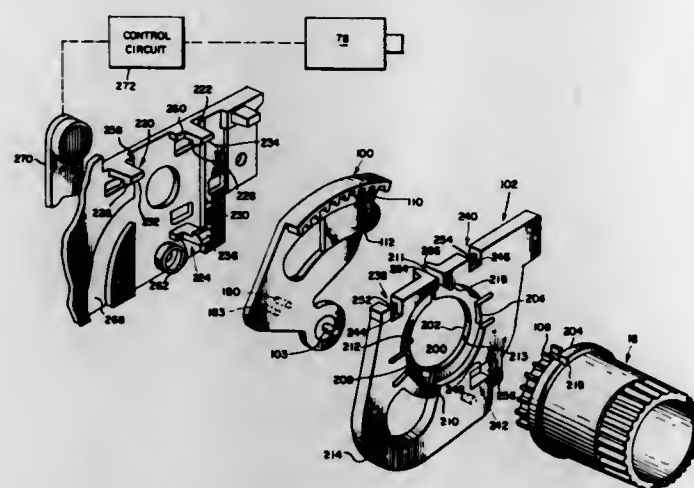
U.S. Cl. 354—24

9 Claims



1. In an electrical system at least part of which is capable of determining, according to the nature of light received by the system, a factor to be utilized in the exposure of photographic film, input circuit means for providing an input signal, output circuit means for providing an output determined at least in part by said input circuit means, and intermediate circuit means electrically connected between said input and output circuit means for controlling the transmission of said input signal to said output circuit means, said input circuit means including a photoelectric conversion means for receiving light and having an open-circuit voltage which is variable depending upon the intensity of the received light for providing by way of the latter voltage at least part of said input signal so that said input signal is determined at least in part by the intensity of the light received by said photoelectric conversion means, and said intermediate circuit means cooperating with said input circuit means for providing a stabilized circuit condition where said photoelectric conversion means is in a stabilized state with no electrical current flowing there-through, said photoelectric conversion means including a photodiode having an open-circuit voltage characteristic which varies according to a logarithmic compression depending upon the intensity of the light received by said photodiode, and said photodiode having a pair of terminals one of which is electrically connected with said intermediate circuit means, a voltage source, and calculation circuit means for providing an electrical magnitude determined by a preselected diaphragm aperture and film sensitivity, said calculation circuit means being electrically connected only with said voltage source, with ground, and with the other of said pair of terminals of said photodiode, for combining said electrical magnitude with the voltage determined by said photodiode in accordance with light intensity, whereby said electrical magnitude is transmitted only through said photodiode to said intermediate circuit means with no electrical current flowing through said photodiode upon reaching said stabilized state.

member for said manually adjustable member to drive said trim member such that clockwise rotation of said adjustable member results in a corresponding clockwise rotation of said trim member while counterclockwise rotation of said adjustable member results in a corre-



sponding counterclockwise rotation of said trim member, thereby varying the amount of scene light reaching the light sensing means in order to trim the response of the exposure control system with respect to a select amount of scene light.

4,007,469

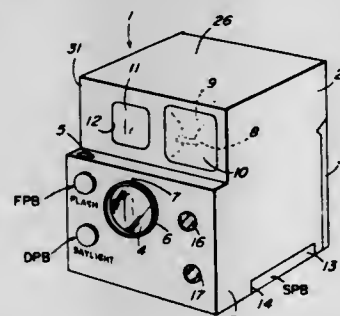
PHOTOGRAPHIC APPARATUS WITH PLURALITY OF SELECTIVELY DETERMINABLE OPERATIONAL MODES

Edwin H. Land, Cambridge, and Richard C. Kee, Chestnut Hill, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 21, 1975, Ser. No. 570,165
Int. Cl.² G03B 7/14, 15/03

U.S. Cl. 354-27

20 Claims



13. A photographic camera apparatus of the type which may be used with a source of artificial illumination; said camera comprising:

- a housing having a scene light admitting aperture there-through;
- means for defining a film exposure plane within said housing;
- means for blocking and unblocking the impingement of scene light on said exposure plane from said aperture to define a photographic exposure interval;
- first manually operable and electrically energizable control means for providing a first signal responsive to the manual operation thereof;
- second manually operable and electrically energizable control means for providing a second signal responsive to the manual operation thereof;
- scene light detecting means for providing a select output signal responsive to the detection of ambient scene light above a predetermined level; and
- electrically energizable circuit means responsive to said first signal resulting from the manual operation of said first control means without the manual operation of said sec-

ond control means in the presence of said select output signal from said scene light detecting means for actuating said scene light blocking and unblocking means to effect a photographic exposure cycle, said circuit means also being responsive to said second signal resulting from the manual operation of said second control means without the manual operation of said first control means in the absence of said select output signal from said scene light detecting means for actuating said scene light blocking and unblocking means for effecting a photographic exposure cycle while also providing a trigger signal for effecting the illumination of the source of artificial illumination during the exposure cycle, said circuit means additionally being responsive to the simultaneous occurrence of said first and second signals resulting from the simultaneous manual operation of said first and second control means for actuating said scene light blocking and unblocking means to effect a photographic exposure cycle subsequent to the expiration of a predetermined time delay after the simultaneous manual operation of said first and second control means.

4,007,470

BATTERY OPERATED CAMERA HAVING A HANDLE THEREON FORMED IN PART BY AN EXTERNAL BATTERY

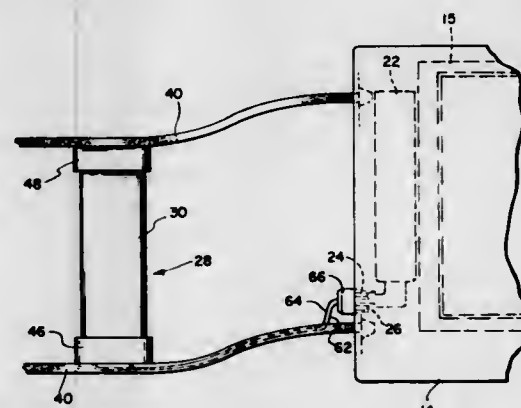
Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 19, 1974, Ser. No. 534,444

Int. Cl.² G03B 17/56

U.S. Cl. 354-293

14 Claims



1. A battery operated camera having at least one component that is adapted to be powered by an elongated electrical battery having leading and trailing ends together with an integral casing therearound, said camera comprising:

- a camera housing;
- electrically conductive terminal means, electrically connected to the at least one component and to which such an electrical battery is to be electrically connected to supply power to the at least one component;
- a camera carrying strap being connectable to said camera housing for facilitating carrying said camera;
- means for connecting said carrying strap to said camera housing;
- means on said carrying strap for respectively receiving and supporting the leading and trailing ends of such an electrical battery such that a portion of the integral battery casing intermediate the leading and trailing ends thereof forms a handle on said carrying strap when the battery is so supported; and
- means for electrically connecting such a battery, when the battery is supported by said battery support means to said electrically conductive terminal means of said at least one component.

4,007,471 SYSTEM FOR MOUNTING PHOTOGRAPHIC ACCESSORIES ON A CAMERA

Edwin H. Land, and John B. Morse, both of Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

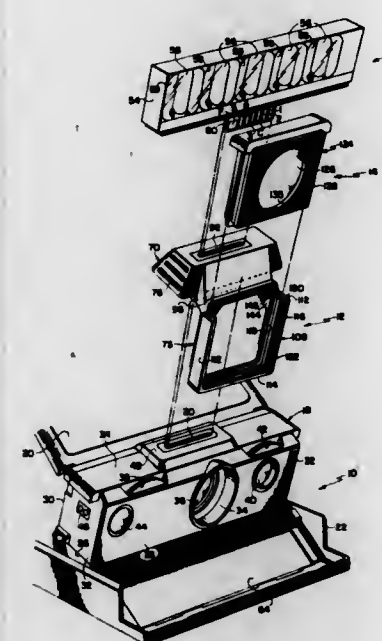
Continuation of Ser. No. 300,820, Oct. 25, 1972, abandoned.

This application Apr. 17, 1975, Ser. No. 568,918

Int. Cl.² G03B 11/00

U.S. Cl. 354-295

20 Claims



18. An accessory holder for receiving and supporting at least one accessory other than a flash unit on a camera of the type including a housing section having a flash unit socket therein, a thin elongated opening in the housing section providing access to the flash socket, and means on the housing section for mounting an objective lens, said accessory holder comprising:

- a support member;
- a thin elongated coupling plug on the support member being dimensioned to be inserted through the thin elongated opening in the camera housing and into the camera flash socket therein for releasably coupling said support member to the camera;
- means on said support member for receiving and supporting at least one accessory other than a flash unit and for positioning the accessory in proximity to the camera objective lens when said support member is so coupled to the camera, said receiving and supporting means including at least one open ended channel into which at least a portion of the accessory is adapted to be slideably inserted;
- a flash unit socket on said support member for receiving and supporting a flash unit; and
- means on said coupling plug for operatively connecting said flash unit socket on said support member to the flash unit socket of the camera when said coupling plug is inserted into the flash unit socket of the camera.

4,007,472

FLAT BATTERY WITH DRY CATHODE STRATA AND SLURRY CATHODE STRATA

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 495,628, Aug. 8, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,590

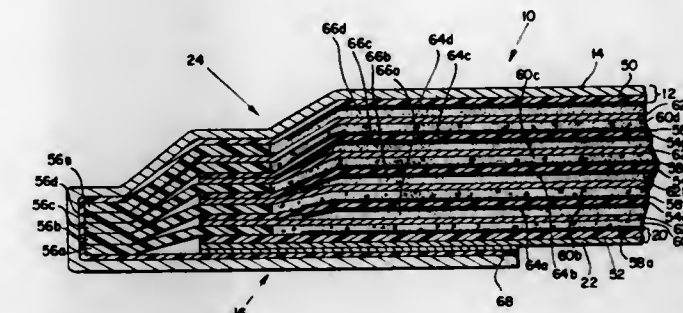
Int. Cl.² H01M 6/46

U.S. Cl. 429-153

18 Claims

1. A planar primary battery having at least one cell, said cell comprising an anode, a cathode and a planar electrolyte ion permeable separator positioned between said anode and said

cathode; said cathode comprising a planar cathode current collector carrying on one surface thereof, in order, a first cathode stratum and a second cathode stratum; said first cathode stratum being of the "dry patch" cathode type and comprising a particulate dispersion of cathode active particles in a binder matrix, said binder matrix being insoluble in but



permeable to aqueous electrolyte and bonded to said cathode current collector; said second cathode stratum being substantially coextensive with said first cathode stratum and comprising a slurry of said cathode active particles dispersed in aqueous electrolyte and adhered to said first cathode stratum, the cathode particles in said first and second cathode strata being the same.

4,007,473

TARGET STRUCTURES FOR USE IN PHOTOCONDUCTIVE IMAGE PICKUP TUBES AND METHOD OF MANUFACTURING THE SAME

Yasuhiko Nonaka, Mobara; Tadaaki Hirai, Koganei; Naohiro Goto, Machida, and Kelichi Shidara, Tama, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

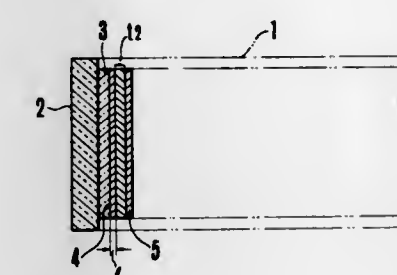
Filed May 23, 1975, Ser. No. 580,539

Claims priority, application Japan, June 21, 1974, 49-70213

Int. Cl.² H01L 27/14

U.S. Cl. 357-31

17 Claims



1. In a target structure for use in a photoconductive image pickup tube of the type comprising a transparent substrate, an N-type transparent conductive film deposited on the rear side of said substrate, and a P-type photoconductive film deposited on the rear side of N-type transparent conductive film with a heterojunction surface therebetween and said P-type photoconductive film containing at least selenium and tellurium as an intensifier, the improvement wherein the starting point of the intensifier containing portion of said P-type photoconductive film is located in a predetermined range of 80A to 1500A spaced in the direction of thickness thereof from said heterojunction surface.

4,007,474

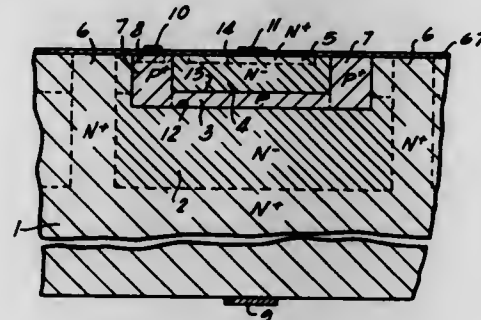
TRANSISTOR HAVING AN EMITTER WITH A LOW IMPURITY CONCENTRATION PORTION AND A HIGH IMPURITY CONCENTRATION PORTION

Hajime Yagi, Tokyo, and Tadaharu Tsuyuki, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 427,648, Dec. 26, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,914
Claims priority, application Japan, Dec. 29, 1972, 48-550; Mar. 28, 1974, 49-35307; Oct. 31, 1974, 49-125869

Int. Cl.² H01L 29/72, 29/00, 27/02

U.S. Cl. 357-34

7 Claims



1. A semiconductor device comprising:
 - a. a first semiconductor region of a first conductivity type;
 - b. a second semiconductor region of the opposite conductivity type interfaced with said first region, and forming a first PN junction therewith;
 - c. a third semiconductor region of said first conductivity type interfaced with said second region and forming a second PN junction therewith lying on the opposite side of said second region from said first region;
 - d. means for forwardly biasing said first PN junction and transporting majority carriers in said first region to said third region;
 - e. said first region having a lightly doped portion adjacent to said first PN junction and a heavily doped portion forming a third junction between said lightly doped portion and said heavily doped portion;
 - f. said third junction being situated from said first PN junction by a distance less than the diffusion length of minority carriers in said lightly doped portion; and
 - g. the impurity concentration and gradient at said third junction being selected to have an electric field such that a drift current of minority carriers produced thereby substantially balances a diffusion current of minority carriers injected from said first PN junction.

4,007,475

SEMICONDUCTOR SWITCHING DEVICE

Yoland Collumeau, Paris, France, assignor to Thomson-CSF, Paris, France

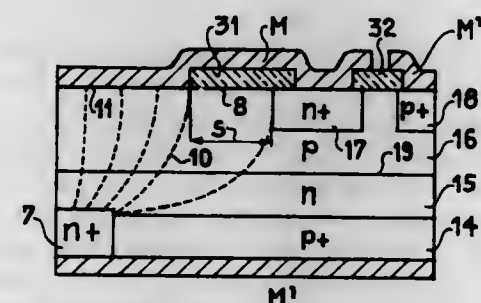
Filed Feb. 21, 1975, Ser. No. 551,856

Claims priority, application France, Feb. 22, 1974, 74.06205

Int. Cl.² H01L 29/747

U.S. Cl. 357-39

5 Claims



1. A solid-state switching device, constituted by a thyristor

and a diode integrated into two parts of one and the same monocrystalline semi-conductor block which has two opposite principal faces, the anode (14) of the thyristor and the cathode (7) of the diode extending up to one of said faces where they are electrically connected, the gate of the thyristor extending up to the other of said faces (16) (18) as also do the anode (11) of the diode and the cathode (17) of the thyristor whose two respective surfaces are unbroken and electrically linked by a conductive connecting layer (M) carried by said other face, device wherein said conductive connecting layer is separated from the face which carries it, at least over the portion (8) comprised between said surfaces, by a layer (31) of an electrically insulating material the extension of said layer on said other face, from the thyristor cathode surface region, being at least equal to the diffusion length of the electrical charge carriers between said thyristor and said diode regions, and the region between said thyristor and diode regions being without added recombination centers.

4,007,476

TECHNIQUE FOR PASSIVATING SEMICONDUCTOR DEVICES

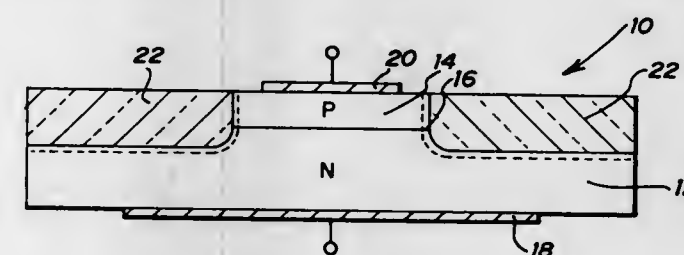
Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Filed Apr. 21, 1975, Ser. No. 569,704

Int. Cl.² H01L 29/34

U.S. Cl. 357-52

9 Claims



1. In a semiconductor device, the combination comprising:
 - a body of semiconductor material having layers of opposite semiconductor conductivity type forming at least one P-N junction,
 - a region of glass doped with carrier lifetime degrading material selected from gold and platinum contacting said P-N junction, wherein the voltage capacity and stability of said P-N junction is enhanced.

4,007,477

ASSEMBLY OF A RECESSED HEAT SINK AND A SEMICONDUCTOR DEVICE SEALED WITHIN THE RECESS IN THE HEAT SINK AND THERMALLY CONNECTED TO THE HEAT SINK

Dennis George Goodman, Birmingham, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Dec. 30, 1974, Ser. No. 537,337

Claims priority, application United Kingdom, Jan. 18, 1974, 2391/74

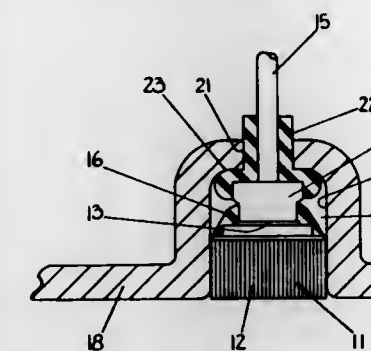
Int. Cl.² H01L 23/28, 23/02, 23/12, 23/42

U.S. Cl. 357-81

3 Claims

1. A semi-conductor assembly including a conductive stud, a semi-conductor device, a first contact area of said device being thermally and electrically connected to said stud, and electrical lead including an expanded head portion, said head portion being thermally and electrically connected to a second contact area of said device, a single body of thermally conductive material forming a heat sink and provided with a cup-shaped recess portion having a bottom wall portion and an aperture through said bottom wall portion, said recessed portion receiving said conductive stud in thermal engagement therewith to close the open end of said recess, said electrical lead passing through said aperture in said recess, sealing sleeve means of insulating material passing through said aper-

ture and disposed between said electrical lead and said aperture to prevent ingress of foreign material into said recess through said aperture, and deformable resilient means dis-



posed within said recess between the expanded head portion of said electrical lead and the inner wall of said recess to urge the head portion of said lead into pressure contact with the second contact area of said semi-conductor device.

4,007,478

FIELD EFFECT TRANSISTOR

Hajime Yagi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 282,898, Aug. 23, 1972, abandoned.

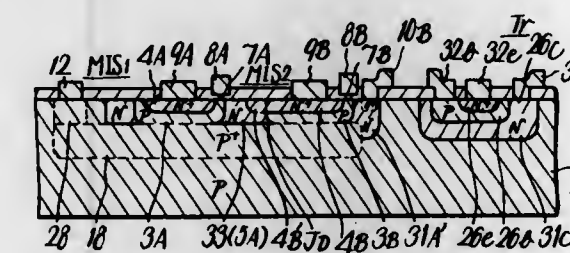
This application Oct. 17, 1973, Ser. No. 407,285

Claims priority, application Japan, Aug. 26, 1971, 46-65271

Int. Cl.² H01L 27/02

U.S. Cl. 357-41

6 Claims



1. An MIS field effect transistor comprising:
 - a body of semiconductor material including
 - a. a first region of semiconductor material of one conductivity type extending to a surface of said body;
 - b. a second region of semiconductor material of the same type conductivity as that of said first region and extending to said surface and being spaced laterally from said first region;
 - c. a single substantially cup-shaped region only of semiconductor material of the opposite type conductivity to that of said first and second regions, said cup-shaped region containing said second region and having a portion located between said first and second regions and forming at least one PN junction therewith, said portion of the cup-shaped region of semiconductor material extending to said surface of the semiconductor body to provide a narrow channel; and
 - d. a buried region of semiconductor material of the opposite conductivity type having a greater impurity concentration than that of said cup-shaped region and being at least substantially laterally coextensive with, and located in underlying relation to said cup-shaped region and in contact therewith over substantially the entire lateral extent of the latter, said buried region being spaced laterally from said first region with the margin of said buried region which is closest to said first region being spaced from said first region in the lateral direction toward said cup-shaped region;
 - e. first and second electrodes respectively connected to said first and second regions at said surface;
 - f. a control electrode electrically insulated from the semiconductor body and being positioned substantially over

the entire area of said portion of said cup-shaped region extending to the surface of said body; and
g. means to apply a potential to said cup-shaped region through said buried region from the outside of said semiconductor body.

4,007,479

FIXTURE FOR AN INTEGRATED CIRCUIT CHIP

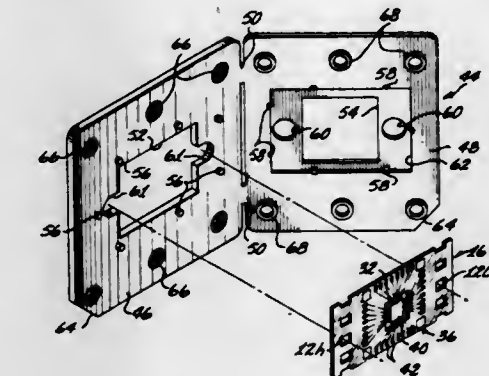
John L. Kowalski, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Mar. 29, 1976, Ser. No. 671,238

Int. Cl.² H01L 23/48; H02B 1/04; H01R 13/50

U.S. Cl. 357-70

22 Claims



1. A fixture for a segment of a film strip, said segment having a lead frame affixed to the segment and an integrated circuit chip bonded to the lead frame, said segment having reference sprocket holes formed therein, a window formed in each segment, the window having a predetermined position relative to the reference sprocket holes, the lead frame having a plurality of electrically distinct leads, each lead having outer portions and inner portions, the outer portion of each of the leads being secured to the segment and the inner portion of each lead extending over the window, the leads having a predetermined position relative to the reference sprocket holes, and the integrated circuit chip being bonded to inner portions of leads of the lead frame, and being positioned in the window;
- said fixture comprising:
 - a laminar layer, an aperture in said layer, the dimensions of the aperture being substantially equal to or greater than the dimensions of the window in said segment but substantially less than the dimensions of said segment;
 - means forming access openings formed in said fixture, said access openings being located to permit access to the reference sprocket holes of a segment when positioned in said fixture;
 - positioning means on the laminar layer adapted to position a segment so that the window of the segment is accessible through the aperture of the laminar layer; and
 - means for retaining a segment in said position and for providing access to the chip, the lead frame, and the reference sprocket holes.

4,007,480

COLOR TELEVISION RECEIVER BEAT FREQUENCY CONTROL USING STABILIZED TELEVISION TRANSMITTER AURAL CARRIER

Dale Wolters, Grandville, Mich., assignor to West Michigan Telecasters Inc., Grand Rapids, Mich.

Filed Sept. 17, 1975, Ser. No. 614,304

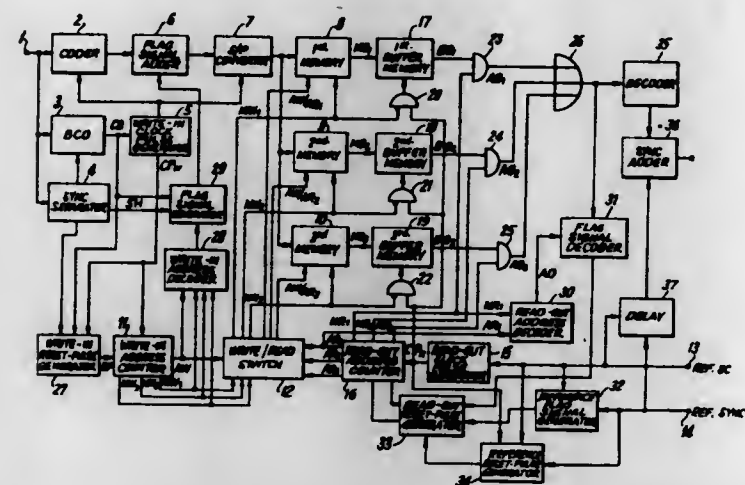
Int. Cl.² H04N 9/02

U.S. Cl. 358-1

6 Claims

1. In combination with a color television transmitter, an aural carrier frequency generating device, for generating the aural carrier of said color television transmitter, comprising:
 - a proportionally controlled oven;

field of the incoming video information, inputting clock addressing and encoding means responsive to the first synchronizing signals for digitally encoding said incoming video information and storing said information in said memory means, outputting clock and addressing means responsive to the second, reference synchronizing signals for reading out said digitally quantized video signal on a frame-by-frame basis from said memory means, said inputting clock, addressing and



encoding means including means for storing a flag signal marking the place of each stored incoming video signal frame on a repeating sequence basis, and wherein said outputting clock and addressing means includes means for generating a flag signal characterizing outputting frames on a repeating sequence basis, and means responsive to the values of a read-out stored flag and of an outputting frame flag signal for selectively skipping storage locations in said memory means during memory interrogation.

4,007,487

ELECTRONIC COMPOSITE PHOTOGRAPHY WITH COLOR CONTROL

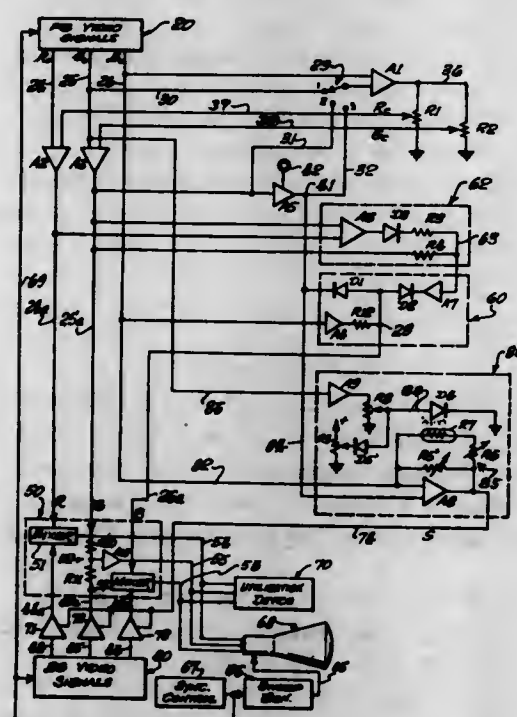
Petro Vlahos, Tarzana, Calif., assignor to The Association of Motion Picture and Television Producers Inc., Hollywood, Calif.

Filed Sept. 25, 1975, Ser. No. 616,685

Int. Cl.² H04N 9/535

U.S. Cl. 358—22

27 Claims



1. In combination with an electronic system for producing a composite color picture from foreground and background video signals, the foreground signals representing respective color components of a foreground scene having areas of different effective transparency against a backing effectively illuminated with light which is predominantly confined to one

of said colors and which contains an impurity of at least one other color; the improvement comprising means for substantially compensating said color impurity throughout a continuous range of said transparency.

4,007,488

SOLID-STATE COLOR IMAGING APPARATUS HAVING CHARGE-COUPLED DEVICES

Masanobu Morishita; Hidehiko Inoue, and Mitsuru Kawasaki, Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

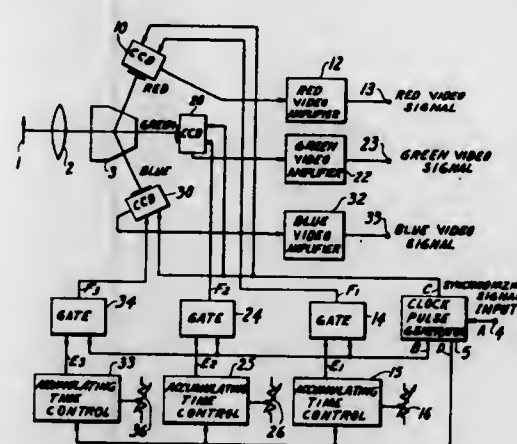
Filed Feb. 6, 1976, Ser. No. 656,007

Claims priority, application Japan, Feb. 7, 1975, 50-16111; Oct. 27, 1975, 50-129151

Int. Cl.² H04N 9/04, 9/535, 3/14

U.S. Cl. 358—29

5 Claims



1. A solid-state color imaging apparatus for producing a color video signal from incident light rays said apparatus comprising means including at least one charge-coupled device having an imaging area for accumulating charges in response to said incident light rays, a storage area for transferring the accumulated charges, and a read-out means for producing an electrical video signal from the transferred charges for producing a video signal;

means for producing first and second driving pulses in response to a synchronizing signal, said first driving pulse setting a time period during which said charges are accumulated in said imaging area and said second driving pulse causing said charge transfer; and, means operatively connected to said first driving pulse producing means for controlling said time period of said first driving pulse.

4,007,489

METHOD AND APPARATUS FOR CREATING COLOR COPIES OF AN ORIGINAL BY AN ELECTROSTATIC CHARGING PROCESS

Josef Helmberger, and Wolfgang Ruf, both of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Sept. 19, 1975, Ser. No. 614,786

Claims priority, application Germany, Sept. 24, 1974, 2445541

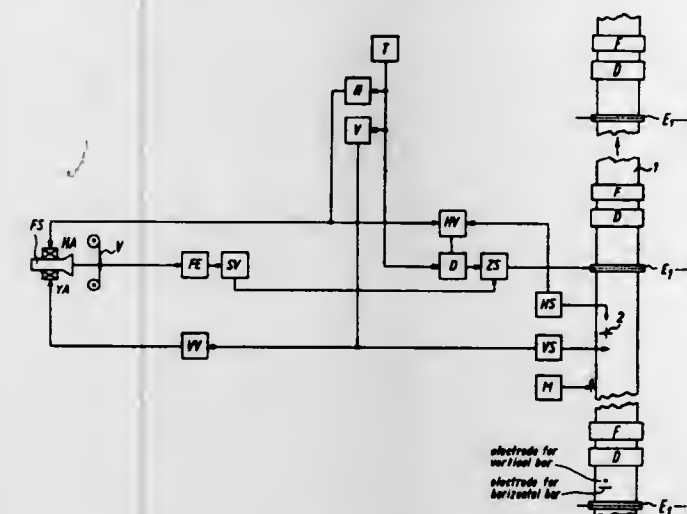
Int. Cl.² H04N 1/46, 1/30

U.S. Cl. 358—78

12 Claims

1. In a method of forming a color image composed of at least three superimposed component images of different respective colors, in combination, the steps of transporting printing material along a predetermined path past at least three spaced successive printing stations, each printing station including a row of printing electrodes extending perpendicular to the printing material transport direction and operable for forming a latent image of a row of points corresponding to the row of electrodes, each printing station including means for converting the respective latent image into a corresponding visible component image of a respective color; scanning a line

on a color original progressively proceeding from one end of the line to the other and generating for such line a first, a second and a third group of scanning signals indicative of the density of successive points of the progressively scanned line with respect to a first, a second and a third component color of the color original; at each printing station applying to the electrodes of the row of printing electrodes a group of activating signals corresponding to a respective one of said first, second and third groups of scanning signals and causing the electrodes of the row of printing electrodes to simultaneously with one another form upon the printing material a latent point image of a line corresponding to the line scanned on the



color original; establishing registration of the point image of the scanned line produced at the second station with that produced at the first station by detecting a registration mark provided on the printing material and controlling the application of the activating signals to the electrodes of the row of electrodes at the second printing station in dependence upon such detection; and establishing registration of the point image of the scanned line produced at the third station with those produced at the first and second stations by detecting a registration mark provided on the printing material and controlling the application of the activating signals to the electrodes of the row of electrodes at the third printing station in dependence upon such detection.

4,007,490

TIME LAPSE VIDEO TAPE RECORDER

Hiroshi Shoda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

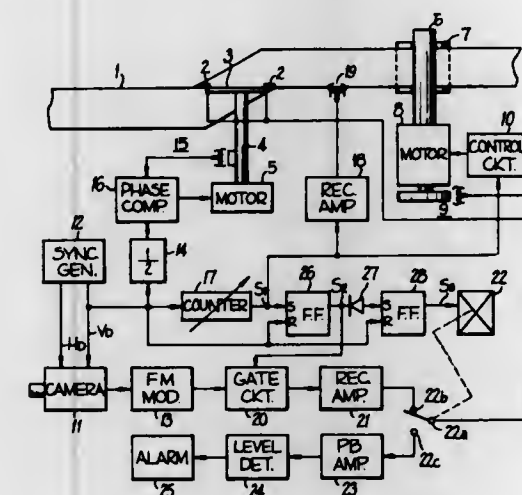
Filed July 30, 1975, Ser. No. 600,212

Claims priority, application Japan, Aug. 7, 1974, 49-89899

Int. Cl.² H04N 5/78

U.S. Cl. 360—11

7 Claims



1. A time lapse video tape recorder comprising:

- A. magnetic transducer means moving at a predetermined speed;
- B. means for selecting certain video image signals of a succession of said signals and for recording only said certain signals on said medium during intermittent recording intervals;
- C. means for moving a recording medium past said transducer means at an average rate of speed too low to record all of said video image signals on said medium; and
- D. means to monitor the recorded signals during intervals succeeding the intermittent recording intervals.

4,007,491

Dictation-Transcription Method and System

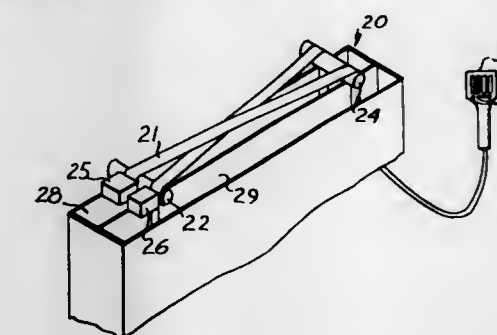
Fred C. Bolick, Jr., Atlanta, Ga., and Ronald F. Fleming, Farmington, Conn., assignors to Lanier Business Products, Inc., Atlanta, Ga.

Continuation of Ser. No. 391,685, Aug. 27, 1973, abandoned, which is a continuation of Ser. No. 149,480, June 3, 1971, abandoned. This application Feb. 10, 1975, Ser. No. 548,543

Int. Cl.² G11B 15/06, 15/18, 27/30, 23/38

U.S. Cl. 360—74

30 Claims



1. System for recording and subsequently transcribing dictation on a recording medium, comprising: movement means selectively operative to move a recording medium in either a first direction or a second direction; first record means operative to record dictated material on the recording medium as the recording medium is moved in a first direction by said movement means; second record means selectively operative to record indexing signals on the recording medium distinguishable from the recorded dictated material as the recording medium undergoes said first direction movement; transcribe means operative in response to such recorded dictated material on the recording medium to reproduce the dictated material as the recording medium is moved in the first direction; indexing signal means operative in response to an indexing signal recorded on the recording medium to provide an indexing signal condition as the recording medium is moved in a selected direction; dictate control means connected to said movement means and to said first record means and operative to command movement of the recording medium in the first direction and to command operation of said first record means; indexing control means connected to said movement means and to said indexing signal means and selectively operative to command movement of the recording medium in either of said directions and to command operation of said indexing signal means; said indexing control means includes movement stop means responsive to the occurrence of said indexing signal condition to terminate said commanded movement of the recording medium only when said indexing control means is commanding movement of the recording medium in a certain one of said directions; and transcribe control means connected to said movement means and operative to command movement of the recording medium in the first direction and to command operation of said transcribe means.

4,007,492

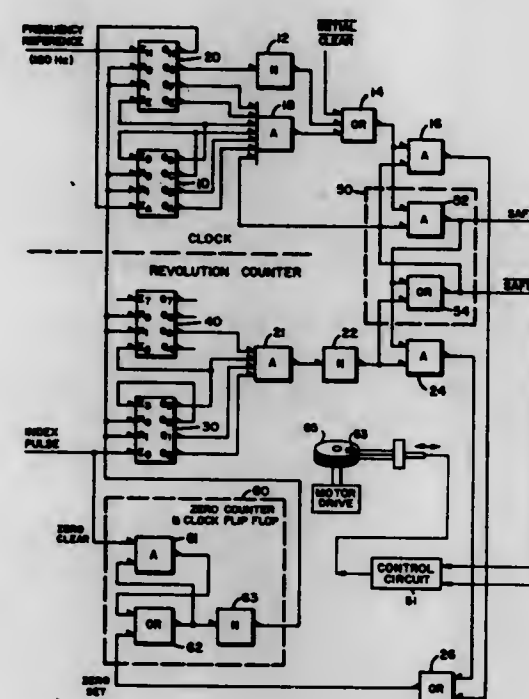
ROTATIONAL SPEED MONITOR

Andrew M. Rose, Pittsburgh, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 449,165, March 7, 1974, Pat. No. 3,900,796. This application Apr. 4, 1975, Ser. No. 565,184

Int. Cl.³ G11B 21/12, 15/46, 19/02; G01B 3/56
U.S. Cl. 360-75

2 Claims



1. The method of lowering a read-write device onto a rotating recording medium comprising the steps of,
 - a. generating a first threshold value comprising two separated rotational speeds,
 - said read-write device being brought into juxtaposition with said recording medium when the medium's rotational speed reaches said threshold;
 - b. switching to a second threshold value comprising two separated rotational speeds upon reaching said first threshold,
 - the second threshold value being lower than the first threshold value,
 - said switching from a first to a second threshold preventing the in and out movement of said read-write device with respect to said recording medium.

4,007,493

TRACK POSITIONING SYSTEM FOR MAGNETIC TRANSDUCER HEAD

Michael Isaac Behr, South Pasadena; Norman Stephen Blesum, Thousand Oaks, and Wilfred Dean Iwan, Sierra Madre, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 6, 1975, Ser. No. 574,872

Int. Cl.³ G11B 21/10

U.S. Cl. 360-77

13 Claims



1. System for positioning a transducer head relative to a recording medium movable past the head, comprising:
 - a first control recording on said medium for identifying a plurality of positions capable of being occupied by the head;
 - first means associated with the first control recording to provide a series of pulses corresponding to said first recording;
 - a second control recording on said medium for identifying a particular position of said plurality of positions;
 - said first and second recordings extending in parallelism, circumferentially on said medium, and said first recording comprising a plurality of magnetic transitions extending at a first angle to the direction of motion of said medium, and said second recording comprising a single magnetic transition oriented at a second angle to the direction of motion of said medium;
 - second means associated with the second control recording to provide a single pulse corresponding to said second recording;
 - a circuit connected to said first and second means for providing a signal corresponding to the deviation of the position of the head from a desired position; and
 - means connected to said circuit and capable of energizing the head for movement thereof in response to said signal.

DESIGN PATENTS

GRANTED FEBRUARY 8, 1977

ERRATA

For	See
CLASS	PATENT NO.
015-053	243,311
023-058	243,325
011-152	243,357
011-152	243,358
011-004	243,359
011-083	243,360
015-104	243,362

DESIGNS

FEBRUARY 8, 1977

243,291

POCKET FOR TROUSERS OR THE LIKE

David Mechaly, Allee de Pins, Immeubles "L'Emeraude",
chemin du Redon, 13609 Marseille, and Jean-Claude Gil-
lard, Lotissement Barqueroute, Allee 5, 13620 Carry-Le-
Rouet, both of France

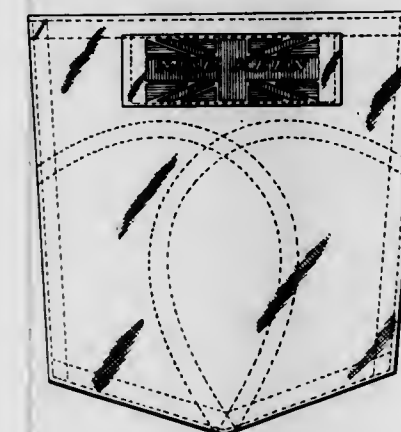
Filed May 5, 1975, Ser. No. 574,711

Claims priority, application France, Nov. 5, 1974, 74.4178 U.S. Cl. D2-404

Term of patent 14 years

Int. Cl. D2-02

U.S. Cl. D2-25



243,293

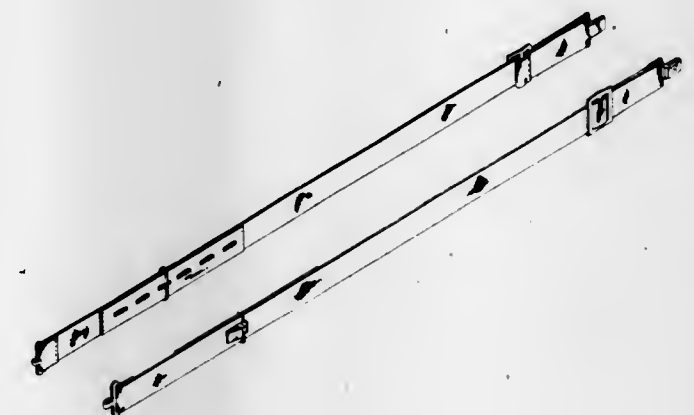
ADJUSTABLE SUSPENDER

Horatio Scheimberg, 5636 Melrose Ave., Los Angeles, Calif.
90038

Filed Mar. 12, 1975, Ser. No. 557,600

Term of patent 14 years

Int. Cl. D2-07



243,292

GLOVE FOR POOL, BILLIARDS, OR THE LIKE

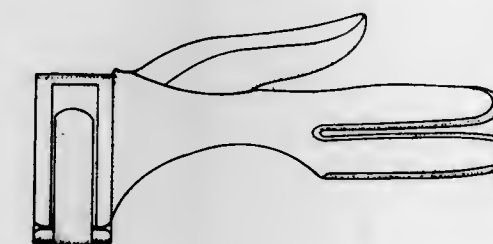
Elmer C. Kochler, 26512 Calle San Francisco, San Juan Capis-
trano, Calif. 92675

Filed Feb. 7, 1975, Ser. No. 548,085

Term of patent 14 years

Int. Cl. D2-06

U.S. Cl. D2-361



243,294

HAND POWERED TUFTING MACHINE

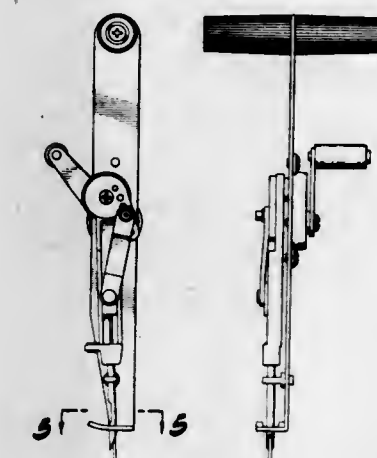
Fred A. Thaheld, and Fred H. Thaheld, both of Minden, Nev.,
assignors to Rumpelstiltskin's Craft Shop, Inc.

Filed June 25, 1975, Ser. No. 590,323

Term of patent 14 years

Int. Cl. D15-06

U.S. Cl. D3-19 R



243,295
PEDESTAL BASE

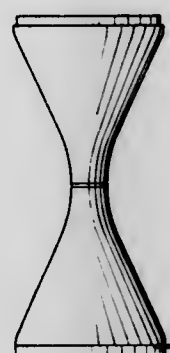
George J. Hartinger, 3906 Thomas Ave. North, Minneapolis, Minn. 55412

Filed June 16, 1975, Ser. No. 586,885

Term of patent 14 years

Int. Cl. D6-03

U.S. Cl. D6-26



243,297
HANGING RACK

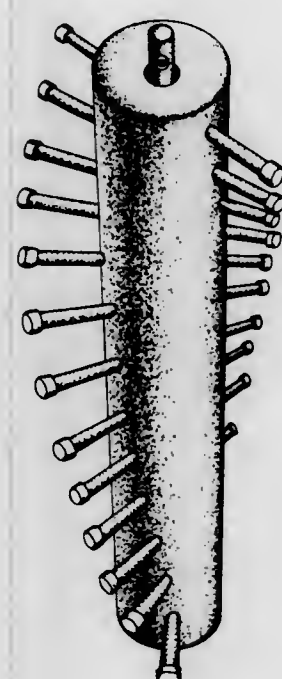
Joseph N. Vizzard, 16041 Greenwood Road, Monte Sereno, Calif. 95030

Filed Dec. 22, 1975, Ser. No. 642,769

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-113



243,296
CHAIR

Marten Gottsegen, 1212 Lake Shore Drive, Chicago, Ill. 60610

Filed June 30, 1975, Ser. No. 591,417

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-71



243,298
RACK FOR SPICE CONTAINERS

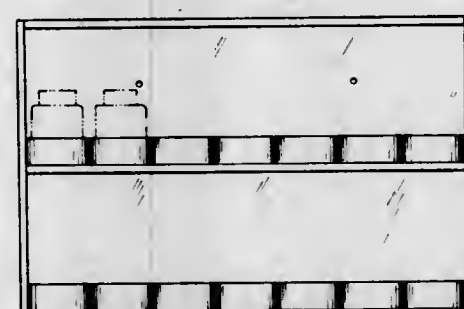
Gayle A. Taubman, 40 Central Park South, Apt. 4D, Wing 41, New York, N.Y. 10019

Filed Dec. 12, 1975, Ser. No. 639,999

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-136



243,299
END TABLE

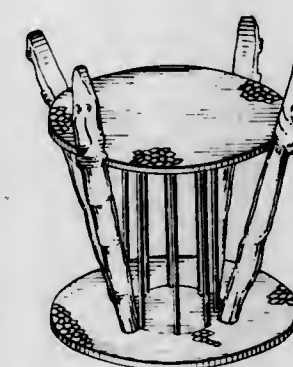
Ralph Jackson, 4815 Texas Ave. SE. No. 402, Washington, D.C. 20019

Filed Sept. 30, 1975, Ser. No. 617,422

Term of patent 14 years

Int. Cl. D6-03

U.S. Cl. D6-148



243,301
CHEVAL-GLASS

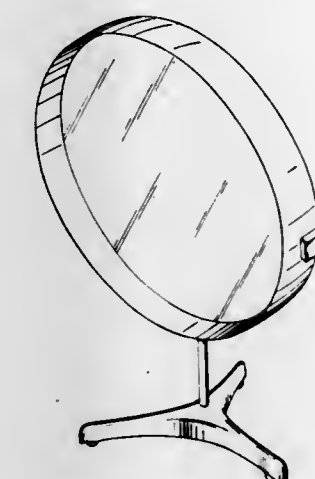
Ole Stig Ravn, Farum, Denmark, assignor to Stig Ravn A/S, Farum, Denmark

Filed Apr. 30, 1975, Ser. No. 573,302

Term of patent 14 years

Int. Cl. D6-07

U.S. Cl. D6-235



243,302
SUNGLASS RACK

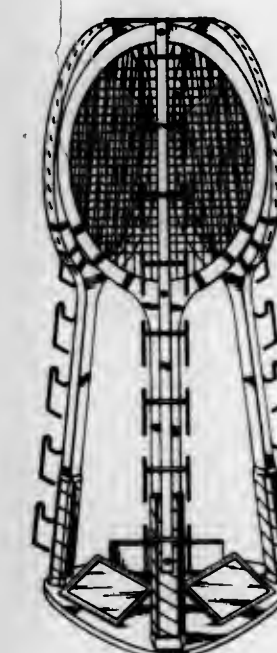
George Weisenfeld, 11920 Briarvale Lane, and David Halpern, 11301 Dona Isabel Drive, both of Studio City, Calif. 91604

Filed Oct. 23, 1975, Ser. No. 625,268

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D6-151



243,300
WORK BENCH FOR A FRUIT AND VEGETABLE GRADER

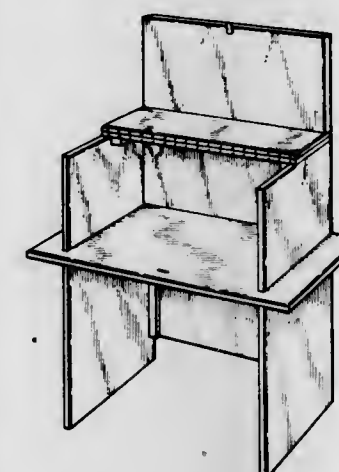
Grover N. Christensen, 18763 Casa Blanca Lane, Saratoga, Calif. 95070

Filed Oct. 2, 1975, Ser. No. 618,788

Term of patent 3.5 years

Int. Cl. D6-03

U.S. Cl. D6-150



243,303

COCKTAIL TABLE

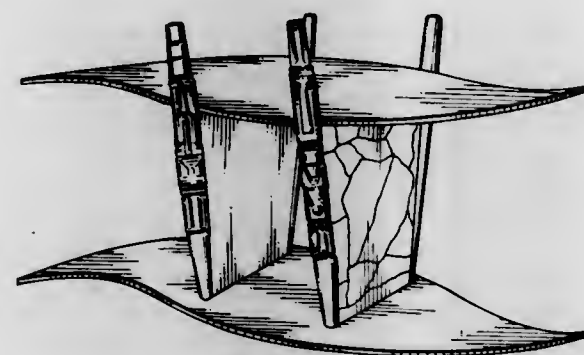
Ralph Jackson, 4815 Texas Ave., SE., No. 402, Washington, D.C. 20019

Filed Sept. 30, 1975, Ser. No. 617,421

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-177



243,304

ARMREST COVER OR SIMILAR ARTICLE

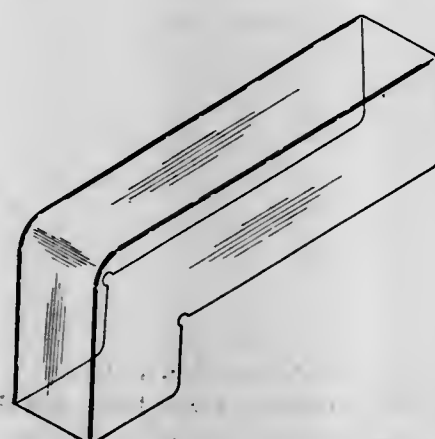
Robert S. Fuqua, 1530 Glenhurst, Wichita, Kans. 67212

Filed Sept. 2, 1975, Ser. No. 609,424

Term of patent 7 years

Int. Cl. D6-13

U.S. Cl. D6-269



243,305

PLACEMAT OR SIMILAR ARTICLE

Gary K. Kobashikawa, 3460 Maluhia St., Honolulu, Hawaii 96816

Filed Aug. 4, 1975, Ser. No. 601,535

Term of patent 14 years

Int. Cl. D6-13; D7-06

U.S. Cl. D6-271



243,306

KNOCKDOWN FURNITURE BASE OR SIMILAR ARTICLE

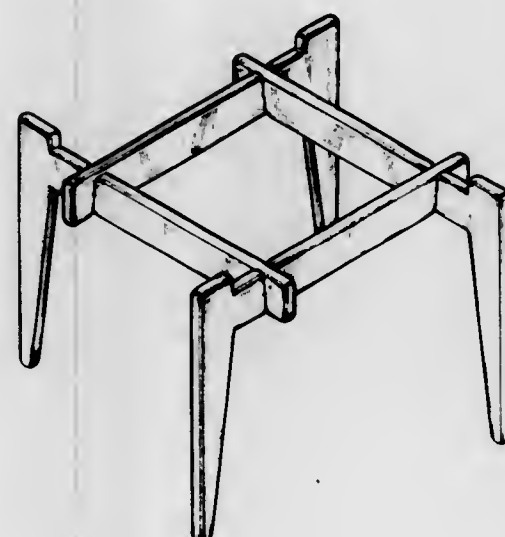
John W. Moyer, 2342 Jackson St., Fremont, Calif. 94538

Filed June 6, 1975, Ser. No. 584,386

Term of patent 14 years

Int. Cl. D6-06

U.S. Cl. D6-191



243,307

CANISTER

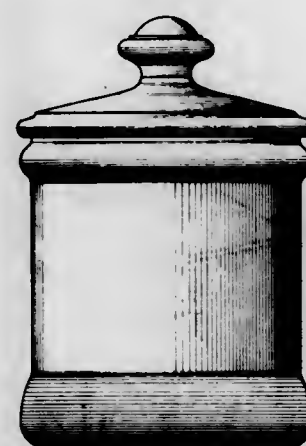
Dominick Loscalzo, New York, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed May 5, 1975, Ser. No. 574,783

Term of patent 14 years

Int. Cl. D7-07

U.S. Cl. D7-79



243,308

COFFEEMAKER OR THE LIKE

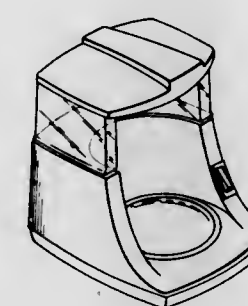
Wolfgang Harms, 209 Harvest Rd., and Karl H. Bergmann, 12 Plymouth Drive, both of Cherry Hill, N.J. 08034

Filed Apr. 16, 1975, Ser. No. 568,391

Term of patent 14 years

Int. Cl. D7-02

U.S. Cl. D7-85



243,310

BARBEQUE

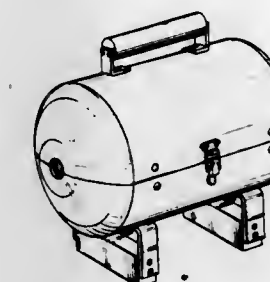
Carol Lee Heberling, 10890 Loma Vista, Ventura, Calif. 93003

Filed Mar. 1, 1976, Ser. No. 662,324

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D7-110



243,311

HOT WATER EXTRACTION-TYPE CARPET CLEANING MACHINE

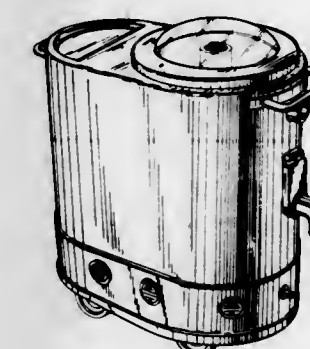
Robert N. Bartlett, Arapahoe County, Colo., assignor to Windsor Industries, Inc., Denver, Colo.

Filed May 16, 1975, Ser. No. 578,072

Term of patent 14 years

Int. Cl. D7-05; D15-05

U.S. Cl. D15-53



243,309

GRILL

Kosti Reunanen, Kodiksaml, Finland, assignor to Reunanen & Roviola Oy, Finland

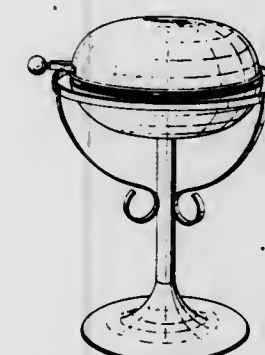
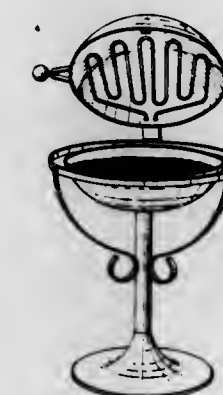
Filed July 23, 1975, Ser. No. 598,149

Claims priority, application Finland, Jan. 23, 1975, 7530

Term of patent 14 years

Int. Cl. D7-04

U.S. Cl. D7-107



243,312

PAINT CAN RIM CLEANING TOOL

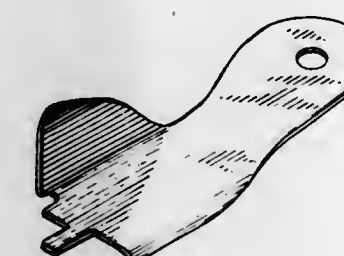
Gerald D. Chaney, 1143 Nunnally Road, Paradise, Calif. 95969

Filed Aug. 29, 1975, Ser. No. 542,439

Term of patent 3 1/2 years

Int. Cl. D7-05; D8-05

U.S. Cl. D7-181



243,313

GLOVE DRAINER AND DRIER

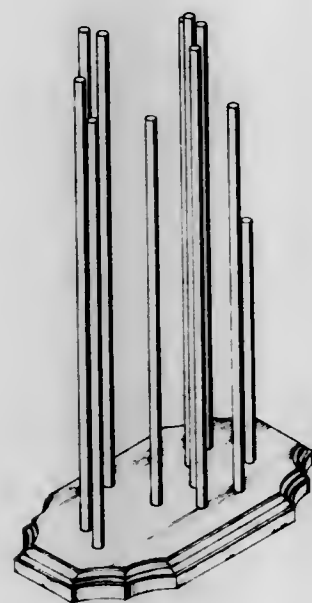
Francis D. Varnado, 575 Dudley, Lakewood, Colo. 80226

Filed Dec. 17, 1975, Ser. No. 641,532

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D7-196



243,315

TAMPING DEVICE

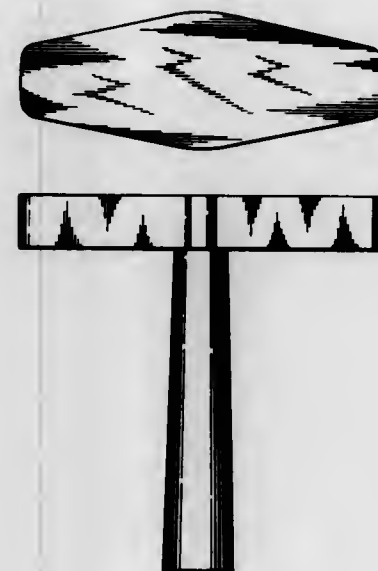
James F. Smith, 1116 Geranium Crescent, Virginia Beach, Va. 23456

Filed Jan. 12, 1976, Ser. No. 648,486

Term of patent 7 years

Int. Cl. D8-02

U.S. Cl. D8-77



243,316

BOTTLE

Raymond G. Reynolds, Leawood, Kans., assignor to Owens-Illinois, Inc., Toledo, Ohio

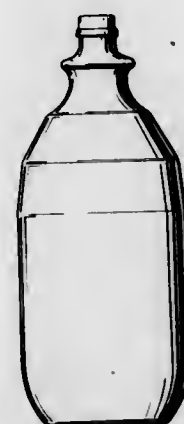
Filed July 25, 1975, Ser. No. 566,271

The portion of the term of this patent subsequent to Nov. 30, 1990, has been disclaimed.

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-119



243,314

AXE

Stig Hedvall, Slattervagen 20, 811 00, Sweden

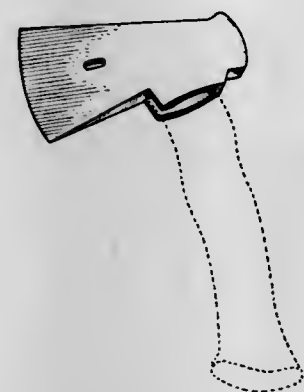
Filed Apr. 17, 1975, Ser. No. 568,906

Claims priority, application Sweden, Nov. 8, 1974, 741842

Term of patent 14 years

Int. Cl. D8-03

U.S. Cl. D8-76



243,317

VEHICLE WHEEL LOCKING NUT

Yasuharu Fukuyama, Los Angeles, Calif., assignor to Fujita Industrial Co., Ltd., Santa Monica, Calif.

Filed Oct. 6, 1975, Ser. No. 619,704

Term of patent 14 years

Int. Cl. D8-08

U.S. Cl. D8-273



243,318

COMBINED WRIST-WATCH CASE WITH BAND

Isao Kurihara, Yokohama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

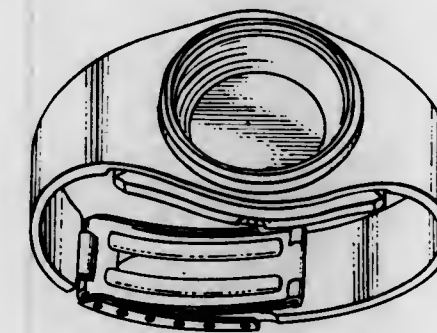
Filed July 21, 1975, Ser. No. 597,355

Claims priority, application Japan, Feb. 25, 1975, 50-7250

Term of patent 14 years

Int. Cl. D10-02

U.S. Cl. D10-32



243,319

SURVEY MONUMENT BASE

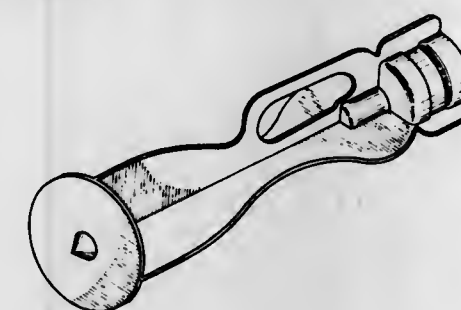
Peter Berntsen, and Phillip R. Peterson, both of P.O. Box 3025, Madison, Wis. 53704

Filed Sept. 19, 1975, Ser. No. 616,271

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-74



243,320

ARCHERY BOW WEIGHT SCALE

Paul D. MacWilliams, 4039 Brunswick Ave., Los Angeles, Calif. 90039

Filed May 1, 1975, Ser. No. 573,394

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-83



243,321

FIRE DETECTOR

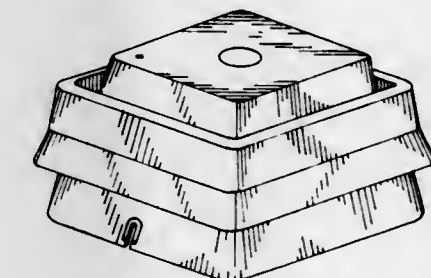
Alvin A. Mayer, Littleton, Colo., assignor to Statitrol Corporation, Lakewood, Colo.

Filed Sept. 2, 1975, Ser. No. 609,341

Term of patent 14 years

Int. Cl. D10-05

U.S. Cl. D10-106



243,322

MARINE AEROGLIDER

Paul Francois Guenne, c/o S.E.D.A.M. 80 Avenue de la Grande Armee, Paris, France

Filed Dec. 2, 1975, Ser. No. 637,076

Claims priority, application France, June 4, 1975, 75.38207

Term of patent 14 years

Int. Cl. D12-14

U.S. Cl. D12-5



243,323
BUMPER

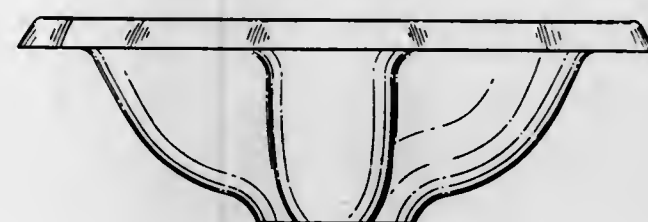
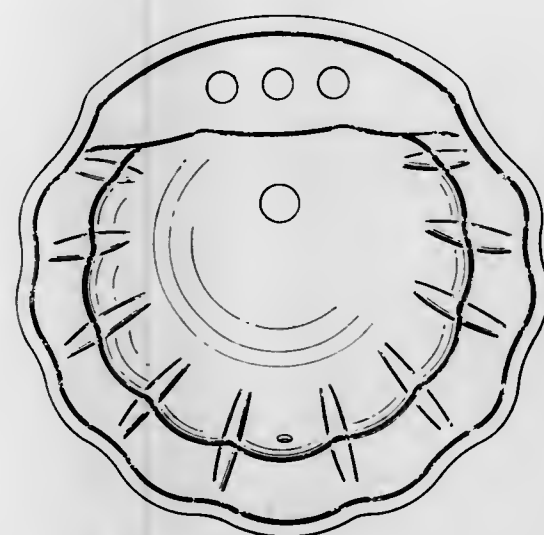
Raymond A. Waldsmith, Placerville, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 594,565, July 9, 1975, abandoned. This application May 6, 1976, Ser. No. 683,839
Term of patent 14 years
Int. Cl. D12-16

U.S. Cl. D12-169

243,325
LAVATORY WASH BOWL

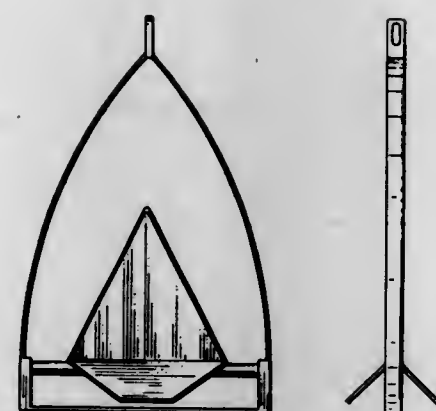
Richard T. Krause, and Richard Van Tilburg, both of Elkhart, Ind., assignors to Leigh Products, Inc., Grand Rapids, Mich.
Filed Nov. 5, 1975, Ser. No. 629,046
Term of patent 14 years
Int. Cl. D23-02

U.S. Cl. D23-58

243,324
ANCHOR

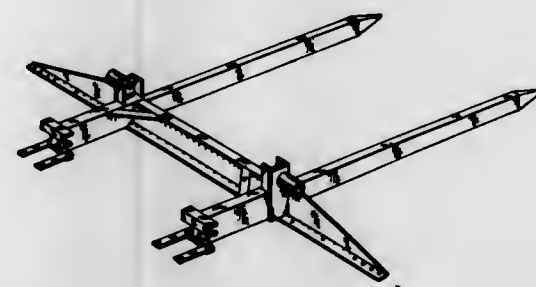
James M. Taylor, West Palm Beach, Fla., assignor to Wishbone Marine Products Inc., Pompano Beach, Fla.
Filed Mar. 8, 1976, Ser. No. 664,969
Term of patent 14 years
Int. Cl. D12-16

U.S. Cl. D12-215

243,326
ROUND BALE HANDLING ATTACHMENT FOR A TRACTOR EQUIPPED WITH A FRONT END BUCKET LOADER OR A REAR END LIFT MECHANISM

Lloyd L. Vandewater, Rte. 1, Box 98, Dexter, Iowa 50070
Filed Apr. 14, 1976, Ser. No. 677,024
Term of patent 14 years
Int. Cl. D15-03

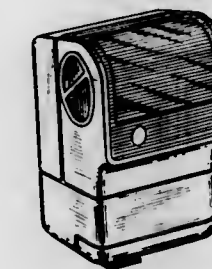
U.S. Cl. D15-28

243,327
ELECTRONIC FLASH UNIT

Aloysius Jacobus Maria Beeren, Nuenen, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.
Filed Nov. 29, 1974, Ser. No. 528,286
Claims priority, application Switzerland, June 7, 1974, 58844/74

Term of patent 14 years
Int. Cl. D16-05

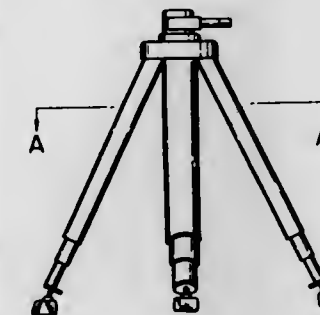
U.S. Cl. D16-42

243,328
TRIPOD

Michio Kawazoe, 30-11 5-chome Narita, Higashi Suginami, Tokyo, Japan
Filed May 23, 1974, Ser. No. 472,515
Claims priority, application Japan, Apr. 11, 1974, 49-012094

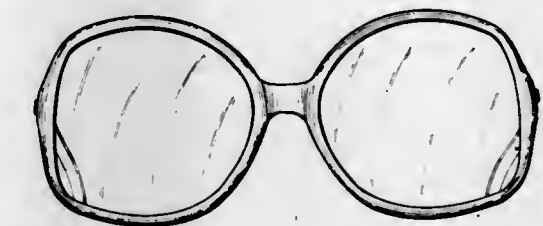
Term of patent 14 years
Int. Cl. D16-05

U.S. Cl. D16-45

243,330
EYEGLASS FRAME

Karl Pichler, Linz, Austria, assignor to Optyl Corporation, Norwood, N.J.
Filed Nov. 24, 1975, Ser. No. 634,912
Term of patent 14 years
Int. Cl. D16-06

U.S. Cl. D16-65

243,331
TOY WRITING INSTRUMENT, OR SIMILAR ARTICLE

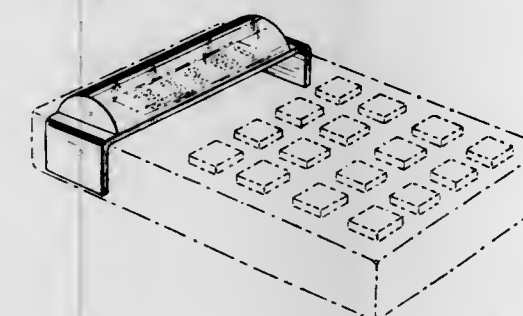
Janis V. Jaunarajs, Somerville, N.J., assignor to Shelbud Products Corporation, New Rochelle, N.Y.
Filed Apr. 16, 1975, Ser. No. 568,692
Term of patent 14 years
Int. Cl. D19-06

U.S. Cl. D19-42

243,329
MAGNIFIER FOR CALCULATOR READ OUT

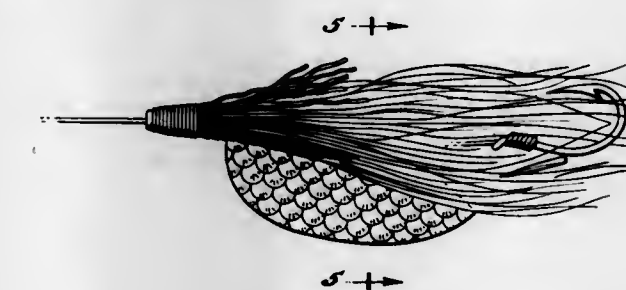
George A. Snarski, 3342 N. Ernst, Franklin Park, Ill. 60131
Filed June 4, 1975, Ser. No. 583,176
Term of patent 3½ years
Int. Cl. D16-06

U.S. Cl. D16-54

243,332
FISHING LURE

Richard C. Carroll, 3115 W. Vogel Ave., Greenfield, Wis. 53221
Filed Apr. 23, 1976, Ser. No. 679,651
Term of patent 14 years
Int. Cl. D22-04

U.S. Cl. D22-27



243,333
SPRAYER

Tetsuya Tada, 2-6, 3-chome, Nishinakano Shinagawa, Tokyo, Japan

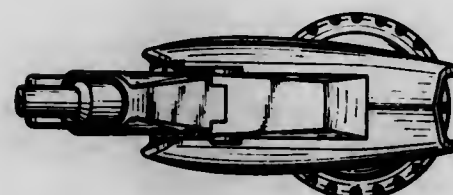
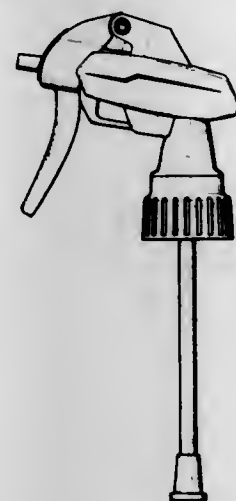
Filed Aug. 27, 1975, Ser. No. 608,268

Claims priority, application Japan, May 8, 1975, 49-17921

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-17



243,335
CONSOLE HUMIDIFIER

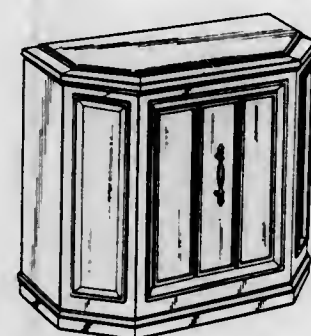
Bertrand N. Trombley, Birmingham, Mich., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 15, 1975, Ser. No. 605,133

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-146



243,336
CONSOLE HUMIDIFIER

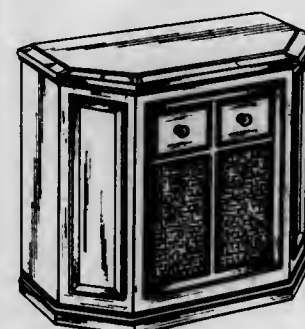
David L. Painter, Glenview, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 15, 1975, Ser. No. 605,132

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-146



243,334
BATHTUB

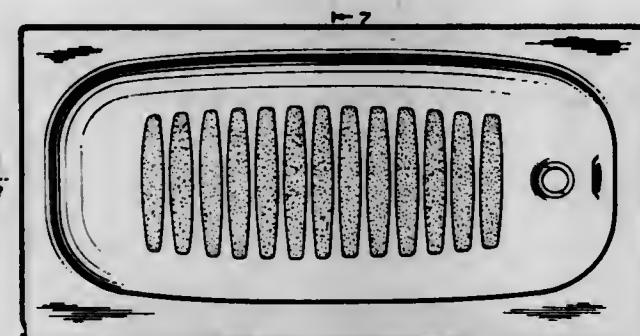
Henry M. Stairs, Jr., Somerville, N.J., assignor to American Standard, Inc.

Filed May 25, 1976, Ser. No. 689,900

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-55



243,337
DENTIST'S SYRINGE

Sven Karl Lennart Goof, Marielundsvej 46 C, DK-2730 Herlev, Denmark

Filed Dec. 24, 1974, Ser. No. 536,250

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D24-1 D



243,338
MULTIPLE CONVERGENCE LINEAR OPTICAL AND RECEIVER PLATE FOR SOLAR CONVERSION OR THE LIKE

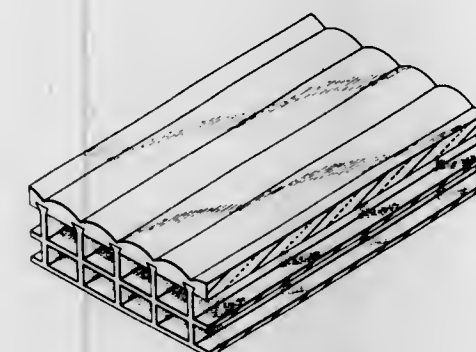
Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752

Filed Jan. 21, 1976, Ser. No. 651,097

Term of patent 14 years

Int. Cl. D13-02; D26-05

U.S. Cl. D26-1 R



243,340
DISK PACK DRIVE AND CONTROLLER

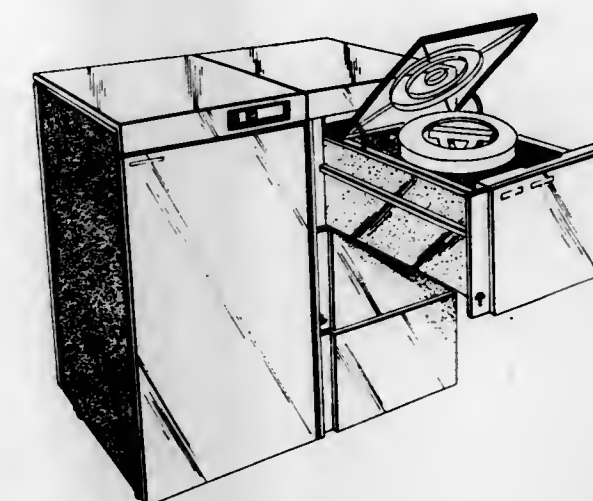
Richard G. Clayton, Detroit; John M. Blue, Troy, both of Mich.; Jack K. Beduhn, Westlake Village, and Norman P. Guetschoff, Jr., Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1975, Ser. No. 642,494

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D26-5 C



243,341
HAND HELD ELECTRONIC SCANNING CAMERA PROBE

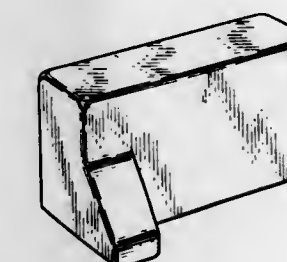
Armin Miller, 2979 Alexis Drive, Palo Alto, Calif. 94304

Filed June 30, 1975, Ser. No. 591,355

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D26-5 C



243,339
CONDENSED MULTIPLE CONVERGENCE LINEAR OPTICAL AND CONVECTIVE RECEIVER PLATE FOR SOLAR CONVERSION OR THE LIKE

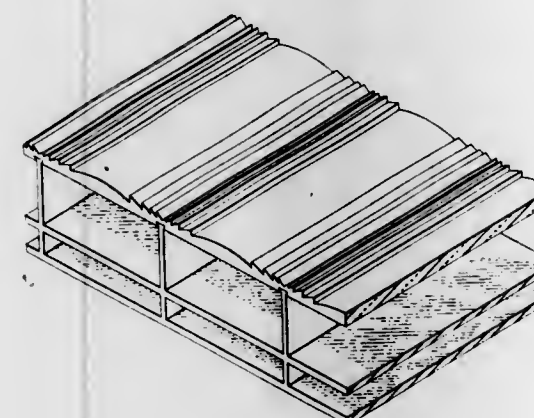
Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752

Filed Jan. 21, 1976, Ser. No. 651,099

Term of patent 14 years

Int. Cl. D13-02; D26-05

U.S. Cl. D26-1 R



243,342
NAIL-ON ELECTRIC FENCE INSULATOR

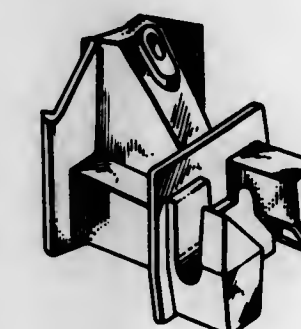
Howard Langille, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026

Filed Dec. 12, 1975, Ser. No. 640,061

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D26-10



243,343

ROUND-POST ELECTRIC FENCE INSULATOR

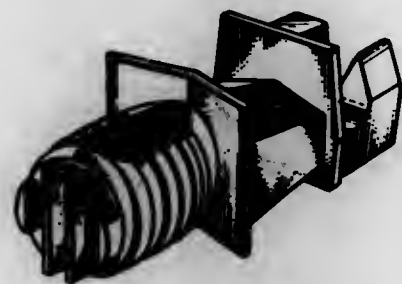
Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026

Filed Dec. 12, 1975, Ser. No. 640,161

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D26-10



243,344

HOUSING FOR FENCE CHARGER

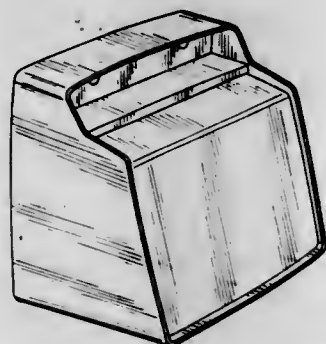
Peter B. Allard, Minnetonka, Minn., assignor to Introl Corporation, Minneapolis, Minn.

Filed June 10, 1975, Ser. No. 585,461

Term of patent 7 years

Int. Cl. D13-03

U.S. Cl. D26-5 R



243,345

POCKET DICTATING MACHINE

Henricus Franciscus Theresia Schellens, Eindhoven, and John Collyer Speakman, Netersel, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 8, 1975, Ser. No. 611,443

Claims priority, application Belgium, Mar. 10, 1975, 50141

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D26-14 B



243,346

STAR-SHAPED PENDANT ROACH CLIP

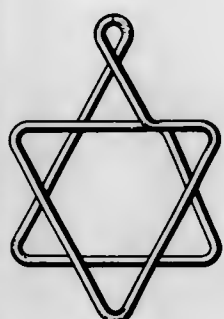
Jerry L. Samuels, c/o J. Laurence Samuels, Incorporated, 808 Bethlehem Pike, Philadelphia, Pa. 19118

Filed Aug. 5, 1975, Ser. No. 601,986

Term of patent 14 years

Int. Cl. D27-02

U.S. Cl. D27-2



243,347

SMOKING PIPE, OR SIMILAR ARTICLE

David Segal, 906 Gordon Terrace, Winnetka, Ill. 60093

Filed Sept. 24, 1975, Ser. No. 616,501

Term of patent 7 years

Int. Cl. D27-02

U.S. Cl. D27-3



243,348

LIGHTER

Franz Alban Stuetzer, Muhlheim, Main, Germany, assignor to Rowenta-Werke GmbH, Offenbach, Main, Germany

Filed Nov. 24, 1975, Ser. No. 634,958

Claims priority, application Germany, May 30, 1975, 59869

Term of patent 14 years

Int. Cl. D27-05

U.S. Cl. D27-42



243,349

LIGHTER

Robert Hocq, Boulogne, France, assignor to Societe Franco-Hispano-Americaine (FRANCISPAM), Saint-Gratien, France

Filed Dec. 9, 1975, Ser. No. 639,102

Claims priority, application France, June 13, 1975, 75.450

Term of patent 14 years

Int. Cl. D27-05

U.S. Cl. D27-42



243,351

ROTARY TIE OUT STAKE FOR A PET ANIMAL

Gaylord V. Laukhuf, Box 89, Antwerp, Ohio 45813

Filed Oct. 17, 1975, Ser. No. 623,420

Term of patent 14 years

Int. Cl. D30-09

U.S. Cl. D30-44



243,352

AQUARIUM

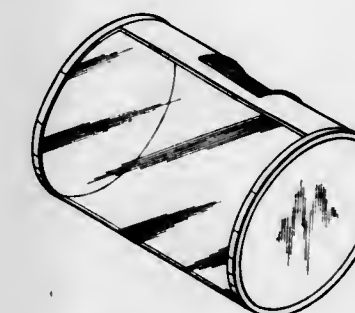
James A. Gray, Sr., 209 Anna St., Dayton, Ohio 45417

Filed July 1, 1976, Ser. No. 701,851

Term of patent 14 years

Int. Cl. D30-02

U.S. Cl. D30-9



243,350

COMBINED CIGARETTE PACK HOLDER AND MATCHBOOK

Kunihiko Shibata, No. 21-18, 4-chome, Kaminoge, Setagaya, Tokyo, Japan

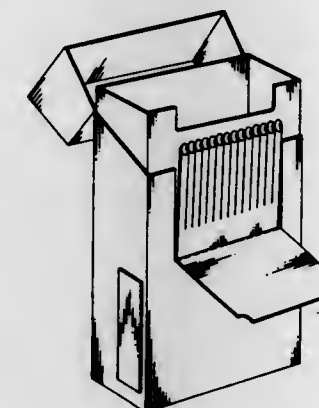
Filed Feb. 13, 1975, Ser. No. 549,824

Claims priority, application Japan, Aug. 17, 1974, 49-98481[U]

Term of patent 14 years

Int. Cl. D27-06

U.S. Cl. D27-49



243,353

GOLF HEAD COVER HOLDER

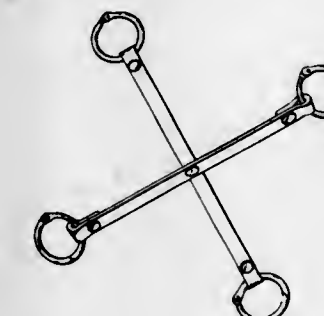
Harry M. Edwards, Los Angeles, Calif., assignor to Matzie Golf Company, Inc.

Filed June 27, 1975, Ser. No. 591,022

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 GB



243,354

TENNIS RACKET THROATPIECE

Paul A. Witte, and Thomas Johnson, both of Hopewell, N.J.,
assignors to Maark Corporation, Plainsboro, N.J.

Filed Sept. 26, 1975, Ser. No. 617,018

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 ST



243,356

TOY ANIMAL FIGURE AND RIDER

John D. Birdsall, 1262 Sunset Plaza Drive, Los Angeles, Calif.
90069

Filed May 30, 1975, Ser. No. 582,220

Term of patent 7 years

Int. Cl. D21-01

U.S. Cl. D34-15 B



243,357

PLANT CONTAINER

Ronald John Gross, 10 Surrey Road, Mount Waverley, Vic-
toria, Australia

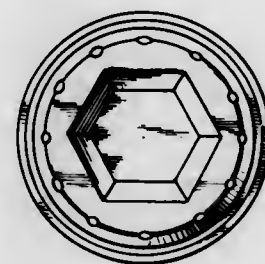
Filed Nov. 11, 1974, Ser. No. 522,918

The portion of the term of this patent subsequent to Jan. 11,
1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-152



243,355

GOLF CLUB GRIP

Clifford A. Spencer, Akron, Ohio, assignor to Eaton Corpora-
tion

Filed June 3, 1975, Ser. No. 583,301

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 GS



243,358

PLANT CONTAINER

Ronald John Gross, 10 Surrey Road, Mount Waverley, Vic-
toria, Australia

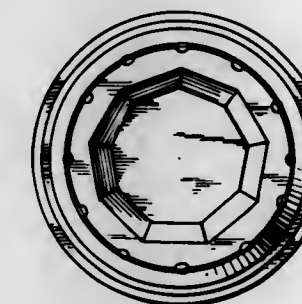
Filed Nov. 11, 1974, Ser. No. 522,919

The portion of the term of this patent subsequent to Jan. 11,
1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-152



243,360

PENDANT

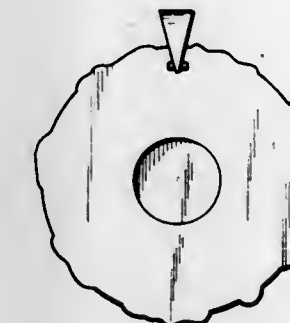
Gary K. Kobashikawa, 3460 Maluhia St., Honolulu, Hawaii
96816

Filed July 23, 1975, Ser. No. 598,213

Term of patent 14 years

Int. Cl. D11-01

U.S. Cl. D11-83



243,361

LAMP

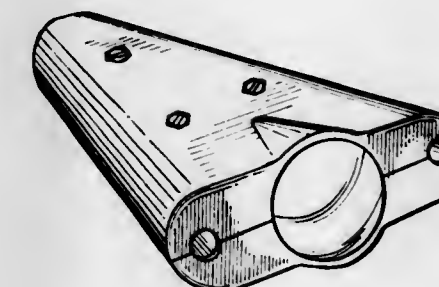
Saul Corber, 5606 Alpine Ave., and Murray E. Moss, 4874
Cote des Neiges, Apt. 301, both of Montreal, Quebec, Can-
ada

Filed Oct. 21, 1974, Ser. No. 516,598

Term of patent 14 years

Int. Cl. D26-02

U.S. Cl. D48-24 A



243,362

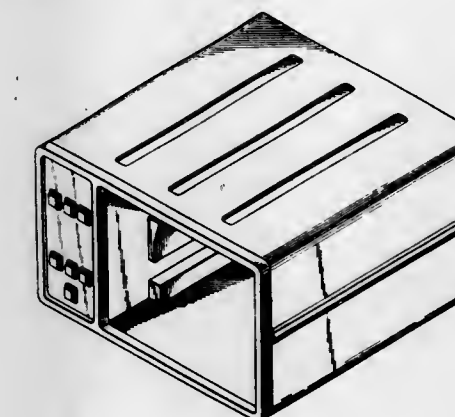
FOOD TRAY TEMPERATURE MAINTENANCE STATION
George K. Shumrak, Natick, and Anthony Mack, North Read-
ing, both of Mass., assignors to Sweetheart Plastics, Inc.,
Wilmington, Mass.

Filed Oct. 6, 1975, Ser. No. 619,624

Term of patent 14 years

Int. Cl. D15-08

U.S. Cl. D15-104



243,359

RING OR BRACELET

Loris Nevrous, 29, Rue Edouard Nortier, Neuilly-sur-Seine,
Hauts-de-Seine, France

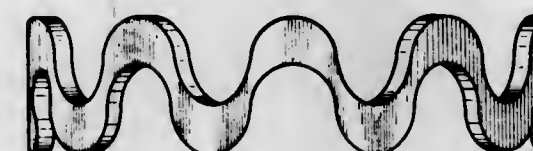
Filed Sept. 23, 1974, Ser. No. 508,286

Claims priority, application France, Mar. 25, 1974,
72.741112

Term of patent 7 years

Int. Cl. D11-01

U.S. Cl. D11-4



243,363

FONT OF CHARACTERS FOR FORMING A GRAPHIC DISPLAY

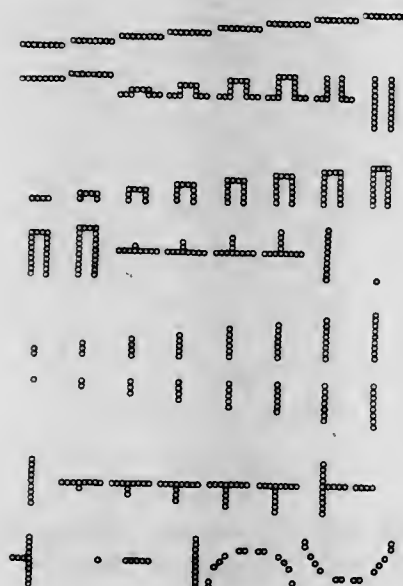
John E. Crowe, Havertown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1974, Ser. No. 513,247

Term of patent 14 years

Int. Cl. D18-03

U.S. Cl. D64-12 B



243,364

HEAD HOOD FOR RESPIRATORY INHALATION SYSTEMS

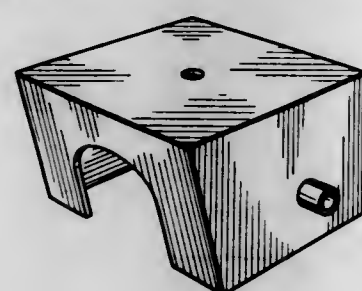
Bruce B. Miller, 714 Ashley Drive, Kalamazoo, Mich. 49001

Filed July 23, 1975, Ser. No. 598,858

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D83-1 F



243,365

MEDICAL AIRWAY TUBE SEPARATOR OR THE LIKE

David E. Cross, Folkestone, England, assignor to Smiths Industries Limited, London, England

Filed Mar. 31, 1976, Ser. No. 672,173

Term of patent 14 years

Int. Cl. D24-04

U.S. Cl. D83-1 R



243,366

PROTECTIVE CASING FOR PACIFIERS

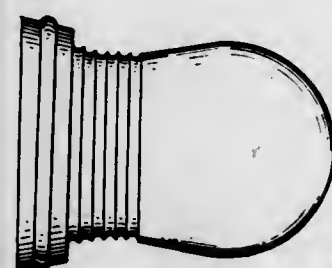
Linda L. Lybe, 14075 Lincoln Ave., and Lola M. Coulombe, 14711 La Salle, both of, Dolton, Ill. 60419

Filed Aug. 18, 1975, Ser. No. 605,597

Term of patent 14 years

Int. Cl. D24-04

U.S. Cl. D83-8 B



243,367

HAIR DRYER

Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

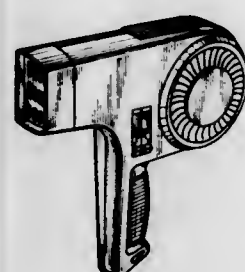
Filed Aug. 11, 1975, Ser. No. 605,219

Claims priority, application United Kingdom, Feb. 11, 1975, 969820/75

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D86-10 F



243,368

HAIR DRYER

Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

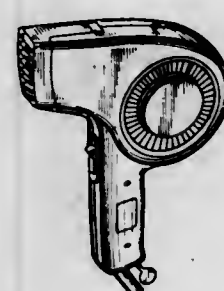
Filed Aug. 11, 1975, Ser. No. 605,220

Claims priority, application United Kingdom, Feb. 11, 1975, 969820/75

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D86-10 F



243,369

DEEP TEXTURED DECORATIVE LAMINATE

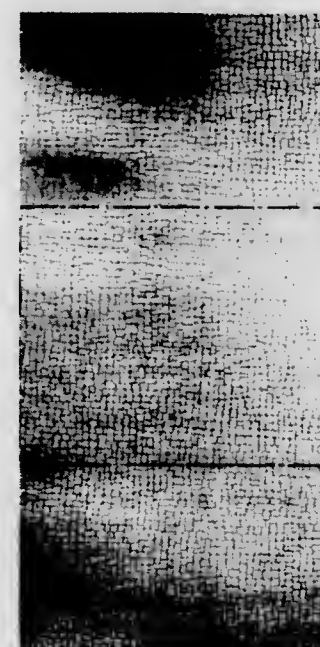
Jack August Willard, Hamilton, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

Filed Mar. 27, 1975, Ser. No. 562,522

Term of patent 14 years

Int. Cl. D5-06

U.S. Cl. D87-3 G



243,370

TEXTILE FABRIC

Susan Collier, London, England, assignor to Liberty of London Prints Limited, London, England

Filed Feb. 24, 1975, Ser. No. 552,717

Claims priority, application United Kingdom, Aug. 23, 1974, 512968/74

Term of patent 14 years

Int. Cl. D5-05

U.S. Cl. D92-1 Y



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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF FEBRUARY, 1977

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- A/S Ferrosan: *See—*
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- Abbott Laboratories: *See—*
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- Abler, Norman C., to Bunker Ramo Corporation. Manufacturing of
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- Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to
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- Abrams, Nathan: *See—*
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- Accrabond Corporation: *See—*
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- Acda, Petrus Marinus; and Karreman, Jacob, to Polva Nederland B.V.
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- Ackerman, Stephen P. Blanket fastening means for a cylinder blanket.
4,006,686, Cl. 101-415.100.
- Acme Scale Company: *See—*
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- Acorn Engineering Company: *See—*
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- Adams Rite Products, Inc.: *See—*
Geer, Larry A.; and Sheffer, Ralph L., 4,006,951.
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- Addison, George Thomas: *See—*
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- Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Nieder-
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ner, to Bayer Aktiengesellschaft. Use of perfluoroalkanesulphonic
acid amides and/or cyclimonium salts of perfluoroalkanesulphonic
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- Adlerborn, Jan: *See—*
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- Adomante, Yanina Antono: *See—*
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gov, Vyacheslav Dmitrievich; Kudanova, Sofya Ivanovna; Sizova,
Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov,
Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna;
Sidaravichus, Jonas-Donatos Bronysaus; Randina, Larisa Vasi-
lievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina
Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Iva-
novna; and Adomante, Yanina Antono, 4,007,317.
- Adrian, Fritz, to Deutsche Babcock & Wilcox Aktiengesellschaft.
Method for transportation and utilization of waste heat of large
condenser power plants. 4,006,857, Cl. 237-2.00B.
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Wood, Robert L., 4,006,503.
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- Aeritalia S.p.A.: *See—*
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- Patin, Pierre, 4,006,916.
- Agency of Industrial Science & Technology: *See—*
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- AGFA-Gevaert, A.G.: *See—*
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- Helmberger, Josef; and Ruf, Wolfgang, 4,007,489.
- Wagensohnner, Eduard; and Winkler, Alfred, 4,006,975.
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- Agribest, Inc.: *See—*
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- Air Control Industries, Inc.: *See—*
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- Aktiebolaget Svenska Flaktfabriken: *See—*
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Cummings, John S., 4,006,835.
- Albany International Corporation: *See—*
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- Albert, Richard D. Multi-target X-ray source. 4,007,375, Cl.
250-404.000.
- Albright, Penrose Lucas. Wheel having resilient spoke means.
4,006,765, Cl. 152-12.000.
- Alder, G. Michael: *See—*
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- Alger, Shirl R.; Arnold, Ronald S.; and Schuler, Manfred, to All-Power
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- Allgaier, Werner, to Raychem Corporation. Strain relief device.
4,006,956, Cl. 339-103.00M.
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- Allport, Maurice James, to Lucas Electrical Company Limited, The.
Three phase full wave rectifier assembly. 4,007,402, Cl.
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- Alten, Ralph W., to Dynamic Industries, Inc. Method and apparatus for
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- Alvey Inc.: *See—*
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- Amari, Shinji, to Sony Corporation. Magnetic recording and/or repro-
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ducing apparatus with chrominance crosstalk elimination.
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- American Beverage Control: *See—*
Shannon, Joseph W., 4,006,840.
- American Chain & Cable Company, Inc.: *See—*
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- American Cyanamid Company: *See—*
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto,
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- Bernstein, Seymour; Bauman, Norman; and Heller, Milton David,
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- Meyers, Marion Douglas; and Landi, Henry Patrick, 4,006,966.
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Anceau, Francois; Beauducel, Claude; Courboulay, Pierre; and Cretin, Jacques, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activites Petrolieries Elf. Microprogrammed computing device. 4,007,444, Cl. 340-172.500.
Anderson, Frank R.; and Nadon, James W., to Cincinnati Milacron-Heald Corporation. Work table index mechanism. 4,006,651, Cl. 74-826.000.
Anderson, James Hilbert. Tube expander utilizing hydraulically actuated pistons. 4,006,619, Cl. 72-54.000.
Anderson, Reynold M.; and Tullar, Donald E., to Caterpillar Tractor Co. Tilt linkage for loader buckets. 4,006,834, Cl. 214-776.000.
Anderson, Richard W.; and Bodenrader, Frederick F., to GTE Sylvia Incorporated. Back-lighted display arrangement. 4,006,546, Cl. 40-132.00D.
Anderson, Teddy Lee: See—
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Ando, Shigenori; Ota, Masato; and Kawashima, Tadashi, to Kabushiki Kaisha Daini Seikosa. Spindle device having bearings lubricated with oil jet. 4,006,944, Cl. 308-187.000.
Ando, Shigenori: See—
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Annerhed, Karl Bertil Verner; and Hemlin, Rolf Ingemar, to Sandco Ltd. System for installing high strength steel belts. 4,007,351, Cl. 219-50.000.
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Aoki, Seiji; Kamiyama, Akira; and Matsuda, Kokichi. Method for continuously supplying plastics film strip from extruder head. 4,007,078, Cl. 156-159.000.
Aono, Tetsuya: See—
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Badger, Everett H., to Textron, Inc. Fuel tank level detector and shut-off valve. 4,006,762, Cl. 141-198.000.
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Bailey, Edward L., to Owens-Illinois, Inc. Variable strength plastic wrap on glass bottles. 4,007,246, Cl. 264-129.000.
Baird, William C., Jr.; and Bearden, Roby, Jr., to Exxon Research and Engineering Company. Combined desulfurization and hydroconversion with alkali metal oxides. 4,007,109, Cl. 208-108.000.
Baird, William Chalmers, Jr., to Exxon Research and Engineering Company. Residue desulfurization and hydroconversion with soda-mide and hydrogen. 4,007,111, Cl. 208-108.000.
Baker, Bruce A., Jr.: See—
Springer, Willard J.; and Baker, Bruce A., Jr., 4,007,102.
Baker, Don R.; and Gutman, Arnold D., to Stauffer Chemical Company. Certain oxime compositions and their use in controlling fungi. 4,007,227, Cl. 260-566.0AE.
Baker, Peter D., to Smiths Industries Limited. Igniters. 4,007,391, Cl. 313-131.00A.
Baker, Raymond J.: See—
Ansell, Joseph L.; Brusius, Phillip G.; and Baker, Raymond J., 4,007,296.
Baker, Theodore Harris; Ghafghaichi, Majid; Stevens, Richard Charles; and Wimpfheimer, Hans, to International Business Machines Corporation. Planarizing insulative layers by resputtering. 4,007,103, Cl. 204-192.000.
Ballard, Denis George Harold; Murray, Robert Thomas; and Jeffs, George Michael Fingland, to Imperial Chemical Industries Limited. Production of fibrils. 4,007,247, Cl. 264-140.000.
Ballarin, Jurgen; and Mattig, Peter, to Bosch-Siemens Hausgerate GmbH. Refrigerating device. 4,006,601, Cl. 62-80.000.
Balm Paints Limited: See—
Clarke, Barry John; Kershaw, Robert William; and Lubbeck, Frederick John, 4,007,142.
Bangor Punta Operations, Inc.: See—
Kippen, Albert J., 4,006,851.
Bara, Edwin Stanley, to Motorola, Inc. Crescent reset system for fast forward 8-track cartridge player. 4,006,853, Cl. 226-178.000.
Barber-Colman Company: See—
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Barber, Everett M., to Texaco Inc. Apparatus useful for the production of hydrogen. 4,007,015, Cl. 23-281.000.
Barish, Benjamin J. Electrical tick-tack-toe game. 4,006,903, Cl. 273-130.0AB.

Barker, Loren B., to American Chain & Cable Company, Inc. Vacuum pad. 4,006,929, Cl. 294-64.00R.
Barrett, DeLoris Joan: See—
Peters, Jack; and Barrett, DeLoris Joan, 4,006,800.
Barrett, Gary L.; and Shoberg, Ralph S., to GSE, Inc. Torque measuring apparatus. 4,006,629, Cl. 73-139.000.
Barth, Harry: See—
Schuddege, Horst-Dieter; Jastrow, Horst; and Barth, Harry, 4,007,234.
Bartholomew, Donald D., to Merit Plastics, Inc. Non-threaded tubing connector. 4,006,922, Cl. 285-39.000.
BASF Aktiengesellschaft: See—
Bleichschmitt, Kurt; Wirth, Friedrich; Hornberger, Paul; Reuter, Peter; and Buerger, Gert, 4,007,136.
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BASF Wyandotte Corporation: See—
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Bassignani, Anthony L. Material measuring and dispensing device. 4,006,842, Cl. 222-43.000.
Bassous, Ernest; Kuhn, Lawrence; Reisman, Arnold; and Taub, Howard H., to International Business Machines Corporation. Ink jet nozzle. 4,007,464, Cl. 346-75.000.
Bastide, Robert Guy Emile, to Etat Francais. Pyrotechnical safety relay. 4,006,689, Cl. 102-70.00R.
Battelle Memorial Institute: See—
Davis, Thomas J., 4,006,625.
Kenan, Richard P.; Verber, Carl M.; and Wood, Van E., 4,006,967.
Batza, Willi; Baier, Gunter; and Schmidt, Hermann, to Metallgesellschaft Aktiengesellschaft. Electrostatic precipitator with collector-electrode spacers. 4,007,023, Cl. 55-112.000.
Batzer, Hans: See—
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Baues, Peter; Mahlein, Hans; Reichelt, Achim; and Winzer, Gerhard, to Siemens Aktiengesellschaft. Controllable, electro-optical grating coupler. 4,006,963, Cl. 350-96.00C.
Bauman, Norman: See—
Bernstein, Seymour; Bauman, Norman; and Heller, Milton David, 4,007,270.
Bauman, Robert Andrew, to Colgate-Palmolive Company. Pharmaceutical compositions containing quaternary ammonium compounds. 4,007,281, Cl. 424-300.000.
Baumann, Richard S.; and Raboin, Ronald K., to Western Industries, Inc. Brazing alloy and brazing paste for gas container joints. 4,006,838, Cl. 220-3.000.
Bayer Aktiengesellschaft: See—
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertine, Werner, 4,007,150.
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Beckman Instruments, Inc.: See—
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Behringwerke Aktiengesellschaft: See—
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Beier, Edmar, to Volkswagenwerk Aktiengesellschaft. Apparatus for tensioning a safety belt. 4,006,644, Cl. 74-242.1FP.
Belanger, Nicholas E.; Bentley, Floyd; and Geoffrey, David C., to Stanley Works, The. Door system with improved weatherseal. 4,006,562, Cl. 49-380.000.
Bell & Howell Company: See—
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Bell Telephone Laboratories, Incorporated: See—
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Benker, Guy; Louvel, Bernard; Tauszig, Dominique; and Vourron, Bernard, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activites Petrolieries Elf. Method of controlling a distillation column for topping crude petroleum. 4,007,112, Cl. 208-350.000.
Benrey, Iveta Markova: See—
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Belanger, Nicholas E.; Bentley, Floyd; and Geoffrey, David C., 4,006,562.
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Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, to Rhone-Poulenc S.A. Cephalosporin derivatives. 4,007,176, Cl. 260-243.00C.
Berger, Peter, to Metallschlauch-Fabrik Pforzheim (vorm. Hch. Witzemann) Gesellschaft mit beschränkter Haftung. Spring support. 4,006,873, Cl. 248-54.0CS.
Berges, David A., to SmithKline Corporation. O-acyl-7-acylaminocephalosporadic acids. 4,007,178, Cl. 260-243.00C.
Bergische Stahl-Industrie: See—
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Bergwerksverband GmbH: See—
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Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Novel 3-triphenylmethoxy-1-alkynes, 3-triphenylmethoxy-1-trans-alkenyl-dialkyl-alanes, and lithium 3-triphenyl-methoxy-1-trans-alkenyl-dialkyl-alanates. 4,007,210, Cl. 260-395.000.
Berney, Jean-Claude. Apparatus for synchronization of a motor. 4,007,408, Cl. 318-314.000.
Bernsen, Borg, to Xerox Corporation. Electronic copy analysis. 4,007,326, Cl. 358-280.000.
Bernstein, Seymour; Bauman, Norman; and Heller, Milton David, to American Cyanamid Company. Complement inhibitors. 4,007,270, Cl. 424-230.000.
Berrer, Dagmar, to Ciba-Geigy Corporation. Herbicidally active triazin-derivatives. 4,007,032, Cl. 71-93.000.
Bethlehem Corporation, The: See—
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Beugin, Louis E. Lawn bag caddy. 4,006,928, Cl. 294-1.00R.
Bianchetta, Donald L.; Lohbauer, Kenneth R.; and Rhodes, Sammy J., to Caterpillar Tractor Co. Hydraulic control system for load supporting hydraulic motors. 4,006,667, Cl. 91-445.000.
Biebuyck, Lawrence F., to Howmet Corporation. Narrow frame wall structure. 4,006,573, Cl. 52-732.000.
Bien, Franz; Pustka, Karel; and Wagonsonner, Eduard, to AGFA-Gevaert, A.G. Motion picture camera with motor control circuit having decreased power consumption. 4,006,978, Cl. 352-174.000.
Bien, Hans-Samuel; and Klauke, Erich, to Bayer Aktiengesellschaft. Azo dyestuffs containing 6-fluoro-pyrimidinyl 4-reactive group. 4,007,164, Cl. 260-146.00D.
Billette, Richard J.; and Zias, Arthur R., to National Semiconductor Corporation. Flow meter. 4,006,634, Cl. 73-207.000.
Binder, Heinrich; Glawion, Rudolf; Gruessy, Ernst; Hitz, Peter; Oetler, Kurt; Seidl, Hans; and Stoekli, Hans, to Inventio AG. Speed limiting device for lifts or the like. 4,006,799, Cl. 187-38.000.
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and Buerger, Gert, to BASF Aktiengesellschaft. Supported catalyst for the oxidation of o-xylene and/or naphthalene to phthalic anhydride. 4,007,136, Cl. 252-476.000.

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Blinow, Igor; Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Trim control apparatus for photographic exposure control system. 4,007,468, Cl. 354-59.000.

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Bocharova, Svetlana Lepnidovna: See—

Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidoravichus, Jonas-Donatos Bronyus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.

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Bonafous, Maurice, to Applications Mecaniques et Robinetterie Industrielles A.M.R.I. Equipment for bottom loading of liquid products. 4,006,761, Cl. 141-94.000.

Bonafous, Maurice, to Applications Mecaniques et Robinetterie Industrielle A.M.R.I. Butterfly valve of large diameter. 4,006,882, Cl. 251-306.000.

Bonanno, Anthony J.: See—

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Bondarenko, Raisa Ivanovna: See—

Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidoravichus, Jonas-Donatos Bronyus; Randina, Larisa Vasilievna; Bocharova, Svetlana Lepnidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,007,317.

Bonifay, Andre. Stretcher holder device for ambulances. 4,006,500, Cl. 5-82.00R.

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Bonyhard, Peter Istvan; Chen, Yu-Ssu; and Smith, James Lanson, to Bell Telephone Laboratories, Incorporated. Magnetic bubble memory organization. 4,007,453, Cl. 340-174.0TF.

Boone, Jimmie H.; and Simpson, Robert D., to Boeing Company, The. Self-aligning roll out guidance system. 4,006,870, Cl. 244-184.000.

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Bowles, Arnold G.; Crum, Andrew S. D.; and Speicher, Melvin E., to National Forge Company. Furnace assembly. 4,007,325, Cl. 13-22.000.

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Brantley, James W.; and Irwin, Thomas P., to United States of America, National Aeronautics and Space Administration. Leading edge protection for composite blades. 4,006,999, Cl. 416-224.000.

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Brooks, Richard Donald, to Bell Telephone Laboratories, Incorporated. Noninverting current-mode logic gate. 4,007,384, Cl. 307-218.000.

Brown, Alvin E.; and Fick, Willy J., to Danfoss A/S. Automatic gain control of pulses. 4,007,428, Cl. 330-129.000.

Brown, Leonard Rudolph. Manual radiator rod. 4,006,508, Cl. 15-104.050.

Brown, Wilburn Kelly, to Pettibone Corporation. Steering system including tandem hydraulic cylinders with self-synchronization. 4,006,664, Cl. 91-171.000.

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Burroughs Corporation: See—

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Burton, Gilbert W.; and O'Farrell, Charles P., to Exxon Research and Engineering Company. Process for preparing latices of sulfonated elastomers. 4,007,149, Cl. 260-29.70B.

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Butter, Stephen Allan, to Mobil Oil Corporation. Selective production of para-xylene. 4,007,231, Cl. 260-672.00T.

Buzza, Edmund E.; and Lillig, John E., to Beckman Instruments, Inc. Electrode module for titration apparatus. 4,007,105, Cl. 204-195.00T.

Cadalora, Fulvio; and Ferrari, Pietro, to GTE International Incorporated. Phase-locked loop having a switched lowpass filter. 4,007,429, Cl. 331-17.000.

Cailloux, Paul, to Promecam Sisson-Lehmann. Positioning device. 4,006,623, Cl. 72-461.000.

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Cascade Pole Company: See—

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Casella, Frank P. Clock housing and decorative means therefor. 4,006,586, Cl. 58-53.000.

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Cervenka, Kenneth G., to Faith Industries, Inc. Jet reaction turbine with rotating combustor for burning slurry fuels. 4,006,591, Cl. 60-39.350.

Cesa, Valentin. Fireplace. 4,006,729, Cl. 126-121.000.

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Chaiet, Louis; Hernandez, Sebastian; and Zimmerman, Sheldon B., to Merck & Co., Inc. Novel fermentation process for the preparation of Sulfomycin. 4,007,090, Cl. 195-80.00R.

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Chambolle, Jacques Andre Louis Marie, to Compagnie Honeywell Bull (Societe Anonyme). Arrangement for fitting and tensioning an endless character-bearing band in a printer. 4,006,682, Cl. 101-111.000.

Chan, Lock-Lim; and Guitard, Arthur Herbert, to Borden Products Limited. Dry strength paper and process therefor. 4,007,084, Cl. 162-167.000.

Chapron, Claude, to U.S. Philips Corporation. Serially-connected circuit groups for integrated injection logic. 4,007,385, Cl. 307-296.000.

Charlot, Guy, to Essilor International (Compagnie Generale d'Optique). Machine for machining two faces of an ophthalmic lens. 4,006,563, Cl. 51-109.00R.

Chase, Erin O. Mop holder. 4,006,509, Cl. 15-150.000.

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Chen, Yu-Ssu: See—

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Cheng, Paul J.: See—

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Chevron Research Company: See—

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Chierici, Osvaldo F., to Holland Company. Hopper car outlet gate and seal. 4,006,692, Cl. 105-282.00P.

Chiu, Ya-Chang: See—

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Chorvat, Robert J.; and Pappo, Raphael, to G. D. Searle & Co. Process and intermediates for manufacture of 2-azasteroids. 4,007,194, Cl. 260-289.0AZ.

Chow, Che Chung, to Xerox Corporation. Electrophotographic printing method. 4,007,041, Cl. 96-1.0LY.

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Chu, Joseph Y. C.; and Gunther, W. H. H., to Xerox Corporation. Process for preparation of solid phase dispersion of photoconductive materials. 4,007,100, Cl. 204-158.00R.

Chu, Joseph Y. C.; and Gunther, Wolfgang H. H., to Xerox Corporation. Process for preparation of solid phase dispersion of photoconductive materials. 4,007,101, Cl. 204-158.00R.

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- Elmer, James W., to Inventors Engineering, Inc. Single shaft programming control for machine tools. 4,006,649, Cl. 74-568.00R.
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McMahon, Garfield W., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defense. Self-deploying instrument assembly. 4,007,436, Cl. 340-8.00S.

McMahon, Robert J.; and Harmer, Dolores A. Wrist watch. 4,006,588, Cl. 58-126.00R.

McQueary, Agnes R., to Procter & Gamble Company, The. Method of conditioning fabrics in a clothes dryer. 4,007,300, Cl. 427-242.000.

Mechaneer, Inc.: See—
Shively, Lawrence A.; Gray, Robert C.; and Hoy, Robert P., 4,006,862.

Medrad, Inc.: See—
Kranys, Rudolph J.; Heilman, Marlin S.; Zdrojowski, Ronald J.; and Swann, George R., 4,006,736.

Meier, Jean: See—
Farthouat, Anne; and Meier, Jean, 4,007,275.

Meiners, Elmo R., to M & W Gear Company. Concurrent-counter-rotating flow grain dryer with air recycling means. 4,006,536, Cl. 34-169.000.

Meinhold, James F.: See—
Siedlecki, Dennis Ted; and Meinhold, James F., 4,007,291.

Melzer, Roland, to R. Melzer oHG Maschinenbau u. Metallverarbeit. Printing machine. 4,006,684, Cl. 101-212.000.

Mengoli, Karl L.: See—
Hanfling, Jerome D.; and Mengoli, Karl L., 4,007,460.

Merck & Co., Inc.: See—
Chaiet, Louis; Hernandez, Sebastian; and Zimmerman, Sheldon B., 4,007,090.

Shen, Tsung-Ying; Jensen, Norman P.; and Wagner, Arthur F., 4,007,190.

Merigoux, Jean-Marie: See—
Friberg, Jean; and Merigoux, Jean-Marie, 4,006,997.

Merit Plastics, Inc.: See—
Bartholomew, Donald D., 4,006,922.

Merz, Ronald: See—
Marincic, Nikola; Merz, Ronald; and Kelsey, Robert H., 4,007,054.

Merzenich, Konrad, to Klockner-Humboldt-Deutz Aktiengesellschaft. Separator worm feed auger and wear plates. 4,006,855, Cl. 233-7.000.

Messacar, Howard E. Artificial baits. 4,006,551, Cl. 43-42.040.

Messer, Mayer Naum: See—
Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naum; and Moutonnier, Claude, 4,007,176.

Messerschmitt-Bolkow-Blohm GmbH: See—
Kranz, Walter; and Tillmann, Heinz, 4,006,755.

Metallgesellschaft Aktiengesellschaft: See—
Batza, Willi; Baier, Gunter; and Schmidt, Hermann, 4,007,023.

Metallschlauch-Fabrik Pforzheim (vorm. Hch. Witzemann) Gesellschaft mit beschränkter Haftung: See—
Berger, Peter, 4,006,873.

Metrailler, William J.; and Weissman, Walter, to Exxon Research and Engineering Company. Process for producing low sulfur coke. 4,007,092, Cl. 201-17.000.

Metschnabl, Andreas; and Burkhardt, Gottfried, to D I E H L datensysteme GmbH. Reversing device for the longitudinal advance of a ribbon of type printers. 4,006,811, Cl. 197-161.000.

Meusdoerffer, Johann Nikolaus: See—
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meusdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,007,150.

Meyer, Ernst; and Burghoff, Karl, to Max Kammerer GmbH. Adjustable air outlet nozzle for automobile heating and venting systems. 4,006,673, Cl. 98-40.00A.

Meyers, Marion Douglas; and Landi, Henry Patrick, to American Cyanamid Company. Process for preparation of an electrode structure containing WO₃ use of the structure in an electrochromic cell. 4,006,966, Cl. 350-160.00R.

Micallef, Lewis A., to Leeds and Micallef. Safety cap. 4,006,836, Cl. 215-218.000.

Michelon, Francois: See—
Sourgens, Jacques; Lajotte, Dominique; and Michelon, Francois, 4,007,341.

Mikhaillets, Georgy Avxentievich: See—
Kulbakh, Valter Osvaldovich; Kokushina, Tatyana Mikhailovna; Lagert, Irina Kondratievna; Mikhaillets, Georgy Avxentievich; Kholodova, Galina Vasilievna; Ekzemplyarov, Oleg Nikolaevich; Zelmanov, Ruvim Bentsionovich; Sokolov, Leonid Borisovich; Etingov, Evgeny Davidovich; and Lushitskaya, Irina Mikhailovna, 4,007,166.

Mikolics, Sandor; Ziegler, Karoly; and Homola, Viktor, to Novex Talalmanyfejlesztés és Ertekesítő Kulkereskedelmi Rt. Cooling-water supply system with self-adjusting hydraulics. 4,006,596, Cl. 60-690.000.

Mikulski, Walter Edward, to United Technologies Corporation. Die casting apparatus which eliminates shot sleeve-metal contact. 4,006,774, Cl. 164-312.000.

Miles, Marshall, to Vapor Corporation. Air conditioning system for a railway vehicle. 4,006,603, Cl. 62-229.000.

Miller Printing Machinery Co.: See—
Mosemiller, Robert L., 4,006,685.

Miller, Richard Lee. Tactile learning device. 4,006,541, Cl. 35-35.00H.

Millheiser, Melvin: See—
Wurzel, Hugo; and Millheiser, Melvin, 4,006,659.

Millmaster Onyx Corporation: See—
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Minami, Tiekou, to Kawamura, Yoichi. Practice golf ball. 4,006,908, Cl. 273-183.00C.

Mincer, Joseph L.; and Pochan, John M., to Xerox Corporation. Mechanically viable developer materials. 4,007,293, Cl. 427-19.000.

Mink, Bernardus H.: See—
Naber, Jaap E.; and Mink, Bernardus H., 4,007,129.

Minnesota Mining and Manufacturing Company: See—
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Mishima Kusan Co., Ltd.: See—
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Mitsubishi Denki Kabushiki Kaisha: See—
Nishi, Atsuyoshi; Futaguchi, Shizuo; Ishida, Akio; Ito, Toshio; Nomaguchi, Tamotsu; Makino, Toshihiko; and Saito, Tatsuo, 4,006,728.

Mitsubishi Jukogyo Kabushiki Kaisha: See—
Uotani, Hiroshi; Kubo, Masayoshi; and Irie, Nobuhiko, 4,007,068.

Miwa, Naoki: See—
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Miyahara, Shigeru: See—
Inaba, Masao; Sugimoto, Atsumi; Shimizu, Mikio; Onosato, Masashi; Miyahara, Shigeru; and Kashigi, Kazuo, 4,007,486.

Miyakawa, Seiichi; and Okamoto, Toyoo, to Ricoh Co., Ltd. Developing unit for electrophotography. 4,006,709, Cl. 118-648.000.

Miyakawa, Seinan, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical system having a photoelectric converter to be used in photography. 4,007,466, Cl. 354-24.000.

Miyamae, Toshiaki. Motorized fishing reel with clutches. 4,006,867, Cl. 242-217.000.

Miyamoto, Akio; Matsukawa, Hiroharu; and Yamamoto, Nobuo, to Fuji Photo Film Co., Ltd. Method of desensitization using desensitizing composition. 4,007,310, Cl. 428-195.000.

Mizunuma, Susumu: See—
Yanagimoto, Samon; Kawaharada, Minoru; Yoshiwara, Seishiro; Mizunuma, Susumu; and Sugiyama, Motoaki, 4,006,618.

Mobil Oil Corporation: See—
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Gillespie, Bernard M.; Ireland, Henry R.; and Stein, Thomas R., 4,007,131.

Smadja, Rene; and Houzot, Louis, 4,007,127.

Mohr, Harvey O., to HydroTech International, Inc. Pipe coupling. 4,006,921, Cl. 285-18.000.

Mohsen, Amr Mohamed, to Bell Telephone Laboratories, Incorporated. Balanced regenerative charge detection circuit for semiconductor charge transfer devices. 4,007,381, Cl. 307-235.00F.

Mollerstedt, Karl Allan Bonde, to IFO AB. Apparatuses for distributing flushing liquid in closet pans. 4,006,497, Cl. 4-1.000.

Monarch Mirror Door Co., Inc.: See—
Kain, Oscar, 4,006,569.

Monsanto Company: See—
Avery, Michael J.; Martino, Lawrence A.; and Yonko, Jon D., 4,007,244.

Kim, Keun Y., 4,007,260.

Leach, Harry S.; Singleton, Thomas C.; and Wei, Yu Wen, 4,007,130.

Montorsi, Giorgio; Pellizzato, Renato; and Gianantonio, Anacleto, to Gruppo Lepetit S.p.A. Preparation of phthalaldehydic acid from $\alpha,\alpha,\alpha',\alpha'$ -pentachloro-o-xylene. 4,007,220, Cl. 260-515.00R.

Moore, William C.; Connors, John D.; and Newman, Richard W., to Welch Allyn, Inc. Otolaryngoscope construction. 4,006,738, Cl. 128-9.000.

Moreno, Roland, to Societe anonyme dite: Societe Internationale pour l'Innovation. Data-transfer system. 4,007,355, Cl. 235-61.70R.

Morgan Construction Company: See—
Hill, William J., 4,006,828.

Mori, Eiko: See—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,007,158.

Mori, Kenji: See—
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Morimura, Syoji: See—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,007,158.

Morishita, Masanobu; Inoue, Hidehiko; and Kawasaki, Mitsuru, to Nippon Electric Co., Ltd. Solid-state color imaging apparatus having charge-coupled devices. 4,007,488, Cl. 358-29.000.

Moritomo, Sadao; Kikuchi, Shinichi; and Ando, Shigenori, to Seiko Seiki Kabushiki Kaisha. Spindle assembly having an electrode spindle. 4,006,953, Cl. 339-6.00R.

Morley, Richard E.: See—
Bromberg, Michael Arnold; Fletcher, William E.; Morley, Richard E.; and Schwenk, George G., 4,007,443.

Morris, Earl L., to Acorn Engineering Company. Security frame and mirror assembly. 4,006,572, Cl. 52-506.000.

Morroni, Peter J. Degating. 4,006,879, Cl. 249-68.000.

Morrow, John Edward: See—
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Morse, John B.: See—
Land, Edwin H.; and Morse, John B., 4,007,471.

Mosca, Virgilio, to Societa Italiana Telecomunicazioni Siemens S.p.A. Videotelephone system with anti-crosstalk means. 4,007,328, Cl. 358-85.000.

Mosemiller, Robert L., to Miller Printing Machinery Co. Axial and circumferential register control apparatus for a cylinder in a press frame. 4,006,685, Cl. 101-248.000.

Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Yanov, Stanislav Ivanovich; Goncharova, Raisa Ivanovna; and Frokina, Zoya Mikhailovna. Pipe bending machine. 4,006,621, Cl. 72-151.000.

Mosler Safe Company, The: See—
Hochradel, Ernest; Hauer, Werner; and Vogel, Victor J., 4,006,868.

Motorola, Inc.: See—
Bara, Edwin Stanley, 4,006,853.

Dattilo, Donald J., 4,006,522.

Moutonnier, Claude: See—
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Mravic, Brian: See—
Shapiro, Stanley; Shapiro, Eugene; Mravic, Brian; and Watson, W. Gary, 4,007,039.

Mueller-Tamm, Heinz: See—
Scholz, Norbert; Vock, Georg Friedrich; Erdmann, Kurt; John, Gunther; Frielingdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,007,321.

Muller, Erwin: See—
Blahak, Johannes; Muller, Erwin; and Kleimann, Helmut, 4,007,239.

Muller, Helmut; Rosenberger, Siegfried; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Stabilisers for polyolefines. 4,007,183, Cl. 260-249.800.

Muller, Rolf; Papst, Georg Friedrich; and Schlicker, Volker, to Papst-Motoren KG. Brushless D-C motor. 4,007,390, Cl. 310-90.000.

Mullery, Alvin Paul: See—
Haibt, Luther Harold; and Mullery, Alvin Paul, 4,007,450.

Munch, Walter, Jr.: See—
Kappes, Joseph L.; Munch, Walter, Jr.; and Uetrecht, Dale M., 4,006,658.

Munk, Miner N., to Varian Associates. Convergent light illuminated flow cell for liquid chromatography. 4,006,990, Cl. 356-246.000.

Murakami, Hisakazu; and Fujiwara, Yasuhiko, to Nissan Motor Co., Ltd. Seat for automobile. 4,006,934, Cl. 297-386.000.

Murakami, Noboru, to Aisin Seiki Kabushiki Kaisha. Fluid pressure control system for motor vehicle transmissions. 4,006,652, Cl. 74-869.000.

Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, to Sankyo Company Limited. Novel piperidine derivatives for the stabilization of synthetic polymers. 4,007,158, Cl. 260-45.8NZ.

Murray, James M. Dish-stabilizers for dish washing machines. 4,006,950, Cl. 312-270.000.

Murray, Kenneth R., to Towmotor Corporation. Cushioning device for a hydraulic jack. 4,006,666, Cl. 91-394.000.

Murray, Robert Thomas: See—
Ballard, Denis George Harold; Murray, Robert Thomas; and Jeffs, George Michael Finland, 4,007,247.

Naber, Jaap E.; and Mink, Bernardus H., to Shell Oil Company. Partial combustion process for manufacturing a purified gas containing hydrogen and carbon monoxide. 4,007,129, Cl. 252-373.000.

Nachtman, Russell L., to United Technologies Corporation. Laser mirror coolant pressure balance means. 4,006,972, Cl. 350-310.000.

Nadon, James W.: See—
Anderson, Frank R.; and Nadon, James W., 4,006,651.

Nagai, Masahiko: See—
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Nagano, Mitsuo: See—
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Najmann, Knut: See—
Heuber, Klaus; Klein, Wilfried; Najmann, Knut; Remshardt, Rolf; and Wiedmann, Siegfried K., 4,007,451.

Nakagawa, Kunio: See—
Kogure, Katsura; Sueda, Noriyoshi; Himoto, Sizuo; Yoshino, Youzuro; and Nakagawa, Kunio, 4,007,217.

Nakajima, Kousei: See—
Kanda, Fumio; and Nakajima, Kousei, 4,006,719.

Nakamura, Junpei, to Kabushiki Kaisha Daini Seikosha. Electro-mechanical filter having a plurality of tuning forks. 4,007,432, Cl. 333-71.000.

Nakamura, Ken: See—
Tomono, Makoto; Nakamura, Ken; and Yamakawa, Koichi, 4,006,987.

Nakamura, Norihiko; and Yanagihara, Hiromichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Compensation apparatus for carburetor. 4,007,237, Cl. 261-41.00D.

Nakamura, Zenzo; Ohtaki, Shohei; Uchiyama, Takashi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Automatic control device for an electronic flash apparatus. 4,007,398, Cl. 315-151.000.

Nakao, Hideo; Yanagisawa, Hiroaki; Nagano, Mitsuo; Shimizu, Bunji; Kaneko, Masakatsu; and Sugawara, Shinichi, to Sankyo Company Limited. Cephalosporin derivatives. 4,007,177, Cl. 260-243.00C.

Narad, Inc.: See—
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Narozny, Ronald S., to Thomas & Betts Corporation. Connector. 4,006,957, Cl. 339-103.00M.

National Forge Company: See—
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National Semiconductor Corporation: See—
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National-Standard Company: See—
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Native Plants, Inc.: See—
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Nazinin, Nikolai Andreevich: See—
Dolov, Svyatoslav Kirillovich; Efimov, Viktor Mikhailovich; Ioonas, Rikhard Eduardovich; Nazinin, Nikolai Andreevich; Piik, Enn Edgarovich; Raad, Khans Eduardovich; Roos, Ivar Kharaldovich; Serebryannikov, Nikolai Dmitrievich; Shaganov, Jury Vasilievich; Ananiev, Leonid Semenovich; and Volkov, Alexei Sergeevich, 4,007,093.

NCR Corporation: See—
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St. Jacques, Gerald A., 4,006,628.

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Nealeforth Farms Pty. Limited: See—
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Neddo, Keith S.; Alder, G. Michael; and Gwilliam, James L., Jr., to Native Plants, Inc. Seedling plant propagation container. 4,006,558, Cl. 47-77.000.

Nelson, Alfred Dwayne; and Espelien, Larry E., to Minnesota Mining and Manufacturing Company. Matrix construction for fuel cells. 4,007,058, Cl. 429-34.000.

Nelson, James K., to Fedders Corporation. Apparatus and method for controlling cycles of operation of a dryer. 4,006,535, Cl. 34-55.000.

Nelson Research & Development Company: See—
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Neubold, Kurt: See—
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Neukom, Chester G.; and Kopecky, Ivyl D., to Haybuster Manufacturing Inc. Lowering device for unloading or loading haystacks. 4,006,833, Cl. 214-506.000.

Neuman, Richard F., to Eaton Corporation. Inflator assembly and flow control valve for same. 4,006,919, Cl. 280-736.000.

Neuschutz, Dieter: See—
Hartwig, Jürgen; Neuschutz, Dieter; and Radke, Dietrich, 4,007,034.

New Archery Products Corporation: See—
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New Zealand Inventions Development Authority: See—
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Newell, William H., to Perkin-Elmer Corporation. The X, Y, θ alignment mechanism. 4,006,645, Cl. 74-479.000.

Newman, Howard, to American Cyanamid Company. Substituted 1,2,4-triazole carboxamide. 4,007,198, Cl. 260-308.00R.

Newman, Richard W.: See—
Moore, William C.; Connors, John D.; and Newman, Richard W., 4,006,738.

Nicolas, Yves, to Schlumberger Technology Corporation. Apparatus

- for measuring the diameter of a well bore. 4,006,530, Cl. 33-178.00F.
- Niederprum, Hans: See—
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,007,150.
- Nikolaus, Harold W.: See—
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- Nikulin, Sergei Sergeevich: See—
Vainer, Shimon Abramovich; Temerev, Anatoly Fedorovich; Vainer, Savely Abramovich; Nikulin, Sergei Sergeevich; Kheifets, Matvei Evseevich; Usoltsev, Vadim Anatolevich; Matveev, Evgeny Fedorovich; Kazakov, Georgy Petrovich; Salkov, Vladimir Alexandrovich; and Malinin, Anatoly Isidorovich, 4,006,890.
- Nilsson, Karl N. A., to Aktiebolaget Svenska Flaktfabriken. Arrangement for utilizing solar energy for heating buildings. 4,006,856, Cl. 237-1.00A.
- Ninomiya, Nobutaka: See—
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- Nippon Electric Co., Ltd.: See—
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- Morishita, Masanobu; Inoue, Hidehiko; and Kawasaki, Mitsuru, 4,007,488.
- Nippon Gakki Seizo Kabushiki Kaisha: See—
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- Nippon Hoso Kyokai: See—
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- Nippon Steel Corporation: See—
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- Houkawa, Kouji; and Ishihara, Fujio, 4,007,433.
- Nishi, Atsuyoshi; Futaguchi, Shizuo; Ishida, Akio; Ito, Toshio; Nomaguchi, Tamotsu; Makino, Toshihiko; and Saito, Tatsuo, to Mitsubishi Denki Kabushiki Kaisha. Room heating apparatus using combustion. 4,006,728, Cl. 126-110.00R.
- Nishiguchi, Hisanori: See—
Ishida, Eisuke; Takashima, Yuji; Nishiguchi, Hisanori; and Oda, Fujio, 4,007,045.
- Nishikubo, Yasuhiko: See—
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- Nishino, Shigeru; and Uchida, Tomio, to Caterpillar Mitsubishi Ltd. Two-way bulldozer mechanism. 4,006,782, Cl. 172-806.000.
- Nissan Motor Co., Ltd.: See—
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- Ikawa, Kazuo; and Ogawa, Naoki, 4,006,954.
- Ikota, Takane, 4,006,590.
- Murakami, Hisakazu; and Fujiwara, Yasuhiko, 4,006,934.
- Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki, 4,006,809.
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- Yanagishima, Takayuki, 4,007,357.
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- Nistratov, Alexei Fedorovich: See—
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- Nitto Electric Industrial Co., Ltd.: See—
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- Njos, Lester B.; and Lamb, Gordon L. Electric immersion heater for stock tanks. 4,007,371, Cl. 219-523.000.
- Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, to Takeda Chemical Industries, Ltd. 4-Benzoylindan-1-carboxamide and derivatives thereof. 4,007,225, Cl. 260-558.00R.
- Nomaguchi, Tamotsu: See—
Nishi, Atsuyoshi; Futaguchi, Shizuo; Ishida, Akio; Ito, Toshio; Nomaguchi, Tamotsu; Makino, Toshihiko; and Saito, Tatsuo, 4,006,728.
- Nomizo, Yasumasa: See—
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- Nonaka, Yasuhiko; Goto, Naohiro; and Shidara, Keiichi, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Target structure for use in photoconductive image pickup tubes. 4,007,395, Cl. 313-386.000.
- Nonaka, Yasuhiko; Hirai, Tadaaki; Goto, Naohiro; and Shidara, Keiichi, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Target structures for use in photoconductive image pickup tubes and method of manufacturing the same. 4,007,473, Cl. 357-31.000.
- Nordson Corporation: See—
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- Norman Dryer Co., Inc.: See—
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- Nouvertne, Werner: See—
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- Novex Talalmanyfejlesztés és Ertekesítő Kulkereskedelmi Rt.: See—
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- Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Yoshimura, Tohru; Katou, Masaya; and Matsuoka, Nozomu, to Hoshidenki-Seizo Kabushiki Kaisha. Writing instrument with calculator. 4,007,364, Cl. 235-152.000.
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- Olsen, Carl Ivar, to Danfoss A/S. Hydraulic Steering apparatus. 4,006,662, Cl. 91-400.000.
- Olshansky, Robert, to Corning Glass Works. Communication system having low dispersion glass optical waveguide. 4,006,962, Cl. 350-96.0WG.
- Olson, Lloyd C.: See—
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- Ort, George M., to A. B. Dick Company. Method of treatment of offset masters prior to conversion. 4,007,046, Cl. 96-33.000.
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- Schirmer, Robert M.; Vanderveen, John W.; and Cheng, Paul J., to Phillips Petroleum Company. Combustors and methods of operating same. 4,007,001, Cl. 431-10.000.
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- Zelmanov, Ruvim Bentsionovich: See—
Kulbakh, Valter Osvaldovich; Kokushina, Tatyana Mikhailovna; Lagert, Irina Kondratievna; Mikhailets, Georgy Avxentievich; Kholodova, Galina Vasilievna; Ekzemplyarov, Oleg Nikolaevich; Zelmanov, Ruvim Bentsionovich; Sokolov, Leonid Borisovich; Etingov, Evgeny Davidovich; and Lushitskaya, Irina Mikhailovna, 4,007,166.
- Zias, Arthur R.: See—
Billette, Richard J.; and Zias, Arthur R., 4,006,634.
- Ziegler, Karoly: See—
Mikolics, Sandor; Ziegler, Karoly; and Homola, Viktor, 4,006,596.
- Zimmerman, Samuel Morton. Video x-ray imaging system and method. 4,007,376, Cl. 250-416.0TV.
- Zimmerman, Sheldon B.: See—
Chalet, Louis; Hernandez, Sebastian; and Zimmerman, Sheldon B., 4,007,090.
- Zimmerman, Steven M.: See—
Kaplan, Leon H.; and Zimmerman, Steven M., 4,007,047.
- Zinnes, Harold; and Lindo, Neil A., to Warner-Lambert Company. 4-(1-Pyrolidenyl)-2H-1-benzothiopyran-3-carboxanilide. 4,007,203, Cl. 260-326.340.
- Zion, Westley, to Majestic Lock Co., Inc. Lock pick mechanism. 4,006,613, Cl. 70-394.000.
- Zrubek, Tadeusz: See—
Schroeder, Jerzy; Synowiec, Jerzy; Zrubek, Tadeusz; Gorecki, Henryk; Wolnicki, Zdzislaw; and Hnatowicz, Roman, 4,007,030.
- Zukatus, John J., Jr.: See—
Simon, Donald R.; Vasudeva, Anil; and Zukatus, John J., Jr., 4,007,377.
- Zusatz, Francois, to Pont-A-Mousson S.A. Centrifugally casting machine having an axial support device. 4,006,773, Cl. 164-298.000.

**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976	B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976	B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976	B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976	B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976	B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976	B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976	B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976

PI 38 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 456,153	3,997,992	Mar. 9, 1976	Oct. 21, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976	B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977	B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976	B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976	B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976	B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977	B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976	B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976	B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976	B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977	B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976	B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976	B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976	B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976	B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976	B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976	B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976	B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976	B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977	B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977	B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977	B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976	B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977	B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976	B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976	B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976	B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977	B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976	B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976	B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976	B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976	B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977	B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976	B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977	B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976	B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976	B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976	B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976	B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976	B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976	B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976	B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976	B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976	B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976	B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976	B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976	B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976	B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976	B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976	B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977	B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977	B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977	B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976	B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976	B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976	B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976	B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976	B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976	B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976	B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976	B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976	B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976	B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977	B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976	B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976	B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976	B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977	B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976	B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977	B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976	B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976	B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976	B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977	B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976	B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976	B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976	B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976	B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976	B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976	B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976	B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976	B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976	B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976	B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976	B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976	B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976	B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977	B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976	B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976	B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976	B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976	B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976	B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977	B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976	B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976	B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976	B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976	B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976	B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976	B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 499,227	3,981,344	Jan. 27, 1976	Dec. 21, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 499,352	3,981,391	Jan. 27, 1976	Dec. 21, 1976	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,588	3,981,539	Jan. 27, 1976	Nov. 21, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 500,981	3,984,681	Jan. 27, 1976	Dec. 14, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,122	3,981,385	Feb. 17, 1976	Dec. 21, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,181	3,984,761	Feb. 10, 1976	Dec. 21, 1976	B 510,855	3,981,059	Jan. 27, 1976	Nov. 21, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,317	3,985,643	Jan. 13, 1976	Dec. 21, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,415	3,982,051	Jan. 13, 1976	Dec. 21, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 501,540	3,985,694	Jan. 13, 1976	Dec. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Nov. 21, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 501,993	3,981,606	Jan. 13, 1976	Dec. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Nov. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,454	3,982,333	Feb. 24, 1976	Nov. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,289	3,982,274	Jan. 13, 1976	Dec. 21, 1976	B 511,885	3,981,346	Jan. 27, 1976	Nov. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,540	3,983,698	Jan. 13, 1976	Dec. 21, 1976	B 511,909	3,981,183	Feb. 17, 1976	Nov. 21, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 512,324	3,985,084	Feb. 17, 1976	Dec. 12, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 512,745	3,981,294	Jan. 13, 1976	Dec. 21, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 502,973	3,982,161	Jan. 27, 1976	Dec. 21, 1976	B 512,849	3,982,141	Feb. 3, 1976	Nov. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,368	3,982,138	Feb. 3, 1976	Nov. 21, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,789	3,981,599	Feb. 3, 1976	Nov. 21, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,169	3,981,219	Jan. 13, 1976	Dec. 21, 1976	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,455	3,982,149	Jan. 27, 1976	Nov. 21, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,060	3,983,572	Feb. 17, 1976	Nov. 21, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,126	3,981,745	Feb. 10, 1976	Dec. 21, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 505,382	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 506,286	3,982,085	Jan. 20, 1976	Dec. 21, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 506,744	3,981,176	Jan. 13, 1976	Dec. 21, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 507,467	3,994,680	Jan. 27, 1976	Nov. 30, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 507,647	3,982,240	Feb. 17, 1976	Dec. 21, 1976	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 519,979	3,982,067	Feb. 3, 1976	Nov. 21, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 508,940	3,981,321	Feb. 17, 1976	Dec. 21, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 509,238	3,982,399	Feb. 24, 1976	Dec. 28, 1976	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976

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AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976	B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976	B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977	B 530,925	3,983,161	Feb. 24, 1976	Dec. 28, 1976
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976	B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976	B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976	B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 520,924	3,982,113	Jan. 27, 1976	Dec. 21, 1976	B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976	B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 521,044	3,983,435	Feb. 24, 1976	Nov. 21, 1976	B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 521,045	3,983,433	Feb. 24, 1976	Nov. 21, 1976	B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 521,046	3,983,434	Feb. 24, 1976	Nov. 21, 1976	B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976	B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976	B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976	B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976	B 532,901	3,984,813	Jan. 13, 1976	Oct. 5, 1976
B 521,324	3,983,143	Jan. 27, 1976	Nov. 21, 1976	B 532,969	3,981,706	Jan. 13, 1976	Nov. 21, 1976
B 521,480	3,982,665	Jan. 13, 1976	Nov. 21, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 521,600	3,981,458	Jan. 27, 1976	Nov. 21, 1976	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Nov. 21, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976	B 533,580	3,982,255	Feb. 3, 1976	Nov. 2, 1976
B 521,711	3,989,835	Nov. 10, 1976	Nov. 2, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 521,984	3,983,220	Feb. 17, 1976	Nov. 21, 1976	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 521,986	3,981,607	Feb. 3, 1976	Nov. 21, 1976	B 534,016	3,983,381	Feb. 3, 1976	Nov. 2, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 534,313	3,981,675	Jan. 27, 1976	Nov. 2, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 534,314	3,981,786	Feb. 10, 1976	Nov. 21, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 534,333	3,981,480	Feb. 17, 1976	Nov. 21, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Nov. 2, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 534,991	3,983,517	Jan. 27, 1976	Nov. 2, 1976
B 522,577	3,982,123	Jan. 27, 1976	Nov. 21, 1976	B 535,076	3,981,718	Jan. 20, 1976	Nov. 2, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Nov. 2, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 523,885	3,981,400	Feb. 17, 1976	Nov. 21, 1976	B 535,386	3,981,150	Jan. 13, 1976	Nov. 2, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 535,391	3,981,386	Jan. 27, 1976	Nov. 2, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 524,121	3,982,536	Feb. 3, 1976	Nov. 21, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 535,466	3,981,309	Jan. 27, 1976	Nov. 2, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 535,813	3,981,819	Jan. 27, 1976	Nov. 2, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 535,928	3,981,466	Jan. 13, 1976	Nov. 2, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 536,009	3,982,112	Jan. 27, 1976	Nov. 2, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 526,190	3,982,129	Feb. 17, 1976	Nov. 2, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 537,102	3,981,829	Jan. 13, 1976	Nov. 2, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 537,709	3,981,368	Jan. 13, 1976	Nov. 2, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Nov. 2, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 538,491	3,982,928	Feb. 17, 1976	Nov. 2, 1976
B 527,669	3,982,206	Jan. 13, 1976	Nov. 21, 1976	B 538,686	3,982,199	Jan. 13, 1976	Nov. 2, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 539,746	3,983,423	Feb. 17, 1976	Nov. 2, 1976
B 527,999	3,981,682	Feb. 3, 1976	Nov. 2, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 540,632	3,981,600	Jan. 13, 1976	Nov. 2, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 540,872	3,982,135	Jan. 20, 1976	Nov. 2, 1976
B 528,761	3,982,221	Feb. 10, 1976	Nov. 2, 1976	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 541,376	3,981,690	Feb. 17, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 541,415	3,982,080	Feb. 3, 1976	Nov. 2, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 529,836	3,994,345	Feb. 24, 1976	Nov. 30, 1976	B 541,496	3,982,232	Jan. 27, 1976	Nov. 2, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,303	4,006,029	Mar. 23, 1976	Nov. 1, 1977	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 542,158	3,981,886	Jan. 13, 1976	Nov. 2, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
				B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976	B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977	B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976	B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PI 43
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976				

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF FEBRUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alvino, William M.: See—
Edelman, Leonard E.; and Alvino, William M., Re. 29,134.
Edelman, Leonard E.; and Alvino, William M., to Westinghouse Electric Corporation. Polyimide precursor and method and composition for preparing it. Re. 29,134, Cl. 260-47.0CB.
General Corporation, The: See—
Sugihara, Yasumasa, Re. 29,135.
Hudson, Willard G.: See—
Snellman, Donald L.; and Hudson, Willard G., Re. 29,133.

Norfin, Inc.: See—
Snellman, Donald L.; and Hudson, Willard G., Re. 29,133.
Snellman, Donald L.; and Hudson, Willard G., to Norfin, Inc. Constant length composite glass fiber cable under varying temperature conditions. Re. 29,133, Cl. 57-140.00G.
Sugihara, Yasumasa, to General Corporation, The. Sequential to simultaneous conversion system. Re. 29,135, Cl. 358-11.000.
Westinghouse Electric Corporation: See—
Edelman, Leonard E.; and Alvino, William M., Re. 29,134.

LIST OF PLANT PATENTEES

Byrum, Roy L., to Joseph H. Hill Company. Yellow rose plant. 4,015, 2-8-77, Cl. 15.000.
Byrum, Roy L., to Joseph H. Hill Company. Rose plant. 4,016, 2-8-77, Cl. 25.000.
Joseph H. Hill Company: See—
Byrum, Roy L., 4,015.
Byrum, Roy L., 4,016.

LIST OF DESIGN PATENTEES

Allard, Peter B., to Introl Corporation. Housing for fence charger. 243,344, 2-8-77, Cl. D26-5.00R.
American Standard, Inc.: See—
Stairs, Henry M., Jr., 243,334.
Bartlett, Robert N., to Windsor Industries, Inc. Hot water extraction-type carpet cleaning machine. 243,311, 2-8-77, Cl. D15-53.000.
Beduhn, Jack K.: See—
Clayton, Richard G.; Blue, John M.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., 243,340.
Beeren, Aloysius Jacobus Maria, to U.S. Philips Corporation. Electronic flash unit. 243,327, 2-8-77, Cl. D16-42.000.
Berg, Albert T., Jr.; and Langlie, Howard. Round-post electric fence insulator. 243,343, 2-8-77, Cl. D26-10.000.
Berg, Albert T., Jr.: See—
Langlie, Howard; and Berg, Albert T., Jr., 243,342.
Bergmann, Karl H.: See—
Harms, Wolfgang; and Bergmann, Karl H., 243,308.
Bernsten, Peter; and Peterson, Phillip R. Survey monument base. 243,319, 2-8-77, Cl. D10-74.000.
Birdsall, John D. Toy animal figure and rider. 243,356, 2-8-77, Cl. D34-15.00B.
Blue, John M.: See—
Clayton, Richard G.; Blue, John M.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., 243,340.
Burroughs Corporation: See—
Clayton, Richard G.; Blue, John M.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., 243,340.
Carroll, Richard C. Fishing lure. 243,332, 2-8-77, Cl. D22-27.000.
Chaney, Gerald D. Paint can rim cleaning tool. 243,312, 2-8-77, Cl. D7-181.000.
Christensen, Grover N. Work bench for a fruit and vegetable grader. 243,300, 2-8-77, Cl. D6-150.000.
Citizen Watch Co., Ltd.: See—
Kurihara, Isao, 243,318.
Clayton, Richard G.; Blue, John M.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., to Burroughs Corporation. Disk pack drive and controller. 243,340, 2-8-77, Cl. D26-5.00C.
Collier, Susan, to Liberty of London Prints Limited. Textile fabric. 243,370, 2-8-77, Cl. D92-1.00Y.
Corber, Saul; and Moss, Murray E. Lamp. 243,361, 2-8-77, Cl. D48-24.00A.
Coulombe, Lola M.: See—
Lybe, Linda L.; and Coulombe, Lola M., 243,366.
Cross, David E., to Smiths Industries Limited. Medical airway tube separator or the like. 243,365, 2-8-77, Cl. D83-1.00R.
Crowe, John E., to Honeywell Inc. Font of characters for forming a graphic display. 243,363, 2-8-77, Cl. D64-12.00B.
Dart Industries Inc.: See—
Loscalzo, Dominick, 243,307.
Painter, David L., 243,336.
Trombley, Bertrand N., 243,335.
Eaton Corporation: See—
Spencer, Clifford A., 243,355.
Edwards, Harry M., to Matzie Golf Company, Inc. Golf head cover holder. 243,353, 2-8-77, Cl. D34-5.00B.
Energy Absorption Systems, Inc.: See—
Waldsmith, Raymond A., 243,323.
England, Will Clarke. Multiple convergence linear optical and receiver plate for solar conversion or the like. 243,338, 2-8-77, Cl. D26-1.00R.
England, Will Clarke. Condensed multiple convergence linear optical and convective receiver plate for solar conversion or the like. 243,339, 2-8-77, Cl. D26-1.00R.
Formica Corporation: See—
Willard, Jack August, 243,369.
Fujita Industrial Co., Ltd.: See—
Fukuyama, Yasuharu, 243,317.
Fukuyama, Yasuharu, to Fujita Industrial Co., Ltd. Vehicle wheel locking nut. 243,317, 2-8-77, Cl. D8-273.000.
Fuqua, Robert S. Armrest cover or similar article. 243,304, 2-8-77, Cl. D6-269.000.
Gillard, Jean-Claude: See—
Mechaly, David; and Gillard, Jean-Claude, 243,291.
Goof, Sven Karl Lennart. Dentist's syringe. 243,337, 2-8-77, Cl. D24-1.00D.
Gottsegen, Marten. Chair. 243,296, 2-8-77, Cl. D6-71.000.
Gray, James A., Sr. Aquarium. 243,352, 2-8-77, Cl. D30-9.000.
Gross, Ronald John. Plant container. 243,357, 2-8-77, Cl. D11-152.000.
Gross, Ronald John. Plant container. 243,358, 2-8-77, Cl. D11-152.000.
Guetschoff, Norman P., Jr.: See—
Clayton, Richard G.; Blue, John M.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr., 243,340.
Guienne, Paul Francois. Marine aeroglider. 243,322, 2-8-77, Cl. D12-5.000.
Halpern, David: See—
Weisenfeld, George; and Halpern, David, 243,302.
Harms, Wolfgang; and Bergmann, Karl H. Coffeemaker or the like. 243,308, 2-8-77, Cl. D7-85.000.
Hartinger, George J. Pedestal base. 243,295, 2-8-77, Cl. D6-26.000.
Heberling, Carol Lee. Barbeque. 243,310, 2-8-77, Cl. D7-110.000.
Hedvall, Stig. Axe. 243,314, 2-8-77, Cl. D8-76.000.
Hocq, Robert, to Societe Franco-Hispano-Americaine (FRANCIS-PAM). Lighter. 243,349, 2-8-77, Cl. D27-42.000.
Honeywell Inc.: See—
Crowe, John E., 243,363.
Introl Corporation: See—
Allard, Peter B., 243,344.

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Jackson, Ralph. End table. 243,299, 2-8-77, Cl. D6-148.000.
Jackson, Ralph. Cocktail table. 243,303, 2-8-77, Cl. D6-177.000.
Jaunarajs, Janis V., to Shelbud Products Corporation. Toy writing instrument, or similar article. 243,331, 2-8-77, Cl. D19-42.000.
Johnson, Thomas: See—
Witte, Paul A.; and Johnson, Thomas, 243,354.
Kawazoe, Michio. Tripod. 243,328, 2-8-77, Cl. D16-45.000.
Kobashikawa, Gary K. Placemat or similar article. 243,305, 2-8-77, Cl. D6-271.000.
Kobashikawa, Gary K. Pendant. 243,360, 2-8-77, Cl. D11-83.000.
Koehler, Elmer C. Glove for pool, billiards, or the like. 243,292, 2-8-77, Cl. D2-361.000.
Krause, Richard T.; and Van Tilburg, Richard, to Leigh Products, Inc. Lavatory wash bowl. 243,325, 2-8-77, Cl. D23-58.000.
Kurihara, Isao, to Citizen Watch Co., Ltd. Combined wrist-watch case with band. 243,318, 2-8-77, Cl. D10-32.000.
Langlie, Howard; and Berg, Albert T., Jr. Nail-on electric fence insulator. 243,342, 2-8-77, Cl. D26-10.000.
Langlie, Howard: See—
Berg, Albert T., Jr.; and Langlie, Howard, 243,343.
Laukhuf, Gaylord V. Rotary tie out stake for a pet animal. 243,351, 2-8-77, Cl. D30-44.000.
Leigh Products, Inc.: See—
Krause, Richard T.; and Van Tilburg, Richard, 243,325.
Liberty of London Prints Limited: See—
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Loscalzo, Dominick, to Dart Industries Inc. Canister. 243,307, 2-8-77, Cl. D7-79.000.
Lybe, Linda L.; and Coulombe, Lola M. Protective casing for pacifiers. 243,366, 2-8-77, Cl. D83-8.00B.
Maark Corporation: See—
Witte, Paul A.; and Johnson, Thomas, 243,354.
Mack, Anthony: See—
Shumrak, George K.; and Mack, Anthony, 243,362.
MacWilliams, Paul D. Archery bow weight scale. 243,320, 2-8-77, Cl. D10-83.000.
Matzie Golf Company, Inc.: See—
Edwards, Harry M., 243,353.
Mayer, Alvin A., to Statitrol Corporation. Fire detector. 243,321, 2-8-77, Cl. D10-106.000.
Mechaly, David; and Gillard, Jean-Claude. Pocket for trousers or the like. 243,291, 2-8-77, Cl. D2-25.000.
Miller, Armin. Hand held electronic scanning camera probe. 243,341, 2-8-77, Cl. D26-5.00C.
Miller, Bruce B. Head hood for respiratory inhalation systems. 243,364, 2-8-77, Cl. D83-1.00F.
Moss, Murray E.: See—
Corber, Saul; and Moss, Murray E., 243,361.
Moyer, John W. Knockdown furniture base or similar article. 243,306, 2-8-77, Cl. D6-191.000.
Nagelkerke, Petrus Jacobus Johanna, to U.S. Philips Corporation. Hair dryer. 243,367, 2-8-77, Cl. D86-10.00F.
Nagelkerke, Petrus Jacobus Johanna, to U.S. Philips Corporation. Hair dryer. 243,368, 2-8-77, Cl. D86-10.00F.
Nevrous, Loris. Ring or bracelet. 243,359, 2-8-77, Cl. D11-4.000.
Optyl Corporation: See—
Pichler, Karl, 243,330.
Owens-Illinois, Inc.: See—
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Painter, David L., to Dart Industries Inc. Console humidifier. 243,336, 2-8-77, Cl. D23-146.000.
Peterson, Phillip R.: See—
Bernsten, Peter; and Peterson, Phillip R., 243,319.
Pichler, Karl, to Optyl Corporation. Eyeglass frame. 243,330, 2-8-77, Cl. D16-65.000.
Ravn, Ole Stig, to Stig Ravn A/S. Cheval-glass. 243,301, 2-8-77, Cl. D6-235.000.
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Rumplestiltskin's Craft Shop, Inc.: See—
Thaheld, Fred A.; and Thaheld, Fred H., 243,294.
Samuels, Jerry L. Star-shaped pendant roach clip. 243,346, 2-8-77, Cl. D27-2.000.
Scheimberg, Horatio. Adjusted suspender. 243,293, 2-8-77, Cl. D2-404.000.
Schellens, Henricus Franciscus Theresia; and Speakman, John Collyer, to U.S. Philips Corporation. Pocket dictating machine. 243,345, 2-8-77, Cl. D26-14.00B.
Segal, David. Smoking pipe, or similar article. 243,347, 2-8-77, Cl. D27-3.000.
Shelbud Products Corporation: See—
Jaunarajs, Janis V., 243,331.
Shibata, Kunihiro. Combined cigarette pack holder and matchbook. 243,350, 2-8-77, Cl. D27-49.000.
Shumrak, George K.; and Mack, Anthony, to Sweetheart Plastics, Inc. Food tray temperature maintenance station. 243,362, 2-8-77, Cl. D15-104.000.
Smith, James F. Tamping device. 243,315, 2-8-77, Cl. D8-77.000.
Smiths Industries Limited: See—
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Snarski, George A. Magnifier for calculator read out. 243,329, 2-8-77, Cl. D16-54.000.
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Hocq, Robert, 243,349.
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Spencer, Clifford A., to Eaton Corporation. Golf club grip. 243,355, 2-8-77, Cl. D34-5.00S.
Stairs, Henry M., Jr., to American Standard, Inc. Bathtub. 243,334, 2-8-77, Cl. D23-55.000.
Statitrol Corporation: See—
Mayer, Alvin A., 243,321.
Stig Ravn A/S: See—
Ravn, Ole Stig, 243,301.
Stuetzer, Franz Alban, to Rowenta-Werke GmbH. Lighter. 243,348, 2-8-77, Cl. D27-42.000.
Sweetheart Plastics, Inc.: See—
Shumrak, George K.; and Mack, Anthony, 243,362.
Tada, Tetsuya. Sprayer. 243,333, 2-8-77, Cl. D23-17.000.
Taubman, Gayle A. Rack for spice containers. 243,298, 2-8-77, Cl. D6-136.000.
Taylor, James M., to Wishbone Marine Products Inc. Anchor. 243,324, 2-8-77, Cl. D12-215.000.
Thaheld, Fred A.; and Thaheld, Fred H., to Rumplestiltskin's Craft Shop, Inc. Hand powered tufting machine. 243,294, 2-8-77, Cl. D3-19.00R.
Thaheld, Fred H.: See—
Thaheld, Fred A.; and Thaheld, Fred H., 243,294.
Trombley, Bertrand N., to Dart Industries Inc. Console humidifier. 243,335, 2-8-77, Cl. D23-146.000.
U.S. Philips Corporation: See—
Beeren, Aloysius Jacobus Maria, 243,327.
Nagelkerke, Petrus Jacobus Johanna, 243,367.
Nagelkerke, Petrus Jacobus Johanna, 243,368.
Schellens, Henricus Franciscus Theresia; and Speakman, John Collyer, 243,345.
Vandewater, Lloyd L. Round bale handling attachment for a tractor equipped with a front end bucket loader or a rear end lift mechanism. 243,326, 2-8-77, Cl. D15-28.000.
Van Tilburg, Richard: See—
Krause, Richard T.; and Van Tilburg, Richard, 243,325.
Varnado, Francis D. Glove drainer and drier. 243,313, 2-8-77, Cl. D7-196.000.
Vizzard, Joseph N. Hanging rack. 243,297, 2-8-77, Cl. D6-113.000.
Waldsmith, Raymond A., to Energy Absorption Systems, Inc. Bumper. 243,323, 2-8-77, Cl. D12-169.000.
Weisenfeld, George; and Halpern, David. Sunglass rack. 243,302, 2-8-77, Cl. D6-151.000.
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Windsor Industries, Inc.: See—
Bartlett, Robert N., 243,311.
Wishbone Marine Products Inc.: See—
Taylor, James M., 243,324.
Witte, Paul A.; and Johnson, Thomas, to Maark Corporation. Tennis racket throatpiece. 243,354, 2-8-77, Cl. D34-5.05T.

ISSUED FEBRUARY 8, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 7	43 4,006,542	39.63 4,006,592	104 4,006,695	831 4,006,755
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CLASS 8	CLASS 37	641 4,006,594	118 4,006,697	109 4,006,757
2.5 A 4,007,003	141 T 4,006,544	651 4,006,595	121.11 4,006,698	118.1 4,006,756
83 4,007,004	CLASS 40	690 4,006,596	241 4,006,699	CLASS 139
127.51 4,007,005	36 4,006,545	721 4,006,597	CLASS 113	116 4,006,758
128 R 4,007,006	132 D 4,006,546	CLASS 61	121 C 4,006,700	191 4,006,759
CLASS 9	322 4,006,547	3 4,006,598	CLASS 114	383 A 4,006,760
13 4,006,503	CLASS 42	11 4,006,599	102 4,006,701	CLASS 141
CLASS 12	1 W 4,006,548	53 4,006,600	CLASS 116	94 4,006,761
8.3 4,006,504	CLASS 43	CLASS 62	63 P 4,006,702	198 4,006,762
CLASS 13	14 4,006,549	80 4,006,601	CLASS 118	CLASS 145
18 4,007,324	17 4,006,550	113 4,006,602	2 4,006,703	29 R 4,006,763
22 4,007,325	42.04 4,006,551	229 4,006,603	50 4,006,704	CLASS 148
CLASS 14	42.48 4,006,552	261 4,006,604	221 4,006,705	2 4,007,062
16.1 4,006,505	54.5 R 4,006,553	356 4,006,605	303 4,006,706	6.3 4,007,063
CLASS 15	57.5 R 4,006,554	449 4,006,606	612 4,006,707	12.1 4,007,064
50 R 4,006,506	CLASS 46	CLASS 64	648 4,006,709	31.55 4,007,066
102 4,006,507	119 4,006,555	21 4,006,607	650 4,006,708	31.57 4,007,065
104.05 4,006,508	228 4,006,556	29 4,006,608	CLASS 119	105 4,007,072
150 4,006,509	CLASS 47	CLASS 65	5 4,006,710	120 4,007,073
245 4,006,510	39 4,006,559	136 4,007,027	14.03 4,006,711	175 4,007,074
300 A 4,006,511	40.5 4,006,560	163 4,007,028	19 4,006,712	CLASS 150
339 4,006,512	58 4,006,561	9 B 4,006,609	20 4,006,713	52 R 4,006,764
CLASS 16	61 4,006,557	75.2 4,006,611	72.5 4,006,716	CLASS 152
99 4,006,513	77 4,006,558	CLASS 68	155 4,006,717	12 4,006,765
CLASS 17	CLASS 48	177 4,006,612	CLASS 123	354 4,006,766
68 4,006,514	197 R 4,007,017	63 4,006,614	32 C 4,006,720	357 A 4,006,767
CLASS 19	4,007,018	363 4,006,615	32 EA 4,006,718	CLASS 156
144.5 4,006,515	4,007,019	394 4,006,613	32 JV 4,006,719	61 4,007,067
CLASS 21	CLASS 49	455 4,006,616	32 SJ 4,006,725	62.2 4,007,075
102 R 4,007,007	380 4,006,562	CLASS 71	119 A 4,006,721	62.8 4,007,076
CLASS 23	CLASS 51	11 4,007,029	124 A 4,006,722	123 4,007,068
230 B 4,007,008	109 R 4,006,563	40 4,007,030	179 B 4,006,723	143 4,007,069
230 R 4,007,009	295 4,007,020	90 4,007,031	198 E 4,006,724	145 4,007,070
253 R 4,007,010	CLASS 52	93 4,007,032	CLASS 124	148 4,007,071
259 4,007,011	9 4,006,564	111 4,007,033	81 4,006,726	159 4,007,078
4,007,012	18 4,006,565	CLASS 72	CLASS 125	330 4,007,079
4,007,013	64 4,006,566	7 4,006,617	11 AT 4,006,727	396 4,007,080
277 R 4,007,014	126 4,006,567	10 4,006,618	CLASS 126	417 4,007,081
281 4,007,015	241 4,006,568	54 4,006,619	110 R 4,006,728	CLASS 160
285 4,007,016	397 4,006,569	10 4,006,619	121 4,006,729	136 4,006,768
CLASS 26	432 4,006,570	66 4,006,620	143 4,006,733	166 A 4,006,769
2 R 4,006,516	498 4,006,571	151 4,006,621	271 4,006,730	263 4,006,770
CLASS 28	506 4,006,572	206 4,006,622	271.1 4,006,732	378 4,006,771
1.6 4,006,517	732 4,006,573	461 4,006,623	400 4,006,734	CLASS 162
CLASS 29	742 4,006,574	CLASS 73	CLASS 98	30 K 4,007,082
39 4,006,518	CLASS 53	13 4,006,626	39 4,006,672	101 4,007,083
243.52 4,006,520	38 4,006,575	23.1 4,006,624	40 A 4,006,673	167 4,007,084
282 4,006,521	124 B 4,006,576	67.8 S 4,006,627	1 4,006,678	CLASS 164
407 4,006,522	171 4,006,577	71.4 4,006,625	138 4,006,679	66 4,006,772
432 4,006,523	282 4,006,578	139 4,006,629	CLASS 101	298 4,006,773
455 R 4,006,524	374 4,006,579	141 A 4,006,628	93.14 4,006,680	312 4,006,774
558 4,006,525	CLASS 55	155 4,006,630	111 4,006,681	CLASS 165
622 4,006,526	33 4,007,021	178 R 4,006,631	118 4,006,682	9 4,006,775
749 4,006,519	41 4,007,022	190 H 4,006,632	212 4,006,684	51 4,006,775
CLASS 30	112 4,007,023	207 4,006,634	248 4,006,685	166 4,006,776
241 4,006,527	126 4,007,024	302 4,006,635	415.1 4,006,686	CLASS 166
276 4,006,528	213 4,007,025	313 4,006,637	CLASS 102	250 4,006,777
CLASS 33	302 4,007,026	387 4,006,638	28 R 4,006,687	261 4,006,778
174 L 4,006,529	CLASS 56	393 4,006,639	42 R 4,006,688	275 4,006,779
178 F 4,006,530	17.2 4,006,580	398 AR 4,006,641	70 R 4,006,689	CLASS 169
261 4,006,531	333 4,006,581	432 R 4,006,642	80 4,006,690	26 4,006,780
288 4,006,532	CLASS 57	CLASS 74	CLASS 104	CLASS 172
	34 AT 4,006,582	12 4,006,643	176 4,006,691	532 4,006,781
	140 G Re.29,133	242.1 FP 4,006,644		

[illegible]

	4,007,453			52	4,007,476	157	4,006,995	258	4,007,275	377	4,007,306
200	4,007,454		CLASS 352	70	4,007,479	239 A	4,006,996	263	4,007,276		CLASS 428
237 R	4,007,456	91 C	4,006,975	81	4,007,477			267	4,007,277	17	4,007,307
259	4,007,457		4,006,976		CLASS 358		CLASS 415	269	4,007,278	92	4,007,308
310 R	4,007,458	133	4,006,977			181	4,006,997	277	4,007,279	116	4,007,309
365 S	4,007,459	174	4,006,978	1	4,007,480	213 T	4,006,998	278	4,007,280	195	4,007,310
		176	4,006,979	2	4,007,481			300	4,007,281	246	4,007,311
	CLASS 343			4	4,007,482		CLASS 416	308	4,007,282	420	4,007,312
225	4,007,455		CLASS 353		4,007,483	224	4,006,999			447	4,007,313
776	4,007,460	118	4,006,980	8	4,007,484			CLASS 423	CLASS 426		4,007,314
844	4,007,461				4,007,485						CLASS 429
	CLASS 346	24	4,007,466	11	Re.29.135	265	4,007,252	34	4,007,283		
I	4,007,462	27	4,007,469	13	4,007,486	329	4,007,253	98	4,007,284	9	4,007,059
75	4,007,463	51	4,007,467	22	4,007,487	416	4,007,254	108	4,007,285	34	4,007,058
	4,007,464	59	4,007,468	29	4,007,488	510	4,007,255	262	4,007,286	53	4,007,060
140 R	4,007,465	293	4,007,470	78	4,007,489	565	4,007,055	535	4,007,287	57	4,007,057
		295	4,007,471	85	4,007,328	584	4,007,256	548	4,007,288	62	4,007,315
				160	4,007,327	646	4,007,257	549	4,007,289	118	4,007,316
	CLASS 350		CLASS 355	280	4,007,326		CLASS 424	594	4,007,290	153	4,007,317
		3 DD	4,006,981		CLASS 360	22	4,007,258		4,007,291	206	4,007,054
96 C	4,006,963	3 P	4,006,982			49	4,007,259	637	4,007,292	222	4,007,056
	4,006,964	4	4,006,983	11	4,007,490	52	4,007,260		CLASS 427		
96 WG	4,006,962	11	4,006,984	74	4,007,491	70	4,007,261	19	4,007,293	1	4,007,000
117	4,006,965	14	4,006,985	75	4,007,492	76	4,007,262	39	4,007,294	10	4,007,001
160 LC	4,006,968		4,006,986	77	4,007,493	78	4,007,263	43	4,007,295		CLASS 526
160 R	4,006,966	15	4,006,987		CLASS 401	82	4,007,264	79	4,007,296	11.1	4,007,317
	4,006,967		CLASS 356	121	4,006,991	92	4,007,265	93	4,007,297	21	4,007,318
	4,006,969	4	4,006,988		CLASS 402	105	4,007,266	195	4,007,298	60	4,007,319
285	4,006,970	106 LR	4,006,989			116	4,007,267		4,007,299	62	4,007,320
293	4,006,971	246	4,006,990	47	4,006,992	200	4,007,268		4,007,300	64	4,007,321
310	4,006,972		CLASS 357		CLASS 403	210	4,007,269	242	4,007,301	292	4,007,322
	4,006,973	31	4,007,473	359	4,006,993	230	4,007,270	244	4,007,302	312	4,007,323
		34	4,007,474		CLASS 408	234	4,007,271	249	4,007,303		CLASS 536
	CLASS 351	39	4,007,475			247	4,007,273	296	4,007,304	17	4,007,166
		41	4,007,478	142	4,006,994	248.51	4,007,272	314	4,007,305		4,007,167
59	4,006,974					249	4,007,274	322			

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D2— 25 243,291	235 243,301	74 243,319	45 243,328	5 C 243,340	D34— 5 GB 243,353
361 243,292	269 243,304	83 243,320	54 243,329	243,341	5 GS 243,355
404 243,293	271 243,305	106 243,321	65 243,330	5 R 243,344	5 ST 243,354
D3— 19 R 243,294	D7— 79 243,307	D11— 4 243,359	D19— 42 243,331	10 243,342	15 B 243,356
D6— 26 243,295	107 243,309	152 243,357	D22— 27 243,332	243,343	D48— 24 A 243,361
71 243,296	110 243,310	83 243,360	D23— 17 243,333	14 B 243,345	D64— 12 B 243,363
113 243,297	181 243,312	5 243,358	55 243,334	2 243,346	D83— 1 F 243,364
136 243,298	196 243,313	169 243,323	58 243,325	3 243,347	D83— 1 R 243,365
148 243,299	D8— 76 243,314	215 243,324	146 243,335	42 243,348	8 B 243,366
150 243,300	77 243,315	28 243,326	243,336	243,349	D86— 10 F 243,367
151 243,302	273 243,317	53 243,311	D24— 1 D 243,337	49 243,350	243,368
177 243,303	D9— 119 243,316	104 243,362	D26— 1 R 243,338	9 243,352	D87— 3 G 243,369
191 243,306	D10— 32 243,318	D16— 42 243,327	243,339	44 243,351	D92— 1 Y 243,370

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P.— 15 4,015	25 4,016				
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Arizona	4	Maine	23	Puerto Rico	43
Arkansas	5	Maryland	24	Rhode Island	44
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Canal Zone	7	Michigan	26	South Dakota	46
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Connecticut	9	Mississippi	28	Texas	48
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PATENTS

1 : 4,007,434	4,006,983	4,006,966	4,006,784	4,006,541	4,006,552
4 : 4,006,674	4,006,990	4,007,039	4,006,797	4,006,865	4,006,556
4,006,703	4,007,005	4,007,079	4,006,808	4,007,037	4,006,562
4,006,775	4,007,006	4,007,113	4,006,822	4,007,318	4,006,629
4,007,053	4,007,017	4,007,114	4,006,824	4,006,777	4,006,641
4,007,446	4,007,018	4,007,160	4,006,834	4,007,092	4,006,646
4,007,479	4,007,019	4,007,182	4,006,850	4,007,109	4,006,661
6 : 4,006,496	4,007,026	4,007,184	4,006,853	4,007,110	4,006,680
4,006,498	4,007,033	4,007,200	4,006,878	4,007,111	4,006,681
4,006,501	4,007,049	4,007,229	4,006,901	4,007,126	4,006,724
4,006,511	4,007,057	4,007,244	4,006,917	4,007,379	4,006,802
4,006,527	4,007,087	4,007,245	4,006,929	4,006,713	4,006,805
4,006,538	4,007,102	4,007,323	4,006,939	4,006,735	4,006,918
4,006,549	4,007,105	4,007,353	4,006,950	4,006,743	4,006,919
4,006,557	4,007,118	4,007,361	4,006,955	4,006,819	4,006,922
4,006,566	4,007,123	4,006,542	4,006,958	4,006,977	4,006,931
4,006,569	4,007,175	4,007,481	4,006,980	4,007,296	4,007,028
4,006,572	4,007,224	4,006,910	4,006,985	4,007,400	4,007,059
4,006,581	4,007,227	4,006,553	4,007,008	4,007,403	4,007,081
4,006,597	4,007,241	4,006,595	4,007,031	4,006,521	4,007,086
4,006,598	4,007,283	4,006,603	4,007,046	4,006,546	4,007,148
4,006,602	4,007,312	4,006,670	4,007,065	4,006,575	4,007,181
4,006,607	4,007,326	4,006,879	4,007,076	4,006,577	4,007,243
4,006,608	4,007,330	4,006,888	4,007,128	4,006,700	4,007,268
4,006,634	4,007,331	4,006,959	4,007,185	4,006,725	4,007,285
4,006,638	4,007,332	4,006,972	4,007,194	4,006,758	4,007,305
4,006,676	4,007,347	4,006,973	4,007,207	4,006,817	4,007,306
4,006,677	4,007,352	4,007,012	4,007,214	4,006,828	4,007,309
4,006,696	4,007,354	4,007,089	4,007,218	4,006,842	4,007,343
4,006,697	4,007,375	4,007,120	4,007,252	4,006,851	4,007,435
4,006,716	4,007,378	4,007,359	4,007,335	4,006,854	4,007,480
4,006,733	4,007,406	4,007,336	4,007,336	4,006,866	4,007,480
4,006,737	4,007,419	4,007,461	4,007,337	4,006,900	4,006,525
4,006,748	4,007,428	4,007,491	4,007,338	4,006,915	4,006,605
4,006,754	4,007,430	4,006,594	4,007,348	4,006,927	4,006,626
4,006,762	4,007,431	4,006,884	4,007,367	4,006,971	4,006,649
4,006,788	4,007,442	4,007,292	4,007,368	4,006,986	4,006,650
4,006,789	4,007,452	4,006,499	4,006,669	4,006,989	4,006,912
4,006,793	4,007,458	4,006,522	4,006,669	4,007,054	4,007,056
4,006,800	4,007,465	4,006,534	4,006,732	4,007,054	4,007,058
4,006,831	4,007,487	4,006,535	4,006,746	4,007,197	4,007,060
4,006,861	4,007,493	4,006,544	4,006,898	4,007,212	4,007,122
4,006,876	4,007,493	4,006,544	4,006,907	4,007,263	4,006,509
4,006,885	8 : 4,006,920	4,006,664	4,006,932	4,007,404	4,006,815
4,006,895	4,007,020	4,006,667	4,006,947	4,007,425	4,006,816
4,006,911	4,007,369	4,006,675	4,007,067	4,007,443	4,006,820
4,006,924	9 : 4,006,537	4,006,686	4,007,108	4,007,448	4,006,914
4,006,925	4,006,639	4,006,692	4,007,115	4,007,460	4,006,928
4,006,933	4,006,702	4,006,731	4,007,155	4,007,468	4,007,260
4,006,951	4,006,707	4,006,739	4,007,274	4,007,469	4,006,591
4,006,957	4,006,711	4,006,752	4,007,316	4,007,470	4,006,715
4,006,961	4,006,774	4,006,759	4,007,392	4,007,471	4,006,714
4,006,968	4,006,812	4,006,770	4,007,418	4,007,472	4,006,559
4,006,970	4,006,906	4,006,780	4,006,502	4,006,512	4,006,694

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34 :	4,006,763	36 :	4,006,514	4,007,167	4,006,845	4,006,786	4,007,130
	4,006,540		4,006,533	4,007,170	4,006,862	4,006,826	4,007,139
	4,006,606		4,006,539	4,007,198	4,006,872	4,006,889	4,007,145
	4,006,726		4,006,543	4,007,210	4,006,877	4,006,892	4,007,216
	4,006,747		4,006,547	4,007,235	4,006,936	4,006,899	4,007,230
	4,006,825		4,006,548	4,007,236	4,006,940	4,006,943	4,007,236
	4,006,836		4,006,550	4,007,255	4,006,967	4,006,948	4,007,256
	4,006,868		4,006,561	4,007,258	4,006,999	4,007,003	4,007,293
	4,006,896		4,006,579	4,007,261	4,007,027	4,007,035	4,007,304
	4,006,909		4,006,592	4,007,270	4,007,070	4,007,071	4,007,311
	4,007,010		4,006,604	4,007,273	4,007,098	4,007,088	4,007,376
	4,007,051		4,006,611	4,007,277	4,007,099	4,007,141	4,007,437
	4,007,055		4,006,613	4,007,288	4,007,107	4,007,154	4,007,462
	4,007,090		4,006,615	4,007,290	4,007,124	4,007,173	4,007,476
	4,007,094		4,006,624	4,007,291	4,007,134	4,007,178	4,006,495
	4,007,125		4,006,645	4,007,324	4,007,147	4,007,249	4,006,558
	4,007,131		4,006,659	4,007,370	4,007,162	4,007,319	4,006,745
	4,007,137		4,006,708	4,007,372	4,007,246	4,007,325	4,006,846
	4,007,149		4,006,738	4,007,388	4,007,300	4,007,384	4,006,631
	4,007,159		4,006,741	4,007,438	4,007,329	4,007,401	4,006,765
	4,007,190		4,006,749	4,007,445	4,007,344	4,007,439	Re.29,133
	4,007,191		4,006,750	4,007,450	4,007,356	4,007,441	4,006,554
	4,007,193		4,006,760	4,007,456	4,007,394	4,007,441	4,006,617
	4,007,203		4,006,769	4,007,464	4,007,397	4,007,492	4,006,625
	4,007,205		4,006,771	4,006,610	4,007,397	4,006,600	4,006,671
	4,007,206	37 :	4,006,902	4,006,688	4,006,832	4,006,863	4,006,869
	4,007,208		4,006,945	4,006,905	4,006,883	4,007,399	4,006,870
	4,007,231		4,006,962	4,007,416	4,006,952	4,006,516	4,006,871
	4,007,262		4,006,974	4,007,454	4,006,991	4,006,844	4,006,874
	4,007,272		4,006,981	4,006,531	4,007,001	4,007,004	4,006,930
	4,007,281	38 :	4,006,982	4,006,833	4,007,002	4,006,564	4,006,941
	4,007,287		4,007,015	4,007,371	4,007,029	4,006,835	4,006,996
	4,007,294	39 :	4,007,016	4,006,506	4,007,028	4,007,024	4,007,075
	4,007,295		4,007,041	4,006,515	4,007,238	4,007,144	4,007,186
	4,007,297		4,007,042	4,006,524	4,007,366	4,007,226	4,006,798
	4,007,298		4,007,043	4,006,529	4,006,532	4,007,322	4,006,837
	4,007,334		4,007,047	4,006,555	4,006,678	4,006,503	4,006,518
	4,007,339		4,007,082	4,006,570	4,006,847	4,006,508	4,006,560
	4,007,340		4,007,083	4,006,571	4,006,860	4,006,573	4,006,609
	4,007,377		4,007,100	4,006,628	Re.29,134	4,006,630	4,006,614
	4,007,381		4,007,101	4,006,643	4,006,519	4,006,705	4,006,616
	4,007,412		4,007,103	4,006,658	4,006,586	4,006,727	4,006,653
	4,007,413		4,007,119	4,006,666	4,006,588	4,006,753	4,006,710
	4,007,421		4,007,121	4,006,691	4,006,619	4,006,779	4,006,838
	4,007,423		4,007,153	4,006,767	4,006,633	4,006,794	4,006,852
	4,007,427		4,007,156	4,006,776	4,006,640	4,006,806	4,006,923
	4,007,447		4,007,157	4,006,807	4,006,685	4,006,814	4,007,009
	4,007,453		4,007,161	4,006,810	4,006,695	4,006,921	4,007,211
	4,007,459		4,007,165	4,006,840	4,006,736	4,007,096	4,007,333
					4,006,768		

DESIGN PATENTS

6 :	243,292	243,323	15 :	243,305	243,316	32 :	243,294	243,355
	243,293	243,341		243,360	25 :	243,362		243,369
	243,297	243,353	17 :	243,296	26 :	243,335	34 :	243,346
	243,300	243,356		243,329		243,340		243,363
	243,302	243,311	8 :	243,336		243,334	42 :	243,363
	243,306	243,313		243,347		243,354	48 :	243,338
	243,310	243,321		243,366	27 :	243,295	36 :	243,339
	243,312	243,299	11 :	243,325		243,342		243,315
	243,317	243,303		243,326		243,343	39 :	243,319
	243,320	243,324	12 :	243,304		243,344		243,332

PLANT PATENTS

18 :	4,015	4,016				
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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

February 15, 1977

Volume 955

Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before March 4, 1977.

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Volpe, Anthony S., 6718 Torresdale Ave., Philadelphia, Pa. 19135
Wannlesky, William M., 2911 Farm Rd., Alexandria, Va. 22302

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,993,479, J. Thurley, FLUID HEATERS; 3,265,113, Thurley and Lowry, GAS BURNER APPARATUS, filed Nov. 22, 1974, D.C., W.D. Okla. (Oklahoma City), Doc. 74-1004, *Block, Stivalis & Bryson, Inc. v. Keystone Steel Fabrication, Inc. et al.* Judgment stating that defendants have not and do not infringe upon plaintiff's patent by the use and manufacture and sale of their industrial heaters. Judgment is entered in favor of defendants. Plaintiff take nothing and injunctive relief is denied, Aug. 18, 1976.

3,056,363, A. F. Naylor, HYDRAULICALLY AND SPHERICALLY SUPPORTED INERTIAL REFERENCE, filed Sept. 27, 1976, United States Court of Claims (District of Columbia), Doc. 216-75, *TRW, Inc. v. The United States*. Judgment is entered for the plaintiff against the United States, Oct. 1, 1976.

3,156,317, I. H. Alexander, CONTROL DEVICE; 3,167,321, S. L. Kaneny, OPERATOR-COMPUTER COMMUNICATION CONSOLE; 3,226,699, Amdahl, Brian, Jr., Scarbrough, Koerner and Schneberger, MODULAR COMPUTER SYSTEM MASTER DISCONNECT CAPABILITY; 3,226,692, Fuller, Koerner and Schneberger, MODULAR COMPUTER SYSTEM; 3,253,748, Schneberger, Scarbrough, Blenhoff and Connolly, STORED LOGIC COMPUTER; 3,275,901, E. J. Schneberger, MEMORY SYSTEM; 3,341,317, J. C. Smeltzer, MEMORY TRANSFER APPARATUS, filed Mar. 1, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c580, *Bunker Ramo Corporation v. International Business Machines Corporation*. Enter stipulation and order of dismissal under Rule 41(a)(2) F.R.C.P., Jan. 22, 1975.

3,167,321. (See 3,158,317.)

3,226,699. (See 3,158,317.)

3,226,692. (See 3,158,317.)

3,253,748. (See 3,158,317.)

3,265,113. (See 2,993,479.)

3,275,901. (See 3,158,317.)

3,293,663, T. D. Cronin, SURGICALLY IMPLANTABLE HUMAN BREAST PROSTHESIS, filed Feb. 27, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c746, *Dow Corning Corporation v. American Hospital Supply Corporation and Heyer-Schulte Corp.* Cause dismissed, Sept. 29, 1976.

3,341,317. (See 3,158,317.)

3,417,569, W. N. Laughlin, PROTECTIVE COATING AND METHOD, filed Aug. 3, 1970, D.C., E.D. La. (New Orleans), Doc. C.A. 70-2075, *W. N. Laughlin v. Royal Industries, Inc.* Final decree on consent stating that plaintiff is owner of said patent. Claim 7 is valid and infringed by defendant. Plaintiff's first and second cause of action is dismissed with prejudice. Plaintiff's third and fourth cause of action is dismissed without prejudice, Apr. 13, 1971.

3,421,678, Thompson and Ihde, PROFILE COATED CARTON, filed July 28, 1976, D.C., N.D. Ga. (Atlanta), Doc. C76-1253-A, *Champion International Corporation v. International Paper Company*.

3,424,111, L. Maslow, READILY ASSEMBLABLE AND ADJUSTABLE SHELVING, filed Aug. 30, 1976, D.C., Pa. (Philadelphia), Doc. 76-2747, *Metropolitan Wire Corporation v. Falcon Products, Inc. et al.*

3,445,165, W. P. Dubbs, PHOTOGRAPHIC DISTORTION DEVICE, filed Oct. 5, 1976, D.C. Minn. (Minneapolis), Doc. 4-76-C-435, *Snook Corporation v. Combined Services, Inc.*

3,448,700, T. C. Hardwick, Jr., MARINE FLOAT CONSTRUCTION, filed Aug. 30, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76-2791-LEW, *Thomas C. Hardwick v. E.S.A. Industries, Inc.*

3,452,188, Zidron, Bau and Nagel, PILOT CHART-BOARD AND EMERGENCY COCKPIT PANEL LIGHTING, filed Aug. 2, 1976, United States Court of Claims (District of Columbia), Doc. 317-76, *Telex Communications, Inc. v. The United States*.

3,482,364, J. M. Bynum, FLUID SEALED JOINT, filed Apr. 29, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76-1882-RJK, *H-I-Shear Corporation v. Kaynar Mfg. Co., Inc.*

3,486,495, H. W. Allen, ARCHERY BOW WITH DRAW FORCE MULTIPLYING ATTACHMENTS, filed Sept. 10, 1974, D.C., E.D. Wash. (Spokane), Doc. C-74-210, *Allen Archery, Inc. v. Martin Archery, Inc. et al.* Judgment against defendant. Kam-Act Enterprises, Inc. Consent judgment and decree entered Sept. 28, 1976.

3,490,356, Peterson and Hogan, SPRAY DISCHARGE HEAD, filed July 9, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1916, *Reynolds Products, Inc. v. Cory Corporation*. Motion of plaintiff pursuant to Rule 41(a)(1)(i). Cause dismissed without prejudice, Sept. 13, 1974.

3,521,500, Duke and Rountree, PIPE SPINNER, filed Aug. 9, 1976, D.C., S.D. Tex. (Houston), Doc. 76-H-1325, *J. L. H. Rountree v. Varco International, Inc.*

3,526,219, L. Balamuth, METHOD AND APPARATUS FOR ULTRASONICALLY REMOVING TISSUE FROM A BIOLOGICAL ORGANISM; 3,539,363, Banko and Kelman, MATERIAL REMOVAL APPARATUS AND METHOD EMPLOYING HIGH FREQUENCY VIBRATIONS; 3,902,495, Weiss and Broadwin, FLOW CONTROL SYSTEM, filed Aug. 16, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3044, *Cavitron Corporation v. Sparta Instrument Corporation*.

3,542,321, R. D. Kahabka, TIE, filed Dec. 14, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c3161, *Panduit Corp. v. Minnesota Mining and Manufacturing Co.* On motion of plaintiff, cause hereby dismissed with prejudice, Apr. 3, 1976.

3,589,363. (See 3,526,219.)

3,594,751, Ogden and Henderson, DETECTION OF PRODUCTS OF COMBUSTION, filed Oct. 1, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3670, *Pittway Corporation v. The BRK Shareholders' Committee*.

3,624,852, D. C. Hanna, MODULE CAR WASH; 3,939,516, same, filed Sept. 15, 1976, D.C., C.D. Calif. (Los Angeles), Doc. 76-2940, *Daniel C. Hanna v. A & G Car Wash Equipment Co. Inc.*

3,711,262, Keck and Schultz, METHOD OF PRODUCING OPTICAL WAVEGUIDE FIBERS; 3,823,995, L. L. Carpenter, METHOD OF FORMING LIGHT FOCUSING FIBER WAVEGUIDE; 3,884,550, Maurer and Shultz, GERMANIA CONTAINING OPTICAL WAVEGUIDE, filed July 14, 1976, D.C., W.D. Va. (Roanoke), Doc. 76-0144, *Corning Glass Works v. International Telephone and Telegraph Corporation*.

3,769,874, Droughton and Rhodes, METHOD FOR PRODUCING HEAT PIPES; 3,880,230, Pessolano and Rhodes, HEAT TRANSFER SYSTEM; 3,884,292, same, AIR-O-SPACE HEATER MEANS FOR RECOVERING HEAT FROM A FLUID STEAM; 3,884,293, same, COOLING MEANS, filed Sept. 24, 1976, D.C., N.D. Tex. (Dallas), Doc. CA3-76-1287, *Q-Dot Corporation v. Isothermics, Inc.*

3,823,995. (See 3,711,262.)

3,880,062, Culpepper, Jr. and Stuck, HOOD; 3,946,650, C. Culpepper, Jr., VENTILATION APPARATUS AND METHOD, filed Oct. 1, 1976, D.C.N.C. (Charlotte), Doc. C-C-76-272, *Aero-Dyne Manufacturing, Inc. v. Marshall Air Systems, Inc. and Robert M. Stuck*.

3,880,230. (See 3,769,874.)

3,884,292. (See 3,769,874.)

3,884,293. (See 3,769,874.)

3,884,550. (See 3,771,262.)

3,897,930, J. E. Young, HOT TOP SUSPENSION SYSTEM FOR INGOT MOLD, filed May 26, 1976, D.C. Md. (Baltimore), Doc. W76-795, *Combustion Engineering, Inc. v. J. W. Marshall, Inc.*

3,902,495. (See 3,526,219.)

3,939,516. (See 3,624,852.)

3,946,650. (See 3,880,062.)

PATENT NOTICES

Certificates of Correction for the Week of Feb. 15, 1977

D. 239,850	3,967,729	3,984,605	3,992,522
3,677,508	3,969,162	3,984,672	3,992,575
3,712,949	3,969,285	3,985,342	3,992,576
3,752,880	3,969,411	3,985,429	3,992,713
3,755,440	3,969,527	3,985,572	3,992,818
3,779,856	3,970,191	3,985,579	3,993,056
3,786,248	3,970,465	3,985,604	3,993,149
3,791,930	3,970,686	3,986,375	3,993,246
3,792,040	3,971,773	3,986,431	3,993,317
3,796,929	3,971,935	3,986,767	3,993,475
3,801,071	3,972,300	3,986,889	3,993,497
3,826,068	3,972,313	3,986,896	3,993,519
3,838,548	3,973,368	3,986,914	3,993,520
3,853,825	3,973,491	3,987,014	3,993,537
3,862,270	3,973,971	3,987,022	3,993,607
3,882,148	3,974,228	3,987,175	3,993,685
3,884,440	3,975,451	3,987,583	3,993,774
3,888,888	3,975,747	3,987,618	3,993,818
3,898,042	3,976,071	3,987,702	3,993,902
3,899,248	3,977,497	3,987,825	3,993,930
3,912,774	3,978,130	3,988,162	3,994,090
3,915,155	3,978,176	3,988,221	3,994,256
3,921,921	3,979,025	3,988,501	3,994,268
3,927,219	3,979,177	3,988,557	3,994,270
3,928,994	3,979,851	3,988,893	3,994,348
3,928,623	3,979,855	3,989,262	3,994,368
3,932,537	3,979,921	3,989,294	3,994,380
3,936,666	3,980,099	3,990,076	3,994,434
3,937,723	3,980,315	3,990,126	3,994,671
3,940,362	3,980,412	3,990,137	3,995,367
3,943,178	3,980,642	3,990,155	3,995,565
3,945,835	3,980,708	3,990,594	3,995,572
3,949,105	3,980,737	3,990,903	3,995,629
3,949,463	3,980,771	3,990,966	3,995,638
3,950,297	3,980,820	3,991,028	3,995,710
3,950,968	3,981,334	3,991,125	3,995,736
3,951,767	3,981,416	3,991,522	3,995,837
3,952,745	3,981,493	3,991,627	3,995,897
3,957,758	3,983,164	3,991,797	3,995,912
3,959,248	3,983,233	3,991,844	3,996,117
3,960,320	3,983,894	3,992,067	3,996,510
3,960,721	3,983,916	3,992,090	3,996,617
3,962,223	3,983,925	3,992,210	3,996,686
3,963,415	3,984,421	3,992,226	3,996,760
3,963,654	3,984,592	3,992,366	
3,966,589	3,984,603	3,992,436	

Patents Available for Licensing or Sale

- D. 242,263. ASHTRAY FOR STOPPING SMOKING. Jack Golden and Philip Jager. Correspondence to: Mr. Jack Golden, 5025 Broadway, New York, N.Y., 10034.
- 3,260,028. METHOD OF CONSTRUCTING A BUILDING. R. Lee Fraser, 3723 Northwood Drive, Memphis, Tenn., 38111.
- 3,602,913. FACIAL PROTECTION FOR HAIR SPRAY. Doris F. Neese, Box 463, Eddy, Tex., 76524.
- 3,626,460. PHOTOGRAPHIC LETTER STYLE AND JOB LAYOUT MACHINE. Ralph H. Miller, 13619 Sunset, Detroit, Mich., 48212.
- 3,634,112. ALUMINUM POLYOXYCHLORIDE BONDED CASTABLE REFRACTORIES. Paul J. Yavorsky et al. Correspondence to: Mr. John D. Kern, Assistant Vice President, Technology, Basic Incorporated, 845 Hanna Building, Cleveland, Ohio, 44115.
- 3,825,262. HAND-HELD AMUSEMENT DEVICE WITH TETHERED BALL AND PLURAL TARGETS. Alicja Grzybowski, 3850 -G Colegrove, San Mateo, Calif., 94403.
- 3,838,841. FOLDING SHELF AND SHELF BRACKET. Phillip B. Cadman, 9206 Chestwall St., Orangevale, Calif., 95662.
- 3,862,699. CAP SECURING MEANS FOR A CONTAINER. William W. Wetzett, 803 Saxony Encinitos, Calif., 92024.
- 3,872,610. MATHEMATICS TEACHING APPARATUS. Matt J. Dumovich, 2151 Hillon St., San Diego, Calif., 92110.
- 3,885,266. SANITARY SCOOP FOR REMOVAL OF DOG LITTER. Betty O. Nafziger, 157 Congress Run Rd., Cincinnati, Ohio, 45215.
- 3,885,689. BOAT LOADING AND UNLOADING APPARATUS. Hitam D. Grove, North Main St., New Athens, Ohio, 43981.
- 3,887,154. SUPPORT. John W. Corkett, 195 Minick St., Franklin, Ohio, 45005.
- 3,887,286. FINGERTIP PEN. Jackson P. Bucey, 41 Scholfield Road, Rochester, N.Y., 14617.
- 3,888,336. SIDEWALK PLUG IN POLE FOR CAR HEATERS OR THE LIKE. James Zajic, Box 176, Walnwright, Alberta, Canada, TOB 4 po.
- 3,889,979. AUTOMATIC HITCHING DEVICE. Gregory E. Schmiesing, R.R. #1, New Bremen, Ohio, 45869.
- 3,890,931. SANITARY PET BOX. H. G. Saver, 65 Prospect St., Stamford, Conn., 06901.
- 3,895,473. PROCESS FOR MANUFACTURE OF LOW COST HOUSING AT SITE. R. Lee Fraser, 3723 Northwood Drive, Memphis, Tenn., 38111.
- 3,899,157. TACK FASTENER AND STRIPPER. Robert Thomas, 30 West Chicago Ave., Chicago, Ill., 60610.
- 3,902,690. DERAILING DEVICE WITH SAFETY LOCK. Rayno H. Wantha, 8269 Vaughan, Detroit, Mich., 48228.
- 3,907,203. SHOWER EQUIPMENT WITH LIQUID DISPENSOR FOR SHOWER HEAD. Thomas L. Skillings, 511 Latourette St., Oregon City, Oreg., 97045.
- 3,907,218. HEAVIER THAN AIR FREIGHT AIRCRAFT. Ralph H. Miller, 13619 Sunset, Detroit, Mich., 48212.
- 3,912,902. ELECTRICALLY HEATED TOURING SKI-BASE WAX APPLICATOR DEVICE. Myron M. Herniter, 20 Regina Place, Yonkers, N.Y., 10703.
- 3,913,440. GUIDE DEVICE FOR POWER SAW AND THE LIKE. Richard D. Baker, 3376, McLaughlin Ave., Los Angeles, Calif., 90068.
- 3,913,871. HEAVIER THAN AIR PASSENGER AIRCRAFT. Ralph H. Miller, 13619 Sunset, Detroit, Mich., 48212.
- 3,913,920. NAVAL WARFARE BOARD GAME APPARATUS. Lonnie B. Brumitt, 1013 Rollins Cr., Hampton, Va., 23663.
- 3,918,385. MOORING DEVICE. George Wallace, 4305 West 13 Mile Road, Royal Oak, Mich., 48072.
- 3,918,827. FUEL LESS WATER PRESSURE MACHINE. John L. Conn, P.O. Box 4501, Spartanburg, S.C., 29303.
- 3,949,730. FISHING REEL SUPPORTING BRACKET FOR ARCHERY BOWS. Simon R. Schoenberger, 1806 Bridge City Ave., Bridge City, La., 70094.
- 3,952,422. PERSISTENCE TEST APPARATUS. David B. Roberts, Jr., 211 4th Place SW., Largo, Fla., 33540.
- 3,952,821. MOTOR DRIVEN GOLF BAY CART. Charles G. Craveu, 35 Will Drive, Canton, Mass., 02021.
- 3,953,983. REFRIGERATION METHOD AND REFRIGERATION APPARATUS FOR CARRYING OUT THE METHOD. Ernst Sander. Correspondence to: Craig Antonelli, 909 Watergate Office Bldg., 2600 Virginia Ave., NW., Washington, D.C., 20037.
- 3,964,105. KNOT SIMULATOR NECKTIE KNOT. Thomas R. Gideon, P.O. Box 399, Aztec, N. Mex., 87410.
- 3,965,663. SPUN YARN. Kammgarnspinnerel Burglen, Burglen, Switzerland. Correspondence to: Striker, Striker, & Stenby, 360 Lexington Ave., New York, N.Y., 10017.
- 3,966,408. STERILANT IMMERSION CONTAINER WITH COVER ACTUATED TRAY. Dr. Richard E. Drennen, Fairway Heights, Denison, Iowa., 51442.
- 3,974,604. EASY ANCHOR. John L. Conn, P.O. Box 4501, Spartanburg, S.C., 29303.
- 3,982,711. SOD LAYING MACHINE. Frank Bradley, Box 255, 71 Highway, Diamond, Mo., 64840.
- 3,983,928. DUAL TEMPERATURE THERMOSTATIC CONTROLLER. Robert W. Barnes, 108 Deep Dale Drive East, Levittown, Pa., 19056.
- 3,985,148. CRUTCH CARRY-ALL ATTACHMENT. Philip B. Cadman, 9206 Chestwall St., Orangevale, Calif., 95662.
- 3,986,723. THE REMOVABLE BOAT WHEEL SYSTEM FOR CAR TOP BOATS. Wayne W. Brockelsby, 1625 Margate Ave., Orlando, Fla., 32803.

Dravo Corporation is prepared to grant non-exclusive licenses under the following patents upon reasonable terms. Applications for license may be addressed to: Patent Counsel, Dravo Corporation, One Oliver Plaza, Pittsburgh, Pa., 15222.

- 3,914,378. PROCESS FOR WET SCRUBBING OF SULFUR DIOXIDE FROM FLUE GAS.
- 3,919,393. PROCESS FOR SULFUR DIOXIDE REMOVAL FROM COMBUSTION GASES.
- 3,919,394. PROCESS FOR THE REMOVAL OF OXIDES OF SULFUR FROM A GASEOUS STREAM.
- 3,920,795. STABILIZATION OF SLUDGE SLURRIES.
- 3,803,624. MONOPULSE RADAR ANTENNA ARRAY FEED NETWORK.
- 3,816,725. MULTIPLE LEVEL ASSOCIATIVE LOGIC CIRCUITS.
- 3,818,452. ELECTRICALLY PROGRAMMABLE LOGIC CIRCUITS.
- 3,819,954. SIGNAL LEVEL SHIFT COMPENSATION IN CHARGE-TRANSFER DELAY LINE CIRCUITS.
- 3,845,490. STRIPLINE SLOTTED BALUN DIPOLE ANTENNA.
- 3,849,638. SEGMENTED ASSOCIATIVE LOGIC CIRCUITS.
- 3,851,299. DATA PROCESSING SYSTEMS.
- 3,851,493. GAS SEPARATION AND PURIFICATION UTILIZING TIME SEQUENCED FLOW THROUGH A PAIR OF REGENERATORS.
- 3,859,519. WIDE DYNAMIC RANGE OMNIDIRECTIONAL OPTICAL SENSOR FOR DETECTING NUCLEAR DETONATIONS.
- 3,859,622. ELECTRONIC SCANNING SWITCH FOR SONAR.
- 3,863,199. BEAM FORMING OF MULTIPLE SIGNALS.
- 3,878,443. CAPACITOR WITH GLASS BONDED CERAMIC DIELECTRIC.
- 3,897,355. METHOD OF MAKING PERMANENT FERRITE MAGNETS.
- 3,905,036. FIELD EFFECT TRANSISTOR DEVICES AND METHODS OF MAKING SAME.
- 3,906,502. BILATERAL SERIES FEED FOR ARRAY ANTENNAS.
- 3,906,541. FIELD EFFECT TRANSISTOR DEVICES AND METHODS OF MAKING SAME.
- Application for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.
- 3,111,830. AUTOMATIC CLOTHES WASHING MACHINE WITH LID SWITCH CONTROL.
- 3,815,113. FOOD TEMPERATURE MONITORING APPARATUS.
- 3,822,029. IMPACT PROTECTION FOR PLASTIC TUBS EMPLOYING MOLD RETENTION RIB.
- 3,826,898. BORDER TREATMENT OF COMPOSITE METAL PLATE SURFACE HEATING UNIT.
- 3,952,557. WOBBLE WASHING MACHINE.
- 3,958,433. WASH BASKET FOR A WASHING MACHINE.
- 3,961,152. MAGNETRON POWER SUPPLY AND CONTROL CIRCUIT.
- 3,963,370. LAUNDRY MACHINE BLOWER MECHANISM.
- 3,968,983. TWO POSITION, THREE FUNCTION LATCHING MECHANISM.
- 3,968,984. DOOR LATCH.
- 3,971,361. LOW THERMAL MASS COOKING UTENSIL.
- 3,975,720. FOOD THERMOMETER FOR MICROWAVE OVEN.
- 3,978,956. DELAYED-ACTION CENTRIFUGAL CLUTCH TRANSMISSION.
- Applications for license under the following patents may be addressed to the General Electric Company, 100 Woodlawn Ave., Pittsfield, Mass., 01201.
- 3,576,458. HEAVY DUTY OVERVOLTAGE POWER GAP.
- 3,611,007. CURRENT LIMITING SPARK GAP ASSEMBLY HAVING ELECTROMAGNETIC MEANS FOR RETARDING ARC MOVEMENT THEREIN.
- 3,611,045. LIGHTNING ARRESTER SPARK GAP ASSEMBLY HAVING OPPOSED ELECTROMAGNETIC FIELD-GENERATING MEANS FOR CONTROLLING ARC MOVEMENT.
- 3,638,302. METHOD OF MAKING ELECTROMAGNETIC CORES.
- 3,663,856. CURRENT LIMITING SPARK GAP WITH MEANS FOR REGULATING GAP VOLTAGE.
- 3,789,177. ACTUATING MECHANISM FOR A LIMIT SWITCH HAVING ELONGATED PIVOTAL MOUNTED ACTUATING MEMBER.
- 3,812,554. CRIMP LOCKED OUTER TURN FOR INDUCTION CORE.
- 3,958,201. INTERLACED DISC COIL WINDING HAVING OFFSET CROSS-CONNECTIONS.
- AMSTED Industries Incorporated is prepared to sell or grant licenses under the following U.S. Patents. Inquiries for license under or sale of these patents may be addressed to Chief Patent Attorney, AMSTED Industries Incorporated, 3700 Prudential Plaza, Chicago, Ill., 60601.
- 3,397,291. RETAINING RIB AND PIN FOR THIRD RAIL CONTACT SHOE.
- 3,679,028. MULTIPLE UNIT BRAKE.
- 3,253,680. WHEEL TREAD BRAKE ARRANGEMENT.
- 3,384,207. RAILWAY BRAKE SAFETY DEVICE.
- 3,396,823. VARIABLE LOAD BRAKE.
- 3,404,754. RAILWAY WHEEL TREAD BRAKE.
- 3,621,941. BRAKE MECHANISM.
- 3,721,323. CLAMPING DEVICE.
- 3,448,837. RAILWAY BRAKE SAFETY DEVICE.
- 3,412,830. AUTOMATIC BRAKE SLACK ADJUSTER.
- 3,432,011. AUTOMATIC SLACK ADJUSTER.
- 3,516,696. SLACK ADJUSTER.
- Re 27,043. SHEARING MACHINE AND METHOD.
- 3,500,513. ISODYNAMIC APPARATUS FOR MOLDING CERAMIC PIPE.
- 3,548,466. MAKING PIPE.
- 3,659,992. EXTRUDING FITTINGS.
- 3,783,042. METHOD OF COOLING A SPHERICAL OBJECT.
- 3,627,018. METHOD FOR PRODUCING CASTINGS IN A PERMANENT MOLD.
- 3,299,853. APPARATUS FOR COATING ELONGATED OBJECTS.
- 3,318,584. CONCRETE MIXER AND CONVEYOR.
- 3,610,288. COMBINED PIPE CONNECTOR AND PIPE CAP.
- General Electric Company is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers. Applications for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.
- 3,991,396. ELECTRIC CIRCUIT PROTECTOR COMPRISING PARALLEL-CONNECTED LIQUID-METAL CURRENT-LIMITING DEVICES.
- Application for license may be addressed to Patent Counsel, Gas Turbine Products Division, General Electric Company, 1 River Road, Building No. 500 2nd Floor, Schenectady, N.Y., 12306.
- 3,993,912. MARINE PROPULSION SYSTEM.
- Application for license may be addressed to Patent Counsel, Switchgear and Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.
- 3,920,885. HIGH-VOLTAGE COMPRESSED-GAS INSULATED BUS.
- 3,959,712. PHASE CONVERTER.
- 3,970,809. ELECTRIC CIRCUIT BREAKER COMPRISING PARALLEL-CONNECTED VACUUM INTERRUPTERS.
- 3,970,810. ELECTRIC CIRCUIT COMPRISING PARALLEL-CONNECTED VACUUM INTERRUPTERS.
- 3,982,088. HIGH VOLTAGE ELECTRIC CIRCUIT BREAKER COMPRISING SERIES-CONNECTED VACUUM INTERRUPTER AND FLUID-BLAST INTERRUPTER.
- Applications for licenses may be addressed to the Division Patent Counsel, Electronic Systems Division, General Electric Company, Building 3, Room 216, Electronics Park, Syracuse, N.Y., 13201.
- 3,786,509. AUTOMATIC CANCELLER.
- 3,793,443. METHOD OF PREPARING FERRITES.

- The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10038.
- 3,989,233. CATHODE RAY TUBE ASSEMBLY FIXTURE.
3,989,348. OPTICAL SCANNER WITH LARGE DEPTH OF FOCUS.
3,989,436. APPARATUS FOR PRODUCING INJECTION MOLDED AND CENTRALLY APERTURED DISC RECORDS.
3,989,997. ABSOLUTE-VALUE CIRCUIT.
3,990,000. ALTERNATING CURRENT CONTROL SYSTEM.
3,990,017. CURRENT AMPLIFIER.
3,990,095. SELENIUM RECTIFIER HAVING HEXAGONAL POLYCRYSTALLINE SELENIUM LAYER.
3,990,099. PLANAR TRAPATT DIODE.
3,990,101. SOLAR CELL DEVICE HAVING TWO HETEROJUNCTIONS.
3,990,692. ARTICLE POSITIONING APPARATUS.
3,990,773. BINARY-CODED FRAUNHOFER HOLOGRAM RECORDING TECHNIQUE.
3,991,227. METHOD FOR FORMING ELECTRODE PATTERNS IN TRANSPARENT CONDUCTIVE COATINGS ON GLASS SUBSTRATES.
3,991,228. DEPOSITION OF TIN OXIDE FILMS ON GLASS.
3,991,328. PLANAR TRANSFERRED ELECTRON LOGIC DEVICE.
3,991,339. LIGHT EMITTING DIODE WITH REFLECTOR.
3,991,380. COMPLEMENTARY FIELD EFFECT TRANSISTOR DIFFERENTIAL AMPLIFIER.
3,991,381. LINEAR HIGH POWER TRANSISTOR AMPLIFIER.
3,992,106. ERROR CANCELLING SCANNING OPTICAL ANGLE MEASUREMENT SYSTEM.
3,992,648. DRIVE PULSE GENERATOR FOR A TELEVISION DEFLECTION CIRCUIT.
3,992,676. CURRENT AMPLIFIERS.
3,992,770. AUTOMATIC ASSEMBLY OF SEMICONDUCTOR DEVICES.
3,993,316. OVERHEAD SIGNAL PICKUP DEVICE.
3,993,515. METHOD OF FORMING RAISED ELECTRICAL CONTACTS ON A SEMICONDUCTOR DEVICE.
3,993,863. DISC RECORD GROOVE SKIPPER.
3,993,868. MINIMUM SHIFT KEYING COMMUNICATION SYSTEM.
3,993,931. GATING CIRCUIT FOR THYRISTOR DEFLECTION SYSTEM.
3,993,951. ALTERNATING CURRENT METER CIRCUIT.
3,993,958. FAST ACQUISITION CIRCUIT FOR A PHASE LOCKED LOOP.
3,993,993. DIGITAL-TO-SYNCHRO CONVERTER.
3,993,995. RESPIRATION MONITOR.
3,994,160. ACCELERATION BURST TEST APPARATUS AND METHOD FOR INTERNAL COMBUSTION ENGINES.
3,995,107. CHARGE COUPLED PARALLEL-TO-SERIAL CONVERTER FOR SCENE SCANNING AND DISPLAY.
3,995,146. DETECTION SYSTEM FOR SPATIALLY-DISTRIBUTED SET OF RADIATION BEAMS MANIFESTING MULTIBIT BINARY CODE.
3,995,224. FAST AUTOMATIC GAIN CONTROL CIRCUIT WITH ADJUSTABLE RANGE.
3,995,235. PHASE CONTROL CIRCUIT INCLUDING AN OPERATIONAL TRANSCONDUCTANCE AMPLIFIER SUITABLE FOR USE IN AUDIO FREQUENCY SIGNAL PROCESSING APPARATUS.
3,984,261. OHMIC CONTACT.
3,984,279. LABELING APPARATUS.
3,984,587. CHEMICAL VAPOR DEPOSITION OF LUMINESCENT FILMS.
3,984,629. FLYING SPOT SCANNER UNAFFECTED BY AMBIENT LIGHT.
3,984,683. APPARATUS AND METHOD FOR ANALYZING BIOLOGICAL CELLS FOR MALIGNANCY.
- 3,984,705. HIGH POWER REMOTE CONTROL ULTRASONIC TRANSMITTER.
3,984,723. DISPLAY SYSTEM UTILIZING BEAM SHAPE CORRECTION.
3,984,729. DEFLECTION WAVEFORM CORRECTION SIGNAL GENERATOR.
3,984,771. ACCURATE DIGITAL PHASE/FREQUENCY EXTRACTOR.
3,984,787. TWO-INDUCTOR VARACTOR TUNABLE SOLID-STATE MICROWAVE OSCILLATOR.
3,984,828. CHARACTER GENERATOR FOR TELEVISION CHANNEL NUMBER DISPLAY WITH EDGING PROVISIONS.
3,984,835. HOMODYNE COMMUNICATION SYSTEM.
3,984,841. BROADBAND ANTENNA SYSTEM WITH THE FEED LINE CONDUCTORS SPACED ON ONE SIDE OF A SUPPORT BOOM.
3,984,861. TRANSCALLET SEMICONDUCTOR DEVICE.
3,984,864. GATING CIRCUIT FOR A VIDEO DRIVER INCLUDING A CLAMPING CIRCUIT.
3,984,865. TRANSIENT SUPPRESSION IN TELEVISION VIDEO SYSTEMS.
3,984,907. ADHERENCE OF METAL FILMS TO POLYMERIC MATERIALS.
3,985,033. APPARATUS FOR ERECTING A TRUE VERTICAL AXIS.
3,985,919. VAPOR DEPOSITION OF CERMET LAYERS.
3,986,065. INSULATING NITRIDE COMPOUNDS AS ELECTRON EMITTERS.
3,986,132. SERIES ENERGIZED TRANSISTOR AMPLIFIER.
3,986,156. YOKE MOUNT ASSEMBLY.
3,986,176. CHARGE TRANSFER MEMORIES.
3,986,198. INTRODUCING SIGNAL AT LOW NOISE LEVEL TO CHARGE-COUPLED CIRCUIT.
3,986,604. OBJECT ORIENTATION APPARATUS.
3,986,872. METHOD OF INCREASING THE IMAGE EXPOSURE AND DEVELOPING SENSITIVITY OF MAGNETO-ELECTRIC PRINTING SYSTEM.
3,987,214. METHOD OF FORMING CONDUCTIVE COATINGS OF PREDETERMINED THICKNESS BY VACUUM DEPOSITING CONDUCTIVE COATING ON A MEASURING BODY.
3,987,285. DIGITAL MATCHED FILTERING USING A STEP TRANSFORM PROCESS.
3,987,327. LOW DARK CURRENT PHOTOCONDUCTIVE DEVICE.
3,987,368. EQUALIZATION OF BASE CURRENT FLOW IN TWO INTERCONNECTED TRANSISTOR AMPLIFIERS.
3,987,414. DIGITAL REMOTE CONTROL FOR ELECTRONIC SIGNAL RECEIVERS.
3,987,441. TRACKING GATE SERVOED BY RELATIVE RANGE.
3,988,167. SOLAR CELL DEVICE HAVING IMPROVED EFFICIENCY.
3,988,601. DATA PROCESSOR REORDER SHIFT REGISTER MEMORY.
3,988,653. REDUCTION OF HUNTING IN SYNCHRONOUS MOTOR.
3,988,738. DISPLAY DEVICE UTILIZING MAGNETIC STORAGE.
3,988,759. THERMALLY BALANCED PN JUNCTION.
3,988,765. MULTIPLE MESA SEMICONDUCTOR STRUCTURE.
3,978,579. AUTOMATIC ASSEMBLY OF SEMICONDUCTOR DEVICES.
3,978,719. TACHOMETER WITHOUT PHYSICAL CONNECTION TO INTERNAL COMBUSTION ENGINE.
3,979,157. ELECTRON TUBE BASE.
3,979,238. ETCHANT FOR SILICON NITRIDE AND BOROSILICATE GLASSES AND METHOD OF USING THE ETCHANT.
3,979,606. CURRENT LEVEL DETECTOR.
3,979,607. ELECTRICAL CIRCUIT.
3,979,611. TRANSISTOR SWITCHING CIRCUIT.
3,979,630. SHADOW MASK COLOR PICTURE TUBE HAVING NON-REFLECTIVE MATERIAL BETWEEN ELONGATED PHOSPHOR AREAS AND POSITIVE TOLERANCE.

- 3,979,672. TRANSISTOR TESTING CIRCUIT.
3,979,689. DIFFERENTIAL AMPLIFIER CIRCUIT.
3,979,735. INFORMATION STORAGE CIRCUIT.
3,980,507. METHOD OF MAKING A SEMICONDUCTOR DEVICE.
3,980,821. POWER SUPPLY FOR A TELEVISION RECEIVER.
3,980,854. GRAPHITE SUSCEPTOR STRUCTURE FOR INDUCTIVELY HEATING SEMICONDUCTOR WAFERS.
3,980,927. DEFLECTION CIRCUIT.
3,980,930. PROTECTION CIRCUIT.
3,980,956. COUNTER TYPE REMOTE CONTROL RECEIVER INCLUDING NOISE IMMUNITY SYSTEM.
3,980,959. TUNER BANDSWITCHING SYSTEM FOR A TELEVISION TUNING SYSTEM.
3,981,554. METHOD OF AIR LETTING AN EVACUATED CATHODE RAY TUBE.
3,981,559. LIQUID CRYSTAL DISPLAY.
3,981,560. ELECTROCHROMIC DISPLAY DEVICE.
3,981,729. PHOTOGRAPHIC METHOD EMPLOYING ORGANIC LIGHT-SCATTERING PARTICLES FOR PRODUCING A VIEWING-SCREEN STRUCTURE.
3,981,819. LUMINESCENT SULFIDES OF MONOVALENT AND TRIVALENT CATIONS.
3,982,054. METHOD FOR ELECTROLESSLY DEPOSITING METALS USING IMPROVED SENSITIZER COMPOSITION.
3,982,066. METAL COATING FOR VIDEO DISCS.
3,982,108. HIGH-SPEED COUNTER WITH RELIABLE COUNT EXTRACTION SYSTEM.
3,982,160. SYSTEM FOR CONTROLLING TENSION OF MAGNETIC TAPE.
- 3,982,197. RADIATION RESPONSIVE VOLTAGE DIVIDING CIRCUIT.
3,982,215. METAL PLATED BODY COMPOSED OF GRAPHITE FIBRE EPOXY COMPOSITE.
3,982,271. HEAT SPREADER AND LOW PARASITIC TRANSISTOR MOUNTING.
3,982,273. SWITCHING ARRANGEMENT FOR FLESH TONE CORRECTION AND CHROMINANCE OVERLOAD CONTROL CIRCUITS.
3,982,908. NICKEL-GOLD-COBALT CONTACT FOR SILICON DEVICES.
3,983,316. TURNTABLE SPEED CONTROL SYSTEM.
3,983,318. VELOCITY CORRECTION SYSTEM WITH DAMPING MEANS.
3,983,443. VACUUM ELECTRON DEVICE HAVING DIRECTLY HEATED MATRIX - CATHODE-HEATER ASSEMBLY.
3,983,452. HIGH EFFICIENCY DEFLECTION CIRCUIT.
3,983,502. BRIDGE-OUTPUT AMPLIFIER WITH DIRECT-COUPLED DIFFERENTIAL-MODE FEEDBACK.
3,983,571. ELECTRONIC IMAGE IDENTIFYING SYSTEM.
3,983,576. APPARATUS FOR ACCENTUATING AMPLITUDE TRANSITIONS.

Patents Withdrawn From Register

General Electric Company hereby withdraws the following patents from the Register of Patents Available for Licensing. The patents were listed as being available in the OFFICIAL GAZETTE as indicated below.

- 3,500,118. ELECTRODELESS GASEOUS ELECTRIC DISCHARGE DEVICE UTILIZING FERRITE CORES. July 21, 1970.
3,521,120. HIGH FREQUENCY ELECTRODELESS FLUORESCENT LAMP ASSEMBLY. July 24, 1971 and Oct. 26, 1976.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 18, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-11-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Records; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-19-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director..... Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-17-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-21-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-22-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-5-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-20-76

Expiration of patents: The patents within the range of numbers indicated below expire during January 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 263. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,919,443 to 2,923,007 inclusive
Plant Patents..... Numbers 1,893 to 1,900, inclusive

REISSUES

FEBRUARY 15, 1977

Matter enclosed in heavy brackets appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

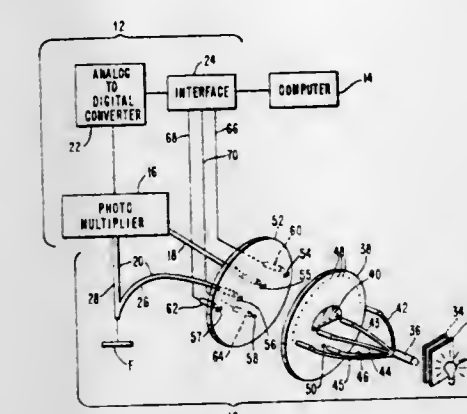
Re. 29,136
ENZYMATIC PROCESS USING IMMOBILIZED MICROBIAL CELLS
Chin K. Lee, and Margaret E. Long, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Original No. 3,821,086, dated June 28, 1974, Ser. No. 161,337, July 9, 1971. Application for reissue Oct. 14, 1975, Ser. No. 621,707

Int. Cl.² C12B 1/00; C12D 13/02
U.S. Cl. 195—116 13 Claims

1. A process for effecting an enzyme-catalyzed transformation of a substrate in the presence of flocculated whole microbial cells having associated therewith active quantities of said enzyme which comprises contacting said substrate with an aggregate comprising said cells and a polyelectrolyte flocculating agent under conditions suitable for effecting said enzyme-catalyzed transformation, *said aggregate having been dried prior to use in said enzyme-catalyzed transformation, and recovering transformed substrate.*

Re. 29,138
SYSTEM FOR PERFORMING SPECTRAL ANALYSES UNDER COMPUTER CONTROL
Frederick H. Dill, South Salem, and Karl L. Konnerth, Jr., Putnam Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Original No. 3,751,643, dated Aug. 7, 1973, Ser. No. 256,030, May 23, 1972. Application for reissue July 31, 1975, Ser. No. 600,739

Int. Cl.² G01B 11/06, 9/02, 19/08
U.S. Cl. 235—151.32 26 Claims



1. A method of operating a spectrophotometric system under the control of a digital computer to determine an attribute of a given material sample which is subject to spectral analysis, said method comprising the steps of:

- conducting to said sample, during each of a series of nonadjacent time periods, a beam of variable wavelength monochromatic light furnished by a given source, the wavelength of said beam varying at a given rate through a specified range of wavelength values during each of said periods;
- conducting to a light detector in said system the light which comes from said sample when it is impinged by said beam;
- conducting directly to said light detector, during time periods intervening the periods specified in step a, the beam of monochromatic light furnished by said source, the wavelength of which varies at said given rate through said specified range during each of said intervening periods;
- converting the output of said detector during each of the periods specified in steps a and c to a sequence of stored digital values representing the respective intensities of light detected at a series of regularly timed intervals throughout the respective one of said periods;
- operating said computer to derive from the sequences of values stored during any pair of successive steps a and c a new sequence of numbers representing the calculated optical responses of said sample to incident light having the wavelength of said variable-wavelength beam at each of said timed intervals under a hypothetical condition where it is assumed that the incident light has uniform intensity for all wavelengths in said range and all system components have constant operating characteristics; and
- operating said computer to determine from said derived sequence of numbers the attribute of said sample which is being measured.

Re. 29,137
PROCESS OF PRESERVING POTATOES IN CLOSED PACKAGES
Franz Mohwinkel, Ahlfen über Soltau, Germany, assignor to Washington Nu Process, Inc., Quincy, Wash.
Original No. 3,658,559, dated Apr. 25, 1972, Ser. No. 878,413, Nov. 20, 1969. Continuation-in-part of Ser. No. 804,694, March 5, 1969, abandoned. Application for reissue Feb. 14, 1974, Ser. No. 442,622

Claims priority, application Germany, June 28, 1969, 1932900; Mar. 9, 1968, 1692048; Aug. 21, 1968, 1792332
Int. Cl.² A23B 7/00 6 Claims

1. A process for cooking and preserving potatoes in a closed and sealed package of plastic material comprising: a vacuum-packing peeled, raw and sliced or diced potatoes in said package without adding any liquid so that there is no water or other liquid in the closed and sealed package other than the natural juices within the potatoes therein, cooking and then cooling said packaged potatoes at an external pressure exceeding the internal pressure in the package, and wherein during the vacuum-packing step each piece of potato in said package is brought into direct contact with the plastic material enveloping the pieces of potatoes to be cooked and preserved.

PATENTS

GRANTED FEBRUARY 15, 1977

ERRATA

For CLASS	See PATENT NO.
029-159 R	4,007,532
029-762	4,007,533
029-566.3	4,007,534
029-261	4,007,535
029-421 R	4,007,536
029-432.1	4,007,537
029-447	4,007,538
029-455	4,007,539
029-509	4,007,540
029-600	4,007,541
429-059	4,008,099
536-017	4,008,218
424-240	4,008,311
424-241	4,008,312
424-242	4,008,313
358-084	4,008,369
358-155	4,008,370
358-206	4,008,371
358-227	4,008,372

PATENTS

GRANTED FEBRUARY 15, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,007,494
BONE CAP

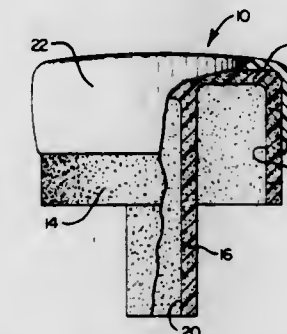
Barry W. Sauer, Central, S.C., assignor to Glasrock Products, Inc., Atlanta, Ga.

Filed Apr. 11, 1975, Ser. No. 567,237

Int. Cl.² A61F 1/24

U.S. Cl. 3—1.9

4 Claims



1. An improved cap for covering the stump of a partially amputated bone, and preventing bone overgrowth in juveniles, comprising a head adapted to abut and overlap the end of the stump, the outer surface of the head being free from sharp corners, at least the portion of the head adjacent to said end of the stump with a thickness of at least 1 mm. being formed of a porous polymeric material with a density of at least 0.912 g./c.c. interspersed with a network throughout its volume of interconnected pores with no straight paths longer than the diameter of the largest pore and adapted for human tissue to grow therein, said porous polymeric material having an average pore diameter ranging from 50 μ m — 300 μ m, the minimum pore volume being 30%, a non-porous cover on the portion of the outer surface of the head which projects beyond the end of the stump for preventing the pores from communicating with said portion of the outer surface.

4,007,495

PATELLO-FEMORAL PROTHESIS

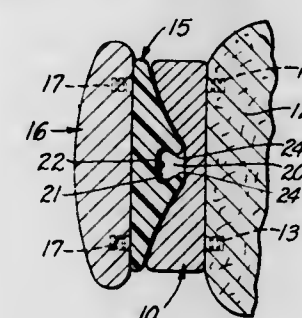
Calvin H. Frazier, 1808 Verdugo Blvd., Glendale, Calif. 91208

Filed May 28, 1976, Ser. No. 690,986

Int. Cl.² A61F 1/24

U.S. Cl. 3—1.91

7 Claims



1. A patello-femoral prosthesis comprising a patellar prosthesis which is dimensioned and contoured complementarily to the natural patella and having one side thereof which is adapted to fit against and be secured to the inner surface of the natural patella, and a femoral prosthesis which is dimensioned and contoured complementarily to the portion of the outer surface of the natural femur which the natural patella normally overlies, said femoral prosthesis having one side thereof which is adapted to fit against and be secured to the outer surface of the natural femur, the opposite side of said femoral prosthesis having a substantially concave configuration, the opposite side of said patellar prosthesis having a substantially convex portion, said convex and concave portions having formed complementarily to and adapted to engage each other, connector means for connecting said pros-

thesis for sliding movement with respect to each other, said connector means comprising a substantially keyhole shaped slot formed in one of said prostheses, said slot having a pair of spaced walls forming a narrow entrance portion and an enlarged inner portion, and a complementarily formed collar button shaped projection carried by the other of said prostheses, said projection having an enlargement on the outer end thereof and a narrow portion disposed inwardly from said enlargement, said projection adapted to be mounted in said slot for sliding movement along said slot, with the engagement between said enlargement and slot preventing undesirable separation or dislocation of said prostheses with respect to each other during the use of said patello-femoral prosthesis.

4,007,496

CONNECTION BETWEEN A COSMETIC COVER AND A PROSTHETIC PART

Richard Glabiszewski, Duderstadt, Germany, assignor to Otto Boch Orthopadische Industrien KG, Duderstadt, Germany

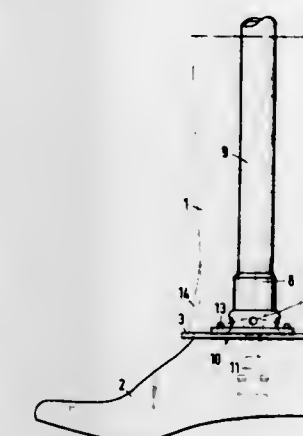
Filed Sept. 8, 1975, Ser. No. 611,497

Claims priority, application Germany, Sept. 16, 1974, 2444177

Int. Cl.² A61F 1/08, 1/06

U.S. Cl. 3—2

4 Claims



1. Connection means between a cosmetic cover and a working part of a skeletal prosthesis comprising a connecting link fastened to the front end of said cosmetic cover with the surface of said link extending transversely across said front end, said link having at least two pin sockets that are contiguous to and run perpendicular to the connecting link surface, and connecting pins on said working part for connection with said pin sockets in such a way that said pin sockets are readily removable from said pins.

4,007,497

ARTIFICIAL FOOT WITH ANKLE JOINT

Werner Haupt, Duderstadt, Germany, assignor to Otto Boch Orthopadische Industrien KG, Duderstadt, Germany

Filed Sept. 3, 1975, Ser. No. 609,995

Claims priority, application Germany, Sept. 5, 1974, 2442441

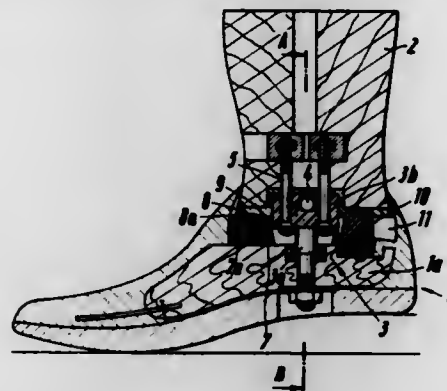
Int. Cl.² A61F 1/04, 1/08

U.S. Cl. 3—33

2 Claims

1. An artificial foot and ankle joint, comprising a foot part having an upper surface including a plastic impregnated socket, an ankle part having a plastic impregnated lower surface including a centrally located plastic impregnated socket and surrounding plastic impregnated articulation surfaces, and a bifurcated joint connecting said foot part and ankle part, said bifurcated joint having a lower part which contains an articulation axis and is connected immovably into said foot part through said plastic impregnated socket of said

foot part, said bifurcated joint having an upper part made of elastic material and generally U-shaped in cross-section which contacts said axis from below, said upper part being connected to said ankle part through said plastic impregnated socket of said ankle part, an elastic articulator between said ankle part and said foot part contacting said plastic impregnated articulation surface of the ankle part, said articulator



having a central opening for receiving said lower part of said bifurcated joint, said articulator having only a front dorsal projection and side rotation surfaces for cooperation with said plastic impregnated articulation surfaces of said ankle part, and a separate, exchangeable resilient member between said ankle part and said foot part and behind said articulator for dorsal plantar flexion, said resilient member contacting said plastic impregnated articulation surface of said ankle part.

4,007,498

TOILET VENTILATOR INCLUDING OVERFLOW-RESPONSIVE SENSOR

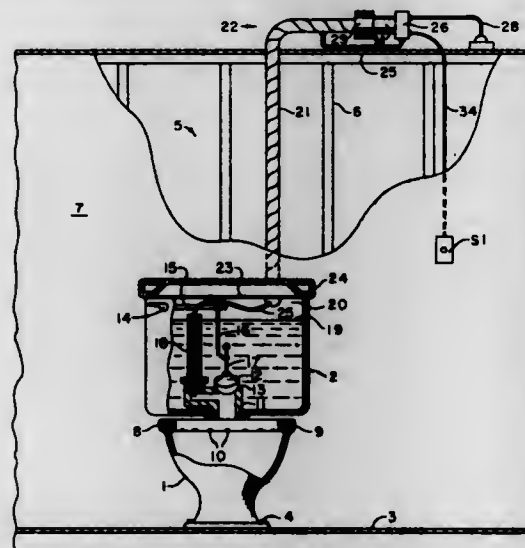
Raymond H. Pearson, 627 Sherwood Drive, Richardson, Tex. 75080

Filed Jan. 5, 1976, Ser. No. 646,570

Int. Cl.² E03D 9/04; A47K 13/00

U.S. Cl. 4-213

1 Claim



1. A toilet deodorizing accessory, said toilet including a toilet bowl and water tank, said water tank including a flushing mechanism and overflow duct, said accessory comprising an air duct in communication with the odorous air within said toilet, air suction means having an intake side and a discharge side, said intake side communicatively connected to said air duct, control means operable to initiate air flow through said air duct, whereby odorous air may be drawn from said toilet, said control means also operable to terminate said air flow, said control means including sensing means responsive to the water rise within said overflow duct, said sensing means having at least one electrically sensible parameter which is a function of said water rise within said overflow duct when said toilet is flushed, whereby said air flow may be terminated in

response to said water rise in said overflow duct when said toilet is flushed.

4,007,499

COMMODE FLUSHING CONTROL APPARATUS

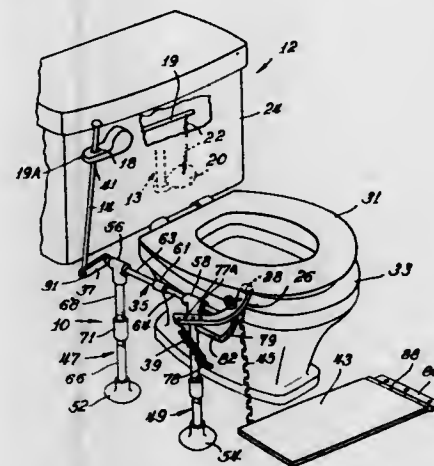
Teng Ke Lin, 2544 Berkshire Court, Waukegan, Ill. 60085

Filed Mar. 29, 1976, Ser. No. 671,899

Int. Cl.² E03D 5/08

U.S. Cl. 4-249

10 Claims



1. Apparatus for controlling commode flushing mechanisms having a drain valve and valve trip device for raising the drain valve to its open position for water discharge purposes, comprising:

connecting means adapted to be connected to the trip device for moving between an initial position and a flushing position to cause the trip device to raise the drain valve to its open position;

spring means for moving said connecting means to its flushing position;

person-operated means attached to said connecting means for storing energy in said spring means and for releasing subsequently the energy from said spring means to move said connecting means toward its flushing position to open the valve;

latching means connected to said connecting means for attaching releasably said connecting means and said device for moving it and the valve against the force of water pressure acting on the valve until the water pressure acting on the valve equals the force applied by the spring means, upon sufficient water discharge, whereby said spring means moves said connecting means after sufficient water discharge has taken place to release said latching means so that said connecting means becomes free of the trip device and the flushing mechanism can complete its normal flushing operation.

4,007,500

BATHTUB STOPPER

Arthur D. Thompson, and Imao Kaibara, both of London, Canada, assignors to Emco Ltd., London, Canada

Filed May 27, 1976, Ser. No. 690,715

Int. Cl.² F16K 31/44; F16L 37/28, 29/00

U.S. Cl. 4-295

6 Claims

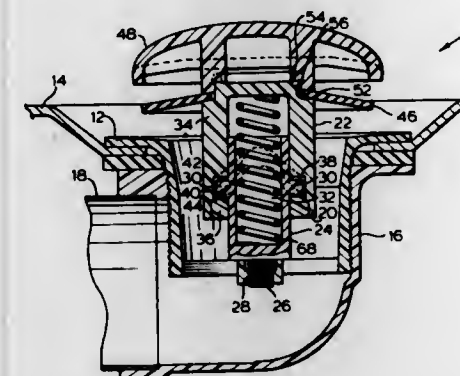
1. A bathtub stopper for closing the drain passage of a strainer cup of a bathtub comprising:

a. a main body consisting of first and second components adapted to telescope longitudinally with respect to one another between an extended position and a shortened position, said components also being rotatable with respect to one another about a longitudinal axis of said main body, said first component being manually engageable to be rotatably driven about said longitudinal axis, said second component being adapted to be secured to a strainer to locate said main body in an operative position with respect to a strainer,

b. closure means carried by said first component for closing

said drain passage when said main body is in said shortened position, said closure means being spaced from said strainer to open said drain passage when in said extended position,

c. continuous cam track means extending circumferentially of one of said components, said cam track means including crest and valley positions which are longitudinally and circumferentially spaced from one another,



d. cam follower means on the other of said components engaging said cam track whereby upon rotation of one component with respect to the other, the cam follower is guided along the cam track to locate said components in said shortened position when in engagement with a crest of said cam track and in said extended position when in engagement with a valley of said cam track.

4,007,501

BED HAVING A BED PAN

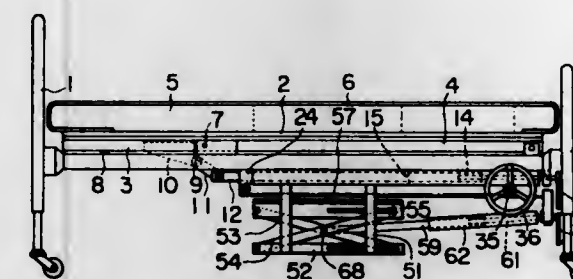
Mikio Kato, Tokyo, Japan, assignor to Nippon Felt Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 605,015

Int. Cl.² A61G 7/02

U.S. Cl. 5-90

9 Claims



1. A bed for a patient comprising a frame, a mattress having a bed pan mounting recess provided centrally therein, a bed pan including a pan seat, tank and a hollow front cover which front cover broadly covers around the excretory organ of the patient and only the periphery of which said front cover comes into contact with the skin of the patient ranging from the groin up to the lower abdomen, and support means for supporting said bed pan at an optional height to be in conformity with a degree of depression of the periphery of said bed pan mounting recess and to keep the buttocks of the patient never strongly touching said bed pan, wherein said pan seat and said front cover are disposed in such a manner that they interpose the body of the patient therebetween.

4,007,502

BED FRAME ASSEMBLY

Frank J. Mis, 9601 Robertson Ave., Oak Lawn, Ill. 60453

Filed Dec. 1, 1975, Ser. No. 636,360

Int. Cl.² A47C 19/02, 21/00

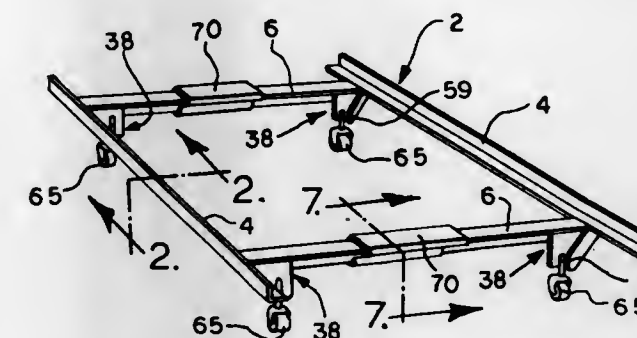
U.S. Cl. 5-202

10 Claims

1. A bed frame adapted to support a spring and mattress assembly comprising a pair of spaced, parallel side-frame member means and at least one cross-frame member means

extending between said side-frame member means, and means releasably securing the ends of said cross-frame member means to said side-frame member means, comprising:

female elements connected to one of said cross-frame and side-frame member means, and male elements connected to the other of said side and cross-frame member means, said male-female elements disposed in sliding telescoping engagement with each other and sloping downwardly and inwardly from the lateral sides of the bed frame, said



male-female elements defining bed-frame corner supports and being extendable and contractible laterally of said bed frame whereby said side-frame members being movable with the securing elements connected thereto are spreadable apart different distances widthwise of the bed frame, and the telescoping male-female elements being cross-wise vertically superposed and mutually supportive to each other and resisting bending moments imposed thereon.

4,007,503

PILLOW AND CASE OF PHYSIOLOGICALLY ADVANTAGEOUS SHAPE

Bernard Currys Watkin, 32 W. Square, London SE. 11, England

Filed Dec. 11, 1975, Ser. No. 585,217

Int. Cl.² A47G 9/00

U.S. Cl. 5-338

1 Claim



1. A pillow comprising a pillow case comprising first and second walls of flexible material each having a shape which is symmetrical about a centre line in the plane of the wall and whose width measured in a direction parallel to the centre line between opposite edges of the wall increases with increasing distance from the centre line measured in a longitudinal direction perpendicular to the centre line, the first and second walls being joined to one another at least along the said edges of the walls, each of the walls having a shape which is symmetrical about a line lying in the plane of the each of said walls being separately formed of fabric material wall and perpendicular to the centre line, each wall being bounded by the said longitudinal edges and by two straight transverse edges parallel to the centre line, the walls being joined together along at least one of the transverse edges of each wall, and a filling of rectangular configuration disposed in said pillow case whereby the pillow has a center portion of reduced dimensions under compression forming a relatively hard central area and the outer areas are relatively soft.

4,007,504

HIVE ENTRYWAY

Ernest Harry West, Cowaramup, Australia, assignor to Laura J. West; Allan A. West; Lionel B. West, all of Cowaramup and Kenneth H. West, Margaret River, all of, Australia, part interest to each

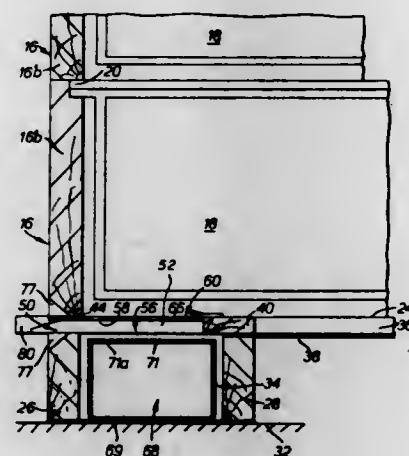
Filed July 11, 1974, Ser. No. 487,732

Claims priority, application Australia, July 11, 1973, 58008/73

Int. Cl.² A01K 47/06

U.S. Cl. 6-4 R

11 Claims



1. A bee hive comprising:

- a. a hive body having an interior open to access by bees via a hive entryway;
- b. a hive floor closing a lower end of the hive body;
- c. means forming an inside opening in the hive floor;
- d. slide means mounted at the floor for slidably receiving and retaining a generally planar control element in a generally horizontal position for controlling bee activity at the entryway;
- e. means forming an outside opening in an upright side wall of the hive body, the outside opening being positioned to allow bee entry to the hive interior first through the outside opening and then through the inside opening, the outside opening being at a lower elevation than the inside opening and being open to a cavity below the inside opening, the slide means being open to the outside opening so that the control element may be positioned across the inside opening by inserting it through the outside opening; and
- f. a pair of generally parallel support elements at least one of which support said floor in an elevated position when the hive is placed on a ground surface, the cavity being defined between the pair of support elements.

4,007,505

FLEXIBLE STABILIZER FOR UNDERWATER VEHICLE
James A. Nowatzki, Northridge, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1975, Ser. No. 630,570

Int. Cl.² B63B 21/52

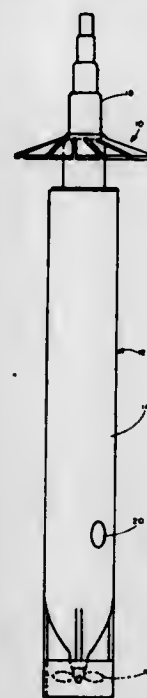
U.S. Cl. 9-8 R

3 Claims

1. In combination with an underwater instrumented vehicle having an elongated cylindrical hull adapted to operate with its longitudinal axis in a vertical position, programmed to alternate between powered ascents and sinking descents, having reduced diameter probe means at the upper end of the hull and propeller means at the lower end, a drag and spin producing device comprising:

- a substantially conical member formed of flexible plastic material and having a central aperture through which said probe means extends in press fit relation;
- said member being segmented into a plurality of vanes by a like plurality of slots extending inwardly from the periph-

eral edge of said member and terminating short of said central aperture, said slots extending along lines tangential to said central aperture whereby said vanes are adapted to be twisted, upon passage of said vehicle through water, to assume a pitch which induces rotation of said device and said vehicle about said longitudinal axis;



said vanes being adapted to flex outwardly to a drag increasing position in response to said sinking descents of said vehicle and to flex inwardly to a drag reducing streamlined position in response to said powered ascents of said vehicle.

4,007,506
SWIM FIN

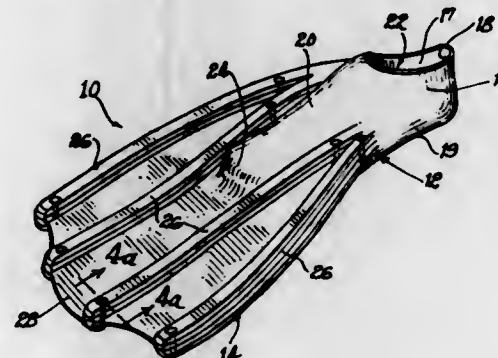
Philip A. Rasmussen, 269 Pacific Ave., Solana Beach, Calif. 92075

Filed Dec. 18, 1975, Ser. No. 642,076

Int. Cl.² A63B 31/10

U.S. Cl. 9-309

9 Claims



1. A swim fin comprising:

- a foot portion and a blade portion, said blade portion including a plurality of transversely spaced longitudinally extending ribs that are connected to each other by web means said ribs having means that produce a reverse curvature in their configuration when one end of the rib is bent into a curve, said means comprising a plurality of elongated members juxtaposed upon each other.

4,007,507

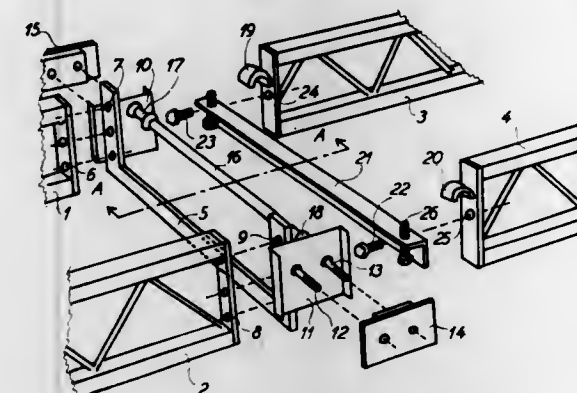
BRIDGE COMPOSED OF INDIVIDUAL SECTIONS
ASSEMBLED BY MEANS OF AN ASSEMBLING UNIT
Carl E. Hansen, Egegaardsvej 33, Roedovre, Denmark (DK-2610)

Filed Nov. 11, 1975, Ser. No. 630,812

Int. Cl.² E04C 3/02

U.S. Cl. 14-17

6 Claims



1. A bridge composed of individual sections assembled by means of an assembling unit whose supporting elements comprise two lateral beams, preferably lattice girders, wherein a main cross beam is bolted to the end of one of two adjoining bridge sections attached to the end of the following adjoining bridge section by a hinge means having a substantially horizontal axis, and a substantially vertical supporting leg is attached to each end of said cross beam.

4,007,508

MANUAL FLOOR SWEEPER

Akio Ooyachi, Tokyo, Japan, assignor to Hiroshi Watanabe, Tokyo, Japan

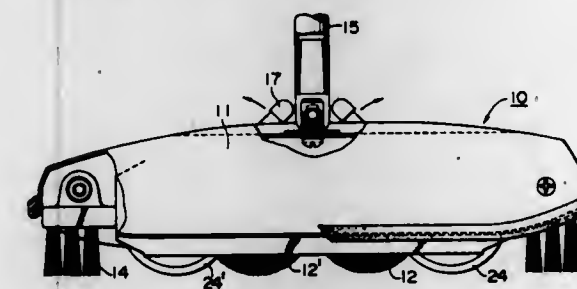
Filed Dec. 2, 1975, Ser. No. 636,967

Claims priority, application Japan, Dec. 3, 1974, 49-146390[U]

Int. Cl.² A47L 11/33

U.S. Cl. 15-42

6 Claims



1. A floor sweeper of the manual type including a casing having a hollow space therein, a pair of front and a pair of rear wheels rotatable on the floor to be swept, and one pair of roll brush brooms arranged at a center portion of the hollow space of said casing and juxtaposed longitudinally in parallel and adjacent to each other in a manner to rotate inwardly, as said wheels rotate, so as to sweep up the dust on the floor into the hollow space of said casing,

wherein the improvement comprises: two substantially enclosed spaced parallel housings one on each side of said casings; a gear train accommodated in each of said housings and including front and rear drive gears positioned in each of said housings coaxially with each pair of said front and rear wheels, front and rear brush actuating gears interposed between said front and rear drive gears supported coaxially with said roll brush brooms, and coactive means interposed between said front and rear brush actuating gears spacing said roll brush brooms and for effecting the inward rotation of said brush actuating gears and

accordingly said roll brush brooms; and selective means interposed between said drive gears and said brush actuating gears for selectively effecting power transmission in accordance with the forward and backward movement of said floor sweepers, such that the drive power from the drive gears, which are located at a front position with respect to the direction of advance of said floor sweeper, may be transmitted to the adjacent brush actuating gears by said selective means and to the brush actuating gears of the far side by way of said coactive means, thus allowing the drive gears in the rear position to idle.

4,007,509

BLACKBOARD ERASER

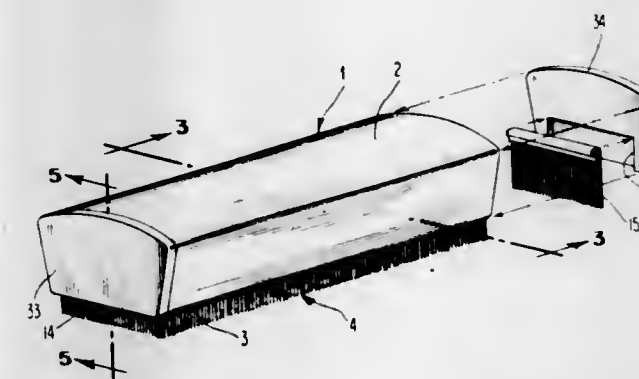
Oliver R. Odhner, R.D. No. 2, Gerloff Road, Schwenksville, Pa. 19473

Filed Mar. 3, 1975, Ser. No. 554,503

Int. Cl.² A46B 3/02, 9/02

U.S. Cl. 15-159 A

11 Claims



1. In a blackboard eraser:

- an elongated handle to be gripped by the hand and guided over the surface of the blackboard, the handle having a bottom surface the locus of which is planar and adapted to face the blackboard during the erasing operation;
 - means on the bottom surface for removing chalk from the blackboard, said means comprising a plurality of parallel cleaning rows, and each row being comprised of a plurality of fiberglass filaments, the rows and the surface forming a plurality of channels; and
 - at the respective opposite ends of the rows, a blocking row of fiberglass filaments closing off the channels between the rows, the closed channels functioning to confine the chalk dust and thereby prevent the dust from falling away during the erasing operation;
 - a pair of end caps respectively disposed on opposite ends of the handle to maintain said blocking rows in position; on respectively the same end of each filament, means to lock the filaments together comprising at least one elongated strand extending along and closely adjacent to each said filament end and an enlarged, elongated bead of hardened adhesive encapsulating the strand and each of said ends; and
 - a plurality of grooves formed in said handle and open to said surface, each groove containing a cleaning row including said enlarged bead and a portion of the filaments thereof.
10. In a blackboard eraser:
- an elongated handle to be gripped by the hand and guided over the surface of a blackboard, the handle having a bottom surface the locus of which is planar and adapted to face the blackboard when the handle is guided during the erasing operation;
 - means on the bottom surface for removing chalk dust from the blackboard comprising a plurality of cleaning groups, the groups being spaced apart to provide spaced channels therebetween for receiving the chalk dust during the cleaning operation and each group being comprised of a plurality of short fiberglass filaments all of said filaments being of uniform length; and
 - means on the handle and extending around the periphery of

said bottom surface and also extending from the bottom surface to the ends of the filaments to close off said channels whereby to prevent dust from dropping out of the channels when the device is moved over the board for the cleaning operation.

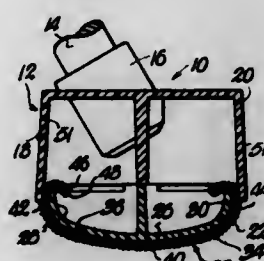
4,007,510 BRUSH HEAD

Baxter I. Scoggin, Jr., Kansas City; Woodrow E. Vaughan; Gerald D. Reed, both of Independence; Don W. Cartner, Kansas City, all of Mo.; David E. Hill, and Jack E. Briar, both of Gardner, Kans., assignors to Modern Plastic Sales, Independence, Mo.

Filed July 9, 1975, Ser. No. 594,338
Int. Cl.² A46B 7/04, 9/02

U.S. Cl. 15-176

8 Claims



1. A tool for removing foreign matter from material to be cleaned, said tool including:

a head provided with a rectangular brush having a rectilinear longitudinal axis,

said brush having:

a pair of opposed, transverse marginal edges,
a first longitudinally extending marginal edge,
a second longitudinally extending marginal edge,
a linear arrangement of ridges and valleys in parallelism with said longitudinal edges,
a transversely convex configuration,
a compressible, resilient, convex backup pad, each ridge comprising a continuous series of relatively stiff, short, densely disposed filaments sloping toward said first longitudinal edge whereby, when the brush is pulled in one direction with said first longitudinal edge leading, while the brush is held in pressing engagement with said material, the foreign matter is picked up by the filaments, and when the brush is pushed in the opposite direction with the second longitudinal edge leading, while the brush is held in pressing engagement with said material, the foreign matter is dislodged from the filaments, and

an elongated, rigid backup panel for the pad, said panel being transversely convex to the same degree as the pad from said first longitudinal marginal edge to said second longitudinal marginal edge of the brush, said pad and brush being of uniform thickness throughout the entire curvature of said panel.

**4,007,511
VEHICLE WINDSHIELD WIPER BLADE ASSEMBLIES**
Raymond A. Deibel, West Falls, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.

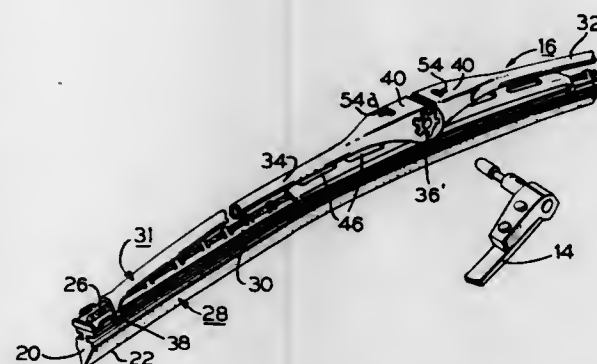
Filed Apr. 7, 1975, Ser. No. 565,641
Int. Cl.² B60S 1/02

U.S. Cl. 15-250.42

1 Claim

1. In a windshield wiper blade assembly for motor vehicles comprising a flexible wiping element, an articulated pressure distributing superstructure for supporting said wiping element comprising a pair of primary levers pivoted at their inboard ends to a pin member and slidably engaging at their outboard ends the flexible wiping element adjacent its outboard ends, a torsion spring surrounding the pin member and having its ends

engaging the lever members to urge the outboard ends thereof in the direction of the flexible wiping element, a third lever member pivotally supported on said pin member intermediate the ends of said third lever and having its ends slidably engaging the wiping element at points spaced substantially from the free ends of the wiping element, and means for applying pressure at said pin dominating the urge of said torsion spring characterized in that the primary levers are each tubular in cross section for substantially their entire length, the adjacent end portions having an integrally formed web and depending apertured ears forming a torsion spring retainer, the ears of

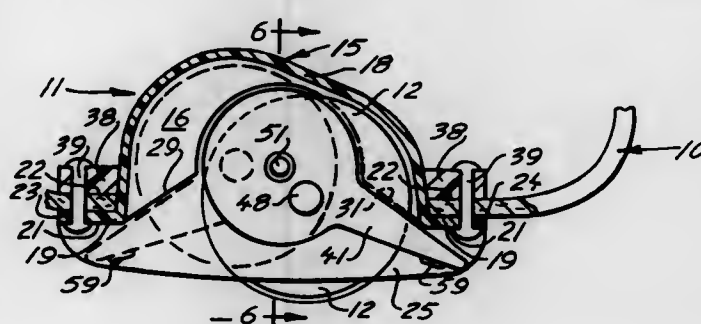


one of said primary levers being interfittable with the ears of the other of said primary levers, the apertures being in transverse alignment to receive said pin member, the outboard ends of said primary levers having integrally formed claws for slidable engagement with said wiping element, said third lever comprising an elongate web portion having depending sides at each edge, said web portion having spaced-apart openings along its length and opposed claws at each end slidably engaging the wiping element, said openings being elongated in the direction of the longitudinal axis of said third lever, the open area of the web of said third lever being greater than the solid area.

**4,007,512
RETRACTABLE LUGGAGE ROLLER ASSEMBLY**
John Hugh Oland, Calgary, Canada, assignor to Oland Industries Limited, Calgary, Canada
Filed Apr. 19, 1976, Ser. No. 677,979
Int. Cl.² B60B 33/04

U.S. Cl. 16-19

5 Claims



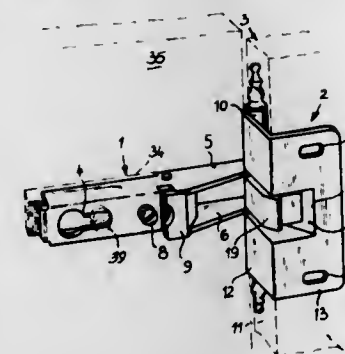
1. A retractable roller assembly for portable luggage pieces and the like comprising:

a. a casing adapted to be secured to the luggage piece having a pair of parallel spaced apart planar side walls and a circumferential wall, the circumferential wall having an elongated opening,
b. the side walls having a pair of co-axially disposed circular sockets in inner surfaces thereof,
c. a yoke having a pair of cheek-plates rotatably fitting in the sockets and a bifurcated lever connecting the cheek-plates and extending from the opening for rotating the cheek-plates about a common axis,
d. a roller mounted between the cheek-plates for rotation about an axis eccentric to said common axis, the roller

having a diameter such that the roller is moved between a hidden position entirely within the casing and a position projecting through the opening in the base when the lever is swung from one end of the opening to the opposite end of the opening.

**4,007,513
SINGLE-PIVOT HINGE**
Ernst Zernig, Muhlenweg 29, 587 Hemer, Germany
Filed July 3, 1975, Ser. No. 593,333
Claims priority, application Germany, July 4, 1974, 2432143; Aug. 28, 1974, 2441258
Int. Cl.² E05D 9/00
U.S. Cl. 16-128 R

7 Claims



1. A hinge for a flush-type door comprising:

a first plate member having two integral, elongate, generally flat, and mutually perpendicular portions for mounting to one of the elements to be hingedly connected with a first of said portions abutting an edge of said one element and the other of said portions abutting a face of said element which adjoins said edge,

a pivot means supported along a free longitudinal edge of said first portion of said first plate member,

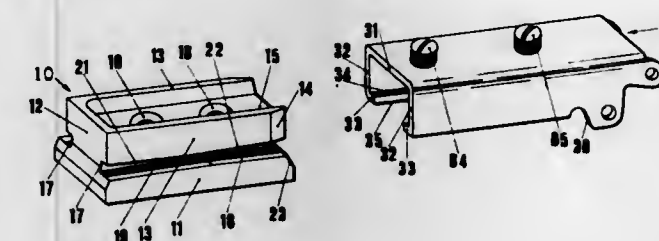
a hinge arm pivotally supported on said pivot means for mounting to a face of the other said element to be hingedly connected and having a width measured along the axis of said pivot means which is substantially less than the length of said first plate member also measured along said axis,

said first and second portions of said first plate member defining a recess whose length along said axis slightly exceeds that of the width of said hinge arm so as to permit said hinge arm to be received within the said recess when the door is in its closed position.

**4,007,514
FIXED HINGE FITTING**
Luciano Salice, Carimate (Como), Italy, assignor to S.A.R.L. Salice France, Nice, France
Filed Jan. 7, 1976, Ser. No. 646,983
Claims priority, application France, Jan. 17, 1975, 75.01535
Int. Cl.² E05D 7/04

U.S. Cl. 16-129

11 Claims



1. A hinge fixture comprising:

a base plate attachable to a wall member, the base plate having side walls and a pair of longitudinally extending grooves formed in each of the side walls;

a hinge fitting of generally U-shaped cross-sectional configuration adapted to fit over the top of the base plate, said hinge fitting having a pair of side walls which terminate in inwardly extending longitudinal flanges receptive in said grooves;

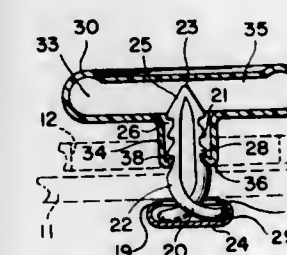
the main web of the hinge fitting having a pair of longitudinally spaced screws threaded therein for engagement with the upper surface of the base plate, one of said screws being effective to lock the hinge fitting to the base plate and the other of the screws being constructed and arranged to vary the angular position of the hinge fitting with respect to the base plate;

said longitudinally extending grooves in the base plate being dimensioned with respect to the flanges of the hinge fitting to permit limited angular adjustment of the hinge fitting with respect to the base plate.

**4,007,515
GARMENT FASTENER**
Joseph F. Agnelli, Medford, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Dec. 29, 1975, Ser. No. 644,603
Int. Cl.² A44B 1/28

U.S. Cl. 24-103

3 Claims



1. A fastener for detachable attachment through one or more layers of material, said fastener formed of a female member and a male member,

said female member formed with a hollow neck section open at one end and formed about such opening with a flanged rim that extends into the opening,

said male member formed of a pin shaped as a U-section of two resilient legs externally joined together at a first end section of each leg to form a common external point, with each of the second end sections of each leg slidably mounted in a common cap so as to permit flexing of the two legs towards or away from each other, with each said second end section of each leg mounted in said cap so as to apply spring bias to flex each of said legs away from the other said leg, said cap formed with a flange that restricts relative movement of the enclosed said second end sections to the cap in the axial direction of the said legs,

said legs each formed externally with serrated surfaces so as to frictionally grip the rim of the female member when the leg sections are inserted in the neck section of the female member,

said external point of the male member serving as a means of piercing the layers of material when the fastener is assembled with the female member located on one side of the material and the male member inserted into the female member from the second opposed side of the material.

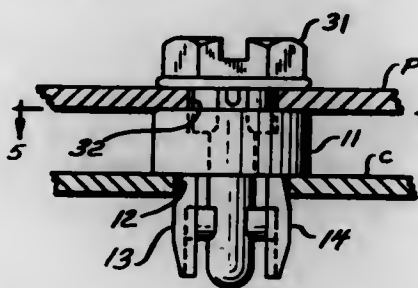
**4,007,516
QUARTER TURN LOCKING FASTENER DEVICE**
Ronald A. Coules, Barrington, Ill., assignor to Richco Plastic Company, Chicago, Ill.
Filed May 19, 1975, Ser. No. 578,474
Int. Cl.² A44B 17/00; F16B 13/04

U.S. Cl. 24-221 R

5 Claims

1. A quarter turn fastener comprising a socket part and a

stud part for removably securing an apertured panel on and spaced apart from an apertured chassis, flexible means on the socket part for snap locking said socket part in said chassis aperture, means on the socket part for spacing said panel from said chassis, a head on the stud part adapted to bear upon said panel, a shaft depending from said head and adapted to extend through said panel aperture and into said socket part, cooper-



ating ribs on the stud part and shouldered grooves on the socket part for locking and unlocking said parts together upon selective rotation of said stud part relative to said socket part, said snap locking means being adaptable to secure said socket part in said chassis aperture when the stud part is disposed in locking position, and means on the stud part adjacent to the head engageable in the panel opening to prevent shifting of the panel.

4,007,517

HEAT TREATMENT OF TEXTILE FABRIC PRIOR TO WET PROCESSING

James Keith Turner, Lincolnton; William Cleere Sturkey, Charlotte, both of N.C., and Christoph W. Aurich, Clemson, S.C., assignors to Gaston County Dyeing Machine Company, Mount Holly, N.C.

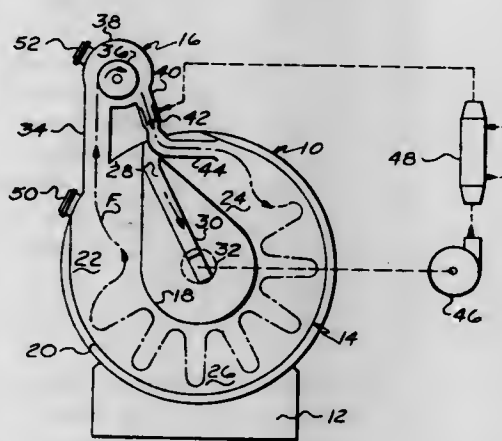
Continuation of Ser. No. 489,404, July 17, 1974, abandoned.

This application Aug. 13, 1975, Ser. No. 604,167

Int. Cl.² D06B 3/28

U.S. Cl. 26—18.5

3 Claims



1. In the art of heat treating textile fabric for bulking or shrinking the same prior to wet processing, the improvement which comprises the combined steps of handling said fabric as a rope in endless loop form by confining a major portion of the fabric loop as a plaited accumulation in a chamber from which the loop is progressively withdrawn and then returned, recirculating the textile fabric endless loop from and to said plaited accumulation free of nip constraint under an aspiration influence induced with a jetted inert gas while applying heat for said treatment to said textile fabric during such recirculation, and continuing said heat application and recirculation until the desired bulking or shrinking has been effected.

4,007,518 STEAM SUPPLY APPARATUS

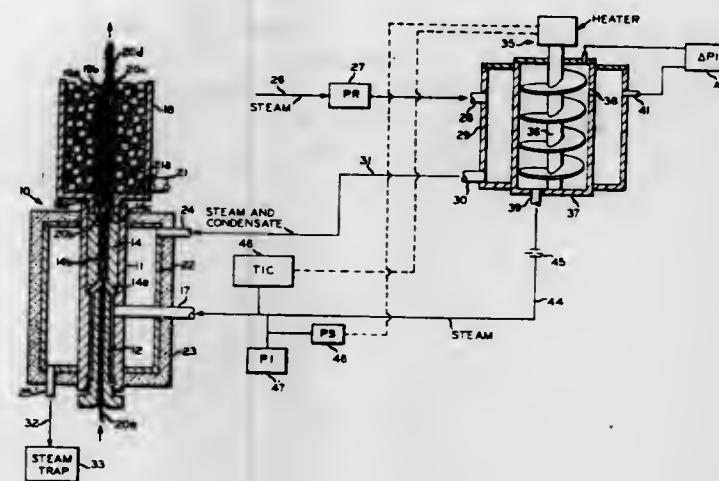
Harold A. Larson, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1975, Ser. No. 607,328

Int. Cl.² D02G 1/12

U.S. Cl. 28—1.6

6 Claims



1. Apparatus adapted to texture yarn by the use of steam which is supplied at a predetermined temperature and free of condensate, comprising:

yarn texturing apparatus in which yarn to be textured is contacted with steam so as to impart turbulence to the yarn and texture same, said yarn texturing apparatus being provided with a jacket;

a heater adapted to elevate the temperature of a fluid passed therethrough, said heater having an inlet and an outlet;

a steam condensate separator having an inlet to receive steam and a first outlet through which steam can be removed, said separator also having a second outlet to remove condensate;

means connecting the first outlet of said separator to the inlet of said heater;

first conduit means connected between the outlet of said heater and said yarn texturing apparatus to pass condensate-free steam to said yarn texturing apparatus;

temperature sensing means connected to said first conduit means to measure the temperature of steam therein;

control means responsive to said temperature sensing means to regulate said heater to maintain the temperature of steam in said first conduit means constant; and

second conduit means connected between the first outlet of said separator and said jacket to pass steam and condensate from said separator to said jacket.

4,007,519

INDICATING DEVICE FOR YARN CRIMPING WHEEL TEETH SPACING ADJUSTMENT

Charles M. Rice, Candler, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed July 11, 1975, Ser. No. 594,940

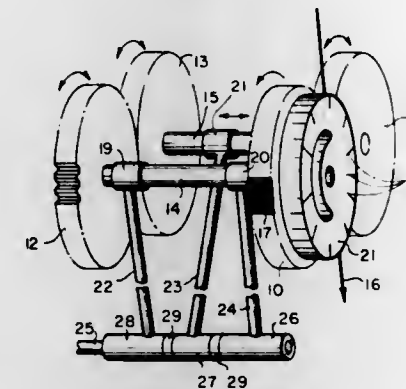
Int. Cl.² D02G 1/14

U.S. Cl. 28—1.8

4 Claims

1. An apparatus for crimping yarns comprising a first gear and a first crimping wheel, both fixedly attached to a first shaft; a second gear and a second crimping wheel, both fixedly attached to a second shaft; said first and second crimping wheels each having a determined number of teeth uniformly spaced around the periphery of the crimping wheel and said first and second gears each having another and different determined numbers of teeth uniformly spaced around the periphery of the gear; means for engaging and disengaging said first and second gears and said first and second crimping wheels; means to rotate said first gear; a device attached to said first

crimping wheel to rotate in conjunction therewith; graduated markings on one face of the device corresponding to points along the periphery of said first crimping wheel; and an index mark on said second crimping wheel correlative to said graduated markings on said first crimping wheel, whereby the peripheral spacing between the teeth of said first crimping wheel



and the teeth of said second crimping wheel, when engaged, can be changed by disengaging the gears and crimping wheels and rotating said first gear and first crimping wheel a predetermined amount with respect to said second gear and second crimping wheel in accordance with the alignment of the index mark and graduated markings and re-engaging the crimping wheels and gears.

4,007,520

PROCESS FOR THE PRODUCTION OF AN ELECTRIC STACK OR LAYER CAPACITOR

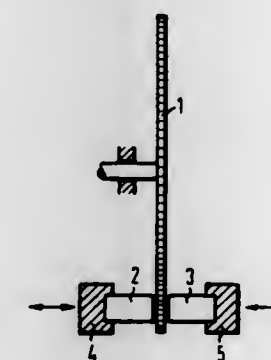
Hubert Kraus, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 9, 1975, Ser. No. 639,120

Int. Cl.² H01G 4/30

U.S. Cl. 29—25.42

9 Claims



1. In a process of producing capacitors in which synthetic dielectric layers carrying metal layers thereon are wound in a stretched state about a drum to form a mother capacitor, in which individual capacitors are formed from the mother capacitor by sawing through the mother capacitor, and in which due to the development of heat during sawing the capacitor layers contract in the region of sawing causing breaking of the metal layers to form insulating islands, the improvement therein comprising the step of:

applying an insulating lubricant to the saw blade and performing said sawing step such that said lubricant impregnates the capacitor being formed and thereby increases its dielectric strength.

4,007,521

AUTOMATIC PRECISION WORKING TOOL

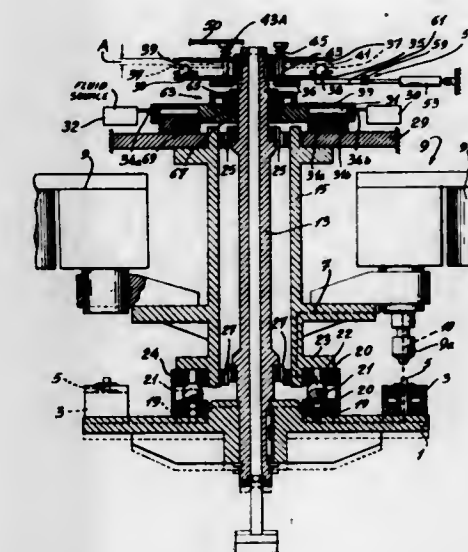
Andreas Keusch, Brossard, Canada, assignor to Hans Seiler, Aargau, Switzerland

Filed Apr. 23, 1976, Ser. No. 679,488

Int. Cl.² B23P 23/00; B23G 1/20

U.S. Cl. 29—38 C

8 Claims



1. An automatic precision apparatus comprising; an elongated rotatable central shaft concentric with and encased by a fixed outer cylinder;

a rotary workpiece table fixed to said central shaft adjacent one end of said central shaft;

a round tool holder table fixed to said cylinder adjacent one end of said cylinder and disposed in spaced relationship with said rotary table and in parallel arrangement with said rotary table;

a plurality of spaced tool holders disposed around said round table;

a plurality of equally spaced workpiece holders disposed on the one surface of said rotary table facing said round table;

each tool holder being precisely aligned with a respective one of said workpiece holders and being alignable with every other one of said workpiece holders;

means for moving said shaft to a second position relative to said cylinder from a first position relative thereto, and from said second position back to said first position;

means for rotating said shaft relative to said cylinder when the shaft is in said first position relative to said cylinder; and

means for releasably attaching said shaft to said cylinder when said shaft is in said second position relative to said cylinder;

whereby, when said shaft is in said first position, said rotary table is rotatable, with said shaft, relative to said round table, fixed to said cylinder, to move each workpiece holder from their positions adjacent one of the tool holders to a new position adjacent another one of the tool holders; and

whereby, when said shaft is in said second position, a closed vibration path is provided from each workpiece, through its respective workpiece holder, through said means for releasably attaching, through said cylinder, through a respective tool holder adjacent each workpiece holder, through the tool in the respective tool holder and back to the workpiece.

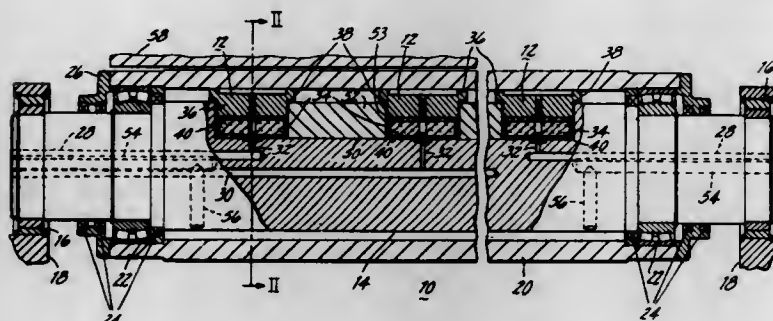
4,007,522

CONTROLLED DEFLECTION ROLL ASSEMBLY

Peter Hold, Milford, and John Cromley Hinchcliffe, Cheshire, both of Conn., assignors to USM Corporation, Boston, Mass.
Filed May 26, 1976, Ser. No. 690,052
Int. Cl.² B21B 13/02

U.S. Cl. 29—116 AD

12 Claims



1. A controlled deflection roll comprising:
a shaft having a support arrangement near each end thereof;
a shell roll journaled for rotation about said shaft, said shell roll and said shaft having a radial space therebetween;
at least one piston mounted in a longitudinally extending slot in said shaft, said slot permitting radial movement of said piston toward the inner surface of the shell roll;
an expandable member in said shaft adjacent the inner end of said piston; and
a hydrostatic bearing shoe disposed upon the outer end of said piston extending into said space and facing the inner surface of said shell roll;
said slot permitting said piston to pivot as it moves in the radial direction while preventing movement of the piston in a circumferential direction with respect to said shaft.

4,007,523

B-X CABLE PLIERS

Archangel J. Bianco, P.O. Box 93, Shores-Road, Brookside, N.J. 07926

Filed June 9, 1975, Ser. No. 584,812

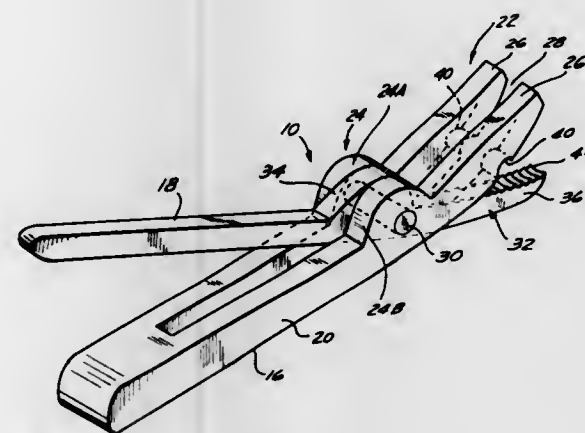
Int. Cl.² B21F 13/00; B26B 27/00

U.S. Cl. 30—90.2

6 Claims

1. A device for cutting B-X cable having a convoluted metal wrapping thereon, said device comprising first and second pivotally interconnected operating members each having first and second end portions with the first end portions thereof being located on one side of the pivotal connection between said members and defining handles; said second end portion of said first operating member being bifurcated to define two parallel extending spaced cutting jaws; said cutting jaws having laterally spaced free end portions remote from said pivotal connection and each having a lower cutting surface which is relatively flat in cross-section and which is slightly convex along the length of the jaw from adjacent the pivotal connection between said operating members to said free end of the jaw spaced from said pivotal connection; said lower surface of said cutting jaws each having an arcuately shaped downwardly opening notch formed therein dimensioned to receive and closely mate with at least one generally complementary convolution on the B-X cable; said second end portion of said second operating member defining a single cutting jaw and being located between the jaws of said first operating member for pivotal movement with respect thereto; said cutting jaw of the second operating member being relatively thin and having an upper cutting surface for cooperating with the lower surface of said first operating member to cut the B-X cable, said single cutting jaw of the second operating member being dimensioned to be inserted longitudinally into one end of a length of B-X cable and its upper surface being serrated transversely of the length of the jaw to enable the jaw to firmly grip the metal wrapping during cutting; said upper surface of said single jaw, including the serrations thereon, being concave in shape transversely of its length thereby to define two

spaced cutting edges respectively associated with the spaced cutting jaws on the first operating member; whereby when said single cutting jaw is inserted in the end of a length of B-X cable with the notch in said cutting jaws of the first operating



4,007,524

CAST ARTICULATED TOOL

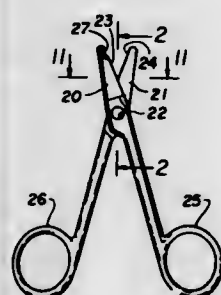
Karl Hannes, White Plains, and Paul C. Rossi, Franklin Square, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.

Division of Ser. No. 536,357, Dec. 26, 1974, Pat. No. 3,965,779, which is a division of Ser. No. 434,106, Jan. 17, 1974, Pat. No. 3,880,021. This application Dec. 23, 1975, Ser. No. 643,701

Int. Cl.² B26B 13/28

U.S. Cl. 30—266

7 Claims



1. A cast articulated shearing tool comprising first and

second cast members each having a shearing blade on one end thereof, said first member having a tapered aperture extending therethrough spaced from the respective blade, said second member having a pin with an enlarged head extending from one side thereof spaced from the respective blade and being integral with said second member, said pin being tapered with its larger diameter end toward said second member, the tapered portion of said pin corresponding in form to the form of said aperture and being fitted therein to form an articulated joint between said members for holding said blades in relative shearing relationship.

4,007,525

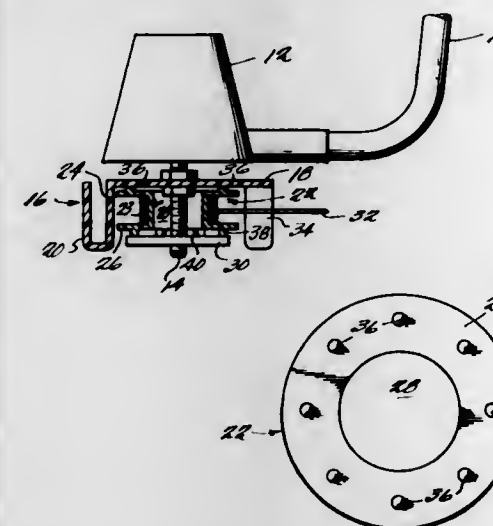
SPOOL FOR A VEGETATION CUTTING APPARATUS HAVING A FLEXIBLE LINE CUTTING ELEMENT

Gordon Francis Utter, 32019 E. I-10, Redlands, Calif. 92373
Filed Mar. 23, 1976, Ser. No. 669,499

Int. Cl.² B26B 7/00

U.S. Cl. 30—276

4 Claims



1. An improved spool for a vegetation cutting apparatus of the type having a drive shaft, a rotatable member for housing said spool, a flexible line extending from the spool through an opening in said member, and adjustable securing means joined to said shaft for retaining the spool within said member, said spool comprising:

- a central support portion having an aperture therein for receiving said drive shaft;
- a first flange located at one end of said support portion;
- a plurality of spaced projections located on an outer surface of said flange;
- a second flange located at the opposite end of said support portion and adapted to be engaged by said securing means to cause the projections to engage said rotatable member whereby the spool is selectively joined with said member in rotatable relationship.

4,007,526

LAWN-EDGE TRIMMER WITH DETACHABLE HANDLE
Max Langenstein, Illertissen, Germany, assignor to Max Langenstein Feld- und Gartengeräte, Illertissen, Germany

Filed May 7, 1976, Ser. No. 684,013

Claims priority, application Germany, May 10, 1975, 2520873

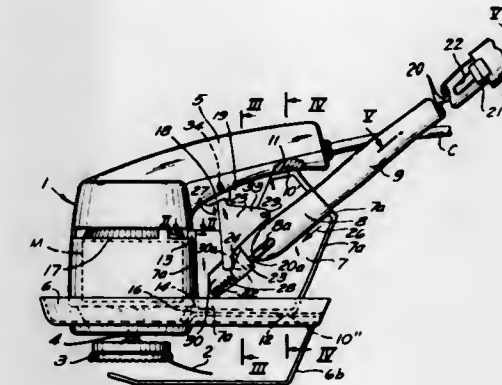
Int. Cl.² B26B 25/00

U.S. Cl. 30—276

10 Claims

1. A lawn-edge trimmer comprising:
a housing rigid with a laterally extending grip at the top thereof and with a generally horizontal shield plate at the bottom thereof;
a motor in said housing provided with a switch including a spring-biased trigger on said grip depressible to energize said motor;
a rotatable cutter underneath said shield plate driven by said motor;

a mounting member detachably secured to said housing between said grip and said shield plate;
a tubular stem extending inclinedly upwardly from said mounting member and terminating in a handle above the level of said grip;



an ancillary actuator for said switch on said stem adjacent said handle; and
link means operatively connecting said actuator with said trigger, said link means including a force-transmitting element movably held in said stem.

4,007,527

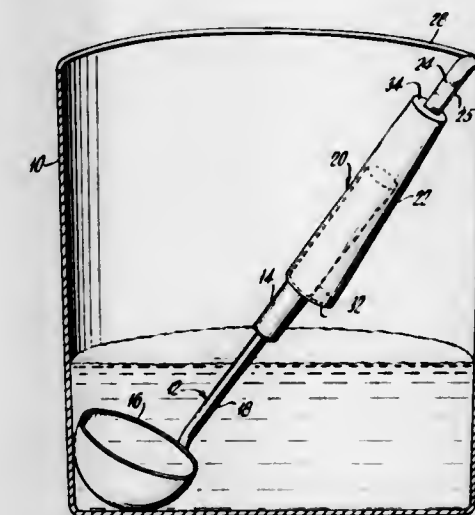
UTENSIL RETAINING MEANS

Edward A. Tibbs, 59 Townsend Ave., Newburgh, N.Y. 12550
Filed July 7, 1975, Ser. No. 593,577

Int. Cl.² A47J 43/28

U.S. Cl. 30—327

9 Claims



1. In combination, a utensil having a handle and means for supporting said utensil within a cooking vessel, said means for supporting said utensil comprising an elongated hollow means having one open end, said hollow means loosely encompassing said handle, and hook means on said means for supporting said utensil, said hook means being adapted to engage the rim of said cooking vessel.

4,007,528

HIGH SPEED BONE DRILL

John J. Shea, and Harry Phillips, both of P. O. Box 4360, Memphis, Tenn. 38104

Filed Oct. 22, 1975, Ser. No. 624,661

Int. Cl.² A61C 1/08

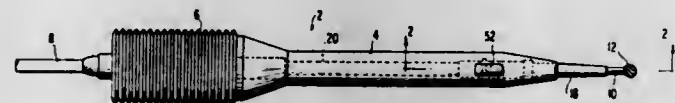
U.S. Cl. 32—26

4 Claims

1. A high speed drill comprising
a burr having an elongate shank,
a hollow casing,
a drive motor in said casing,
a drive member rotatably supported in said casing and drivingly connected at one end to said motor, said drive

member having an elongate hollow tubular portion at the other end thereof for receiving said burr shank which slidably fits therein, means at the inner end of said hollow tubular portion for drivingly connecting said burr shank thereto,

a sleeve surrounding the drive member and slidable lengthwise thereon between first and second positions, detent means engaging between said sleeve and said burr shank, said detent means being movable between one position in which the burr shank is held against endwise movement relative to said sleeve and another position in which the burr shank is released for endwise movement in said sleeve,



said sleeve in the first position thereof retaining said detent means in said one position and in the second position thereof releasing said detent means so that they are free to move to the other position thereof, resilient means for urging said sleeve towards said first position, and a finger piece movably supported on said casing engageable with said sleeve for moving the same to said second position, a rotary bearing member between the casing and the hollow tubular portion of the drive member, the elongate hollow tubular portion of said drive member projecting outwardly beyond said casing, and providing support for said burr shank along a substantial portion of its length.

4,007,529

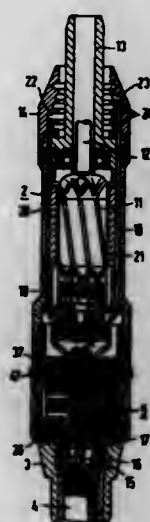
MOTOR-DRIVEN DENTAL HANDPIECE

Ernst Otto Fleer, Bensheim-Auerbach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed June 24, 1975, Ser. No. 589,923
Claims priority, application Germany, July 1, 1974, 2431472

Int. Cl.² A61C 1/10

U.S. Cl. 32-27

13 Claims



1. In a dental handpiece including an electrical motor; an essentially cylindrical housing for receiving said motor; a supply hose containing an energy supply conduit for said motor; at least one cooling media supply conduit; connector means for attaching said supply hose to one end of said housing; a rotatable drive shaft projecting from the other end of said housing; a gripping member for the handpiece, exchangeably and detachably mounted to said housing and having a power-transmission shaft engaging with said drive shaft; a head portion having a work tool provided at the end of said gripping member remote from said housing and coupled to said power shaft; said cooling media supply conduit leading

from said connector means to said head portion; the improvement comprising: said cooling media supply conduit being divided into at least two fixedly displaced conduit sections respectively extending along said housing and said gripping member; and coupling means positioned concentrically to said drive shaft for interconnecting said conduit sections intermediate said housing and said gripping member; said gripping member being rotatably arranged with respect to the portion of said housing holding said drive shaft.

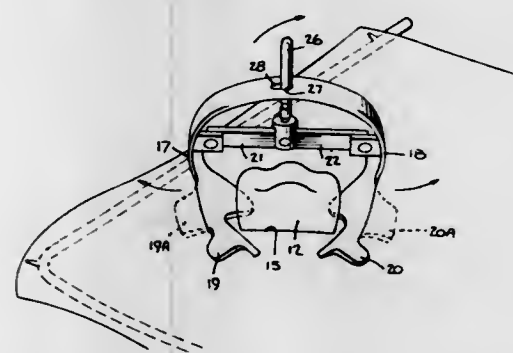
4,007,530

QUICK-RELEASE DENTAL CLAMP

Carmine Gaccione, 4 John Jay Place, Rye, N.Y. 10580
Filed Sept. 16, 1975, Ser. No. 613,912
Int. Cl.² A61C 5/12

U.S. Cl. 32-36

6 Claims



1. A clamp usable with a rubber dam for engaging a tooth to permit a dentist to work thereon without interference from mouth saliva and moisture, said clamp comprising:

A. a bow spring having a yoke and a pair of legs depending therefrom, said yoke being provided with a center hole;

B. a pair of jaws joined to the ends of said legs and extending forwardly therefrom the inner edge of said jaws being contoured to engage said tooth, said bow spring having a normal bias maintaining said jaws in a spread-apart passive state; and

C. a trigger mechanism constituted by a pair of links hinged to a trigger head, the ends of said links being pivoted to said legs whereby in said passive state said links bridge said legs to assume a colinear relationship, a trigger pin anchored in said head and extending upwardly through said yoke hole, whereby when said legs are pressed inwardly against the tension of the spring to cause said clamp to assume an activated state, the pin rides up the hole and the jaws are caused to engage said tooth, and releasable means to hold said pin to maintain said activated state, which means, when actuated, frees said pin, whereby when said releasable means are actuated to fire said trigger mechanism, said pin rides down the hole and the jaws are immediately retracted from the tooth.

4,007,531

DUAL DENTURE MODEL SURVEYOR

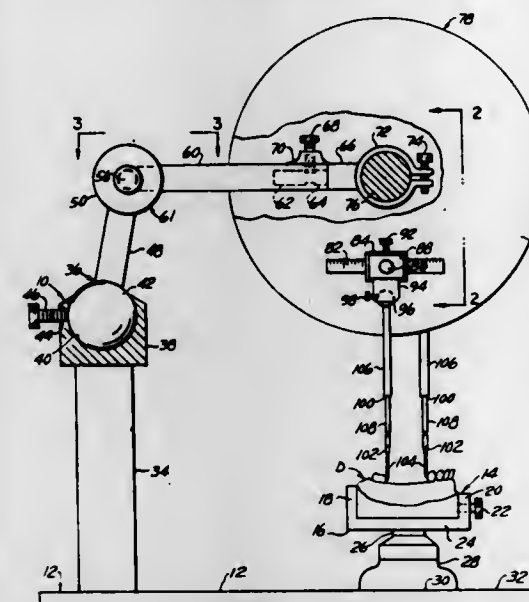
Earl L. Anderson, P.O. Box 1601, Grand Rapids, Mich. 49501
Filed May 22, 1975, Ser. No. 579,932
Int. Cl.² A61C 3/00

U.S. Cl. 32-67

7 Claims

1. A dual denture model surveyor, comprising a base, a denture model table mounted on said base and having means thereon for holding a denture model in a substantially horizontal position, an upright structure mounted on said base in spaced relationship to said table, an elongated extensible support extending forward from said upright structure and having a rearward end portion connected to said upright structure and having a forward end portion with a transverse pivotal connection thereon movable toward and away from said table,

and a dual tool head tiltably mounted on said forward end portion at said pivotal connection, said tool head having thereon a pair of longitudinal slideways disposed in planes substantially parallel to said extensible support in laterally spaced relationship, and also having a pair of longitudinal sliders movable back and forth along said longitudinal slideways,



said tool head having a pair of oppositely-extending lateral slideways disposed perpendicularly to said longitudinal slideways and connected to and movable unitarily with said longitudinal sliders and also having a pair of lateral sliders movable to and fro along said lateral slideways,

said tool head having a surveyor tool holder mounted on and depending from each lateral slider in laterally-spaced relationship to one another.

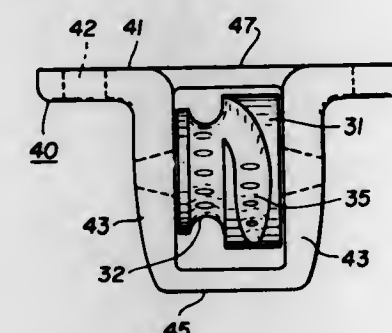
4,007,532

LOCKING PULLEY ASSEMBLY AND METHOD OF MAKING SAME

Ruediger Elhorn, Katonah; Lee Richard Chasen, Port Chester, and Karl Hannes, White Plains, all of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Division of Ser. No. 550,162, Feb. 14, 1975, Pat. No. 3,944,186. This application Nov. 10, 1975, Ser. No. 630,717
Int. Cl.² B21K 1/42

U.S. Cl. 29-159 R

3 Claims



1. A method for forming an article having a freely rotatable element comprising die casting a first element with frustoconical bearing surfaces on opposite ends thereof, die casting a second element with a pair of opposed outwardly bowed portions joined by spaced apart bridging portions having frustoconical bearing surfaces on facing sides, whereby one of said first and second elements is cast prior to the other with the frustoconical bearing surfaces of said one element forming the bearing part of the die for the casting of the other element, then inwardly compressing said bowed portions of said second element to thereby urge said bridging portions apart for freeing the rotational joints between said first and second elements defined by said bearing surfaces.

4,007,533

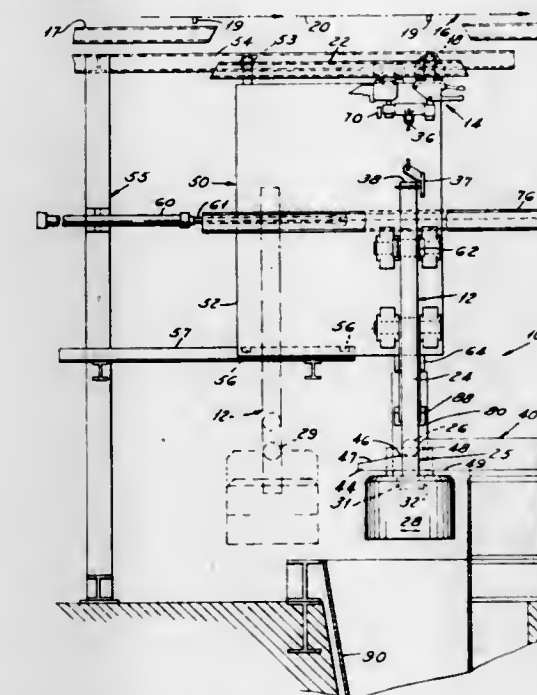
APPARATUS FOR STRIPPING AN ANODE BLOCK FROM AN ANODE ASSEMBLY

Ross H. Brandon, Detroit, and Peter P. Zeffler, Harper Woods, both of Mich., assignors to Jervis B. Webb Company, Detroit, Mich.

Filed Nov. 24, 1975, Ser. No. 634,840
Int. Cl.² B23P 19/04

U.S. Cl. 29-762

15 Claims



1. Apparatus for stripping an anode block from an anode assembly which consists of said anode block, a yoke attached thereto, and a rod having one end secured to the yoke, said apparatus comprising:

an anode assembly conveyor including a carrier track, a carrier supported thereon, and means for propelling the carrier along the carrier track;

suspension means attaching the other end of the rod of the anode assembly to the carrier;

a stripping station located along the path of carrier travel on the carrier track;

said stripping station including a fixedly mounted anvil located below the carrier track and having supporting means for engaging the yoke of the anode assembly, transfer means for transferring the support of the anode assembly from the conveyor carrier to said supporting means, stripping means mounted adjacent to the anvil for movement relative thereto, and means for moving the stripping means into engagement with the anode block of the anode assembly supported by said supporting means to strip the anode block from the yoke.

4,007,534

MULTI-CONDUCTOR HALF TAP

John James Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jan. 14, 1976, Ser. No. 649,010
Int. Cl.² H01R 43/04

U.S. Cl. 29-566.3

6 Claims

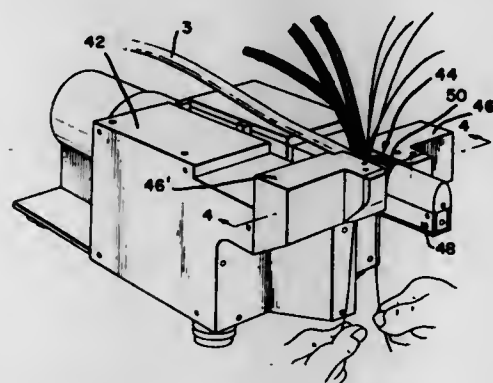
1. An apparatus for simultaneously inserting a pair of wires into the oppositely facing wire-receiving portions of corresponding terminals in each of two similar adjacent multi-contact electrical connectors, a top connector and a bottom connector each connector having a mating side and a rearward side with a plurality of terminals extending from said mating side to said rearward side, said wire-receiving portions on terminals in each connector being in two parallel rows along said rearward side, said connectors being positioned with said rearward sides adjacent and all of said rows parallel, said apparatus comprising:

an insertion zone,

connector holding means for positioning the wire-receiving portions of corresponding terminals in said insertion zone with said rearward sides of said two connectors in said insertion zone and said mating sides above and below said insertion zone,

wire stop means on each side of said zone, said wire stop means extending transversely of, and adjacent to, said rows and generally between said mating side and said wire receiving portions in said top connector.

opposed wire-insertion means below said wire stop means



on opposite sides of said insertion zone and movable towards each other into said zone,

actuating means for simultaneously moving said insertion means towards each other upon placement of a pair of wires across said wire stop means, in alignment with corresponding wire-receiving portions on each side of said connectors, and parallel to the axis of said terminals, whereby

a multi-conductor tap can be formed by simultaneously attaching wires to corresponding terminals in two oppositely facing multi-contact electrical connectors.

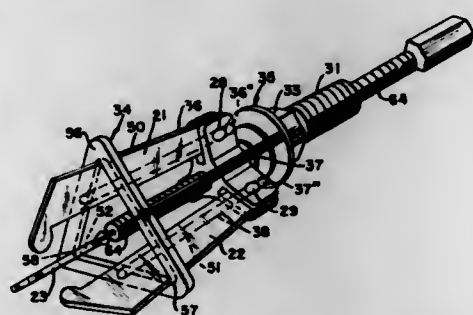
4,007,535 LOCKING PULLER DEVICE

Paul W. Brandt, and Dean S. Somerville, both of McHenry, N. Dak.

Continuation-in-part of Ser. No. 550,978, Feb. 19, 1975, abandoned. This application Sept. 4, 1975, Ser. No. 610,412
Int. Cl.² B23P 19/04

U.S. Cl. 29—261

1 Claim



1. A locking puller device for pulling an object such as an inner race of a bearing off of a shaft, said device having three tapered jaws, a collar having mounting means at spaced intervals about the collar, said jaws projecting forward and having their rearward ends pivotally mounted to said mounting means of said collar, a cam ring framework comprising a cam ring laterally surrounding said jaws at a location spaced forward of the pivotal mounting of the collar, said collar having a sleeve fixed thereto and projecting rearward from the collar, a single threaded nut means threaded onto said sleeve, said cam ring framework also including a rear collar mounted to said single threaded nut means by an annular rotatable tongue and groove connection, said framework including braces fixed between the cam ring and the rear collar to place the cam ring and rear collar in fixed relation to one another whereby rota-

tion of the single threaded nut means in one direction moves the threaded nut forward, and through the tongue and groove connection within the rear collar, the nut means also acts to push the rear collar forward, the bracing the cam ring forward in fixed relation to one another pushes the framework forward in a straight line nonrotating manner to cause the cam ring to move forward and engage against the jaws and pivot the forward ends of the jaws radially into engagement about the object and cause the jaws in turn to lock about the object, and rotation of the single threaded nut means rearward through the tongue and groove connection applies a rearward force to the rear collar to push the rear collar, braces, and cam ring rearward in fixed relation to one another in a straight line nonrotating manner to disengage the cam ring from the jaws to free the jaws from their locking engagement about the object, a rod threaded into the sleeve to be turned forward against the shaft, while the cam ring is locked about the jaws, the jaws are locked about the object on the shaft to apply a forward force against the shaft, with the reaction causing the jaws to pull the object rearward off the shaft, a plurality of spring means mounted on said collar adjacent the pivotal mountings having their one ends connected to the collar and their other ends connected to the jaws to simultaneously and continuously bias said jaws outward against the inside edges of the cam ring and cooperate with the cam ring, said jaws when locked about an object of appropriate size, having its outer surfaces tapered to diverge forward and outward gradually along a relatively straight line, said cam ring having an inside diameter less than the outside diameter of the jaws along the forward portions of the jaws and having an inside diameter less than the outside diameter of the jaws along the rearward portions of the jaws, whereby movement of the cam ring forward causes gradual engagement with the jaws causing the jaws to be gradually cammed toward one another, by the cam ring overcoming the action of the springs to the extent to cause the jaws to converge toward one another at a rate as allowed by the cam ring to thereby cause said jaws to be automatically engaged about the object before pulling the object off the shaft, and rearward movement of the cam ring enables the jaws to expand radially outward under the biasing of the springs at a rate as allowed by the cam ring, thereby automatically disengaging and freeing the jaws from the object after pulling the object off the shaft.

4,007,536 METHOD OF USING A SEALING STRIP TO MOUNT A GLASS PANEL IN A SHEET METAL BODY

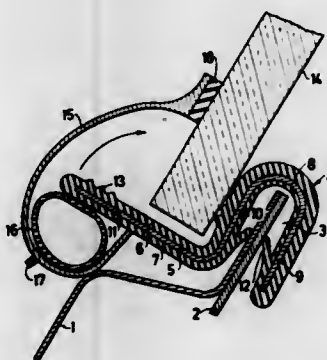
Gosta Soderberg, Karl Johansgatan 47 H, Goteborg, Sweden
Division of Ser. No. 445,091, Feb. 25, 1974, abandoned. This application June 27, 1975, Ser. No. 591,018

Claims priority, application Germany, Feb. 28, 1973, 2309921

Int. Cl.² B23P 17/00

U.S. Cl. 29—421 R

3 Claims



1. A method of installing a glass panel in a window opening extending through a body of sheet metal in a predetermined direction, said body having an edge portion bounding said opening, said method comprising:

a. placing a laminar, elongated sealing strip on said body,

1. said sealing strip including a core layer of sheet metal having two longitudinal edges and two opposite major faces connecting said edges, and first and second surface layers of elastomeric material respectively superimposed on said major faces and projecting laterally beyond said edges, the projecting portions of said first and second layers being integrally connected, whereby said core layer is enveloped by said elastomeric material, said strip and each of said layers thereof being of uniform, hook-shaped cross section over the length thereof and constituting an approximately U-shaped channel portion and a plate portion angularly joined to said channel portion,
2. said sealing strip being placed on said body in a position in which said edge portion is received in said channel portion, and said plate portion projects from said channel portion in said direction;
- b. moving said panel in said direction along said plate portion until said panel abuts against said channel portion and a part of said panel portion projects away from said channel portion beyond said panel; and
- c. folding the projecting part of said plate portion inward of said opening on said panel.

4,007,537

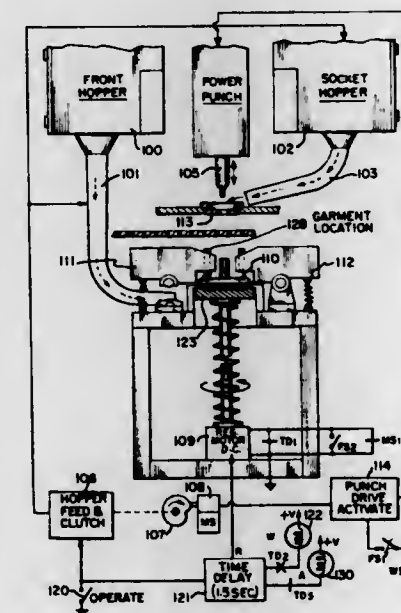
METHOD OF REGISTERING LOGO CARRYING FASTENER PRIOR TO EMPLACEMENT ON GARMENT
Herbert M. Silverbush, Providence, R.I., and Philip B. Jensen, Seekonk, Mass., assignors to Rau Fastener, a division of U.S. Industries, Inc., Providence, R.I.

Division of Ser. No. 529,689, Dec. 5, 1974, abandoned. This application Aug. 20, 1975, Ser. No. 606,076

Int. Cl.² B23P 11/00

U.S. Cl. 29—432.1

9 Claims



1. A method of registering a fastener containing a given logo on a surface prior to the emplacement of the same on a garment, said fastener including indicator means located on a surface thereof indicative of the orientation of said logo with respect to any one of a desired number of preferred orientations, comprising the steps of:

- a. placing said fastener on a rotatable emplacement table in any one of a plurality of arbitrary positions,
- b. rotating said table at a relatively high speed to cause said fastener to rotate solely about its axis,
- c. selecting any one of a plurality of projections located about the rotational path, each adapted to coact with said indicator means, to restrain said fastener in a desired position determined by said selected projection,
- d. coating said indicator means with said projection when

said fastener is at said desired position during rotation of the same,

e. ceasing rotation of said fastener when said indicator means is coated,

f. emplacing said fastener on said garment when said rotation is ceased and therefore when said indicator means is coated.

4,007,538

METHOD OF CONSTRUCTING A STRUCTURAL MEMBER

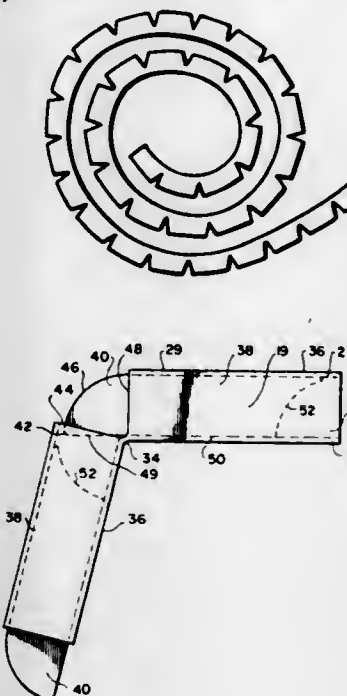
John David Petrie, 1112 ManuLife House, 603-7th Ave., S.W., Calgary, Alberta, Canada

Division of Ser. No. 510,863, Sept. 30, 1974, Pat. No. 3,925,943. This application Sept. 18, 1975, Ser. No. 614,602

Claims priority, application Canada, Oct. 2, 1973, 182482
Int. Cl.² B23P 11/02

U.S. Cl. 29—447

12 Claims



1. A method of constructing a structural member capable of being coiled by bending said member in one direction and being uncoiled by bending said member in the opposite direction to form a frame member, said method comprising forming an elongated one-piece body member of suitably flexible material by extrusion of said material, embedding suitably high strength, flexible members in one side of said body member during said extrusion, said flexible members extending longitudinally in said body member, and cutting said body member transversely at a number of locations along the length thereof, each cut formed thereby extending inwardly from the side of the body member opposite said one side and having a bottom near but spaced apart from said one side of the body member, whereby a relatively thin, flexible joint at said one side is formed by each cut and has said flexible members extending therethrough.

2. A method of constructing a structural member according to claim 1 including forming a passageway extending lengthwise through said body member during extrusion thereof, inserting sheer members of suitably strong material in said passageway, arranging said sheer members in said passageway whereby each sheer member traverses a respective cut formed by said cutting of said body member when said structural member is uncoiled and absorbs sheer forces in said structural member at its respective cut, and securing said sheer members to prevent longitudinal movement of said sheer members in said passageway.

4,007,539

METHOD OF CLAMPING A LATTICE-LIKE CERAMIC STRUCTURE BODY

Shinji Nishio, Komaki, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

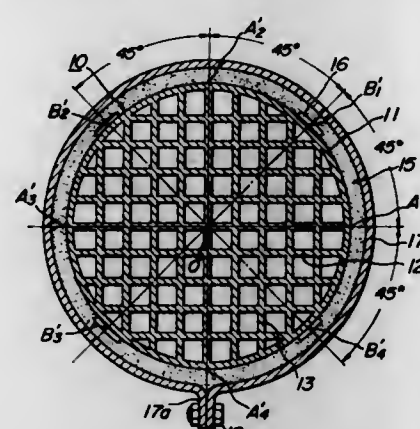
Filed Apr. 7, 1976, Ser. No. 674,488

Claims priority, application Japan, Apr. 11, 1975, 50-44567

Int. Cl.² B21D 39/00; B23P 19/04

U.S. Cl. 29—455 R

6 Claims



1. In a method of clamping a lattice-like ceramic structural body, which is substantially cylindrical in contour and a substantially uniform lattice in section, said lattice having a number of square holes formed by a pair of parallel wall groups crossing perpendicular with each other and extending in lengthwise direction of said structural body, through a damping member by a casing, an improvement which comprises clamping said structural body without subjecting a clamping force to portions at which two planes passing through a center line of said structural body and inclined from said wall groups by an angle of about 45°, respectively, are intersected with the outer peripheral wall of said structural body.

4,007,540

METHOD FOR FABRICATING A CAVITY RIVET ASSEMBLY

Gerald W. Tyree, Canoga Park, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

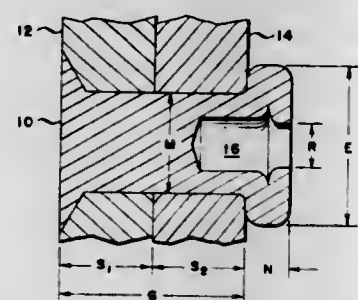
Division of Ser. No. 399,311, Sept. 21, 1973, abandoned. This

application Mar. 3, 1975, Ser. No. 555,074

Int. Cl.² B21D 39/00; B23P 11/00

U.S. Cl. 29—509

2 Claims



1. The method of joining a plurality of parallel, abutting structural members, comprising the steps of: forming axially aligned holes through such members; inserting through said holes a rivet having a shank with a head on one end and a cavity is an opposite end until said head firmly contacts one of such members, the bottom of said cavity terminating intermediate of the thickness of the structural member nearest the cavity-containing rivet end; applying a deforming force to said cavity-containing rivet end so as to deform said rivet in the region intermediate the bottom and the end of said cavity doubling it upon itself and increasing its diameter to a size greater than the

diameter of said holes to obtain a firm contact with an external surface of the adjacent structural member, the diameter of said cavity at its end after such deformation being smaller than the diameter of said holes, thereby securing together the structural members.

4,007,541

METHOD FOR FABRICATING A DIELECTRIC FILLED FERRITE TOROID FOR USE IN MICROWAVE DEVICES

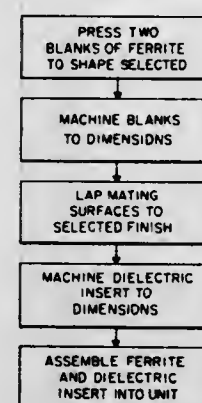
Frank R. Monforte, Los Altos, and Giltan M. Argentina, San Jose, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 14, 1975, Ser. No. 567,757

Int. Cl.² H01P 11/00; H01F 41/02

U.S. Cl. 29—600

7 Claims



1. A method for fabricating a two-piece toroid having a dielectric material insert, which two-piece toroid exhibits the hysteresis loop characteristics of a one-piece toroid, comprising the steps of:

pressing selected quantities of a magnetic material into a pair of selected complementary blanks of substantially uniform density over their entire cross-sections; machining the pair of blanks to define confronting mating surfaces commensurate with complementary cross-sectional shapes and lengths of given dimensions within selected tolerances; lapping the confronting mating surfaces of the pair of machined shapes to a finish sufficient to maintain the hysteresis loop characteristics inherent in a similar one-piece configuration formed of the same magnetic material; machining a single dielectric material insert to outside dimensions which allow the insert to fit snugly within the complementary pair of magnetic machined shapes along the entire length thereof; and assembling the complementary pair of machined shapes about the dielectric material insert with intimate contact between all surfaces of the insert facing respective confronting surfaces of the machined shapes, wherein the lapped confronting surfaces of the machined shapes are in such intimate contact that the hysteresis loop characteristics are similar to those of a one-piece toroid.

4,007,542

STRAIGHTEDGE

Fred R. Bergendorff, 7429 Orien, La Mesa, Calif. 92041

Continuation-in-part of Ser. No. 512,470, Oct. 7, 1974,

abandoned, which is a continuation-in-part of Ser. No.

397,603, Sept. 14, 1973, abandoned. This application July 3,

1975, Ser. No. 593,170

Int. Cl.² B43L 13/14

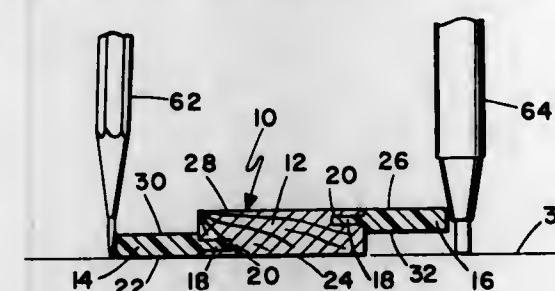
U.S. Cl. 33—77

1 Claim

1. A two level perspective straightedge, comprising: an elongated, substantially flat rigid spine having opposed faces and edges; longitudinally extending transparent edge members fixed to opposite edges of said spine, the edge members being offset in opposite directions with one face of one edge member flush with a first face of the spine and the other face of said

one edge member inset from the second face of the spine, one face of the other edge member flush with said second face of the spine and the other face of said other edge member inset from said first face of the spine; and each of said edge members having graduated markings on the inset faces thereof in

quent groove cut in terms of the specified inside dimension of that side of the structure lying between the aforesaid groove cut and the aforesaid subsequent groove cut whether or not the butt edge face of the aforesaid groove cut faces in a direction toward, or oppositely from, the aforesaid subsequent groove cut.



4,007,544

CONSTANT LOAD PROBE SYSTEM FOR COORDINATE MEASUREMENT MACHINES

William E. Kirby, and Robert Duncan, both of Columbia, S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 30, 1974, Ser. No. 519,326

Int. Cl.² G01B 3/00

U.S. Cl. 33—174 R

2 Claims

increments which diminish in spacing from one end to the other in perspective proportion and wherein the direction of diminishing spacing of the markings on one of said edge members is in the opposite direction from the direction of diminishing spacing of the markings on the other of said edge members.

4,007,543

MULTIPLE GAUGING DEVICE FOR MODIFIED SHIP-LAP CORNER SEAMS

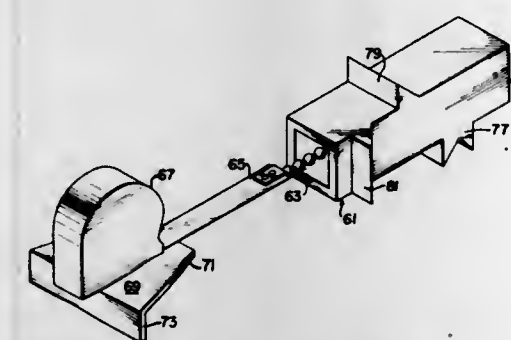
Alexander W. McClay, Jr., 29 W. Bank St., Petersburg, Va. 23803

Continuation of Ser. No. 486,654, July 2, 1974, abandoned, which is a continuation of Ser. No. 178,696, Sept. 8, 1971, abandoned. This application Nov. 12, 1975, Ser. No. 631,037. The portion of the term of this patent subsequent to July 23, 1991, has been disclaimed.

Int. Cl.² G01B 3/10

U.S. Cl. 33—137 R

13 Claims



1. A gauging means including a linear measurer for use in a dimensioning procedure to set the position of a guide-edge for cutting tools prior to making single vertical cuts, and modified ship-lap groove cuts containing a rabbeted edge along one side and a vertical butt edge along the other side, in insulating board of appreciable thickness, in order that a corner may be formed therealong for the subsequent fabrication of structures specified as to inside dimensions including ducts, duct fittings, conduits, and box-like structures; said gauging means comprising a multi-sided body, and linear measurer, and rotatable means of attachment, one to the other to permit rotation of the body relative to the measurer, a plurality of appendages extending from the body and each having at least one alignment face to engage edges of, or cuts in, the board; at least one of said appendages having both a leading and a trailing face with a third means of alignment centered therebetween; said one appendage extending outwardly of said body for a distance no greater than the rabbet depth of said rabbeted edge; said one appendage having a length longitudinally of the body equal to twice the distance between the vertical face and the adjacent rabbeted edge of the modified ship-lap groove; either of said leading and trailing gauging faces, when adjacent the vertical butt edge of a groove cut, sets the position of the body and the attached linear measurer in that longitudinal location along a line of measurement which will allow the linear measurer to indicate the position of the guide-edge for the subse-

1. A coordinate measurement machine comprising a base having spaced upstanding bridge arms, a housing mounted on each of said bridge arms, a carriage on said spaced bridge arms supported for movement in a Y-axis direction, a probe translator having a sensing probe projecting downwardly therefrom slidably mounted on said carriage in the X-axis direction, and a readout console connected with said probe for visually displaying the measurement of part coordinates made by said probe, the improvement comprising:

separate means mounted on opposite ends of one of said arms and on opposite ends of said carriage, each of said separate means comprising a spring motor having a flexible cable therein designed to exert a constant load of uniform force on an object; a stationary device mounted on one end of the carriage which is closest to said arm carrying the flexible cables, so that when the flexible cables on the arms are separately attached to the stationary device on the carriage, the probe will be urged in either a + or - Y axis direction; a pair of stationary devices mounted on opposite ends of the probe translator so that when the flexible cables on the carriage are separately connected to the stationary devices on the probe translator, the probe will be urged in either a + or - X axis direction; whereby upon placing the probe against a part to be measured, and appropriately connecting flexible cables respectively to the carriage and probe translator, the probe will be urged with a uniform force simultaneously in the X and Y axis directions against the part when the probe is positioned to sense part coordinates in any one of four quadrants.

4,007,545

METHOD FOR ADJUSTING TEMPERATURE AND PRESSURE OF A FLUID

George Oliver Briggs, West Lake, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,744

Int. Cl.² F26B 5/14, 7/00

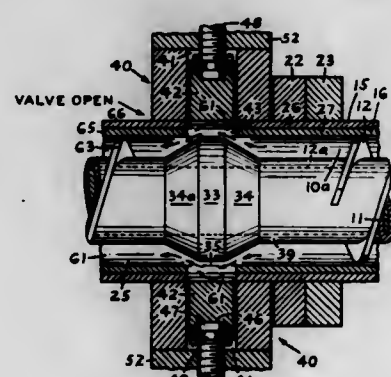
U.S. Cl. 34—14

4 Claims

1. A method for adjusting the upstream pressure or temperature of a moist polymeric material flowing through a conduit,

or the flow rate of said material, said material being under sufficient pressure to prevent the moisture from vaporizing at the temperature of the material, which comprises:

1. passing the material through a channel defined by an inner wall of the conduit and an obstruction having a substantially smooth outer surface located within the conduit, said channel having a cross-sectional area less than that of said conduit and an upstream and downstream end, the upstream end communicating with said pressurized polymeric material;
2. enlarging the cross-sectional area of at least a portion of said channel radially outward to provide an enlarged portion thereof to which material flowing through said



channel has access, said enlarged portion comprising a chamber which communicates with said channel;

3. adjusting the resistance to the flow of material through the conduit by adjusting the volume of said chamber;
4. conducting the material emanating from the downstream end of said channel into a zone wherein the pressure is sufficiently low to permit substantially all the moisture associated with the material to immediately vaporize and immediately expand the material to the full extent required for said vaporization thereby drying the material; and
5. compacting the dried material under pressures sufficiently low to prevent condensation of the vapor released from the material back onto the material.

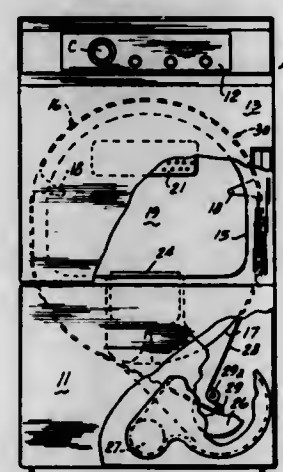
4,007,546

CLOTHES DRYER WITH FLEXIBLE DRUM
Leo H. Sauer, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 6, 1975, Ser. No. 602,235
Int. Cl.² F26B 11/02

U.S. Cl. 34-133

18 Claims



1. A clothes drying appliance having a cabinet including front and rear wall portions, a drum mounted within the cabinet for tumbling clothes, drive means for rotatably driving the drum, and means for circulating heated air through the interior of the drum to facilitate drying of the clothes therein; said drum comprising:

a front and a rear bulkhead formed respectively adjacent said front and rear cabinet wall portions, each said bulkhead having surfaces defining corresponding annular tracks thereon; and
an endless flexible belt member forming a sidewall of the drum, said belt member including front and rear edge portions mounted for movement adjacent the respective front and rear bulkheads with each edge portion riding one of said tracks,

whereby the shape of the drum is defined by said tracks.

4,007,547

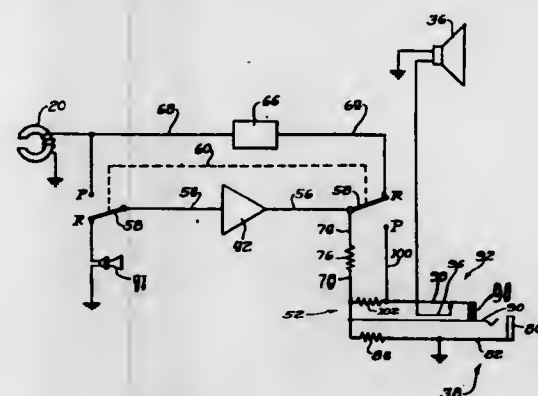
CARD HANDLING TEACHING MACHINE WITH INSTANTANEOUS FEEDBACK SYSTEM

Glenn A. Butler, Hanover Park, and George McKinley, Northbrook, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 9, 1975, Ser. No. 539,773
Int. Cl.² G09B 19/04

U.S. Cl. 35-35 C

11 Claims



1. An improvement in a card reading type teaching machine adapted to read an information card having a magnetic stripe for providing normal hearing of one's own voice, comprising, in combination:

a transducing means for recording information on the card and reproducing information from the card;
card transport means for moving the card from a first position past the transducing means to a second position and returning the card to the first position;
a microphone for receiving a person's spoken sounds and producing a microphone output signal;
a sound output means for producing an audible signal; an amplifier;
switch means movable between a record mode and a playback mode for alternately connecting said amplifier to said microphone and transducing means when in a record mode, for recording the microphone output signal on the magnetic stripe and for connecting the transducing means and amplifier with the sound output means when in the playback mode for audibly reproducing a recorded signal from the magnetic stripe; and
an instantaneous feedback means connecting said amplifier with said sound output means by a non-frequency responsive attenuated path whereby the information being recorded is simultaneously transmitted to the sound output means to permit the user to simultaneously hear an undistorted reproduction.

4,007,548

METHOD OF TEACHING READING

Kathryn Frances Cytanovich, 230 California Ave., Suite 109, Palo Alto, Calif. 94306

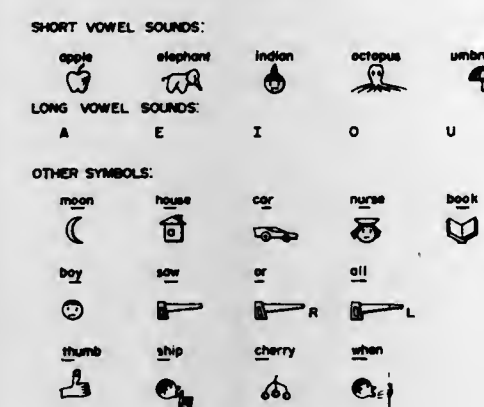
Filed Jan. 31, 1975, Ser. No. 546,029
Int. Cl.² G09B 17/00

U.S. Cl. 35-35 R

13 Claims

1. In a method of teaching reading, the steps of
1. presenting the student with material to be read in an orthography consisting of:

- a. the words to be read in standard type;
- b. symbols representing the sounds of vowel phonemes and consonant digraphs appearing in the material proximately located to the phonemes and digraphs to assist in pronouncing the sounds,



- c. markings to designate combined letters forming a single sound, and
 - d. numerical designations in directional sequence of each sound in each word, and
2. sequencing the sounds of each syllable in the direction of increasing numbers.

4,007,549

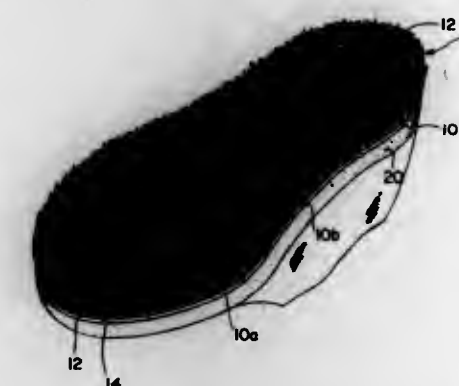
SOLE FOR ATHLETIC SHOE

Robert J. Moore, 3533 Ridgewood Drive, Pittsburgh, Pa. 15235

Filed June 3, 1975, Ser. No. 583,300
Int. Cl.² A43B 5/00, 23/28

U.S. Cl. 36-59 C

7 Claims



1. In an athletic shoe having uppers and an inner sole to which said uppers are joined, an improved traction sole for use on playing fields selectively of natural turf and artificial turf, each said turf defining a surface of said playing field comprising upwardly protruding, randomly oriented, fiber-like elements, comprising:

synthetic turf material of a configuration corresponding to a desired traction sole configuration and having a flexible backing layer and plural resilient fiber-like elements extending substantially individually from one surface of said backing layer in random orientations and of a sufficient length to project individually into and interengage with the randomly oriented fiber-like elements of said turf of said playing field surface for providing improved traction therewith in all directions of movement of the sole on the said playing field turf surface, and
a layer of adhesive material intermediate said synthetic turf traction sole and said inner sole for securing the traction sole to said inner sole.

4,007,550

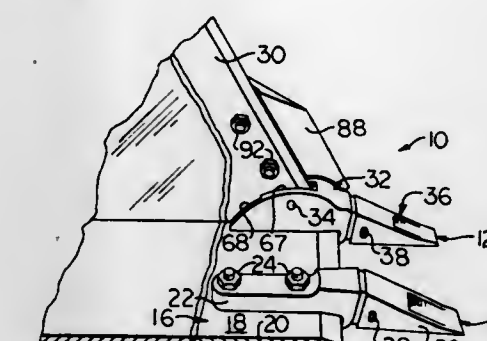
REPLACEABLE CORNER TOOTH ASSEMBLY

Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 19, 1975, Ser. No. 578,579
Int. Cl.² E02F 9/28

U.S. Cl. 37-141 T

4 Claims



1. A replaceable corner tooth assembly, for a loader bucket having a predetermined forward and rearward direction of travel and having an upright sidewall member and a leading cutting edge member disposed in laterally extending horizontal relation therefrom and defining an effectively workable corner edge, comprising:

a corner tooth adapter having an elongated body of three longitudinally arranged sections including a centrally disposed solid body portion, an integrally forwardly extending nose portion, and an integrally rearwardly extending gripping portion with a strong inwardly facing L-shaped angle member including a sidewall having a convexly shaped upper surface and a thick base for extended service life and with an inner leg of rugged upright rectangular cross section having a convexly shaped upper surface coextending deeply rearwardly therefrom which define between them a rearwardly L-shaped cavity that interlockingly closely receives the sidewall member and the leading cutting edge member protectingly at the intersection thereof whereupon said angle member embraces the outside of the corner edge and said inner leg lies in load bearing engagement substantially for its full length within the corner edge;

a replaceable wear tip removably mounted on said nose portion of said adapter; and
retaining means intermediate said corner tooth adapter and the loader bucket, and intermediate said replaceable wear tip and said nose portion to permit quick release thereof for servicing purposes and to allow working operation of the bucket corner edge without said adapter and said tip.

4,007,551

ORNAMENTAL GREETING CARD DISPLAY

Frank J. Vernon, 131 Central Ave., Bogota, N.J. 07603
Filed June 27, 1975, Ser. No. 591,082

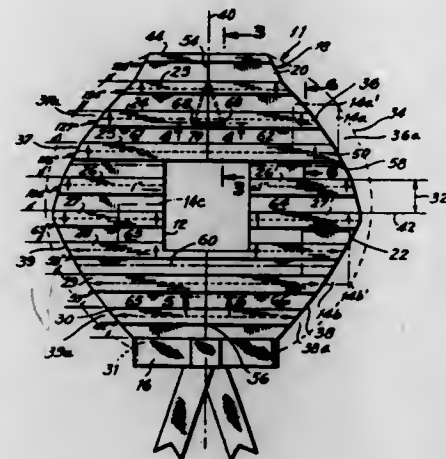
Int. Cl.² G09F 1/10

U.S. Cl. 40-124.2

8 Claims

1. A display device for mounting greeting cards each having a dimension at least equal to a predetermined value, comprising a generally annularly or wreath-shaped support member having a substantially flat surface and outer and inner peripheral edges bounding said surface; a plurality of elongate substantially parallel mounting strips spaced along one planar direction of said surface said strips being oriented in horizontal directions when the device is mounted for use, the spacing between adjacent strips being equal to the predetermined value, each of said strips being connected on said support member at only one elongate edge thereof to form an opening in the nature of a card-receiving pocket between the other elongate edge of the respective strip and said support member, the openings of all said strips facing the same direction along

said planar direction, said strips having the opposing ends thereof each extending to at least one of said peripheral edges, and being at least partially open at the end edges thereof to permit greeting cards to be received within the respective pockets and to extend beyond the ends of said strips and said peripheral edges, whereby insertion of greeting cards in overlapping relation into all said pockets formed by said strips along the entire lengths and beyond the ends thereof so as to



project beyond said peripheral edges covers said support member and said strips above the lowermost strip; and decorative covering means mounted on said support member for covering the lowermost strip and that part of said support member not covered by the greeting cards, whereby said support member and all said strips are totally hidden from view and said display device is covered with an array of greeting cards which generally assumes the shape of said support member.

4,007,552

EXTRUDED ALUMINUM SIGN FRAME SYSTEM

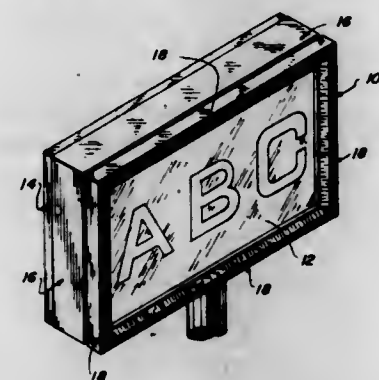
Jackson R. Brooks, Fort Collins, Colo., assignor to ABC Extrusion Company, Fort Collins, Colo.

Filed Sept. 4, 1973, Ser. No. 393,927

Int. Cl.² G09F 7/18

U.S. Cl. 40—130 R

19 Claims



1. A sign frame assembly for constructing a hollow peripheral frame that supports a sign display panel comprising: an extruded main frame member having a generally flat main panel; a pair of opposed side webs integral with said main panel and extending along the opposite side edges thereof; cover support flanges, integral with each of said side webs, extending along the edge of each side web remote from said main panel and projecting from the respective side webs into spaced overlying parallel relationship with said main panel; a generally flat cover member adapted to span the space between said support flanges; longitudinally extending rib means on said cover member projecting from the interior side of said cover member along the opposite side edges thereof;

said support flanges of said main frame member having longitudinally extending rib receiving recesses therein located to receive said ribs to releasably clamp said cover member to said main frame member and cooperatively define a closed hollow tubular structure; and an extruded retainer member having a first web adapted to lie in face-to-face engagement with one of said support flanges, alignment means on said first web for locating said retainer member upon said main frame member and a second web on said retainer member having a portion disposed in perpendicular relationship to said first web and adapted to clamp a sign display panel against the exterior side of said side web.

4,007,553

SAFETY INDICATORS FOR GUNS

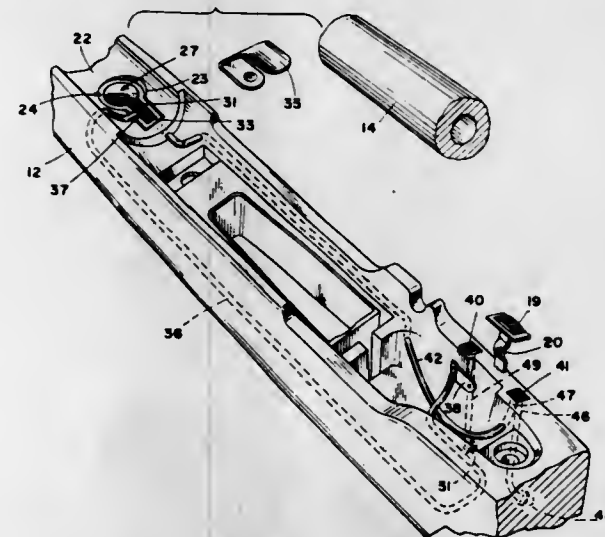
Kessler Q. Clegg, 904 Perkinswood SE., Warren, Ohio 44484

Filed Aug. 4, 1975, Ser. No. 601,380

Int. Cl.² F41C 17/00, 11/04

U.S. Cl. 42—1 A

4 Claims



1. A safety indicator device for a gun having a barrel, a stock and a safety mechanism for selectively setting the gun in a first condition for firing or in a second condition to prevent firing, said safety mechanism including a slide member mounted on said gun for movement between first and second positions corresponding respectively to said first and second conditions, said indicator device comprising a first jewel mounted on said gun adjacent said slide member and exposed by said slide member in said first position and covered thereby in said second position, a battery, light bulb and electrical circuit therebetween mounted in said gun, and including switch means cooperatively associated with said slide member for closing said circuit to energize said bulb when said slide member is in said first position, and opening said circuit in said second position, a first light-transmitting conduit means mounted on said gun extending between said light bulb and said jewel thereby to internally illuminate said jewel when said slide member is in said first position, and, second light-transmitting conduit means mounted in said gun to extend from said jewel to a point on the exterior thereof thereby to pick up ambient light to illuminate said jewel in the event of electrical failure with concomitant absence of positive light bulb illumination.

4,007,554

ADJUSTABLE GUN SUPPORT

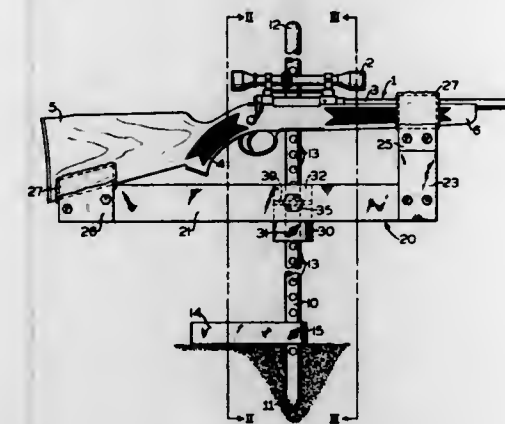
Glenn D. Helmstadter, 381 Niagara Drive, North Huntingdon, Pa. 15642

Filed May 5, 1975, Ser. No. 574,350

Int. Cl.² F41C 29/00

U.S. Cl. 42—94

10 Claims



1. An adjustable gun support comprising, an elongated unipod having one end pointed for ground affixation, said elongated unipod member accommodating a step-on member for depressing said pointed end of said elongated unipod member into the ground, a two-point contact cradle member cooperatively associated with said elongated unipod member for steadily holding a gun in place, means for allowing said cradle member to be adjusted to various positions along the length of said elongated unipod member and spring-loaded means for allowing the gun to be unaidedly carried by said cradle member yet to be facily rotated and pivoted for sighting-in on a target.

4,007,555

COMBINATION OF BLOCK UNITS

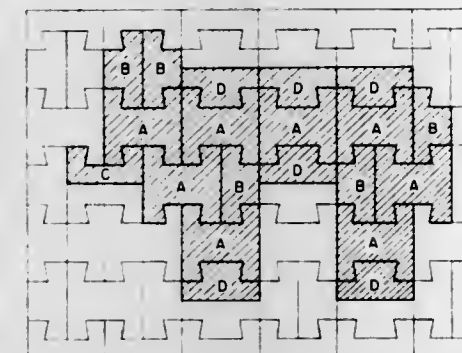
Nobuhiko Sasaoka, Tokyo, Japan, assignor to Okamura Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1976, Ser. No. 647,623

Int. Cl.² A63H 33/08

U.S. Cl. 46—25

6 Claims



1. A combination of block units comprising: a generally H-shaped block unit having a configuration including two symmetrical grooves extending in Y-axis direction in a basic rectangular parallel-piped having X-, Y- and Z-axes intersecting with the right angle with each other, each of said grooves has a base wall which is parallel with X-axis and oppositely inclining side walls intersecting with the base wall with an acute angle, the distance between the centerlines extending in Y-axis direction on the side walls being half of the length of said parallel-piped in the X-axis direction, a generally T-shaped block unit having a configuration attained by bisecting the H-shaped block unit along the X- and Z-axes thereof, a generally U-shaped block unit having a configuration

attained by bisecting the H-shaped block unit along the X- and Y-axes thereof, and a generally T-shaped block unit having a configuration complementary to the U-shaped block unit.

4,007,556

FOAM BODY AND PROCESS FOR THE PRODUCTION THEREOF

Maternus Glück, Leonding-Doppel; Walter Kriegner, and Bernhard Eder, both of Linz, all of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 184,406, Sept. 28, 1971, abandoned.

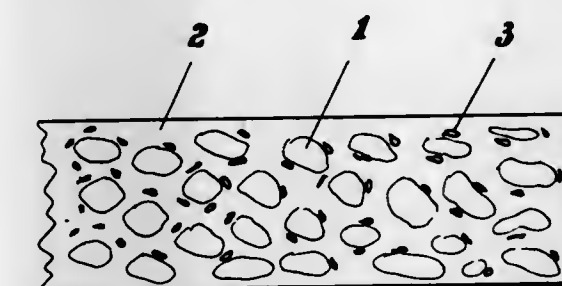
This application May 14, 1973, Ser. No. 360,321

Claims priority, application Austria, Oct. 1, 1970, 8859/70

Int. Cl.² A01C 1/04

U.S. Cl. 47—56

1 Claim



1. Process for the manufacture of a seed growing body characterized in that a foamed binding agent is added to a mixture of polyurethane foam-pieces and seeds whereupon the resulting mixture is moulded.

4,007,557

PIVOT HUNG POWER OPERATED DOOR AND INERTIA INSENSITIVE DISCONNECTABLE DRIVE LINKAGE THEREFOR

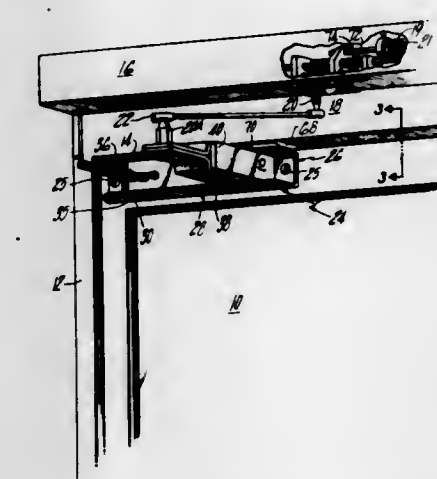
William R. Davis, West Simsbury, and William H. Flaherty, Jr., Bristol, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Mar. 3, 1975, Ser. No. 554,632

Int. Cl.² E05F 15/54

U.S. Cl. 49—139

6 Claims



1. A power operated pivot hung door suited for bi-swinging movement, a power operator for powering the door through a door opening and closing cycle in one direction from the door closed position, and an inertia insensitive disconnectable drive linkage for connecting the operator to the door, said drive linkage comprising a door bracket fixed to the door and an operator arm pivotally mounted thereto, said operator arm providing a drive arm offset from the pivot axis of the door, means operatively connecting said drive arm to said power operator, a latch for positively locking said operator arm to

said bracket during the normal powered operation of the door regardless of the forces imposed thereon, and latch release means automatically operable to release said operator arm for pivotal movement relative to said bracket only when the door is swung beyond said door closed position in the direction opposite to said one direction for emergency operation.

4,007,558

TURNABLE WINDOW ARRANGEMENTS

Bernhard Heggdal, deceased, late of Hamsøy, Norway (by Helene Heggdal, legal representative), assignor to Leif N. Austines, Hamsøy, Norway

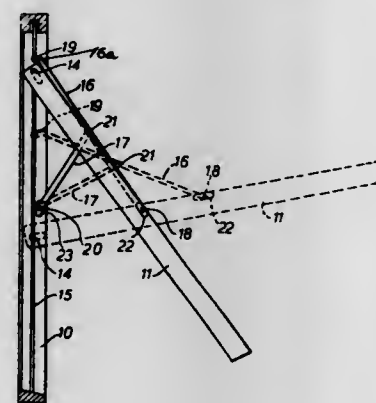
Filed Jan. 29, 1976, Ser. No. 653,396

Claims priority, application Norway, Apr. 30, 1975, 751542

Int. Cl.² E05D 15/44

U.S. Cl. 49-252

5 Claims



1. A turnable window arrangement which comprises a window frame having a guide groove extending along each of two opposing sides between upper and lower ends thereof, a casement having a pair of oppositely directed pivot pins at an end thereof which is uppermost when said casement is in a normal closed position relative to said frame, said pivot pins being displaceable in said casement in a direction substantially parallel to the height dimension of said casement and slidably engaging said guide grooves to permit said end of said casement to be displaced to selected pivotal positions between said upper and lower frame ends, said pivot pins being displaceable in said casement from the uppermost end thereof towards its opposite end against resilient means, and a link arm mechanism arranged on opposite sides of said casement to support the latter in said frame at said pivotal positions.

4,007,559

MACHINE FOR REPRODUCING AN ARTICLE FROM A PATTERN

Dzidris Guillard, Paris, France, assignor to Societe C.M.V., Puteaux, France

Filed Oct. 29, 1974, Ser. No. 518,957

Claims priority, application France, Oct. 26, 1973, 73.38221

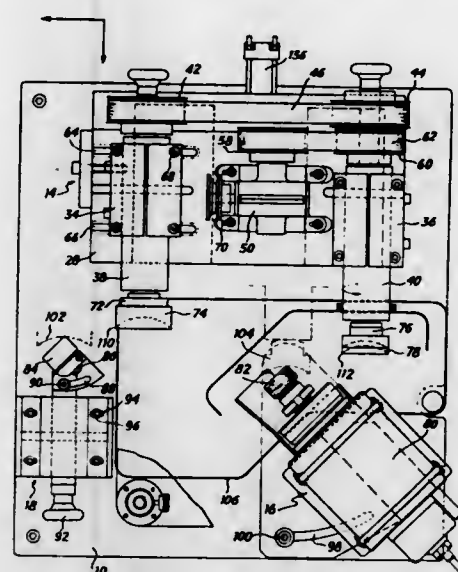
Int. Cl.² B24B 17/02

U.S. Cl. 51-101 LG

3 Claims

3. In a machine for reproducing an article from a pattern, the machine comprising a drive means, a pair of parallel supporting shafts adapted to be driven at the same continuous rotational speed by said drive means for supporting said article and said pattern respectively, a tool and a feeler for contacting said article and said pattern respectively and arranged in a constant spacial relationship equal to the interval between said article and said pattern, the improvement comprising said tool and said feeler being fixed and a table on which said supporting shafts are mounted, said table being capable of making an advance movement in a direction perpendicular to said supporting shafts and a contact movement in a direction parallel to said supporting shafts, said machine further including a motor, wherein said tool and said feeler are in the form of discs of the same diameter rotatable about parallel, fixed

axes of rotation, said tool being driven by said motor and said feeler rotating freely about its axis, and wherein the axes of



rotation of said tool and said feeler are perpendicular to said supporting shafts.

4,007,560

TWO WHEEL LAPPING MACHINE

Jos M. Janssen, Mettmann, Germany, assignor to JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung, Mettmann, Germany

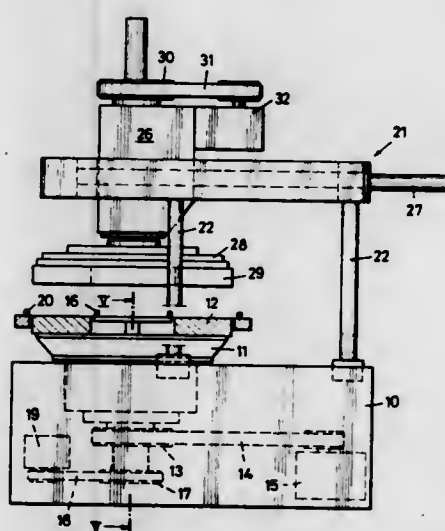
Filed Aug. 18, 1975, Ser. No. 605,762

Claims priority, application Germany, Sept. 3, 1974, 2442081

Int. Cl.² B24B 7/04, 57/00

U.S. Cl. 51-111 R

10 Claims



1. A two wheel lapping machine for surface-, plane-parallel- and external plain- lapping, comprising a machine bed including a main shaft rotatably mounted therein, said main shaft having an upper end, an upper frame including a crosspiece and a plurality of frame support means connected to said crosspiece and to said machine bed for rigidly supporting said crosspiece in a position spaced above said machine bed, a slide horizontally displaceably mounted in said crosspiece, a cylinder rotatably mounted in said slide, a main spindle formed as a piston and mounted in said cylinder axially displaceable and non-rotatable relative to said cylinder, said main spindle having a lower end, an upper lapping wheel carrier mounted on said lower end of said main spindle, a lower lapping wheel carrier on said upper end of said main shaft, and two lapping wheels mounted on said upper and lower lapping wheel carriers, respectively.

4,007,561

DEVICE FOR AUTOMATICALLY LAPPING VALVE SEAT

Masami Okano, Kita-kyushu; Morito Sadamura, Yukuhashi; Muraichi Iwasaki, Kita-kyushu; Takeshi Suzuki, Kita-kyushu; Yasushi Utunomiya, Kita-kyushu; Yoshihiro Yajima, Kita-kyushu; Yozi Yamauchi, Yukuhashi, and Yutaka Terawaki, Kita-kyushu, all of Japan, assignors to Okano Valve Seizo Kabushiki Kaisha

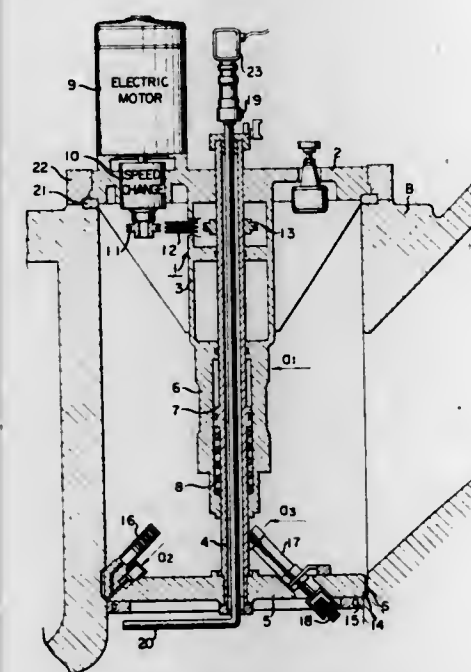
Filed Sept. 15, 1975, Ser. No. 613,300

Claims priority, application Japan, Sept. 17, 1974, 49-106021

Int. Cl.² B24B 9/00, 23/00

U.S. Cl. 51-241 VS

4 Claims



1. A device for automatically lapping a valve seat, comprising, in combination, a supporting plate for securing said device to a valve body including a valve seat to be lapped, a sleeve member pendent from the central portion of said supporting plate, a hollow driven shaft extending through both said supporting plate and said sleeve member to have one end portion slightly projecting beyond said supporting plate and the other end portion projecting beyond said sleeve member, fluid operated cylinder means disposed in said sleeve member on that side remote from the supporting plate, a piston member disposed on the driven shaft to cooperate with said cylinder means to longitudinally move said driven shaft, a lapping plate attached to the extremity of said other end portion of said driven shaft and including a peripheral edge capable of being intimately contacted by said valve seat through the longitudinal movement of said driven shaft when said supporting plate is positioned on said valve body, driving means for driving said driven shaft along with said lapping plate, and automatically supply means disposed on said lapping plate to automatically supply a lapping agent to said peripheral edge of said lapping plate.

4,007,562

GRINDING APPARATUS FOR COMMUTATORS

Hiroji Egashira, 6-25, 6-chome, Shinmachi, Hoya, Tokyo, Japan

Filed Jan. 12, 1976, Ser. No. 648,742

Claims priority, application Japan, Sept. 26, 1975, 50-116854; Nov. 14, 1975, 50-136837

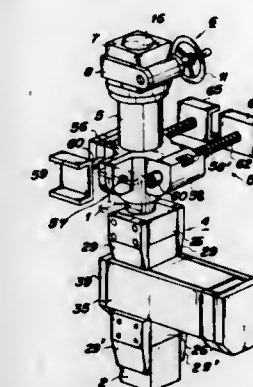
Int. Cl.² B24B 19/00

U.S. Cl. 51-244

6 Claims

1. A grinding apparatus for reforming a surface of a commutator of a motor comprising a guide sleeve, a main spindle slidably movable in said guide sleeve, feeding adjustment means on said sleeve for fine adjustment of movement of the spindle in the sleeve for adjusting the cutting depth of the main spindle relative to the commutator, holder means

mounted on said main spindle for mounting a grinding stone, and clamping means mounted coaxially on said main spindle for installing the apparatus in an opening of a casing of the motor, said clamping means comprising a main clamp positionally adjustable relative to said guide sleeve and having opposite sides, subclamps releasably mounted on both sides of said main clamp and having respective channels, a sleeve



4,007,563

DECK ANCHOR

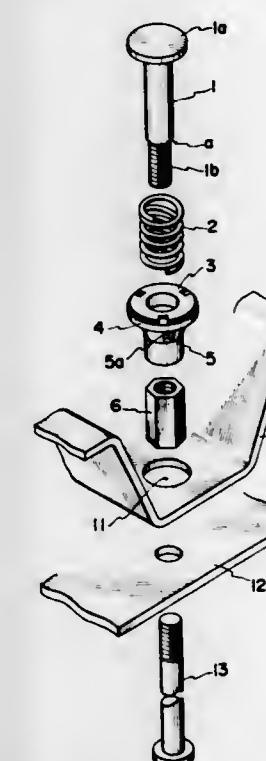
Momoki Nakagawa, 1-8-4 Sakai, Musashino, Tokyo, Japan

Filed June 2, 1975, Ser. No. 583,324

Int. Cl.² E04B 1/16

U.S. Cl. 52-98

6 Claims



1. In a deck anchor, for use in concrete building structures of the kind comprising:
i. a bolt including a head and a stem, said stem having a smooth portion adjacent said head and a screw-threaded portion remote from said head
ii. an assembly including a washer slidable on the smooth portion of the stem, and a coaxial collar slidable on the threaded portion of the stem, said washer and collar being formed of resiliently deformable material, and said collar being axially slotted, and
iii. a nut threadedly engaged on the threaded portion of said stem,
the improvements which comprises, in combination:
a. said stem having said threaded portion of less diameter

than said smooth portion thereof, thereby to present a radial shoulder where said portions meet

- b. said collar including an internal radial shoulder adapted to abut against said radial shoulder of the stem, thereby to permit the transmission of axial driving force from the bolt to the collar in the direction from the bolt head towards the nut
- c. said collar including a frusto-conical portion having a plurality of angular spaced axial slots, and a cylindrical portion connected integrally to the narrower end of said frusto-conical portion, and
- d. said frusto-conical portion being connected at its broader end to said washer by a plurality of fractureable bridging pieces disposed at angularly spaced positions about said frusto-conical portion intermediate neighbouring axial slots.

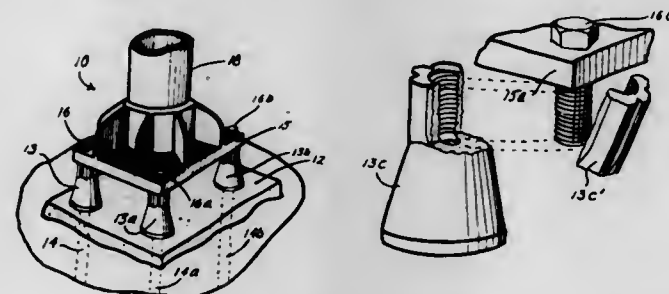
4,007,564

BREAKAWAY COUPLING AND ASSEMBLY

Douglas B. Chisholm, 1906 Memory Court, Vienna, Va. 22180
Continuation-in-part of Ser. Nos. 519,760, Nov. 12, 1974, abandoned, and Ser. No. 628,641, Nov. 4, 1975, abandoned, said Ser. No. 519,760, is a division of Ser. No. 350,173, April 11, 1973, abandoned, said Ser. No. 628,641, is a continuation of Ser. No. 539,089, Jan. 7, 1975, abandoned, which is a continuation of Ser. No. 350,173. This application Mar. 23, 1976, Ser. No. 669,476
Int. Cl.² E04B 1/36

U.S. Cl. 52-98

10 Claims



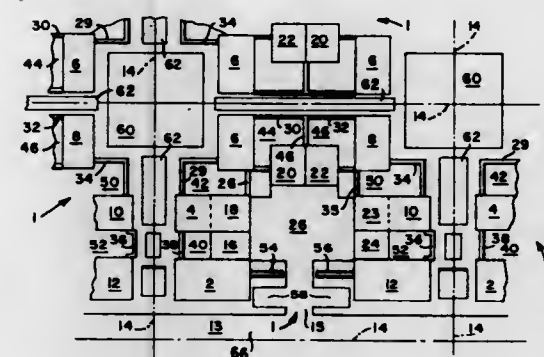
1. An upright standard assembly comprising the combination of a generally vertical standard, a base member, a connection member, and means affixed to one of said base member or said standard for receiving said connection member to releasably attach said standard to said base member, and having a generally vertical axis of connection extending through said connection member, said means comprising coupling means for receiving said connection member and for fracturing radially with respect to said axis of connection in response to an impact force applied to said standard in a generally horizontal direction generally normal to said axis of connection, said coupling means comprising a coupling body generally symmetrically disposed about any plane containing said axis of connection, said body having a first end in operative association with said base member, and a second end in operative association with said upright standard, at least one of said first and second end defining a connection member receiving opening therein, said connection member extending into said body a predetermined length along said axis of connection, said body having a plurality of V-shaped grooves which define regions of minimum strength, said grooves surrounding said connection member receiving opening of said coupling body and extending from said connection member receiving end of said body parallel to said axis of connection and extending at least the length of said predetermined length of said connection member received by said body, and extending so that upon an impact force in a generally horizontal direction acting upon said standard, said coupling means will radially fracture to thereby

release said connection member and thereby provide detachment of said standard from said base member.

4,007,565

DWELLING MODULE

Richard Finnegan, P.O. Box 367, Saratoga, Calif. 95070
Continuation-in-part of Ser. No. 838,599, July 2, 1969, abandoned. This application Oct. 29, 1971, Ser. No. 193,631
Int. Cl.² E04B 1/00; E04H 5/00
U.S. Cl. 52-169.3 5 Claims



1. A cluster of dwelling modules comprising at least four dwelling modules, each of said dwelling modules having a plurality of automobile shelters disposed about in an inner substantially U-shaped configuration defining an automobile court interior thereof having an open end adequate to accommodate passage of automobiles from an auto thoroughfare, said shelters being in substantial abutment to minimize the area of said automobile court, a corresponding plurality of separate and apart family residential dwellings disposed in an outer substantially U-shaped configuration adjacently circumscribing said inner U-shaped configuration, each of said dwellings being disposed adjacent one of said shelters and including front entry means adjacent the exterior of said outer U-shaped configuration, and a walkway circumscribing the exterior of said outer U-shaped configuration and communicating with said front entry means to segregate primary pedestrian access on the exterior of said outer U-shaped configuration from auto access on the interior of said inner U-shaped configuration, four of said modules being disposed adjacent one another in a quadrantal arrangement with a corner of the U-shaped configuration of each module being adjacent the center of said arrangement, the walkways of said modules abutting one another and cooperating to form common malls.

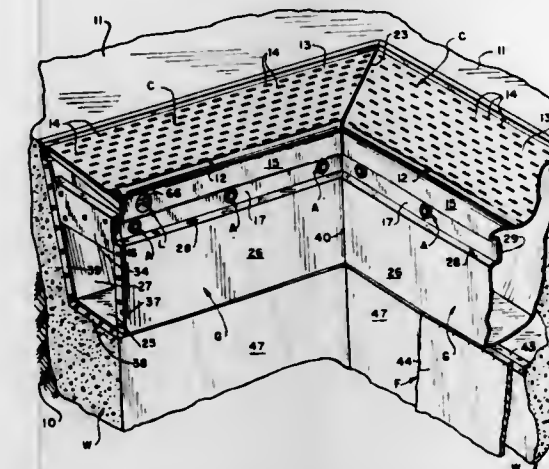
4,007,566

COPING AND GUTTER FOR RIM FLOW SWIMMING POOLS

Victor D. Molitor, Denver, Colo., assignor to Stainless Equipment Company, Englewood, Colo.
Filed June 25, 1973, Ser. No. 373,143
Int. Cl.² E04H 12/00; E02D 27/00
U.S. Cl. 52-169.7 10 Claims

1. A rim flow swimming pool coping assembly having a nose over which water will flow to maintain a desired depth of water in the pool, comprising:
 - a. a longitudinally extended, corrosion resistant sheet having an upstanding nose at its front edge and a front wall depending from said nose, said sheet having a top wall extending rearwardly from said nose for a predetermined distance and having slots therein for drainage of water to a drain beneath said top wall;
 - b. support means for said sheet including a front support extending at a front position upwardly to said front wall which is disposed in overlapping relation to said support;
 - c. said support means having a rear support for said sheet;
 - d. means connecting said sheet to said rear support; and

- e. means at longitudinally spaced positions along said front wall connecting said front wall and front support, said

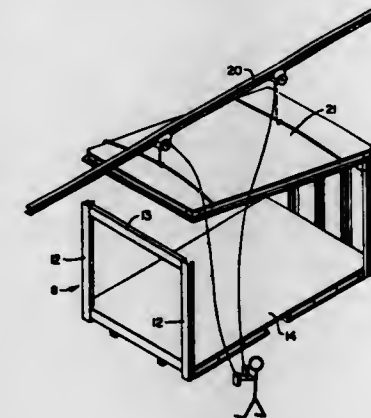


connecting means being adjustable to permit adjustment of said front nose upwardly and downwardly.

4,007,567

TRUCK BODY ASSEMBLY

Edward L. Mooney, and Kenneth L. Pritchard, both of Baltimore, Md., assignors to Pritchard-King, Inc., Baltimore, Md.
Division of Ser. No. 448,197, March 5, 1974, Pat. No. 3,882,592. This application Feb. 13, 1975, Ser. No. 549,662
Int. Cl.² B62D 23/00
U.S. Cl. 52-262 2 Claims

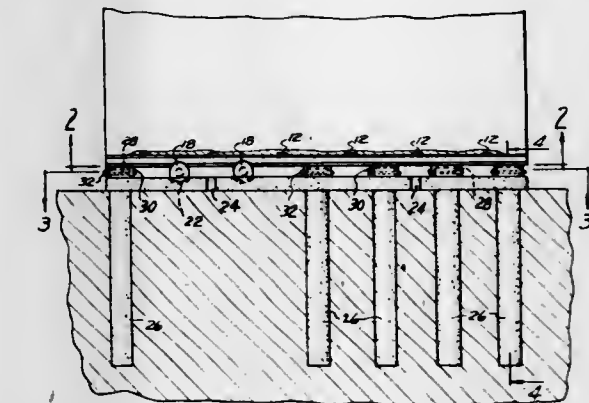


1. The prefabricated parts used in assembling a truck body comprising
 - an underframe assembly;
 - first and second end wall assemblies on opposite ends of said underframe assembly;
 - a roof on said end wall assemblies having side edges and first and second end edges;
 - sidewall assemblies attached to said roof on opposite sides of said roof with vertical edges mating with vertical edges of said end wall assemblies;
 - said roof having a rail along each of its edges with hooking means on both side edge rails, and means to hook said rail along said first end edge to said first end wall, and with a hookless cooperating means along said rail on said second end edge and said second end wall, with said hooking means of said side edge rails for attaching said sidewall assemblies to said roof by tilting said roof and sidewall assemblies in relation to each other to engage to each other;
 - said sidewall assemblies each having a complementary hooking means along its top edge to attach said side wall assemblies to said roof by attachment to said hooking means of said side edge roof rails,
 - said hooking means of said side edge roof rails having a horizontal portion extending outward from said roof, a hook on the outside edge of said horizontal portion, and

a depending flange on the inside edge of said horizontal portion, said complementary hooking means having a top cap complementary with said horizontal portion, a bulbous projection extending into said hook, and a slanted portion means opposite said bulbous projection for aiding the fitting of said complementary hooking means into said hooking means.

4,007,568

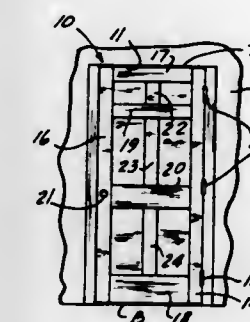
FOUNDATION FOR MODULAR BUILDINGS
Bernard D. Soble, 19151 Berkley, Detroit, Mich. 48221
Filed Mar. 10, 1975, Ser. No. 556,969
Int. Cl.² E02D 27/00
U.S. Cl. 52-294 2 Claims



1. A foundation for retaining a modular building having an underframe employing a pair of elongated steel beams, comprising: a concrete pad having a horizontal surface with dimensions at least equal to the dimensions of the underside of the building; concrete piers formed through the pad and extending downwardly from the lower surface of the pad, said piers being arranged in two rows spaced from one another by the same distance as the steel beams of the building; first cylindrical steel tubes supported centrally through each pier, and with the upper end of each tube substantially flush with the upper surface of the pad, the lower end of each tube being disposed substantially below the lower surface of the pad; a plurality of second steel tubes having outer dimensions complementary to the inner dimensions of the first steel tubes so that the second steel tubes may telescope within said first steel tubes; and means for securing one end of each of the second steel tubes to the underside of the steel beams so that the second steel tubes telescope within the first steel tubes and allow vertical motion of the modular building relative to the pad while restraining horizontal movement.

4,007,569

METHOD AND MEANS FOR SEALING DOOR EDGES
Norman E. Hascall, 1035 E. State Street, Geneva, Ill. 60134
Filed Feb. 2, 1976, Ser. No. 654,167
Int. Cl.² E04C 2/20
U.S. Cl. 52-309.3 4 Claims



1. In combination, a wooden stile and rail door having vertical stiles and top

and bottom rails forming top and bottom door edges and such door edges normally constituting unfinished moisture-absorptive areas, and including sticking on each stile and on each rail formed in complementary male and female configurations and together with one another forming a matched joint between a corresponding stile and rail which intersects a corresponding top and bottom door edge, which joint is susceptible to expansion and will form a passage or leakage joint along which moisture may travel to the interior of the door,

a thin, continuous moisture-imperious sheet-form member for completely covering a door edge and for bridging said matched joint between the corresponding stile and rail to form a barrier blocking the passage or leakage joint and preventing leakage of moisture into the stiles, the rails, and the joints of the door,

and pressure-sensitive adhesion means between the sheet-form member and the adjoining edge of the door bonding such sheet-form member and said door in sealed-together conforming relation,

the material of said sheet-form member comprising a vinyl plastic exhibiting a moisture-permeability measured in terms of a water transfer rate in the order of about 2.0 gr. H₂O/100 square inches/24 hours, thereby to seal the absorptive area and to prevent entry of moisture into the door edge,

said sheet-form member being further characterized by said material of said sheet-form member having a minimum tensile strength in the order from at least 10 lb./in. width,

thereby to withstand expansion so that said sheet-form will continue to bridge and seal the matched joints for the purposes set forth.

4,007,570

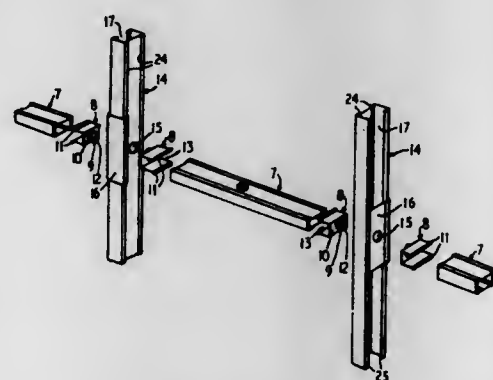
SUPPORT FOR NOGGING STRIPS IN WALL FRAMES
Richard Henry Hunter, Elanora Heights, Australia, assignor to Rondo Building Services Pty. Limited, Australia
Filed Feb. 18, 1975, Ser. No. 550,707

Claims priority, application Australia, Feb. 25, 1974, 6719/74.

Int. Cl.² E04C 3/00

U.S. Cl. 52-317

5 Claims



1. A wall frame comprising at least one pair of spaced upright studs with each stud of said pair being provided with an aperture at nogging level, at least one pair of nogging clips with each clip of said pair being of substantially U form with a hole in the base of the clip and an outwardly protruding collar surrounding said hole, each of said nogging clips of said pair having said protruding collar located within said aperture of a respective one of said studs, and a nogging strip supported between said pair of studs with its opposite end portions located between the arms of respective ones of said pair of nogging clips, said studs and nogging clips formed of folded sheet metal and each protruding collar formed by outwardly bending a marginal edge portion surrounding said hole, said studs being substantially C-shaped in cross section and having longitudinal formations facilitating interlocking two stud lengths in box form, said nogging strips provided in interlocking box form with a hole in one of their walls, certain of said nogging clips having elongated stepped arms extending through the open side of said C-shaped stud to the interior thereof, and the protruding collars on these nogging clips being of smaller size than the collars of other nogging clips and being telescopically engaged within the protruding collars of said other clips, the collars of said other clips being in turn received within said stud aperture.

locked box form with a hole in one of their walls, certain of said nogging clips having elongated stepped arms extending through the open side of said C-shaped stud to the interior thereof, and the protruding collars on these nogging clips being of smaller size than the collars of other nogging clips and being telescopically engaged within the protruding collars of said other clips, the collars of said other clips being in turn received within said stud aperture.

4,007,571

PANEL ATTACHMENT SYSTEM

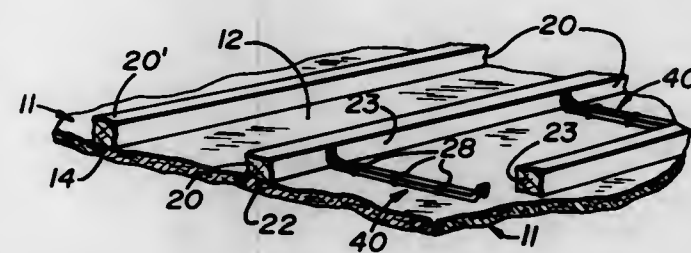
Maurice J. Marchello, Hickory Hills, and Gordon H. Bassett, Buffalo Grove, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Mar. 27, 1972, Ser. No. 241,612

Int. Cl.² E04F 13/08

U.S. Cl. 52-483

2 Claims



1. In an assembly including a panel, a plurality of spaced apart, generally coplanar framing members for supporting said panel and a plurality of elongate supports attached to one surface of said panel and extending between adjoining framing members; the improvement wherein

the opposite ends of each said support are attached to two adjacent framing members at opposed, facing surfaces of said adjacent members, said supports not being directly connected one to the other, and said supports intimately contact said panel surface substantially the length of the supports, and

wherein said assembly is a ceiling assembly, said panel is a ceiling board having opposed edges, and said members are rafters, one of the edges of the panel being attached to a rafter the edge of which extends beyond said edge of the panel said assembly further including fasteners straddling each of said supports and penetrating into, but not through, said panel, and wherein said fasteners are staples characterized as having a divergent extension of their ends, and wherein the supports are characterized by an anvil shape the sides of which diverge; whereby the supports cause the staples to take divergent shape as they are driven into the panel back surface over the supports.

4,007,572

HOG SLAT REINFORCING BAR SUPPORT

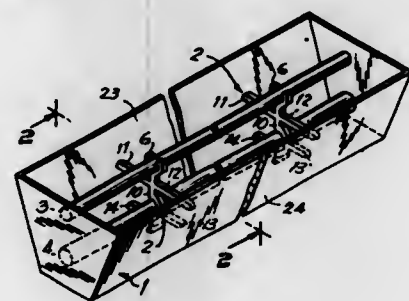
Robert J. Ilukowicz, Coram, N.Y., assignor to Preco Industries, Ltd., Plainville, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,635

Int. Cl.² E04C 5/16; E04G 17/06

U.S. Cl. 52-687

4 Claims



1. A hog slat reinforcing bar support comprising a one-piece elongated structural member having substantially triangular cross-sections along the longitudinally extending axis of the elongated members, and said structural members including means joining said members together to provide a support framework skeleton of vertical and horizontal structural components transmitting forces in compression, tension, shear, bending, torsion and any combination thereof; said substantially triangular cross-sections providing each member with three outer faces;

plastic body including first and second support portions for respective reinforcing bars, each portion including a surrounding wall with an opening through which a reinforcing bar can be inserted, means connecting said portions, and projecting members defining a plurality of support points by which said body can be stably supported in a form and the reinforcing bars held in predetermined positions within said form whereby upon the casting of concrete within said form the reinforcing bars will be placed within the cast body at predetermined positions therein, said support portions being aligned and said connection means comprising a straight connecting piece joining said support portions; said projecting members including two pairs of arms extending laterally with respect to said straight connecting piece and a projection at the bottom of said body in alignment with said connecting piece, one of said pairs of arms being disposed above the other pair and having a greater length than said other pair, said arms of said other pair being disposed at different levels.

4,007,573

TRUSS TOP BEARING CLIP

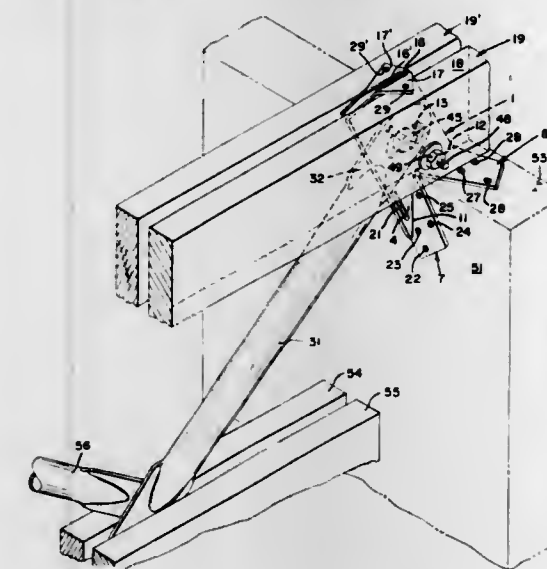
Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Feb. 9, 1976, Ser. No. 656,308

Int. Cl.² E04C 3/02

U.S. Cl. 52-696

7 Claims



1. A truss top-bearing clip comprising:

- a generally rectangular planar metal sheet having side edges with a portion forming a web support portion;
- said sheet is sheared along a line running generally parallel to the long dimension of said sheet, spaced from said side edges, dividing a portion of said sheet into first and second flanges;
- said first flange is bent along a first bend line at an angular relation to said shear line so that said first flange is at right angles to said web support portion;
- said second flange is bent along a second bend line at an angle to said shear line and at a greater angle to said first line so that said second flange is at a right angle to said web support portion and to said first flange; and
- an opening formed in said web support portion.

4,007,574

STRUCTURAL MEMBER AND SYSTEM

C. Randolph Riddell, 4141 Tennyson, Houston, Tex. 77005

Filed Sept. 22, 1975, Ser. No. 615,162

Int. Cl.² E04C 3/34, 3/30

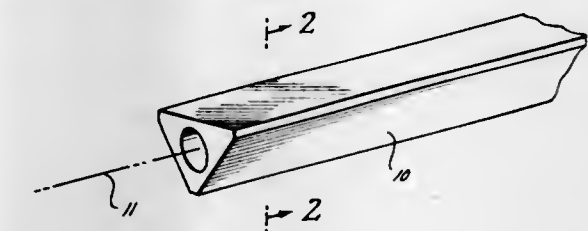
U.S. Cl. 52-722

6 Claims

1. A structural system, comprising:

- a plurality of elongated structural members having substantially triangular cross-sections along the longitudinally extending axis of the elongated members, and said structural members including means joining said members together to provide a support framework skeleton of vertical and horizontal structural components transmitting forces in compression, tension, shear, bending, torsion and any combination thereof; said substantially triangular cross-sections providing each member with three outer faces;

tural members including means joining said members together to provide a support framework skeleton of vertical and horizontal structural components transmitting forces in compression, tension, shear, bending, torsion and any combination thereof; said substantially triangular cross-sections providing each member with three outer faces;



each member having a substantially circular axial passage therethrough defining an inner surface of a substantially circular passageway extending parallel to the longitudinal axis of the member and substantially at the centroidal axis of the member to reduce the weight of the member; and non-supporting elements comprising electrical, plumbing, ventilation or sprinkler systems installed in said structural system for which said passageways serve as conduits.

4,007,575

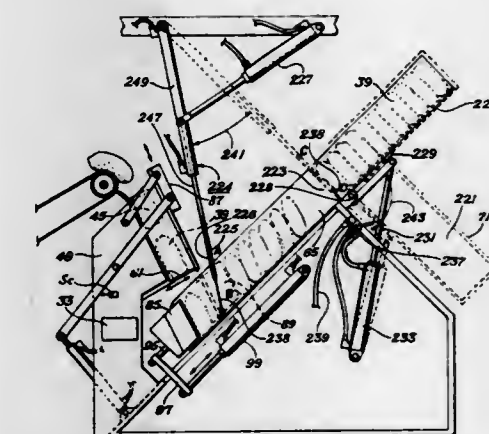
SEMI-AUTOMATIC PACKING OF PACKAGES

Carl C. Hartman, 415 N. Pacific COH, Mineola, Tex. 75773
Division of Ser. No. 454, 449, March 25, 1974, Pat. No. 3,890,764, which is a division of Ser. No. 267,022, June 28, 1972, Pat. No. 3,815,321. This application Mar. 5, 1975, Ser. No. 555,567

Int. Cl.² B65B 35/40

U.S. Cl. 53-26

2 Claims



1. A method of semi-automatically packing packages being supplied by automatic packaging apparatus at a rapid rate, comprising the steps of:

- diverting said packages into at least one upstanding chute;
- accumulating respective said packages from said at least one chute on a gate;
- transferring said packages from said gate into an inclined load chute in front of an active ram in a desired position; said load chute being inclined at an angle sufficient for said packages to retain said desired position as they are advanced along said chute by said active ram;
- providing clearance in said load chute for a next plurality of packages transferred from said gate by advancing said active ram and said packages deposited in front thereof; holding said packages; and retracting said active ram to receive an additional plurality of packages from said gate;
- repeating steps a-d until a pre-determined number of packages have been accumulated in said load chute; and, thereafter,
- activating a surge means to move said predetermined number of packages from directly in front of an active

ram; and emplacing said pre-determined number of packages into a container.

4,007,576

METHOD AND APPARATUS FOR CONTROLLING STATIC CHARGES

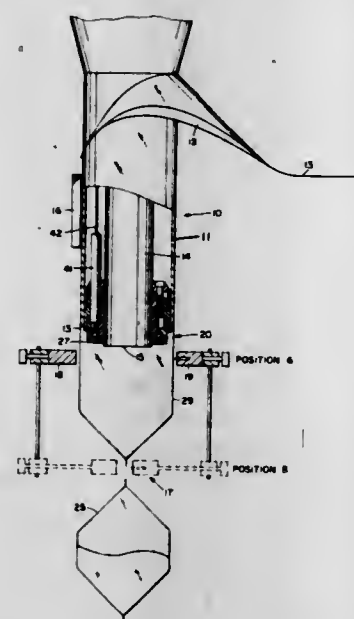
Bruce E. Metz, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 19, 1975, Ser. No. 588,557

Int. Cl.² B65B 61/00

U.S. Cl. 53-28

10 Claims



1. A method for controlling static charges on moving film being formed into packages and being filled with particulate material through a fill tube with said material discharging past the bottom edge of said fill tube comprising: positioning the ionizing portion of a static elimination device in close proximity to the inner surface of said moving film and at the bottom edge of said fill tube; and applying a high voltage to said static elimination device to produce an ionized field about the bottom edge of the fill tube to remove the static charges on both said moving film and on the particulate material passing through said field.

4,007,577

APPARATUS FOR PACKAGING FLUID MATERIALS IN PACKETS

Ernest L. Matthews, and Ralph E. Matthews, both of Decatur, Ala., assignors to Matthews Machine Company, Inc., Decatur, Ala.

Division of Ser. No. 474,164, May 29, 1974, Pat. No. 3,923,084. This application May 22, 1975, Ser. No. 579,930

Int. Cl.² B65B 9/08

U.S. Cl. 53-180 R

3 Claims

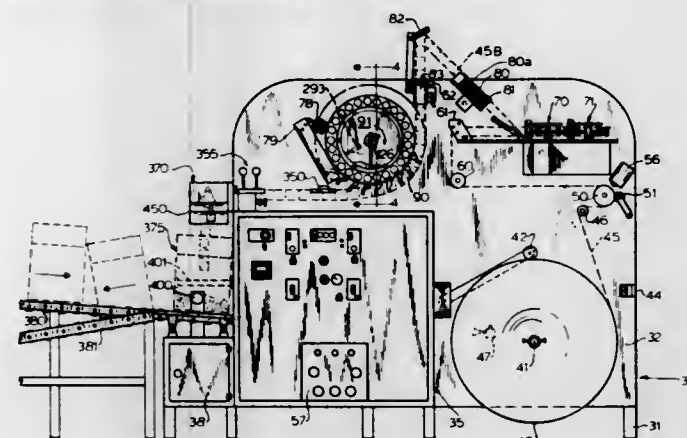
1. In an apparatus for dividing fluid material into uniform units and for packaging the units, which includes:

- a hollow cylindrical filling drum containing a volume of fluid material to be dispensed in discrete units;
- a plurality of uniformly spaced and circularly arranged metering trap chambers formed on the periphery of said drum for rotation as an integral filling structure around a central horizontal axis, each chamber providing at least one open non-linear elongated fluid material flow path extending between an inlet communicating with the interior of said drum and an outlet laterally displaced along said flow path;
- means for rotating said filling structure at a uniform predetermined speed and in a constant direction around

said central axis, each chamber being adapted on each rotation and at said speed to communicate its respective inlet with the interior of said drum at a first rotative station, to receive a portion of said fluid material into said flow path, to discharge through said inlet as said chamber rotates away from said first station all except a quantity equal to one unit of said material, and to guide said unit along said flow path towards said outlet under the influence of the rotative forces asserted thereon as said chamber rotates at said speed towards a second rotative station whereby said unit is discharged from said outlet during passage of said chamber past said second station;

- material supply means including a storage receptacle containing a volume of said material, conveyor means arranged to convey said material from said receptacle to said drum and leveling means independently controlling said conveyor means whereby said conveyor means may operate independently of said drum and being effective to operate said conveyor means intermittently as required to maintain a predetermined level of material in said container;

the improvement, comprising:



- a source in folded heat-sealable strip form of transversely sealed packets;
- means to guide and continuously move said strip of transversely sealed packets to and around a portion of said drum and in synchronism with the presence of said outlets at said second station wherein each said packet may receive and retain a said unit of material and then be moved to a longitudinal sealing station; and
- longitudinal sealing means at said longitudinal sealing station including a longitudinal sealer and means to tension said strip while passing through said longitudinal sealer, said longitudinal sealer comprising a pair of electrically heated laterally spaced bars adapted to receive and longitudinally seal the tops of said packets as the same are passed through and between said bars, said bars providing opposed parallel rectangular heating surfaces having plural changes in direction of curvature from end to end and adapted to cause said packet tops to follow an undulating path during longitudinal sealing thereof whereby the top portions of the opposite external sides of said packet are alternately contacted and heated during said longitudinal sealing.

4,007,578
MOWER

Eugene C. Borstel, Jr., Oregon City, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Dec. 18, 1975, Ser. No. 641,999

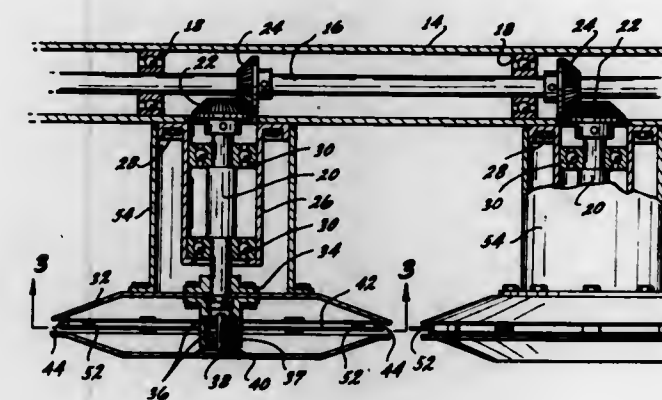
Int. Cl.² A01D 55/18

U.S. Cl. 56-295

5 Claims

1. A mower including a carrier adapted for rotation about an axis defining a circular path at the outermost extension of the carrier, a flexible elongated member having at least one cutter fastened thereto, and mounting means mounting the elongated member to the carrier at spaced locations substan-

tially in the plane defined by said circular path with the cutter positioned between said locations and extended outwardly of the circular path, and further including guard means com-



prising of a protective edge adjacent to and inwardly of the outwardly extended cutter whereby upon impact of the cutter with a hard object the flexible elongated member flexes inwardly to withdraw the cutter behind the protective edge.

4,007,579

SELECTIVE ASPARAGUS HARVESTER

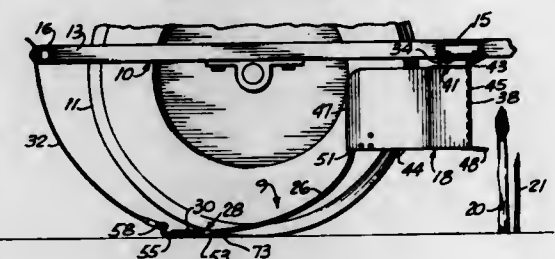
Leslie Wadekamper, 17 Lowe Ahtanum Road, Yakima, Wash. 98903

Filed Nov. 28, 1975, Ser. No. 635,863

Int. Cl.² A01D 45/00

U.S. Cl. 56-327 A

5 Claims



1. An asparagus harvester cutting assembly for selectively cutting mature spears having a prescribed height without cutting immature spears having a lesser height, as the harvester is propelled over the ground, comprising:

- a cutting knife subassembly for riding on the soil surface having a blade adapted for cutting the mature spears at ground level;
- a pair of guide wires attached to the cutting knife subassembly and extending forward therefrom to forward ends for guiding the cutting blade to the mature spears;
- a sensing means operatively mounted to the harvester forward of the cutting knife subassembly at the prescribed height and connected to the front ends of the guide wires for sensing the lateral position of the mature spear and laterally moving the front ends of the guide wires and cutting knife subassembly laterally into alignment with the sensed mature spear to receive the mature spear.

4,007,580

METHOD FOR THE MANUFACTURE OF TWISTLESS OR SUBSTANTIALLY TWISTLESS YARN AND YARN WHENEVER MANUFACTURED BY THE APPLICATION OF THIS METHOD

Jan Nijhuis, Hengelo (O), Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Apr. 23, 1975, Ser. No. 570,729

Claims priority, application Netherlands, May 6, 1974, 7406030

Int. Cl.² D02G 3/04, 3/40

U.S. Cl. 57-140 BY

7 Claims

1. Method of manufacturing twistless yarn or substantially

twistless yarn from a sliver or roving comprising at least two staple fibre components of which at least one is potentially adhesive upon the application of at least a liquid, including the sequential steps of:

- applying liquid to the sliver or roving;
- wet-drafting the sliver or roving to a thinner fibre strand;
- false twisting said thinner fibre strand;
- reapplying liquid to the false twisted fibre strand to increase the liquid content in the fibre strand;
- activating the potentially adhesive component in the fibre strand; and
- drying the fibre strand.

4,007,581

METHOD FOR THE SPINNING AND TWISTING OF YARN ON RING SPINNING FRAMES AND TWISTING FRAMES

Rolf Langer, Peter Thierfelder, and Harald Geisler, all of Karl-Marx-Stadt, Germany, assignors to VEB Spinnereimaschinenbau, Karl-Marx-Stadt, Germany

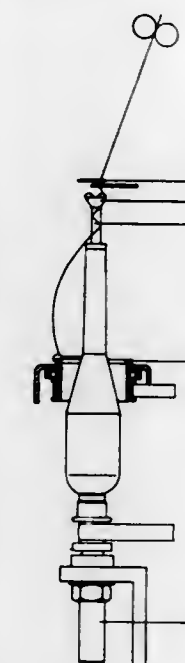
Filed Sept. 18, 1975, Ser. No. 614,385

Claims priority, application Germany, Oct. 25, 1974, 0118190

Int. Cl.² D01H 7/58

U.S. Cl. 57-156

3 Claims



1. In the spinning or twisting of continuous fibrous material at a spinning or twisting frame station comprising a spindle for carrying a bobbin, a ring concentrically mounted about the spindle and supporting a traveler for guiding the fibrous material onto the bobbin, and means for driving the ring and spindle, the improvement comprising engaging the fibrous material at the head of the spindle thereby to reduce or eliminate ballooning of the fibrous material and rotating the ring and the spindle asynchronously with the ring being driven at a lesser rate than the spindle thereby to decrease the tension on the yarn.

4,007,582

METHOD AND APPARATUS FOR SYNCHRONIZING AN ELECTRODYNAMIC CLOCKWORK DRIVE

Robert W. Dugan, and Charles R. Edson, both of Saratoga, Calif., assignors to Eurosl, G.m.b.H., Munich, Germany

Filed Mar. 12, 1974, Ser. No. 450,355

Claims priority, application Germany, Mar. 13, 1973, 2312412

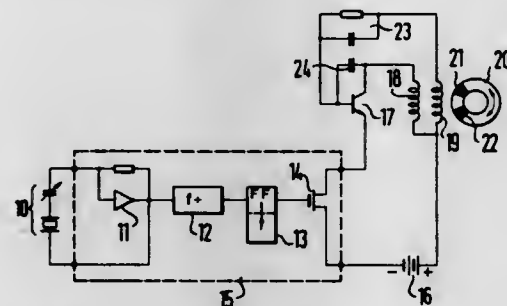
Int. Cl.² G04C 3/00

U.S. Cl. 58-23 A

7 Claims

1. A circuit for synchronizing electrodynamic clockwork drives having a first and second inductor and two permanent magnet assemblies wherein said magnet assemblies are moved

relative to said inductors by a mechanical oscillation system having the inherent frequency f , comprising:
 a switching transistor having a conducting circuit coupled to a power supply and a control circuit;
 said first inductor being disposed in series in the conducting circuit of said switching transistor;
 said second inductor being disposed in the control circuit of said switching transistor whereby current pulses induced in said second inductor by said magnet assemblies switch said switching transistor to its conducting state;
 a source of synchronizing pulses including a series connec-



tion of a quartz controlled oscillator, a frequency divider and a one-shot multivibrator producing synchronizing pulses having a frequency of $2^a \cdot f$ where $a = 1, 2, 3 \dots$ and a duration at least equal to the duration of the current pulses induced in said inductors by said magnet assemblies; and
 a field-effect transistor connected in series in one of said transistor circuits and to the output of said multivibrator for triggering said field-effect transistor by said synchronizing pulses whereby the circuit automatically synchronizes an electrodynamic clockwork drive connected to said mechanical oscillation system.

4,007,583

ELECTRONIC TIMEPIECE

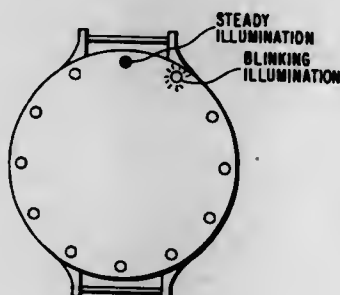
Edward Oscar Johnson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 22, 1975, Ser. No. 579,962

Int. Cl.² G04B 19/24

U.S. Cl. 58—50 R

10 Claims



1. An electronic timepiece comprising, in combination:
 an electrooptical analog display comprising only 12 indicators spaced from one another in positions corresponding to the 12 hour markers on the face of a timepiece, said indicators occupying substantially similar areas and being of substantially similar shape and being distinguishable from one another, in their unactuated condition, only in their relative positions in the display; each indicator representing a different hour when employed to indicate hours, and each representing a different five minute increment when employed to represent minutes;
 means for producing hours signals, one for each of the 12 hours making up a half day;
 means for producing 5 minute signals, one for each of the 5 minute intervals making up an hour;
 means responsive to the production of a five minute signal for selecting and actuating the one of the 12 indicators representing that 5 minute time interval for causing it to produce an optical output; and

means responsive to the production of an hours signal, when that signal represents an hour different from that which would be indicated by the indicator actuated in response to said 5 minute signal, for selecting and actuating the indicator for that hour for causing it to produce an optical output which is optically distinguishable from the optical output produced by said actuated indicator for said 5 minute time interval.

4,007,584

ADJUSTABLE PITCH TOOL BAR ASSEMBLY FOR TRACK PRESSES

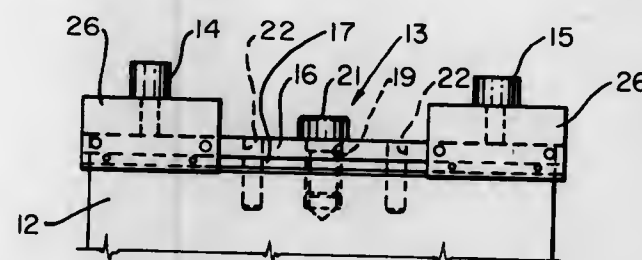
William H. Wolff, 216 A Horton Ave., Atherton, Calif. 94025

Filed Mar. 22, 1976, Ser. No. 668,977

Int. Cl.² B21L 5/00

U.S. Cl. 59—11

3 Claims



1. An adjustable pitch tool bar assembly for mounting on the movable head of a track press of the type adapted to receive a track chain having pins and bushings and present the chain to the movable head for removing or inserting the track pins and bushings during assembly and disassembly of a track comprising: an elongated tool bar track, said tool bar track including means for receiving a mounting bolt for securing the bar to the movable head, a pair of U-shaped tool blocks mounted on said tool bar track with their legs straddling the track for independent movement therealong, means carried by said legs cooperating with the track for holding said blocks on said track, pin and bushing tool assemblies including securing means, and means on said blocks for receiving said pins and bushing tool securing means to hold said pin and bushing tool assemblies whereby the blocks may be moved along the track to adjust the spacing of the pin and bushing tools to accommodate various track pitches.

4,007,585

TAPE TYPE YARN FEED SYSTEM FOR A KNITTING MACHINE

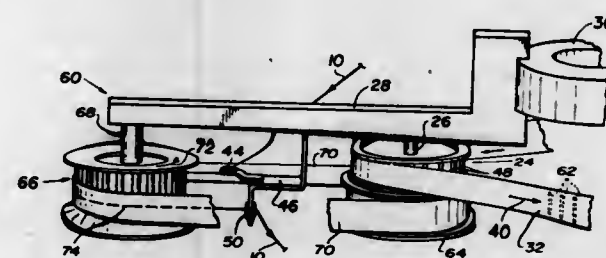
Robert Vossen, 35 E. Woods Drive, Huntington, N.Y. 11743

Filed Nov. 20, 1975, Ser. No. 633,711

Int. Cl.² D04B 15/48

U.S. Cl. 66—132 T

1 Claim



1. In a knitting machine of the type having a control tape for causing yarn feed movement from elevated supply stations to knitting stations located beneath and in vertically aligned relation to said supply stations, the improvement thereto comprising an arrangement of rotatable tape-supporting wheels operatively arranged to support a closed loop of said control tape in surrounding relation about said vertically aligned supply and knitting stations and thereby to be powered in rotation in response to longitudinal movement of said con-

trol tape in a looped path, a first auxiliary wheel connected in depending relation to each of a cooperating one of said tape-supporting wheels so as to rotate in unison therewith, a second auxiliary wheel rotatably mounted in an operative clearance position from each said first auxiliary wheel and in a radial orientation to said vertically aligned supply and knitting stations, a radially oriented second closed loop of tape entrained about each cooperating pair of said first and second auxiliary wheels so as to be urged by said rotation of said first auxiliary wheel through feed movement including a partial wrap about said second auxiliary wheel, and a single yarn fed in an interposed position between said second tape loop and said second auxiliary wheel at said partial wrap therebetween so as to be urged by said second tape loop through feed movement at a speed corresponding to the movement speed of said control tape but without actual contact therewith.

4,007,586

SPIN NOZZLE AND THRUST AUGMENTOR MECHANISM

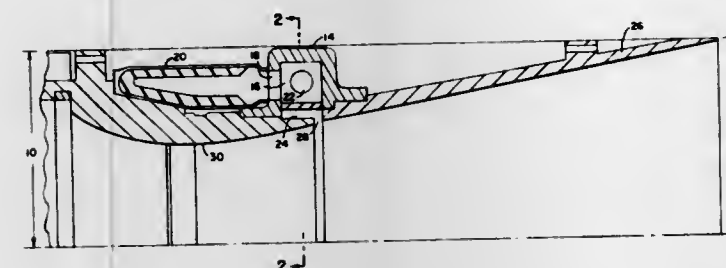
Joseph J. McDermott, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 10, 1975, Ser. No. 630,114

Int. Cl.² F02K 1/24

U.S. Cl. 60—201

3 Claims



1. A spin and thrust augmentor mechanism for pre-spinning a missile prior to launching and increasing total missile thrust comprising: a missile having a main motor diameter of the same diameter as the motor exhaust exit cone; a plurality of spin nozzles disposed within and around said main motor diameter, said nozzles including a chamber provided with a fuel or gas inlet and an exit outlet, said nozzle exit outlet being smaller in size than said nozzle inlet to compress gas exiting therefrom and a plenum chamber disposed to collect the spin exhaust gases from all of said nozzles and to direct said gases into the motor exhaust cone to increase missile thrust.

4,007,587

APPARATUS FOR AND METHOD OF SUPPRESSING INFRARED RADIATION EMITTED FROM GAS TURBINE ENGINE

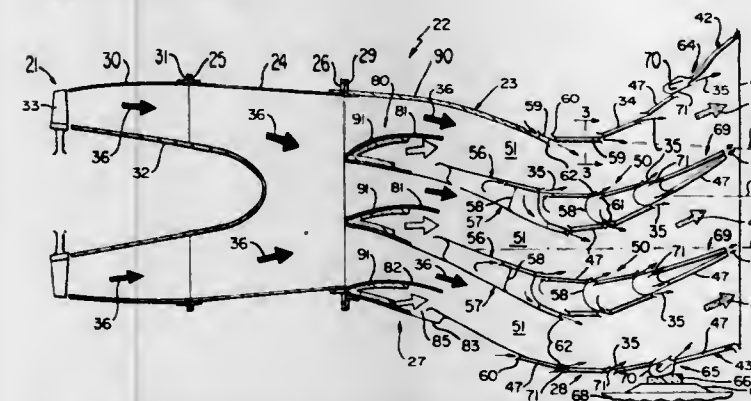
Clifford R. Banthin, Easton; Gary W. Decko, Wethersfield, and John F. Hurley, Huntington, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,226

Int. Cl.² F02K 1/02, 1/26

U.S. Cl. 60—204

25 Claims



1. An apparatus for suppressing infrared radiation emitted

from hot metal parts at the aft end of a gas turbine engine and from the exhaust gas plume thereof during engine operation comprising a dual purpose ejector vane assembly operatively attached to said engine for introducing cooling ambient air into the hot engine exhaust gases and hiding said hot metal parts and means attaching said vane assembly to said engine, said vane assembly comprising, a tubular duct structure for receiving a confining said engine exhaust gases, and ejector means providing at least one stream of cooling ambient air completely across said duct structure to break the exhaust gases confined by said duct structure during engine operation into a plurality of separate exhaust gas streams and provide optimum mixing of said one stream with said exhaust gases completely across said duct structure.

4,007,588

IDLING AND PART-LOAD CONTROL OF IGNITION DISTRIBUTOR RESPONSIVE TO PRESSURE UPSTREAM OR DOWNSTREAM OF THROTTLE VALVE

Klaus Müller, Sevetal, Germany, assignor to Exxon Research and Engineering Company, Linden, N.J.

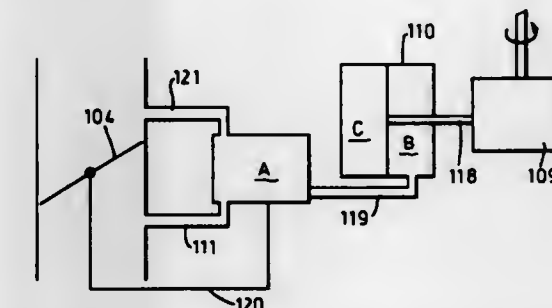
Filed May 20, 1974, Ser. No. 471,598

Claims priority, application Germany, May 22, 1973, 2325807

Int. Cl.² F01N 3/00; F02P 5/04

U.S. Cl. 60—274

5 Claims



1. A method of operating a spark ignition automotive engine provided with an exhaust gas reactor device, said engine having an intake manifold, a carburetor connecting with said manifold and a throttle valve in the carburetor, said method comprising retarding the ignition from normal spark timing of said engine during engine-part-load solely in response to the pressure upstream of the throttle valve; and, retarding the ignition from normal spark timing of said engine during engine-idling solely in response to the pressure downstream of the throttle valve, said retarding during engine-idling being greater than the retarding during engine-part-load.

4,007,589

INTERNAL COMBUSTION EXHAUST CATALYTIC REACTOR MONITORING SYSTEM

Horst Neidhard, Korntal; Ernst Linder, Muhlacker; Josef Wahl, Stuttgart; Peter Jürgen Schmidt, Schwieberdingen, all of Germany, and Peter A. Schoeck, Balzers, Liechtenstein, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Division of Ser. No. 436,863, Jan. 28, 1974, Pat. No. 3,962,866. This application Feb. 20, 1976, Ser. No. 659,716

Claims priority, application Germany, Jan. 31, 1973, 2304622

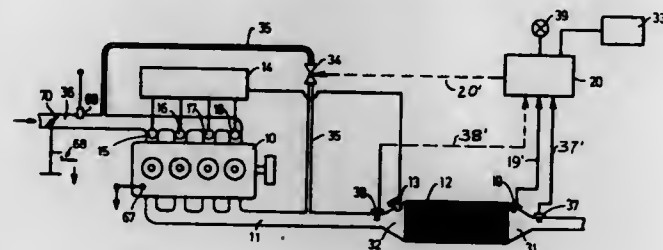
Int. Cl.² F01N 3/15

U.S. Cl. 60—276

12 Claims

1. Catalytic reactor monitoring system to supervise operation of a catalytic reactor (12) connected to the exhaust system of an internal combustion engine, to detoxify exhausted gases from the engine, comprising
 at least two oxygen sensor elements (19, 38), one exposed to exhaust gases upstream, and the other downstream of the reactor (12) to respectively determine oxygen content in the exhaust gases from the internal combustion

engine upstream, and downstream of the reactor each including an ion conductive solid electrolyte (21) forming an ion concentration chain;
a detection circuit (20) including a difference circuit having



its respective terminal connected to the respective sensor elements to determine the difference in output signals from the sensor elements
and response means (39, 34) responsive to the output signal from the detection circuit (20).

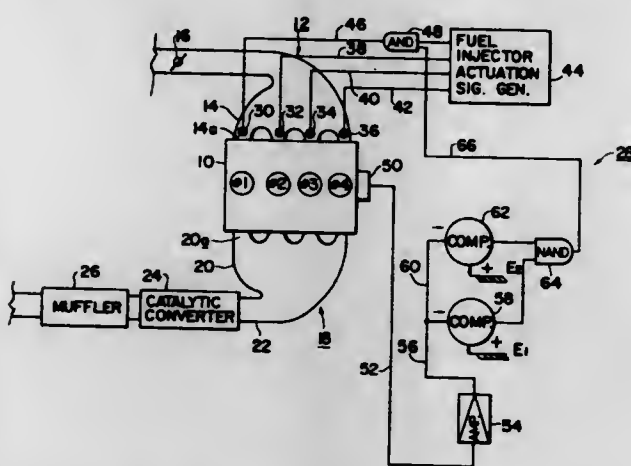
4,007,590

CATALYTIC CONVERTOR WARMING UP SYSTEM
Tadashi Nagai, Yokosuka, and Kunihiko Sugihara, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan
Filed May 30, 1975, Ser. No. 582,275

Claims priority, application Japan, June 1, 1974, 49-626340
Int. Cl.² F02B 75/10

U.S. Cl. 60-284

3 Claims



1. A fuel injection system for a multi-cylinder type internal combustion engine employing a catalytic converter in the exhaust system thereof comprising:

- a plurality of fuel injection valves respectively disposed in branch passages of an intake manifold of said engine, each of said valves being electronically operable by a fuel injector actuation signal;
- a temperature sensor mounted on said engine for producing a temperature signal representing the temperature of said engine;
- a fuel injector actuation signal generator having output terminals respectively connected to said fuel injection valves, for generating fuel injector actuation signals on the output terminals thereof;
- an AND gate having one input terminal connected to one of said output terminals of the fuel injector actuation signal generator, and an output terminal connected to the associated fuel injection valve;
- a first comparator for generating a logic 1 signal when the magnitude of the temperature signal is larger than a relatively low predetermined level;
- a second comparator for producing a logic 1 signal when the magnitude of the temperature signal is lower than a relatively high predetermined level; and
- a NAND gate for producing a logic 0 signal when it receives both of said logic 1 signals from said first and second

comparators and for applying said logic 0 signal to the other input terminal of said AND gate for preventing said associated fuel injection valve from opening.

4,007,591

POWER DEVICE

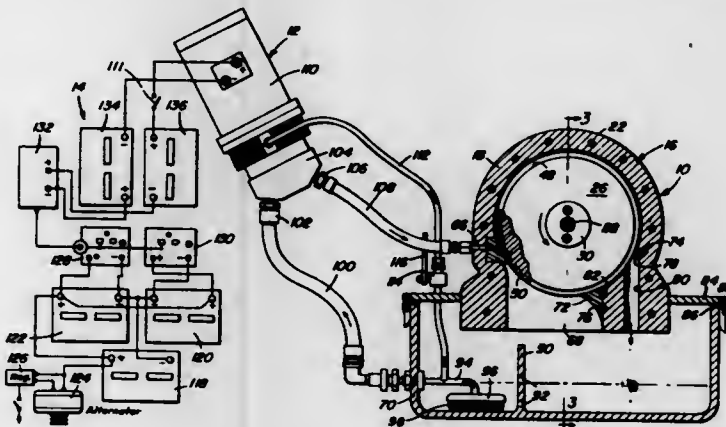
Leslie R. Hinchman, and Robert B. Hinchman, both of San Benito, Tex., assignors to Bessie L. Caldwell, San Benito, Tex., a part interest

Filed May 16, 1975, Ser. No. 578,164

Int. Cl.² F15B 15/18

U.S. Cl. 60-325

5 Claims



1. A power device comprising a housing having a circular chamber therein, a rotor journaled in said housing and being of circular configuration and provided with a plurality of circumferentially spaced pockets on the periphery thereof, said housing including a hydraulic fluid inlet associated therewith for impinging pressurized hydraulic fluid onto said rotor, said housing including a discharge opening for hydraulic fluid at the bottom thereof for gravity discharge of hydraulic fluid after it impinges against the rotor and causes rotation of the rotor, a reservoir tank for the hydraulic fluid disposed below said housing and receiving hydraulic fluid therefrom, pump means having an intake communicated with the tank and an outlet communicated with the inlet in the housing for circulating hydraulic fluid from the tank into the housing under pressure, said pump means including an electric motor connected therewith, and an electrical assembly for supplying electrical energy to said pump motor, said rotor including drive means associated therewith extending externally of the housing for connection with a device for utilizing the rotational output from the rotor, said housing including an injector block having an inner surface sealingly engaged with the periphery of the rotor, said injector block including a discharge orifice therethrough communicating with the pump means, said rotor having peripheral edge shoulders, said injector block having spaced ribs engaging the shoulders and a central channel receiving the portion of the rotor between the shoulders, said pockets in the rotor being generally tapered in configuration and provided with an abutment wall in the leading end thereof disposed in substantially perpendicular relation to the orifice as the pocket passes the orifice, said injector block being disposed below the horizontal center of the rotor for imparting torque thereon when pressurized hydraulic fluid is discharged through the orifice into the pockets in angular relation to the radius of the rotor intersecting the pocket.

4,007,592

POWER TRANSMISSION

Walter J. Zoya, Rolling Hills Estates, Calif., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Nov. 13, 1975, Ser. No. 631,760

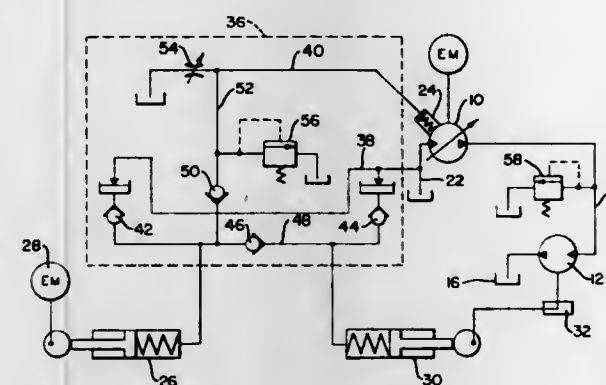
Int. Cl.² F15B 21/12

U.S. Cl. 60-391

5 Claims

1. A speed controller for a hydraulic power transmission comprising a rotary pump and a rotary motor, one of which has a regulator for its displacement, the controller comprising

a reference hydraulic pulse generator for producing an alternately reversing flow of a predetermined quantity, a feed-back pulse generator for producing another alternately reversing flow of a similar quantity, reference means for driving the reference pulse generator at a desired speed, means driving



the feed-back pulse generator proportionally to the motor speed, and a circuit connecting the two pulse generators to the displacement regulator, to maintain the motor speed in step with the reference means speed in response to error signals produced by relative phase changes between the two pulse generators.

4,007,593

MOTOR VEHICLE OPEN CENTER SERIES HYDRAULIC CIRCUIT

James P. Baker, Cleveland, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

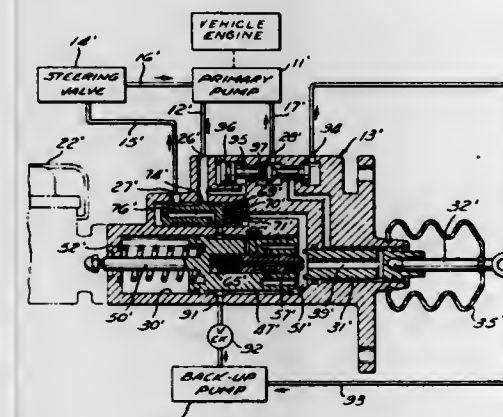
Continuation of Ser. No. 379,319, July 16, 1973, abandoned.

This application June 30, 1975, Ser. No. 591,842

Int. Cl.² B60T 13/18

U.S. Cl. 60-548

5 Claims



1. A motor vehicle fluid power circuit comprising a primary pump having an inlet side and an outlet side, a steering valve, a brake booster having an inlet side and an outlet side, and an auxiliary pump having an inlet side and an outlet side, said steering valve being an open center valve, said brake booster having a fluid power chamber and a power piston movable in response to the working pressure in said power chamber, first means hydraulically connecting said primary pump outlet side to said steering valve and hydraulically connecting said primary pump outlet side to said brake booster, second means responsive to the working pressure of said brake booster throttling fluid flow from said primary pump outlet side to said steering valve and maintaining the pressure of said primary pump outlet side at at least a predetermined pressure differential above the working pressure of said brake booster power chamber under all normal operating conditions, and pilot valve means responsive to the pressure level of said primary pump outlet side hydraulically connecting the outlet side of said brake booster to the inlet of said auxiliary pump under emergency conditions when said primary pump is inoperable

4,007,594

AUTOMOTIVE DRIVE SYSTEM SUMMING MULTIPLE INDEPENDENT DRIVES IN THE DIFFERENTIAL HOUSING

John W. Elsea, Jr., Rte. 2, Box 121-A, Laceys Spring, Ala. 35754

Filed July 30, 1974, Ser. No. 493,172

Int. Cl.² F01K 23/10; F16H 37/06

U.S. Cl. 60-618

4 Claims

1. An automotive drive system comprising:
a differential housing and ring gear rotatably mounted therein;
a differential gear assembly attached to said ring gear and including gear means for differentially driving a pair of axles;
bearing means supported by said housing and comprising bearings on opposite sides of said housing;
first and second discrete shafts, each supported by a said bearing means and extending through said housing;
a first pinion gear rigidly attached to said first shaft and positioned to engage and drive said ring gear and a second pinion gear rigidly attached to said second shaft and positioned to engage and drive said ring gear;
an internal combustion engine and means coupled to said engine for rotatably driving said first shaft; and
a steam engine and means coupled to said steam engine for driving said second shaft.

4,007,595

DUAL TURBINE POWER PLANT AND A REHEAT STEAM BYPASS FLOW CONTROL SYSTEM FOR USE THEREIN

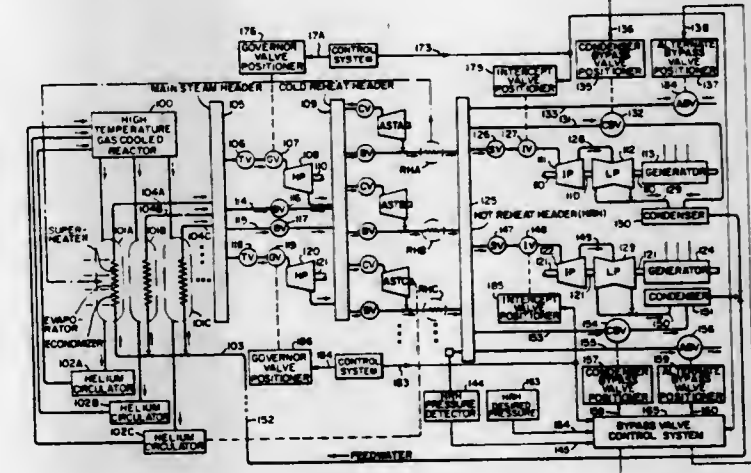
Andrew S. Braytenbah, Pennsauken, N.J., and Karl O. Jagtines, Chester, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1975, Ser. No. 618,096

Int. Cl.² F01K 7/22

U.S. Cl. 60-644

25 Claims



1. A power plant comprising,
a steam source to generate superheat and reheat steam,
a first turbine-generator including at least a first high-pressure turbine portion operated by superheat steam, a first lower pressure turbine portion operated by reheat steam, and an electric generating means rotatably driven by said first high and first-lower pressure turbine portions,
a second turbine-generator including at least a second high-pressure turbine portion operated by superheat steam, a second lower pressure turbine portion operated by reheat steam, and an electric generating means rotatably driven by said second high and second lower pressure turbine portions,
first bypass means for conducting reheat steam from said steam source,
second bypass means for conducting reheat steam from said steam source, and
means for comparing a measured value of the pressure of reheat steam with a desired value of such pressure to detect a difference between such values, and for varying

the combined steam flow through said first and second bypass means to reduce a detected difference to a zero steady state level.

4,007,596
DUAL TURBINE POWER PLANT AND METHOD OF OPERATING SUCH PLANT, ESPECIALLY ONE HAVING AN HTGR STEAM SUPPLY

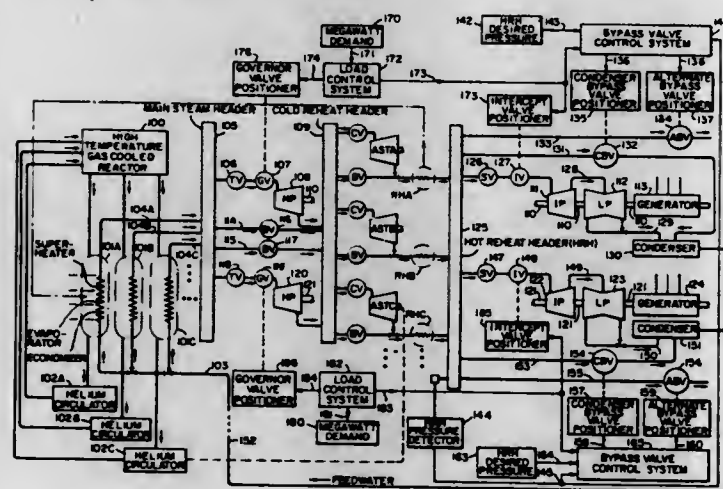
Andrew S. Braytenbah, Pennsauken, N.J., and Karl O. Jaegtnes, Chester, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 24, 1975, Ser. No. 571,145

Int. Cl.² F01K 13/02

U.S. Cl. 60—652

33 Claims



1. A power plant having a high temperature gas-cooled nuclear reactor and a steam source to derive heat from the coolant gas of the reactor for generating superheat and reheat steam in respective superheater and reheater sections, said power plant comprising,

first and second turbine-generators, each of said turbine-generators including at least a high pressure turbine portion connected to pass superheat steam from the superheater section to the reheater section and a lower pressure turbine portion connected to receive reheat steam from the reheater section, the high and low pressure portions of each turbine-generator being rotatably connected to drive an associated electric generating means, first and second governor valve means connected to control the flows of superheat steam through the high pressure portions of the respective first and second turbine-generators,

first and second intercept valve means connected to control the flows of reheat steam through the lower pressure portions of the respective first and second turbine-generators,

main steam bypass means connected to pass superheat steam from the superheater section to the reheater section without passage through the high pressure turbines to permit a desired minimum flow of steam through such section at times when the total steam flow through the high pressure portions of said first and second turbine-generators is less than such minimum,

means for collecting steam after its passage through the high pressure portions of said first and second turbine-generators and through said main steam bypass means, and for passing the collected steam through the reheater section, at least a portion of the steam flow through the reheater section being passed from said steam collecting means through an auxiliary steam turbine means before such portion is reheated, which auxiliary steam turbine means is rotatably coupled to drive a means for circulating the coolant gas through the reactor and the steam source, hot reheat bypass means connected to pass reheat steam from said collecting means to the reheater section without passage through the auxiliary turbine means to permit

a desired minimum steam flow through such section at times when the total steam flow through the auxiliary turbine means of said first and second turbine-generators is less than such minimum,

first means for positioning said first governor valve means to decrease the power output of said first turbine-generator to a reduced level that is suitable for tripping said second turbine-generator,

second means for positioning said second governor valve means to decrease the power output of said second turbine-generator to the reduced level of the power output of said first turbine-generator, and thereupon for positioning said second governor valve means and said second intercept valve means to further reduce the power output of said second turbine-generator to a minimum level at which said second turbine-generator may be tripped, and third means for maintaining a desired steam flow through the reheater section at times when the power generated by said first and second turbine-generators is reduced to a level such that the combined steam flow through the lower pressure turbine portions is less than the desired flow, said third means being responsive at least to changes of a predetermined power plant variable that is related to the flow through the reheater section to govern the flow through said hot reheat bypass means, whereby the desired flow is maintained.

4,007,597
POWER PLANT AND SYSTEM FOR ACCELERATING A CROSS COMPOUND TURBINE IN SUCH PLANT, ESPECIALLY ONE HAVING AN HTGR STEAM SUPPLY

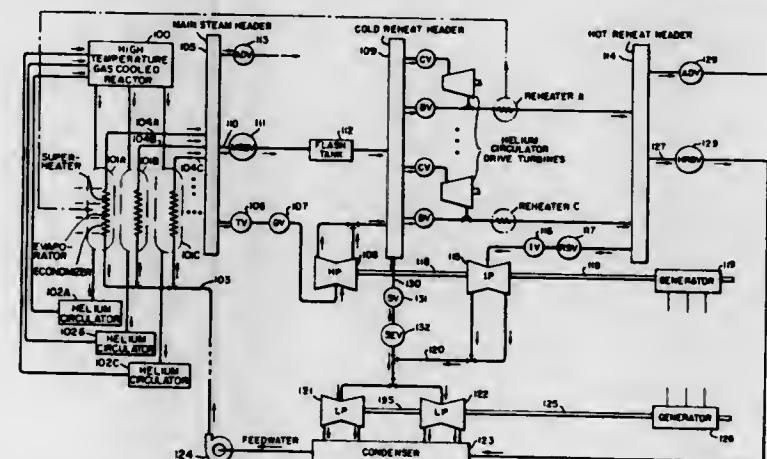
Karl O. Jaegtnes, Chester Heights, Pa., and Andrew S. Braytenbah, Pennsauken, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1975, Ser. No. 618,097

Int. Cl.² F01K 13/02

U.S. Cl. 60—707

29 Claims



1. A power plant comprising,

a steam source to generate superheat and reheat steam;

a cross compound turbine-generator including, a high pressure turbine portion operated by a first flow of superheat steam, an intermediate turbine portion operated by a second flow of reheat steam, and a first electrical generating means rotatably driven by said high and intermediate pressure turbine portions, and a second electrical generating means rotatably driven by a low pressure turbine portion operated by the second flow after it is exhausted from the intermediate pressure portion;

first bypass means for conducting a flow of superheat steam from said steam source to a steam exhaust of said high pressure turbine portion;

second bypass means for conducting a flow of reheat steam from said steam source to a steam exhaust of said low pressure turbine portion; and

control means for independently governing the first and second flows, wherein one of the first and second flows is varied for purposes of controlling the rotational speed of said first electrical generating means in accordance with a

desired value of such speed, while the other of the first and second flows is varied to regulate a power plant variable in accordance with its desired value.

4,007,598
ARTIFICIAL ISLAND AND METHOD OF ASSEMBLING THE SAME

Hans Tax, Potsdamer Str. 3, D-8 Munich 40, Germany

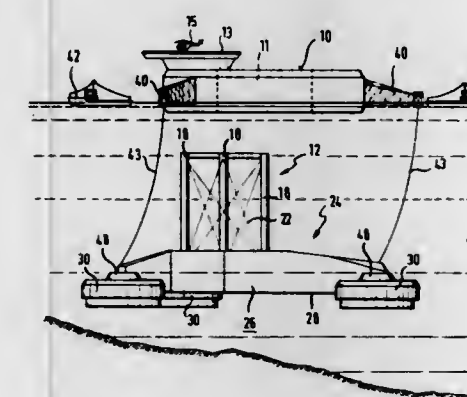
Filed Dec. 8, 1975, Ser. No. 638,338

Claims priority, application Germany, Dec. 16, 1974, 2459478

Int. Cl.² E02D 17/00

U.S. Cl. 61—90

8 Claims



1. In a method of assembling, in a body of water, an artificial island consisting essentially of a platform and of at least one upright supporting column including a bottom portion standing on the floor of said body of water and a plurality of sections extending upward from said bottom portion in superimposed relationship, said platform being supported by said at least one column in an operative position above the surface of said body of water, in which method said column and said platform are floated on the surface of said body to a desired location, the column is lowered in said water until said bottom portion engages said floor, the platform thereafter is raised above said surface along said column, and the raised platform is fastened to said column in said operative position, the improvement which comprises:

- attaching a first one of said sections to said bottom portion to constitute a sub-assembly therewith, said bottom portion being hollow;
- filling said bottom portion with enough air to make said sub-assembly buoyant;
- floating said buoyant sub-assembly and said platform to an assembly site;
- flooded said hollow bottom portion at said assembly site with sufficient water to submerge said sub-assembly below said surface, said platform being formed with an aperture extending vertically therethrough;
- aligning the submerged sub-assembly with said aperture;
- expelling enough water from said bottom portion to make said sub-assembly buoyant until a part of said sub-assembly enters said aperture; and
- securing the sub-assembly partly entered in said aperture to said platform while the platform floats at said site.

4,007,599

MARINE PLATFORM

Robert L. Brown, 27594 Parkview Blvd., Warren, Mich. 48092

Filed Dec. 8, 1975, Ser. No. 638,353

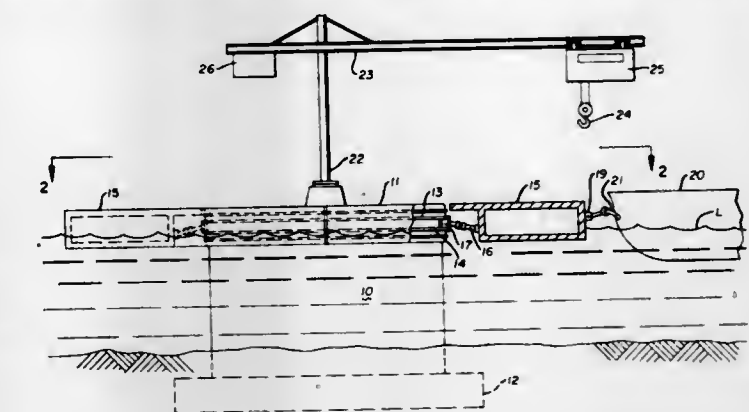
Int. Cl.² B63B 21/00; E02B 3/22

U.S. Cl. 61—104

6 Claims

1. A marine platform comprising a stationary central platform having an upright axis, said platform having an uppermost portion of annular configuration, continuous annular guide means on said annular portion and a plurality of floating dock units arranged in a circle around said stationary central

platform, flexible means movably engaged in said annular guide means and connected with said floating dock units, said flexible means positioning said floating dock units in closely

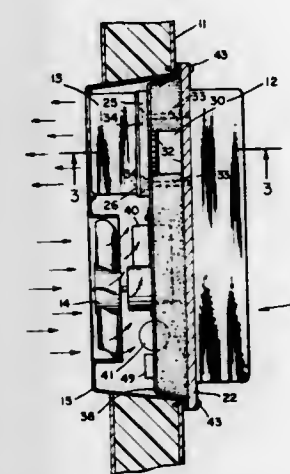


spaced relation to said annular guide means and said stationary central platform for free rotary movement thereabout and free vertical movement relative thereto.

4,007,600
ICEBOX CONVERSION UNIT
Larry L. Simms, P.O. Box 1083, San Pedro, Calif. 90733
Continuation-in-part of Ser. No. 548,601, Feb. 10, 1975, abandoned. This application Apr. 2, 1976, Ser. No. 672,996
Int. Cl.² F25B 21/02; F25D 3/08

U.S. Cl. 62—3

5 Claims



1. A compact, self-contained refrigeration adapter unit for installation in any existing insulated enclosure comprising: a heat-sink plate with heat-radiating fins on one side thereof, a cold plate with heat-absorbing fins on one side thereof and defining a base and mounting means for said refrigeration adapter unit, a thermoelectric module disposed between said plates, a fan disposed for circulating air past said heat-radiating fins, means for energizing said module and said fan, thermal insulation material disposed between said plates to substantially completely fill the space therebetween, an intermediate separator disposed to substantially enclose the space between said plates, said separator having a flange in contact with the edge of said cold plate, said separator extending to cover said insulation material and pass beneath said heat-sink plate, said separator having an opening for said module to pass through, a cover disposed to nest over said intermediate separator and extend to enclose said fan and said heat-sink plate and said heat-radiating fins, said cover having a flange in contact with the flange of said separator, said cover having openings over said fan and over said heat-radiating fins to permit the circulation of air, fastening means for fastening the flanges of said separator

and said cover to said cold plate to form a compact, self-contained refrigeration adapter unit, and means for mounting said cold plate and the associated refrigeration adapter unit in an aperture in an existing insulated enclosure.

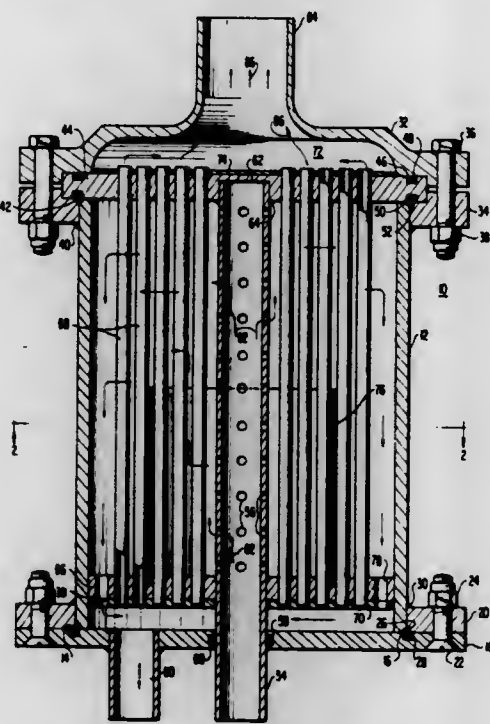
4,007,601

TUBULAR SUBLIMATOR/EVAPORATOR HEAT SINK
Bruce W. Webbon, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 16, 1975, Ser. No. 623,187
Int. Cl.² F25B 19/00; F28C 1/00

U.S. Cl. 62—100

8 Claims



8. A method of cooling fluid comprising the steps of:
- circulating the fluid to be cooled in a chamber, said chamber having a plurality of hollow porous heat exchangers such that fluid, liquid or vapor is absorbed by said heat exchangers;
 - coupling the inside of said hollow porous heat exchangers to a source of low pressure;
 - evaporating fluid absorbed and venting the resulting vapor;
 - allowing ice to form on said heat exchanger as a result of evaporation such that sublimation occurs across said heat exchanger;
 - maintaining the volume of fluid in said chamber to melt said ice while cooling fluid to the point where the ice melts; and,
 - repeating steps c through e repeatedly to cycle said cooling through evaporation and sublimation.

4,007,602

EXTERIOR ICE SERVICE FOR FREEZER-REFRIGERATORS

Richard D. Maxwell, John J. Pink, Michael J. Fitzharris, all of Cedar Rapids, and Louis R. Marz, Homestead, all of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa
Division of Ser. No. 433,902, Jan. 16, 1974, Pat. No. 3,911,692. This application Sept. 8, 1975, Ser. No. 610,972

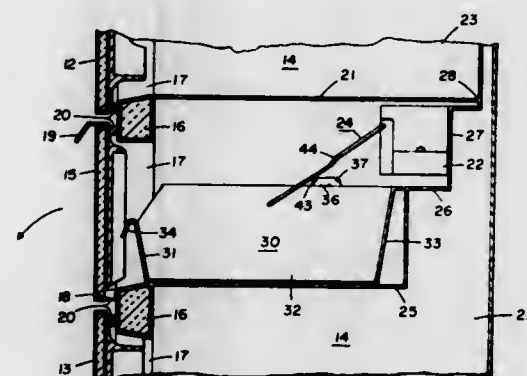
Int. Cl.² F25C 1/10

U.S. Cl. 62—137

1 Claim

1. In a refrigeration unit having a food storage cabinet including freezing portions normally maintained at below freezing temperatures with vertically disposed front access openings, and ice apparatus disposed in one of the freezing portions, the ice apparatus including an automatic ice maker

and an ice storage receptacle receiving ice manufactured by the ice maker, the combination therewith of a pair of vertically spaced, horizontally extending mullions forming a fixed part of the cabinet and defining one of said access openings, the storage receptacle being accessible through said one access opening; a panel having a lower edge portion hingedly secured along the lower mullion for swingable movement between a normally closed position in which the panel cooperates with the cabinet including the mullions to close said one access opening and an open position outwardly of the cabinet for access to the ice storage receptacle; the ice storage receptacle comprising a tray manually slidably movable on a shelf in said one freezing portion from a normal position therewithin out through said one access opening to a position at least partially outside of the cabinet after the panel is swung to its open position; and hinged door means having a normally closed position in which the door means cooperate with the cabinet including the mullions to close the remainder of the freezer access opening and movable to an open position for access to the remainder of the freezing portions; said ice maker including an ice level sensing arm movable from a



lower position in the tray when in its normal position to an upper position above the tray, and including means to deactivate the ice maker when the tray is moved to said outside position, the deactivating means comprising: a first pin carried by the exterior of a tray side wall and extending laterally toward an adjacent portion of the cabinet, a plate-like lever disposed between said tray side wall and said portion of the cabinet and pivoted to the latter about a horizontal axis normal to the plane of the lever, the lever including a seat in an edge thereof below the level of the pivot and receiving the first pin when the tray is in its normal position, the seat opening generally downwards through said edge to provide, a pair of opposed, diverging cam faces straddling the first pin, the first pin and one of the cam surfaces being effective to rotate the lever about its pivot in a second direction when the tray is returned to its normal position, and a second pin extending from the lever laterally across the top of said tray side wall and beneath the sensing arm when in its lower position, the second pin being disposed to engage and lift the sensing arm to its upper position when the lever is rotated in its first direction and to allow return of the sensing arm to its lower position when the lever is rotated in its second direction.

4,007,603

APPARATUS FOR DEFROSTING OF AN EVAPORATOR IN A HEAT PUMP

Berth Ulrik Gustafsson, Ostervik, Sweden, assignor to Projektus Industriprodukter AB, Stockholm, Sweden
Filed May 6, 1975, Ser. No. 575,037

Claims priority, application Sweden, May 10, 1974, 74063165

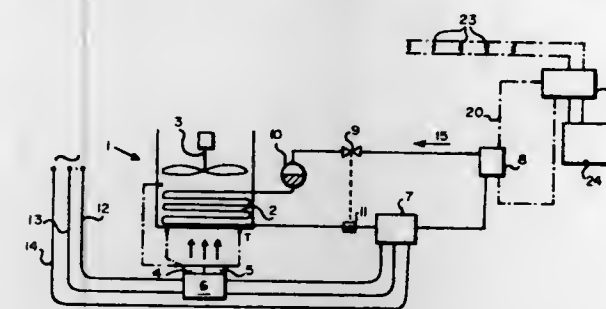
Int. Cl.² F25D 21/06; F25B 13/00

U.S. Cl. 62—151

3 Claims

1. In a heat pump including a compressor for directing the flow of a heat transfer medium through said heat pump, said compressor being capable of reversing the direction of flow of the heat transfer medium through said heat pump, an evaporator, said evaporator including a fan and a heat exchanger to

which the heat transfer medium flows from said compressor, said fan arranged to drive air over said heat exchanger for indirect heat exchange with the heat transfer medium flowing through said heat exchanger, the exterior surface of said heat exchanger being subject to the accumulation of a frost or ice formation during operation of said heat pump, wherein the improvement comprises means associated with said compressor for reversing the direction of flow of the heat transfer medium through said heat pump, pressure sensitive means operatively connected to said reversing means for said compressor and said pressure sensitive means arranged to sense



the pressure differential of the air flowing over said heat exchanger and to compare it with a predetermined value so that the direction of flow of the heat transfer medium provided by said compressor can be reversed when the pressure differential reaches the predetermined value, and a temperature sensitive means located for sensing the temperature at the exterior surface of said heat exchanger, said temperature sensitive means operatively connected to said reversing means for said compressor for maintaining the reversed pumping direction of said compressor as long as the temperature at said heat exchanger is less than or equal to 0° C.

4,007,604

REFRIGERATOR UNIT, PARTICULARLY DUAL TEMPERATURE REFRIGERATOR

Jürgen Ballarin, Giengen, Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Germany

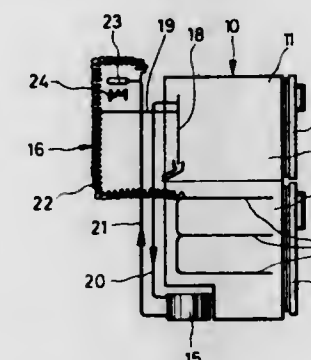
Filed Feb. 18, 1976, Ser. No. 658,896

Claims priority, application Germany, Feb. 18, 1975, 2506750

Int. Cl.² F25B 41/00, 43/00

U.S. Cl. 62—174

3 Claims



1. In a refrigeration unit with a heat-insulated housing and a refrigeration machine driven by a single compressor having a refrigeration cycle and provided with a condenser, a refrigerant metering capillary and refrigerant transfer lines with at least two evaporator sections disposed in series in the flow path of the refrigerant, the evaporator sections including a first section associated with a colder compartment and a second section associated with a warmer compartment, a connecting coolant line connecting said first evaporator section with said second evaporator section, a control element dependent on the temperature in said warmer compartment for intermittently activating said compressor, said control element being adapted simultaneously to activate a heating element for a refrigerant collector, said collector having a

volumetric capacity equalling that of the second evaporator and being disposed before said refrigerant metering capillary, additional liquid refrigerant being dischargeable from said refrigerant collector into and through said refrigerant metering capillary and thence into said first evaporator section, when said heating element is switched on by said control element so as to cause the first evaporator to overflow and discharge liquid refrigerant from said first evaporator section into said second evaporator section, at least a part of said metering capillary being disposed in heat-conducting contact with said connecting coolant line connecting said first evaporator section with said second evaporator section.

4,007,605

REFRIGERATION SYSTEM AND CONTROL CIRCUIT

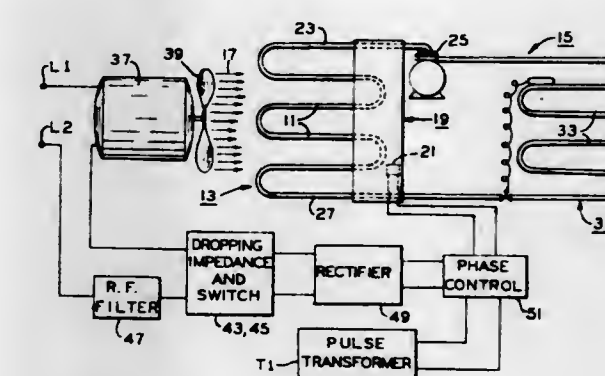
Dann W. Denny, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 10, 1975, Ser. No. 548,764

Int. Cl.² F25B 39/04

U.S. Cl. 62—184

19 Claims



1. A refrigeration system for conditioning air in a space, a condenser generally isolated from the space and having a plurality of coils for passage therethrough of a refrigerant of the system, means operable generally at different speeds for flowing ambient air in a preselected flow path past the condenser so as to regulate the temperature thereof, means responsive to the temperatures of the condenser and the ambient air in the preselected flow path thereof for controlling the speed operation of the flowing means; the improvement wherein the controlling means includes a metallic member engaged in heat transfer relation across at least some of said condenser coils and disposed in heat transfer relation with the ambient air in the preselected flow path thereof generally downstream of said condenser with respect to said flowing means so as to attain a weighted average of the respective temperatures of said at least some condenser coils and the ambient air in the preselected flow path thereof downstream of said condenser, and means predeterminedly disposed on said metallic member with respect to said at least some condenser coils and the preselected flow path of the ambient air downstream of said condenser for sensing the weighted average temperature.

4,007,606

HYDROGEN GAS EXTRACTOR

Fujita Yoshio, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1975, Ser. No. 632,630

Claims priority, application Japan, Dec. 2, 1974, 49-136984

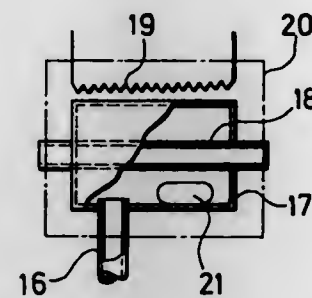
Int. Cl.² F25B 43/04

U.S. Cl. 62—475

8 Claims

1. A hydrogen gas extractor adapted for use with a refrigerating machine in which a high vacuum is maintained and hydrogen gas is evolved largely by corrosive reactions of a solution, comprising a case, hydrogen gas exhaust means fabricated of palladium or its alloy and gastightly secured through the walls of said case, a connecting pipe communicated at one end with said machine and open at the other end

in said case, a mass of metal contained in said case, said metal being capable of occluding hydrogen gas at ordinary tempera-



ture and releasing the same at elevated temperature, and heater means for heating both said hydrogen gas exhaust means and said metal.

4,007,607

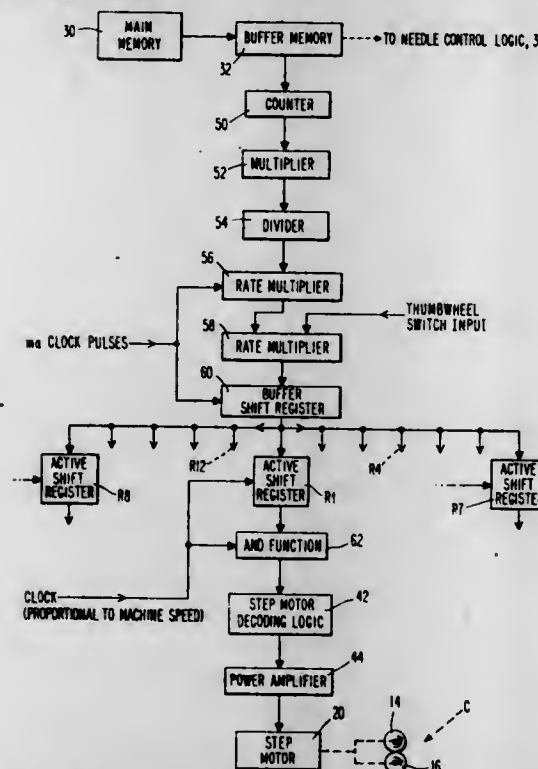
METHOD AND APPARATUS FOR KNITTING PATTERNED SLIVER HIGH PILE FABRIC
Paul Christiansen, Fort Washington, and George K. Roshon, Woxall, both of Pa., assignors to Hayes-Albion Corporation, Norristown, Pa.

Filed Oct. 9, 1975, Ser. No. 621,015

Int. Cl.² D04B 9/12, 9/14, 9/16, 9/44

U.S. Cl. 66—9 B

8 Claims



1. In a sliver high pile fabric circular knitting machine having a rotatable circle of independent needles, a plurality of sliver feeding cards spaced about the circle of needles, needle selecting mechanism associated with each card and a yarn feed disposed adjacent selected cards,

- electronic control means operable to cause the needle selecting mechanisms to select needles according to a predetermined needle pattern,
- said control means including a memory for storing knitting pattern data only,
- variable speed drive means associated with each card operable to deliver a sliver to each card at selected rates, and
- a data calculating and transfer electronic circuit interposed between the memory and each variable speed drive means, for receiving knitting pattern data in digital form from the memory,
- said data calculating and transfer electronic circuit including calculating means automatically operative to calculate continuously the speed of each variable speed

drive means using the digital knitting pattern data transferred from the memory to the circuit and to regulate the rates of delivery of sliver to the cards, to harmonize sliver input to the knitting machine with the demand of the needles for sliver fibers according to the predetermined needle pattern.

4,007,608

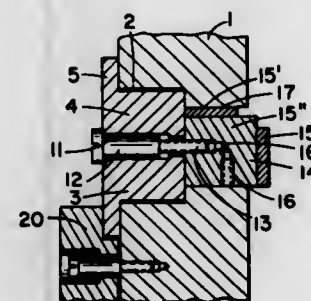
CAM SYSTEMS FOR CIRCULAR KNITTING MACHINES
Harald Kürth, Mittweida; Dieter Lölbe, Frankenau, and Erich Berthold, Mittweida, all of Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Germany

Division of Ser. No. 298,163, Oct. 16, 1972, Pat. No. 3,926,013. This application Aug. 7, 1975, Ser. No. 602,607

Int. Cl.² D04B 9/00

U.S. Cl. 66—40

5 Claims



5. A cam system for a circular knitting machine comprising a cam retainer, cam carrier means movably mounted on said retainer, cooperating means on said retainer and cam carrier means effective to releasably secure said carrier means in a selected one of at least two positions relative to said container, a cam element having at least two cam surfaces, said cam element being mounted on said carrier means, cooperating means on said carrier means and said cam element effective to releasably secure said element in a selected one of at least two positions relative to said carrier in each of said positions of said element relative to said carrier only one of the cam surfaces being in an operative position and the others being in inoperative positions.

4,007,609

TWISTED BEARD NEEDLE

Luigi Omodeo Zorini, Cilavegna, Italy, assignor to Comez, S.p.A., Pavia, Italy

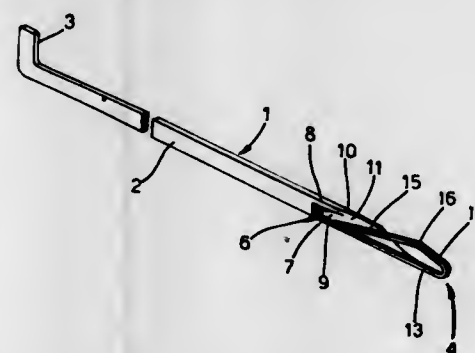
Filed Apr. 9, 1975, Ser. No. 566,278

Claims priority, application Italy, May 20, 1974, 22934/74

Int. Cl.² D04B 35/02

U.S. Cl. 66—116

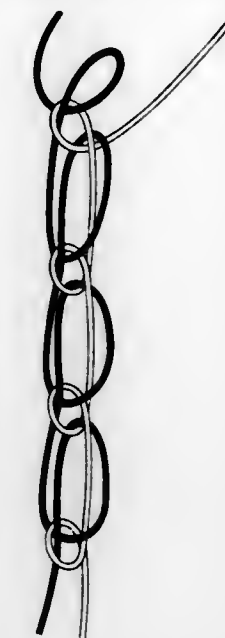
2 Claims



1. Twisted Beard needle for crochet frames, raschel, raschel chain and similar products comprising a rectangular stem, a heel on one end of said stem and a beard with the needle point of the beard bent towards the heel on the other end of said stem in a direction displaced on the side with respect to the longitudinal axis of the needle and in repose being positioned within the cross section of the rectangular stem, the portion of the beard bent towards the heel consisting of two segments inclined upwardly to a point extending above the cross section

of the rectangular stem to form an obstacle to the loop which slides on the beard so that the loop is obliged to slack its sliding and to widen to overcome the abovementioned obstacle constituted by the point, said widening determining the recovery of the thread from the stitch previously formed to thereby tighten more said stitch.

interlocking with the loop of the first strand that extends through the loop of the second strand, said second portion of



4,007,610

HAND KNITTING APPARATUS

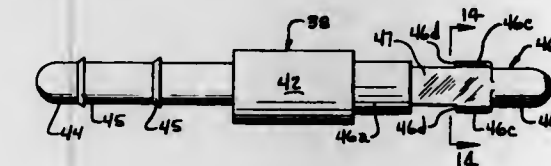
Lorraine A. Linstead, 4643 Cardamon Lane, Rockford, Ill. 61111

Filed Apr. 13, 1976, Ser. No. 676,510

Int. Cl.² D04B 35/02

U.S. Cl. 66—117

18 Claims



the second strand overlapping with said first portion thereof to form the loop of said second strand therewith.

4,007,612

WASHING MACHINE BALANCE AND SUSPENSION SYSTEM

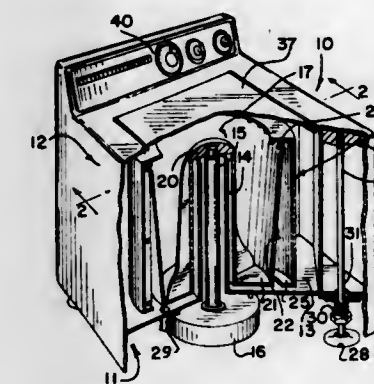
Claude Morris Brimer, Tucson, Ariz., assignor to Linear International Corporation, Rancho La Costa, Calif.

Filed Aug. 18, 1975, Ser. No. 605,624

Int. Cl.² D06F 37/24

U.S. Cl. 68—23.2

10 Claims



6. In a washing machine of the type having a structural framework and an outer covering mounted thereto which together define a box-like casing having four vertical corners and a generally rectangular horizontal top surface with an access door hingedly positioned centrally therein and a substantially vertical control panel extending upwardly from the back thereof,

- a vertically axially oriented clothes receiving tub rotatably mounted on said structural framework and enclosed by said outer covering; said tub including
- a main tub portion including a bottom wall and an integral inclined frusto-conical sidewall for retaining fluid therein, an agitator portion centrally fixedly positioned therein;
- an electric motor mounted to said framework;
- drive means connecting said motor and said tub;
- and an improvement comprising in combination:
- a fluid retaining jacket surrounding said main tub portion and in fluid communication therewith for obtaining fluid extracted therefrom and retaining said fluid therein by centrifugal force to counteract loading imbalances in said tub during rotation of same; and
- a plurality of vertically oriented flexible casing mounting

4,007,611

YARN AND METHOD KNITTING SAME

Robert C. Blezard, Woonsocket, R.I., assignor to Smithfield Fibers, Inc., Lincoln, R.I.

Division of Ser. No. 83,588, Oct. 23, 1970, Pat. No. 3,748,874.

This application Apr. 16, 1973, Ser. No. 351,577

Int. Cl. D04b 21/00

U.S. Cl. 66—195

2 Claims

1. A knitted yarn, comprising first and second strands alternately formed into successive stitches about a common axis, each stitch of said first strand including a loop that is formed by overlapping of portions of said first strand, each stitch of said second strand including a loop through which the loop of the first strand extends, said second strand including a first portion that interlocks with the loop of the next successive loop of the first strand, a second portion of the second strand

support bars, each being elongated, and including opposed top and bottom ends adapted for mounting to external members, each of said bars being rigidly mounted at its top end to said casing inwardly adjacent one of said vertical corners and top surface of said casing, extending substantially freely downwardly through frictional damping means on said casing; and including foot pads of resilient material mounted on its bottom end for providing frictional contact with a mounting surface for said washing machine.

4,007,613

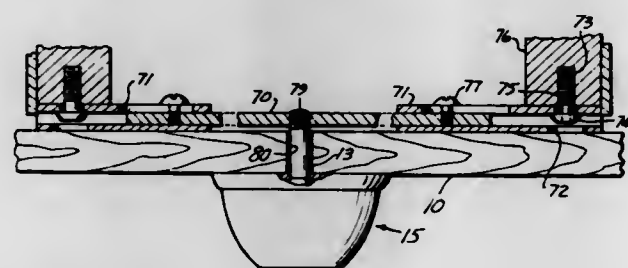
EQUIPMENT SECURITY LOCKING DEVICE

James Scott Gassaway, 2356 Glendon Ave., Los Angeles, Calif. 90064

Division of Ser. No. 498,658, Aug. 19, 1974, Pat. No. 3,910,079. This application Aug. 1, 1975, Ser. No. 601,189
Int. Cl.² E05B 73/00

U.S. Cl. 70-58

6 Claims



1. In combination:

bar means adapted for placing on the upper surface of a table and for mounting on said bar means an equipment to be protected;
an anchor bolt having a head and a threaded shank, the head being adapted to be placed beneath the under surface of the table and the shank being adapted to pass through the table and fasten to the bar means;
lock means adapted to be placed against the under side of said table and to envelop said head, thereby preventing access to the bolt except by unlocking of said lock means;
said bar means comprising a strip and two hollow sleeves spaced from each other within which said strip is slidable; means holding said strip and sleeves against sliding relative to each other; and
fastening means adapted to attach each of said sleeves to said equipment,
said holding means and said fastening means being positioned so that they are covered by the equipment, and thereby rendered inaccessible, when the equipment is mounted on, and attached to, said bar means, whereby removal of the equipment from the bar means or the table is inhibited without unlocking said lock means.

4,007,614

LOCK FOR VEHICLES

Roger A. Schott, 13559 Rutland, Detroit, Mich. 48227, and Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223

Filed Nov. 3, 1975, Ser. No. 628,395
Int. Cl.² B62H 5/00

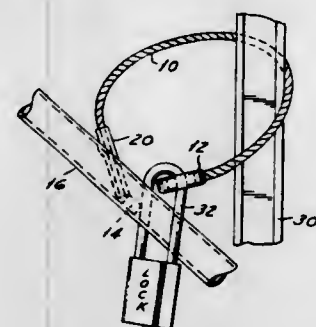
U.S. Cl. 70-234

5 Claims

1. A conversion lock system for a tubular frame vehicle such as a bicycle which utilizes an elongate flexible member such as a cable or chain slidable into a hollow elongate frame member which comprises:

- a. a short tubular member inserted through an opening in said frame member at an angle having one portion of one end jammed against an inner wall of said frame member opposite said opening and the other end projecting from said frame member,
- b. a cable member threaded through said tubular member,
- c. a withdrawal stop and a lock loop on said cable member,

said stop and said loop having effective diameters larger than the inside diameter of said tubular member to prevent removal of said cable member, and



d. means interengaging said tubular member and said frame member to secure the tubular member in place.

4,007,615

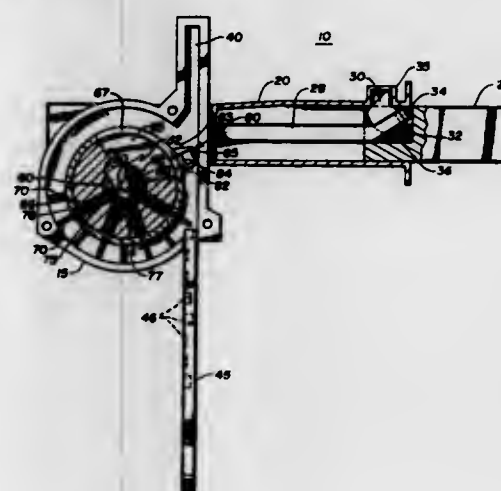
KEY CONTROLLED PICK RESISTANT LOCK

Knut Nossur, 707 Lowry Ave. NE., Minneapolis, Minn. 55418
Filed June 1, 1976, Ser. No. 691,419

Int. Cl.² E05B 35/04, 63/22

U.S. Cl. 70-387

19 Claims



1. A lock mechanism operated upon insertion and removal of a key comprising, an enclosing housing and a transversely extending housing containing a latch therein, a shaft mounted in the first housing, an inner cylindrical member journaled on said shaft and having a plurality of spaced apertures therein, a hood carried by said shaft and encircling said inner cylindrical member, said hood having a window therein, an outer cylindrical member journaled on said hood and having a plurality of apertures therein with a spring biased pin mounted in each aperture; said pins being slidably positioned through said outer cylindrical member and adapted to engage the apertures in the inner cylindrical member through said window in said hood; a keyway in said first housing; a key having a surface with a plurality of sequential indentations therein which when inserted into the keyway engage the exposed ends of the pins in the outer cylindrical member to rotate the outer cylindrical member urging said pins into engagement with the apertures with the inner cylindrical member to rotate the inner cylindrical member simultaneously therewith; means included in the inner cylindrical member and the shaft to prevent rotation of the inner and outer cylindrical members in the event the apertures in the key do not cause predetermined engagement of the pins with the inner cylindrical member; means included in part in said enclosing and in part in said outer cylindrical member to prevent rotation of the outer cylindrical member except in a predetermined time sequence with the insertion of said key; and means included in part in said inner cylindrical member and in part with the latch to cause operation of the latch upon complete insertion of the key and subsequent withdrawal of the key.

4,007,616

CYLINDRICAL CONTAINERS BY HOUR GLASS FORMATION OF METAL TUBES

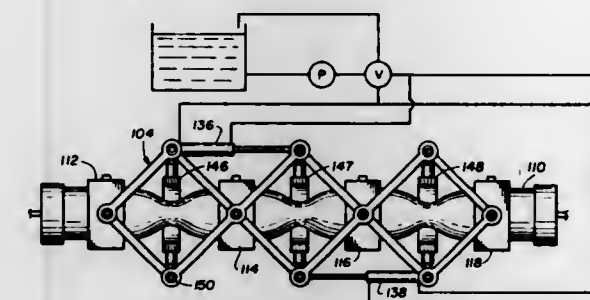
Benjamin J. Aleck, Jackson Heights, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,648

Int. Cl.² B21D 31/00

U.S. Cl. 72-38

21 Claims



1. The method of making cylindrical containers comprising: mounting a metal tubular stock within holders so as to localize a cylindrical area for axial tensile forces and heating;
heating the tubular stock cylindrical area while creating an inert atmosphere by applying a vacuum and/or inert gas within the tubular stock, especially at the original cylindrical heated area to prevent the need for a subsequent oxidation removal process;
pulling, while heating and creating the inert atmosphere, the tubular stock to impart local tension in the heated cylindrical area to reduce the stock diameter and thickness thereat.

4,007,617

METHOD OF ROLLING METAL BLANKS

Curt Gunnar Falk, Stockholm; Per-Olof Strandell, Taby; Per Erik Albrecht, Bromma, and Goran Anders Wallner, Hagfors, all of Sweden, assignors to AB Metalform, Stockholm, Sweden

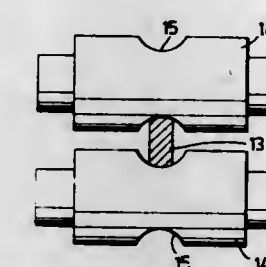
Filed Oct. 17, 1975, Ser. No. 623,507

Claims priority, application United Kingdom, Sept. 23, 1975, 38910

Int. Cl.² B21B 1/12

U.S. Cl. 72-234

7 Claims



1. A method of reducing a metal blank by rolling in a plurality of passes, comprising rolling the blank successively through two types of alternating, sequentially arranged passes, of which passes each of one type of pass comprises flat-rolling said blank to a width-height ratio of 2 - 6 in at least one pair of rolls having substantially smooth roll barrels, and each of the other type of pass comprises upset-rolling said blank to a height-width ratio of 1.5 - 3.5 in at least one pair of rolls having open grooves exhibiting a rounded groove bottom and a width of 1.5 - 3.5 times the width of the blank to be upset-rolled.

4,007,618

RETROFIT METHOD AND APPARATUS FOR ROLLING MILLS

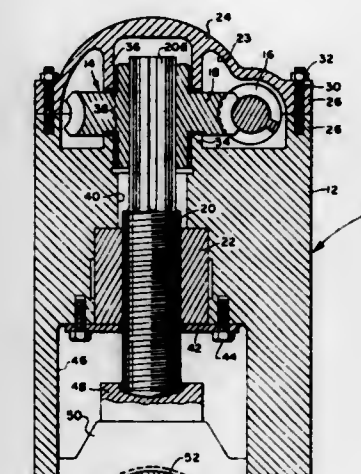
Robert J. Ponter, Glenshaw, Pa., assignor to Ritter Engineering Company, Pittsburgh, Pa.

Filed Mar. 22, 1976, Ser. No. 669,171

Int. Cl.² B21B 31/32

U.S. Cl. 72-245

16 Claims



1. A method of retrofitting a hydraulic roll actuating mechanism in a screw-down rolling mill of the type including a frame having a housing element mounted thereto for enclosing screw drive means operably connected to a screw member extending through an opening in said frame toward the roll members of said mill, said screw member being threadedly engaged with a rotationally fixed screw nut carried by said frame, comprising (a) providing and fitting a hydraulic cylinder to said frame adapted to be mounted thereon in replacement of said housing element; (b) providing and inserting an externally threaded piston rod sleeve into said opening, said sleeve being coaxially secured to said hydraulic cylinder and threadedly engaged with said screw nut; and (c) providing and disposing a hydraulic piston in said hydraulic cylinder, said hydraulic piston including a piston rod extending through said sleeve and arranged for operating the roll members of said mill in replacement of said screw member.

4,007,619

CONTAINER FOR AN EXTRUSION PRESS

Adolf Ames, Hiltzingen, and Alfred Wagner, Steisslingen, both of Germany, assignors to Swiss Aluminium Ltd., Neuhausen am Rheinfall, Switzerland

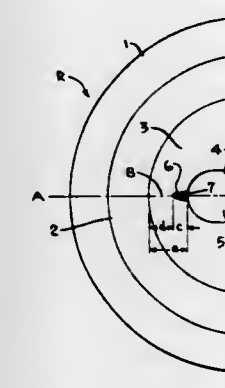
Filed Apr. 4, 1975, Ser. No. 564,997

Claims priority, application Germany, Apr. 11, 1974, 2417815

Int. Cl.² B27B 27/00; B23K 31/06

U.S. Cl. 72-272

8 Claims



1. A container for an extrusion press for use in an extrusion process, comprising:
a liner space having its shape defined by at least one liner wall;

said liner wall having at least one groove defined in a predetermined part thereof at which high stresses during the extrusion process are expected and extending in the direction of extrusion; and
a weld joint disposed in said groove filling and sealing it; said weld joint being elastic during the extrusion process.

4,007,620

METAL CONTAINER FORMING APPARATUS

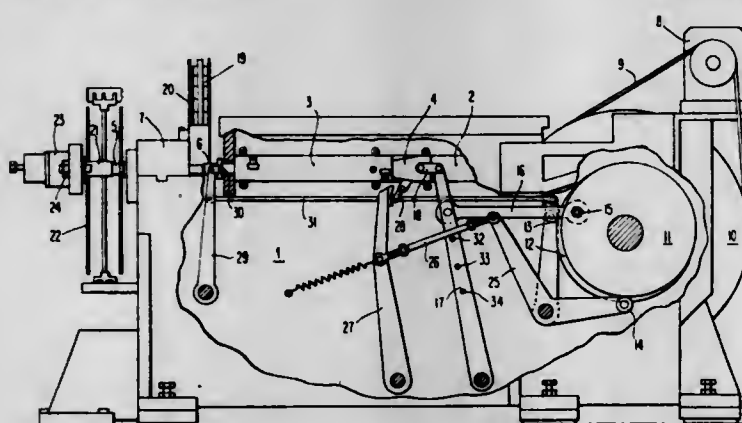
Joseph J. Urban, Pleasantville, N.Y., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed June 11, 1975, Ser. No. 586,023

Int. Cl.² B21D 45/00

U.S. Cl. 72-345

18 Claims



1. In an apparatus for forming drawn and ironed containers and including a reciprocating ram for urging container blanks through at least one annular die, means for aiding in stripping formed containers from said ram comprising:

- a stripper punch comprising an elongate rigid stem extending within said ram and having an enlarged head portion adapted to seat against one end of the ram;
- a carriage reciprocally guided within said apparatus and carrying said ram;
- a toggle member pivotally coupled to said carriage and having a first end coupled to said stripper punch and a second end;
- a planar cam element rotatable about a stationary axis in synchronism with the reciprocation of said ram; and
- an intermediate link mounted to pivot upon a stationary axis and reciprocally operated by said cam element and contacting said second end of said toggle member for maintaining said stripper punch in an advanced position as said ram retreats from said position to allow said ram to withdraw from within a formed container.

4,007,621

CONTAINERS

Jozef Tadeusz Franek, Chorelywood, and Paul Porucznik, St. Albans, both of England, assignors to The Metal Box Limited, Reading, England

Filed May 6, 1975, Ser. No. 574,966

Int. Cl.² B21D 22/08, 24/08

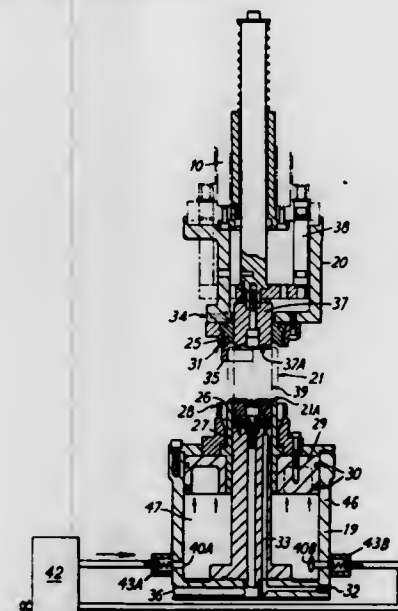
U.S. Cl. 72-351

18 Claims

1. A single action cam operated press comprising two end frames in spaced relationship to each other, an axle spanning the distance between said end frames, means for rotating said axle, said axle having fixed thereto a tool bolster and a turret in axial spaced relationship to each other, said tool bolster carrying a plurality of first tools, a plurality of rams disposed for reciprocal motion parallel to said axle, a plurality of guide ways defined by said turret for guiding the reciprocal motion of said rams, a drum cam means fixed to a first of said end frames remote from said tool bolster, each ram having at an end thereof adjacent said first end frame a follower in contact with said drum cam means, each ram having at an end thereof adjacent said tool bolster a second tool with pairs of said first and second tools being in axial alignment, preloaded tie bars extending between said end frames to maintain said end

frames in spaced relationship and said drum cam means in spaced axial relationship to said tool bolster and said turret, said drum cam means being operative during rotation of said tool bolster, turret and rams to move said rams in a sequence of motion including

- a. impact free engagement of a workpiece between said first and second tools followed by



- b. a workpiece forming operation beginning at zero velocity of said rams at controlled acceleration and terminates with controlled deceleration followed by
- c. a return stroke of said rams of greater linear velocity than the forming operation, and
- d. said return stroke includes at least one period of deceleration during which the formed article is stripped from the punch.

4,007,622

DEVICE FOR BENDING THIN-WALLED PIPES

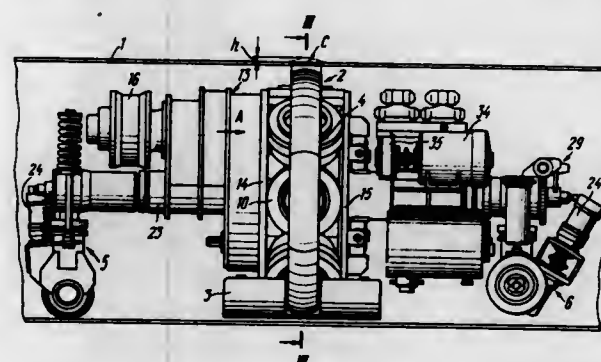
Abram Isaevich Galperin, 7 Parkovaya ulitsa, 25a, korpus 21, kv. 25; Lev Vladimirovich Vishnyakov, 3 Frunzenskaya ulitsa, 13, kv. 86; Boris Vladimirovich Pokrovsky, Schelkovskoe shosse, 81, kv. 94; Vladimir Iogonovich Kalganov, ulitsa Scherbakovskaya 57/20, kv. 277; Boris Borisovich Vasiliev, Khorovodny proezd, 20, kv. 51, and Igor Nikolaevich Kotikov, ulitsa Textilshchikov, 2/20, kv. 8, all of Moscow, U.S.S.R.

Filed May 1, 1975, Ser. No. 573,514

Int. Cl.² B21D 9/14

U.S. Cl. 72-393

5 Claims



1. A device for bending thin-walled pipes by embossing them with eccentric corrugations (C), comprising: an expander block (2) introducible into a pipe (1) to be bent, to the point of the desired bend, and being formed by a supporting shoe (3) and a punch (4), the latter being installed on the former, with provision for positive motion relative to said block in the course of the bending radially to the pipe surface, for making the desired corrugation on the pipe, the corrugation being eccentric to the pipe axis, and for thus bending the

pipe; said punch having the shape of a ring in a cross-sectional plane of the pipe, being open at the side of said shoe and composed of individual punch elements (7) around the circumference of said punch; power cylinders (10) whose axis are arranged radially to a cross-sectional plane of the pipe, having movable members (9) that are respectively articulated to said punch elements while having stationary members (10) connected with said shoe; said movable members making strokes that are substantially equal to the height (h) of the desired corrugation on the corresponding generatrix of the pipe.

4,007,623

SPRING OPERATED ACCELERATOR AND CONSTANT FORCE SPRING MECHANISM THEREFOR

George L. Shillinger, Jr., Campbell, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 24, 1975, Ser. No. 625,732

Int. Cl.² G01N 3/32

U.S. Cl. 73-12

9 Claims



1. Apparatus for applying acceleration to a body comprising a carriage for supporting the body, means for constraining said carriage for movement on a linear path, a spool supported for rotation on an axis adjacent and perpendicular to said path, a spirally biased spring circumscribing said spool and having a distal extremity, and means for attaching said distal extremity to said carriage so that when said carriage is displaced along said path in a direction away from said spool, a first portion of said spring is straightened into approximate parallelism with said path, a second portion of said spring circumscribes said spool, and a transition region intermediate said first and second portions is curvilinearly deformed so as to apply a force tending to accelerate said carriage toward said spool, said spring including a plurality of segments, each said segment having a different force producing capability to afford acceleration of said carriage at a varying magnitude along said path.

4,007,624

ELECTRONEGATIVE GAS DETECTION TECHNIQUE

Peter J. Chantry, and Cheng-Lin Chen, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 2, 1975, Ser. No. 592,857

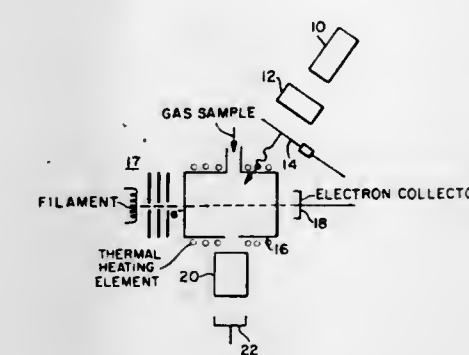
Int. Cl.² G01N 27/62

U.S. Cl. 73-23

10 Claims

1. A method for improving the sensitivity of electronegative gas detection techniques employing a dissociative electron attachment process, comprising the steps of, introducing electrons into a gas, said electrons having a suitable energy for attachment to molecules of interest within said gas, exciting molecules of interest to a vibrational or electronic level sufficient to increase the cross section of the molecules of interest for dissociative attachment by the elec-

trons to produce negative ions indicative of the molecules of interest, and



measuring the negative ions as an indication of said molecules of interest.

4,007,625

FLUIDIC OSCILLATOR ASSEMBLY

Heinz Houben, Monchen-Gladbach, and Manfred Pabst, Weiden near Cologne, both of Germany, assignors to A. Monforts, Monchen-Gladbach, Germany

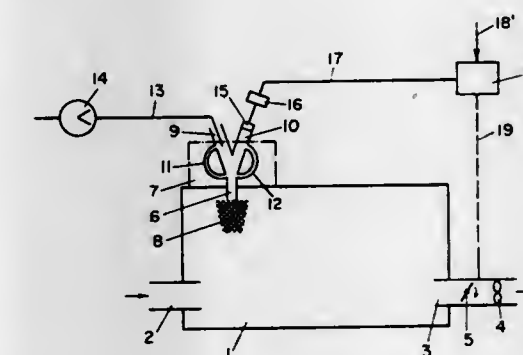
Filed July 14, 1975, Ser. No. 595,481

Claims priority, application Germany, Oct. 12, 1974, 2448783; July 13, 1974, 2433765

Int. Cl.² G01N 9/00

U.S. Cl. 73-23

5 Claims



1. A fluidic oscillator assembly comprising a fluidic oscillator having an inlet and two outlets, and a piezoelectric element for detecting frequency of oscillations induced in said fluid oscillator, said piezoelectric element being located at and closing one of said outlets of said fluidic oscillator.

4,007,626

CHROMATOGRAPHIC ANALYSIS

Lewis B. Roof, Bartlesville, Okla., and Donald D. DeFord, Glenview, Ill., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 18, 1975, Ser. No. 569,437

Int. Cl.² G01N 31/08

U.S. Cl. 73-23.1

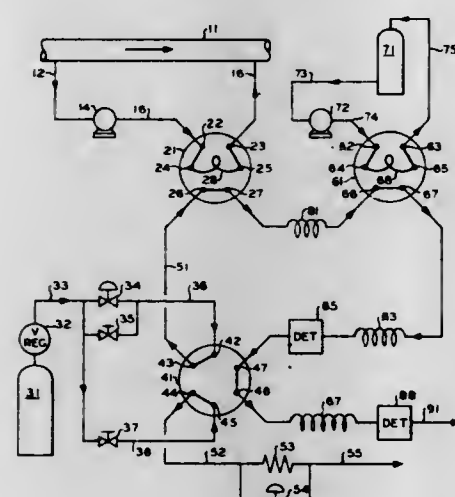
11 Claims

1. Chromatographic analysis apparatus comprising: an unpacked tubular vaporizer column means for vaporizing at least a portion of a liquid sample material introduced thereto, said vaporizer column means having a first end and a second end; means for providing a flow of a gaseous carrier fluid stream into said first end of said vaporizer column means; first valve means for introducing a preselected volume of said liquid sample material into said carrier fluid stream flowing into said first end of said vaporizer column means; first chromatographic column means in fluid communication with said second end of said vaporizer column means for at least partially separating preselected constituents of the vaporized sample material passing therethrough and

for delaying the passage of vapors of a solvent liquid therethrough until the passage of all said preselected constituents therethrough has been completed;

second chromatographic column means for receiving said preselected constituents from said first chromatographic column means and for further separating said preselected constituents;

chromatographic detector means for receiving each of said preselected constituents from said second chromatographic column means and delivering a signal responsive



to the amount of each said preselected constituent passing therethrough;

third valve means for reversing the flow of fluid through said first chromatographic column means and said vaporizer column means after said preselected constituents have passed from said first chromatographic column means to said second chromatographic column means; and

second valve means for introducing a preselected volume of said solvent liquid into the thus reversed fluid stream flowing into said second end of said vaporizer column means.

4,007,627 DENSITY TRANSDUCERS

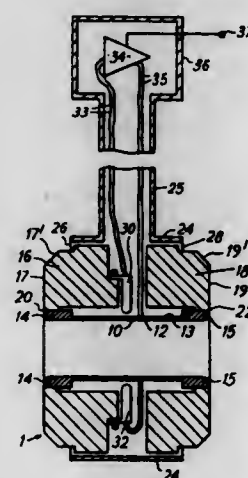
James Woolryche Stansfeld, Beech, near Alton, England, assignor to The Solartron Electronic Group Limited, Hampshire, England

Filed Sept. 18, 1975, Ser. No. 614,574
Claims priority, application United Kingdom, Sept. 21, 1974, 41208/74

Int. Cl.² G01N 9/00

U.S. Cl. 73-32 A

11 Claims



1. A density transducer for producing an output signal representative of the density of a fluid, comprising a hollow circumferentially vibratable cylinder arranged so that the fluid

can come into contact with only one of its internal and external surfaces, means for exciting and maintaining circumferential resonant vibration of the cylinder and for producing an output signal representative of the frequency of said vibration, and means responsive to the pressure of the fluid to apply a compressive axial force dependent upon said pressure to the cylinder, whereby to reduce the effect of variations of the pressure of the fluid on the frequency of said vibration.

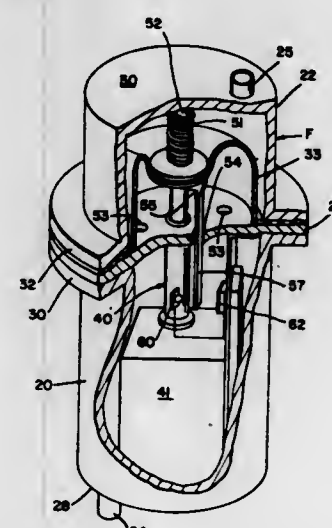
4,007,628 REMOTE FLOW TRANSDUCER FOR COMMUNICATION CABLE

Leslie Worcester, Los Altos, Calif., assignor to Mark Systems, Inc., Sunnyvale, Calif.

Filed Nov. 1, 1974, Ser. No. 520,192
Int. Cl.² G01M 3/28; G01F 1/38

U.S. Cl. 73-40.5 R

10 Claims



1. Apparatus for remotely monitoring air flow at a central station to the interior of a remotely located cable sheath surrounding a plurality of communication conduits, said apparatus comprising: a source of dehumidified air; an air conduit between said source of dehumidified air and the interior of said cable sheath for supplying dehumidified air to the interior of said sheath, a flow meter inserted in said air conduit proximate said sheath for passing at least part of the air there through to said sheath, said flow meter including a housing having an inlet for receiving at least part of said air, an outlet for discharging at least part of said air, and a biased diaphragm mounted for movement with respect to said housing responsive to changes in flow of said dehumidified air from said conduit to said cable sheath, and wherein said diaphragm comprises a flexible member rigidly attached to said housing at at least one portion, and movable within said housing responsive to air flow at another portion, means for defining an aperture in said diaphragm, a tapered member mounted to said housing and contacting with said aperture for defining changing air flow areas between said inlet and outlet upon changing concentric movement of said aperture over said tapered member responsive to changes in fluid flow between said inlet and outlet; a member having variable optical density within said meter operatively attached to said diaphragm for relative movement to said meter with said diaphragm responsive to fluid flow; a light source in said flow meter on one side of said member of variable optical density; a photo sensor on the other side of said member of variable optical density for receiving from said light source a signal proportional to the diaphragm actuated movement of said member of variable optical density; at least a pair of electrical conduits extending between said central station and said flow meter; means for remotely monitoring and powering said light source and photo sensor through said pair of electrical conduits; means for connecting said photo sensor across said pair of electrical conduits to impart between said conduits said signal proportional to the diaphragm actuated movement of said member of

variable optical density; and meter means at said central power station connected across said electrical conduits for reading said proportional signal.

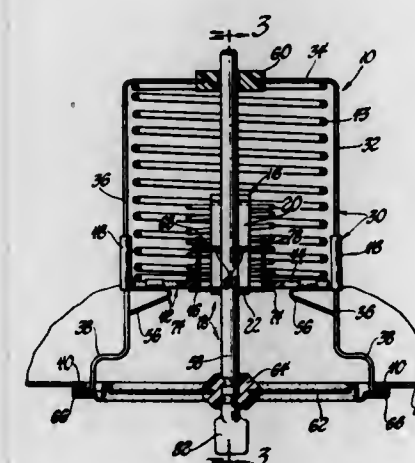
4,007,629 METHOD AND APPARATUS FOR MONITORING OIL DEGRADATION

Peter A. Hochstein, 14020 15 Mile Road, Sterling Heights, Mich. 48077

Filed Nov. 4, 1975, Ser. No. 628,810
Int. Cl.² G01N 33/30

U.S. Cl. 73-53

49 Claims



1. An apparatus for monitoring the degradation of oil comprising: first sensing means for producing an exponential output in response to oil temperature and the time the oil is subjected to the temperature, second sensing means for producing an additive output reflecting the number of occurrences the oil is heated without reaching a predetermined temperature, and summing means for producing a summation of said outputs.

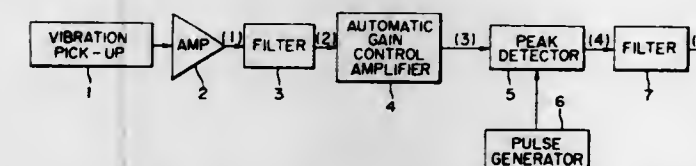
4,007,630 DEVICE FOR DETECTING DAMAGE ON ROTATORS

Banda Noda, Tokyo, Japan, assignor to Nippon Seiko K.K., Tokyo, Japan

Filed July 9, 1975, Ser. No. 594,251
Claims priority, application Japan, July 12, 1974, 49-79111
Int. Cl.² G01M 13/04, 15/00

U.S. Cl. 73-71.4

3 Claims



1. A device for detecting damage on a rotator by converting into electric signals the mechanical oscillation or sound produced when said rotator is rotated, and evaluating the amplitude of the electric signals originating from the presence of damage on the rotator manifested as an impulsive oscillation having a period dependent upon the rate of rotation of said rotator, said device comprising:

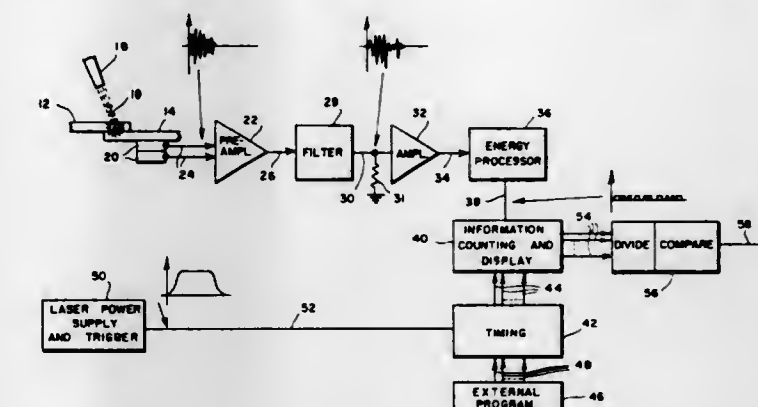
- a peak detector for detecting the peak value of said electric signals and holding that value as a DC level,
- a reset pulse generator for generating reset pulses having a predetermined pulse repetition rate to reset said peak detector at a predetermined time interval, the repetition rate of the reset pulses being predetermined so that said peak detector repeats at least twice the cycle of peak detecting, holding and resetting during one period of said impulsive oscillation, and
- means for deriving an output signal from said peak detector.

4,007,631 METHOD AND APPARATUS FOR EVALUATING WELDS USING STRESS-WAVE EMISSION TECHNIQUES

Mansoor Ali Saifi, and Sotirios John Vahaviolos, both of East Windsor Township, Mercer County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,481
Int. Cl.² G01N 29/00

10 Claims



1. A method for the real-time, non-destructive evaluation of a weld using stress-wave emission techniques, comprising the steps of:

- a. dividing a weld cycle into n intervals of time where $n \geq 4$, each interval corresponding to a different aspect occurring in the weld area during said weld cycles;
- b. measuring stress-wave energy emitted from the weld area during each of said intervals;
- c. forming ratios of the measured stress-wave energies between at least two of said time interval measurements; and
- d. determining the acceptability of a particular weld by comparing the measurements obtained for said n time intervals and the ratios thereof with a set of predetermined acceptable ranges for measurements selected from any combination of corresponding ones of said n time intervals and the corresponding ratio of said interval measurements.

4,007,632 APPARATUS FOR DETERMINING THE TEXTURAL QUALITIES OF FOOD

Ronald A. Segars, Hopkinton, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

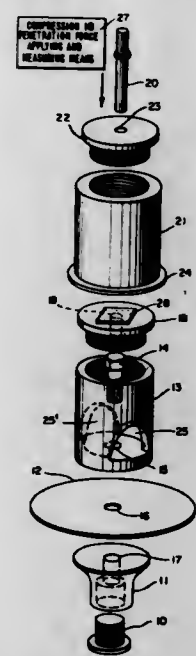
Filed Jan. 29, 1976, Ser. No. 653,418
Int. Cl.² G01N 3/24

U.S. Cl. 73-78

6 Claims

1. In an apparatus for evaluating the textural characteristics of a food product of the type comprising a rod-like food penetrating punch means and means for applying a compression or penetration force to said food product through said punch means and for measuring said force, said punch means being detachably attached to the compression or penetration force applying component of said means for applying a compression or penetration force and for measuring said force, the improvement comprising means for supporting a slice of said food product in a substantially horizontal plane substantially perpendicular to the central axis of said punch means, said food slice supporting means comprising a shear plate, a hollow cylindrically-shaped shear plate support, a solid circularly-shaped protection disk on which said shear plate support rests and to which said shear plate support is detachably attached, a support base means for supporting said protection disk in a substantially horizontal plane and an adapter means conformed to mate with said support base means so as to maintain said support base means, said protection disk, said shear plate support, and said shear plate properly oriented relative to said punch means, said adapter means being detachably attachable to a lower vertically movable or stationary element of said

compression or penetration force applying and measuring means, said shear plate being detachably attachable to the upper portion of said shear plate support and having a circularly-shaped die passing vertically through said shear plate with its central vertical axis coinciding with the central vertical axis of said shear plate, said circularly-shaped die having a diameter less than but not more than about 0.01 cm less than the diameter of said punch means, said punch means having a substantially planar face on its lower end, said punch means



and said shear plate being oriented so as to cooperate whereby said punch means enters into said circularly-shaped die while completing the punching of a plug from a slice of said food product being supported by said shear plate, the force measuring component of said means for applying a compression or penetration force and for measuring said force measuring and recording the force being applied by said punch means to said food product as said punch means punches said plug from said slice of food product.

4,007,633

METHOD OF DETERMINING THE PHYSICAL CHARACTERISTICS OF A SEA FLOOR

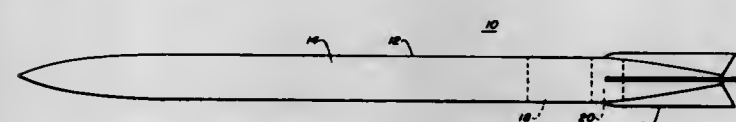
John R. Thompson, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 14, 1975, Ser. No. 621,714

Int. Cl.² G01N 3/30, 3/48

U.S. Cl. 73-84

4 Claims



1. A method of determining the physical characteristics of the sea floor comprising the steps of:

- providing a body of known size, weight, and shape capable of generating and transmitting acoustical signals;
- releasing said body into the sea such that said body descends in free fall until it strikes and penetrates the sea floor coming to rest therein;
- directing said acoustic signals substantially vertically upward from said body;
- receiving said acoustic signals in receivers disposed near the sea surface; and
- generating from said received acoustic signals, utilizing the doppler effect, a direct-current analog signal which is a function of the velocity of said body from a time immediately preceding said body's striking the sea floor surface until said body comes to rest in the sea floor, thereby

obtaining an indication of the physical characteristics of the sea floor.

4,007,634

FUEL RATE MONITOR APPARATUS FOR VEHICLES

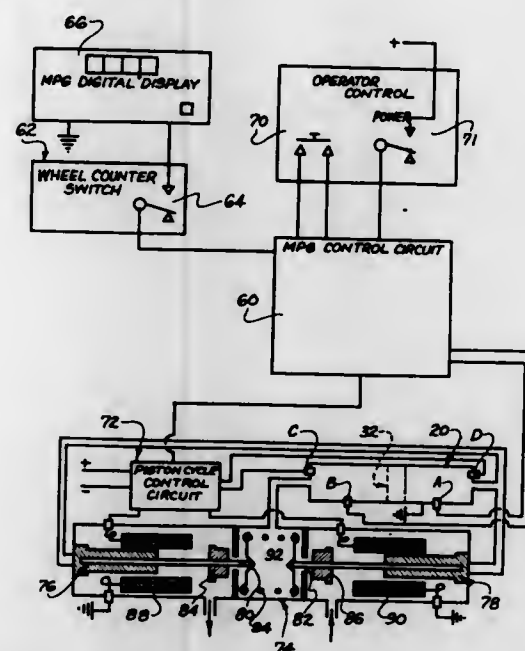
William R. Alban, R.R. No. 1, Galena, Ohio 43021

Filed Oct. 28, 1975, Ser. No. 625,946

Int. Cl.² G01F 9/00

U.S. Cl. 73-114

18 Claims



1. A digital fuel rate monitor apparatus for vehicles comprising, in combination, control circuit means including signal producing means for producing signals proportional to units of fuel flow volume and units of distance of vehicle travel and for relating such units to effect a single digital readout in miles per gallon; a positive displacement flow volume metering means mountable in said fuel flow for measuring fuel flow in small digital units of volume and for delivering fuel flow signals to said control circuit means; and vehicle travel measurement means for measuring vehicle travel in small digital units of distance occurring during a measured fuel flow volume, said measurement means being connected to said control circuit means for delivering distance traveled signals thereto, said flow volume metering means including a metering cylinder for receiving said flow, a position revealing piston mounted for reciprocation in said cylinder, and a low-friction peripheral seal on said piston and engaging the inner wall of said metering cylinder.

4,007,635

FLUID VOLUME APPARATUS FOR MEASURING A FLUID UNDER PRESSURE

Eberhard Friebe, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 23, 1975, Ser. No. 589,002

Claims priority, application Germany, June 28, 1974, 2431751

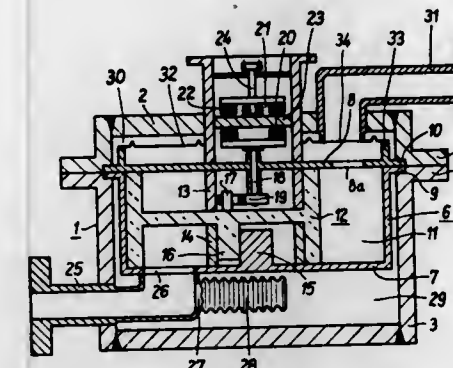
Int. Cl.² G01F 3/08, 15/14

U.S. Cl. 73-273

7 Claims

1. In a fluid-volume apparatus for measuring fluid flow under pressure having a pressure-resistant housing, a measuring chamber housing arranged within the outer housing so as to conjointly define therewith a space, and a fluid medium contained within said space, inlet and outlet ducts being provided to supply said fluid under pressure to and remove it from said measuring chamber housing, said inlet and outlet ducts passing through said outer housing, the improvement comprising: pressure-responsive means interposed between the fluid

to be measured and the fluid medium in said space thereby enclosing said space, said pressure-responsive means equalizing



ing the pressures developed by the fluid to be measured and said fluid medium contained in said enclosed space.

4,007,636

LIQUID METAL LEVEL INDICATOR

Martin H. Wahl, Evans City, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Continuation of Ser. No. 392,965, Aug. 30, 1973, abandoned.

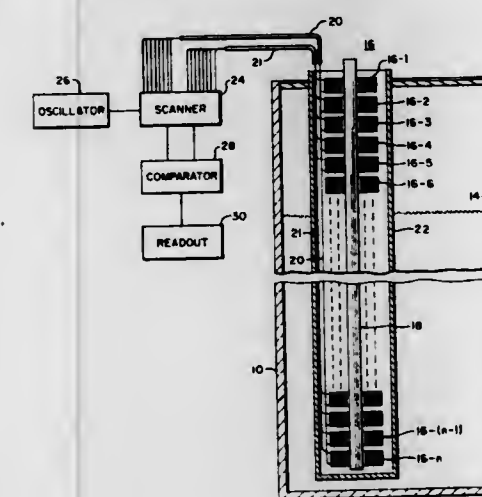
This application Mar. 4, 1975, Ser. No. 555,146

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 20, 1976

Int. Cl.² G01F 23/26

U.S. Cl. 73-290 R

2 Claims



1. A liquid metal level indicator comprising a plurality of substantially identical unshielded coils, means for supporting said coils in a vertical coaxial array extending over substantially the full depth of liquid metal to be measured, means for comparing the impedance of each coil to the impedance of the next adjacent coil successively from one end of the array to the other, and a common magnetic core on which said coils are supported.

4,007,637

DISPOSABLE-TYPE TEMPERATURE RECORDER

George Nakagawa, and Robert M. Nakagawa, both of 1812 Dakota Ave., Modesto, Calif. 95351

Filed Mar. 11, 1976, Ser. No. 666,043

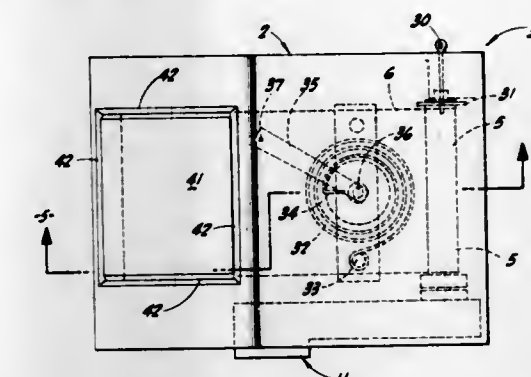
Int. Cl.² G01K 5/70

U.S. Cl. 73-343.5

7 Claims

1. A temperature recorder comprising a case, a feed spool and a take-up spool rotatably mounted in the case in spaced, parallel relation, a tape wound on the feed spool and extending therefrom to connection with the take-up spool, motor means connected to the take-up spool and acting to rotate the same in a direction to cause the tape to travel from the feed spool and wind onto said take-up spool, a temperature-responsive device mounted in the case and including a movable

stylus having means to scribe on the tape at a point between the spools, a speed-control device arranged in connection with at least one of the spools and operative to govern the speed of travel of the tape between said spools, and releasable means



initially preventing rotation of said spools; the take-up spool being of greater diameter than the feed spool, and the case being formed with a cylindrical portion which surrounds the take-up spool in concentric relation.

4,007,638

LIQUID SAMPLING

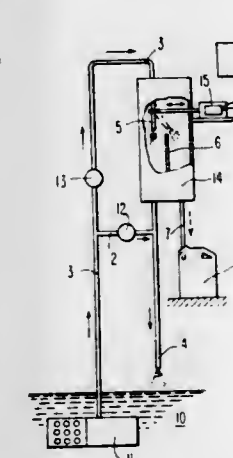
Malcolm F. Irwin, West Chester, and Charles A. McClure, Malvern, both of Pa., assignors to Pro-Tech Inc., Malvern, Pa.

Filed Sept. 29, 1975, Ser. No. 617,649

Int. Cl.² G01N 1/18

U.S. Cl. 73-421 A

12 Claims



1. In liquid sampling wherein liquid is withdrawn from a body of liquid being sampled to flow past an intermittent diversion locus and back to the body of liquid or to waste except when being diverted from such locus to a collection location, the improvement in providing a plurality of separate samples simultaneously comprising passing the flow of liquid through a first temporarily confining region having a plurality of outlets therefrom, separately flowing streams of liquid from the respective outlets into a second temporarily confining region and past loci of intermittent diversion and back to the body of liquid or to waste except when being diverted, intermittently diverting each such stream at its diversion locus to the collection location, and collecting them as individual samples thereat.

4,007,639

CAPILLARY VESSEL FOR BLOOD REMOVAL

Rainer Haackel, Hannover, Germany, assignor to Firma Walter Sarstedt Kunststoff-Spritzgusswerk, Numbrecht, Rommelsdorf, Germany

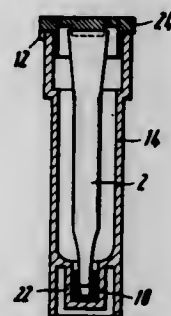
Filed Aug. 14, 1975, Ser. No. 604,812

Claims priority, application Germany, Aug. 16, 1974, 2439218

Int. Cl.² B01L 3/02

U.S. Cl. 73-425.4 P

10 Claims



1. Capillary vessel for extracting very small quantities of blood, wherein the nozzle is in the form of a capillary tube, while the remaining region is widened such that a micropipette can be inserted therein, and at least the end of the nozzle is closable by means of a plug.

4,007,641

MOLTEN METAL SAMPLER WITH VACUUM

Edward A. Kelsey, Disley, England, assignor to Robert C. Collins, Ashippun, Wis.

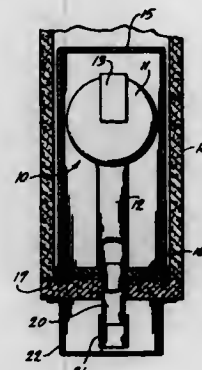
Filed Mar. 17, 1975, Ser. No. 559,046

Claims priority, application United Kingdom, Mar. 20, 1974, 12363/74

Int. Cl.² G01N 1/12

U.S. Cl. 73-425.6

16 Claims



1. In a molten metal sampler; a container adapted to be mounted at the end of a probe; a mold in said container for receiving the sample of molten metal; means permitting the flow of air between the interior of said mold and said container but preventing the flow of molten metal out of said mold; air tight sealing means for sealing said container so that the atmosphere can be evacuated from said container as well as from the mold in said container and the vacuum can be maintained therein; and filler means for admitting molten metal into said mold while the mold is in said container and while the vacuum is maintained in said container for assisting the flow of molten metal into said mold.

4,007,642

SYSTEM AND METHOD FOR IDENTIFYING ANGULAR LOCATION AND AMOUNT OF WHEEL BALANCING WEIGHTS

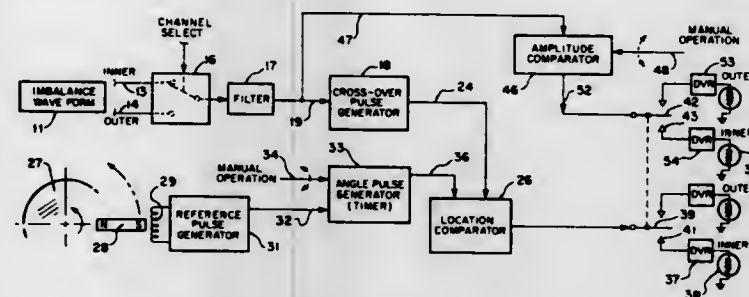
Bernie F. Jackson, Los Gatos, Calif., assignor to Nortron Corporation, Mountain View, Calif.

Filed May 14, 1975, Ser. No. 577,457

Int. Cl.² G01M 1/22

U.S. Cl. 73-462

3 Claims



1. In a system for detecting the angular locus for weights to be secured to a rotatable body in balancing the body means for electronically monitoring unbalanced forces on the body to generate a periodic waveform thereof in which the wave crosses the zero amplitude axis in a negative going direction during the period thereof at an angular position wherein said weight should be added to the body, comprising means for generating a cross-over pulse in response to each negative going crossing of the zero axis, locus detecting means having two inputs, one of said inputs being operatively coupled to receive said cross-over pulses, means serving to sense each revolution of the body and to provide a reference pulse in response thereto, timer means responsive to said reference pulse for generating an angle pulse, said angle pulse forming said second input to said locus detecting means, lighting means coupled to said locus detecting means, said detecting means serving to detect when said signals are conjointly pre-

4,007,640

SAMPLING APPARATUS

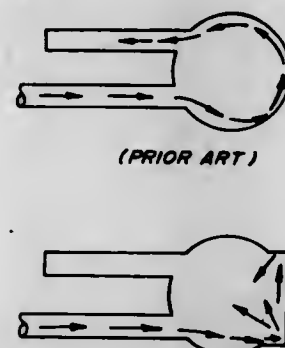
Joseph J. Boron, Medina, Ohio, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1976, Ser. No. 651,710

Int. Cl.² G01N 1/20

U.S. Cl. 73-425.4 R

17 Claims



1. Apparatus for taking a sample from a flowing stream of molten metal comprising: container means defining a mold cavity having a mold chamber and a pin chamber communicating with each other for receiving a sample quantity of said molten metal and forming a mold chamber sample and a pin sample; a sample tube communicating with said mold chamber and having an open end adapted to be placed in said stream of molten metal for supplying said metal to said tube and chambers; said mold chamber, pin chamber and sample tube defining a flow path; means in the flow path for substantially equalizing the carbon content of the pin sample and the mold chamber sample.

sent on said two inputs and serving to operate said lighting means from a first to a second condition responsive to the conjoint presence of said first and second inputs, means for varying the duration of said angle pulse from a first pulse duration to a second pulse duration until said second condition is on the verge of being achieved, the degree of said varying of the last named said means serving to define the angular position for weight to be added.

4,007,643

VIBRATION SENSING AND RESPONDING DEVICE

Yukio Matsushita, 202-5 Tsuchiyama, Hiraoka, Kakogawa, Hyogo, Japan

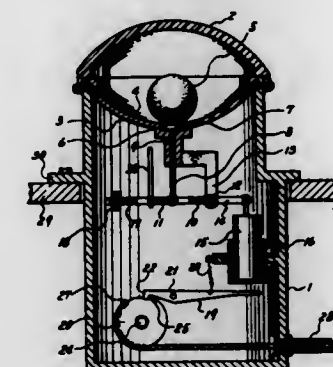
Filed June 6, 1975, Ser. No. 584,628

Claims priority, application Japan, Dec. 9, 1974, 49-141828; Dec. 9, 1974, 49-141829

Int. Cl.² G05G 17/00

U.S. Cl. 74-2

2 Claims



1. A device for sensing vibration and responding thereto to actuate a utilization device, comprising a spherical ball, a ball saucer having a spherical inner surface for sustaining said ball, the radius of curvature of said inner surface being sufficiently greater than the radius of said ball, a depression formed in the bottom of said inner surface, a reciprocable member substantially disposed in said depression and placed just under said ball in the normal stationary condition, means of urging said reciprocable member upwardly such that said reciprocable member can not move against the weight of said ball in the normal stationary condition but can move upwardly to protrude from the inner surface of said ball saucer when said ball leaves said reciprocable member, and means for coupling said reciprocable member to said utilization device for actuating said utilization device in response to the vertical motion of said reciprocable member, said device further comprising a suspension weight suspended vertically by a spring to allow a vertical vibration, a kicking mechanism coupled to said suspension weight for displacing said ball in response to the vertical vibration of said suspension weight.

4,007,644

BELT

Ernest F. Weinberger, Ardsley, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,691

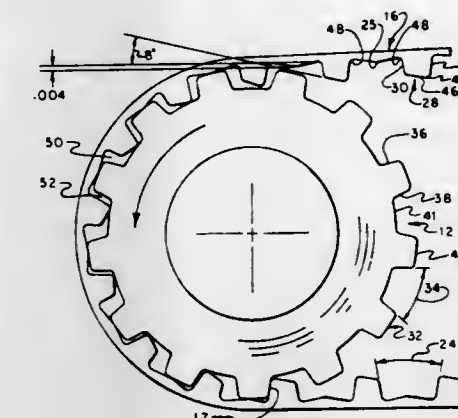
Int. Cl.² F16H 7/00; F16G 1/28

U.S. Cl. 74-229

26 Claims

1. A power transmitting toothed belt comprising: means to provide a single tooth driving contact between the toothed belt and the pulley; and

means on the toothed belt including an apex between the



teeth to provide minimal contact between the tooth valleys of the belt and the teeth of the pulley.

4,007,645

OPERATOR MECHANISM

Ernest Baker Dove, Auckland, New Zealand, and James Frederick Hemens, Billericay, England, assignors to Teleflex Morse Ltd., Basildon, England

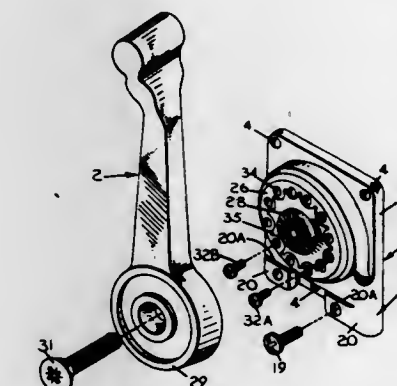
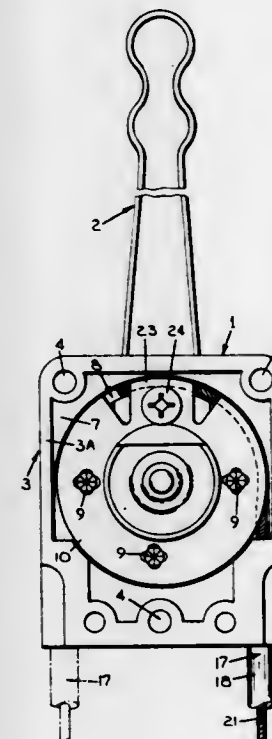
Filed Feb. 6, 1975, Ser. No. 547,676

Claims priority, application United Kingdom, Feb. 13, 1974, 6560/74

Int. Cl.² F16C 1/10

U.S. Cl. 74-501 R

18 Claims



1. An operator mechanism for translating the core of a cable having a casing guiding the core, comprising a cable wheel mounted for rotation inside a housing, the cable wheel being adapted for attachment of the core to a defined region

of the periphery thereof so that the core, when so attached, will, at its attached area, be rotatably fast with the peripheral region of the cable wheel, a handle for rotating the cable wheel, the handle being positioned outside the housing and adjacent a forward end face thereof, the handle being capable of operative securement with respect to the cable wheel in any of a plurality of angular orientations relative thereto about the axis thereof, a chamber within said housing in which the cable wheel is positioned, the chamber opening to the rearward face of the housing which is adapted for mounting the operator mechanism, the chamber opening being closed upon such mounting, the cable wheel incorporates a hub which is journaled for rotation in the housing, the hub projects through and forwardly of the forward end face of the housing, the projecting end and face of the hub being serrated, and the handle has a hub with complementary serrations by which the handle can be positively mounted on the cable wheel hub in any of said multitude of angular orientations relative to the cable wheel, screw means for securing the handle at its hub to the cable wheel hub, means for limiting the degree of rotational movement available to the cable wheel.

4,007,646

MODEL VEHICLE CONTROL SYSTEM

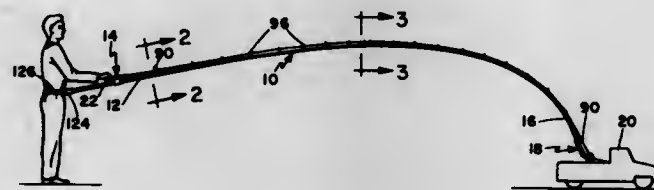
Edward N. De Jonge, 5024 Ovid Place, San Diego, Calif. 92117

Filed May 1, 1975, Ser. No. 573,763

Int. Cl.² A63H 27/04

U.S. Cl. 74—501 R

6 Claims



1. A model vehicle control system, comprising:
an elongated flexible rod having a butt end and a tip end, said rod being substantially rigid at the butt end and increasing in flexibility toward the tip end;
a control unit secured on said butt end and having hand operated control means mounted therein;
a connector on said tip end with means for universal pivotal attachment to a vehicle to be controlled;
flexible cables coupled to said control means and extending along said rod to said connector;
guide means spaced along the rod for supporting said cables;
and terminal guidance means on said connector for guiding said cables into the vehicle.

4,007,647

CHOKE CONTROL ASSEMBLY

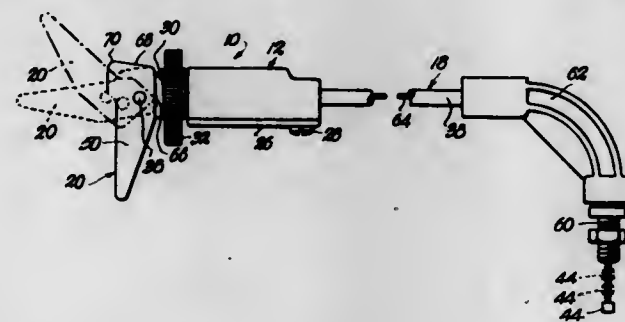
John A. Carlson, Wichita, Kans., assignor to Conchemco, Incorporated, Lenexa, Kans.

Filed Aug. 13, 1975, Ser. No. 604,321

Int. Cl.² F16C 1/10

U.S. Cl. 74—501 R

10 Claims



1. A control assembly including:

an elongate body having mounting means thereon for attachment to a mounting panel or the like;
an elongate slide member carried by said body for longitudinal non-rotatable reciprocation relative thereto, said slide member having at least one end projecting beyond said body;
a lever secured to said one end of said slide member;
at least one control element secured to and extending from an opposite end of said slide member for the reciprocable shifting movement therewith; and
means for biasing said slide member in the direction of said control element and for maintaining said lever in abutment with said body,
said lever being selectively shiftable relative to said slide member and said body from a normal position to at least one alternate position in which said slide member is shifted against the action of said bias means in the direction of said lever to correspondingly reposition said control element.

4,007,648

FIVE-SPEED AUTOMATIC TRANSMISSION

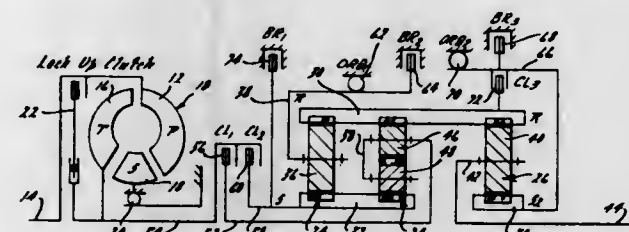
Charles C. Bookout, Orchard Lake, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 24, 1975, Ser. No. 571,025

Int. Cl.² F16H 57/10

U.S. Cl. 74—763

6 Claims



1. A multiple ratio power transmission mechanism for use in an automotive vehicle driveline for delivering torque from a driving shaft to a driven shaft comprising three planetary gear units, said gear units including first and second planetary units and a compound planetary gear unit, each planetary gear unit having a ring gear, a sun gear, planetary pinions engaging the sun and the ring gears and a carrier for journaled the planetary pinions, the sun gears for the first simple planetary gear unit and the compound planetary gear unit being connected together, the ring gears for the planetary gear units being connected together, the carrier of the second planetary gear unit being connected to said driven shaft, the driving shaft being connected to the carrier of said compound planetary gear unit, first clutch means for establishing a torque delivery path to said torque input shaft during operation in each forward driving ratio, second clutch means for establishing a torque delivery path to the common sun gear for the first planetary gear unit and said compound gear unit during operation in the fourth and fifth forward driving ratios and during operation in reverse ratio, first brake means for anchoring the carrier of the first planetary gear unit during operation in the first two underdrive ratios, second brake means for anchoring the sun gear of the second simple planetary gear unit during operation in the first speed ratio and in the third and fourth speed ratios, and third brake means for anchoring the sun gears of said first simple planetary gear unit and said compound planetary gear unit during operation in the third drive ratio.

4,007,649

TRANSMISSION ASSEMBLY

Harry Stirland, 'Poplars', Fosse Road, Colston, Nottinghamshire, England

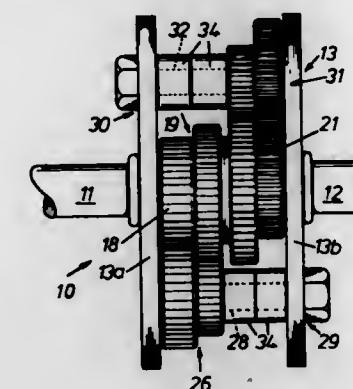
Filed May 1, 1975, Ser. No. 573,801

Claims priority, application United Kingdom, May 2, 1974, 19400/74

Int. Cl.² F16H 1/28

U.S. Cl. 74—803

16 Claims



1. A transmission assembly comprising an input shaft and a take-off shaft in co-axial alignment, a gear carrying member rotatably mounted on the input and take-off shafts, a first gear fixedly mounted on the input shaft and a second gear fixedly mounted on the take-off shaft, a control gear co-axial with the input and take-off shafts and mounted for rotation relative thereto, a first gear train rotatably carried by the gear carrying member and arranged to provide a driving connection between the first gear and the control gear and a second gear train rotatably carried by the gear carrying member and arranged to provide a driving connection between the control gear and the second gear, the first and second gear trains being arranged to rotate the gear carrying member in opposite directions for a given direction of rotation of the input shaft, the first gear, first gear train and control gear being so sized to form a step down in rotational speed from the first gear to the control gear, and the control gear, second gear train and second gear being so sized to form a step up in rotational speed from the control gear to the second gear, the gear sizes being such that the amount of step up is greater than the amount of step down, the arrangement being such that for a given speed of rotation of the input shaft the assembly automatically adjusts the speed of rotation of the take-off shaft between a maximum and a minimum speed of revolution in accordance with load applied to the take-off shaft.

4,007,650

GARDEN HOSE COUPLING TOOL

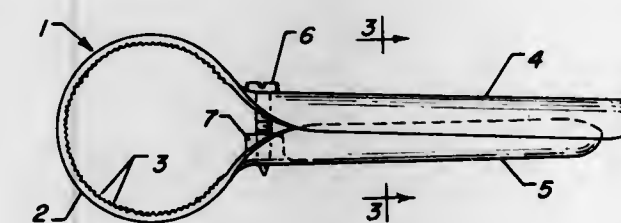
Lester R. Wellman, Highland Park, Ill., assignor to Barbara F. Wellman, Highland Park, Ill.

Filed Nov. 12, 1975, Ser. No. 631,411

Int. Cl.² B25B 13/52

U.S. Cl. 81—64

2 Claims



1. A hose coupling handle which comprises, in combination:
a. a unitary body having a pair of elongated arms, one end of each being integral with a wider flat portion forming a band-like ring, the interior surface of which is knurled parallel to the central axis of said ring, said arms being (i)

U-shaped in cross section, (ii) of unequal length and, (iii) sized to provide nesting of the shorter arm within the longer arm; and,
b. means providing a wrapping force of said ring around said coupling, said means disposed (i) proximate to the junction of said arms with said wider flat portion and, (ii) substantially perpendicular to the horizontal plane containing the axis of said ring.

4,007,651

DEVICE FOR INCREASING THE TORQUE APPLIED TO A HAND TOOL

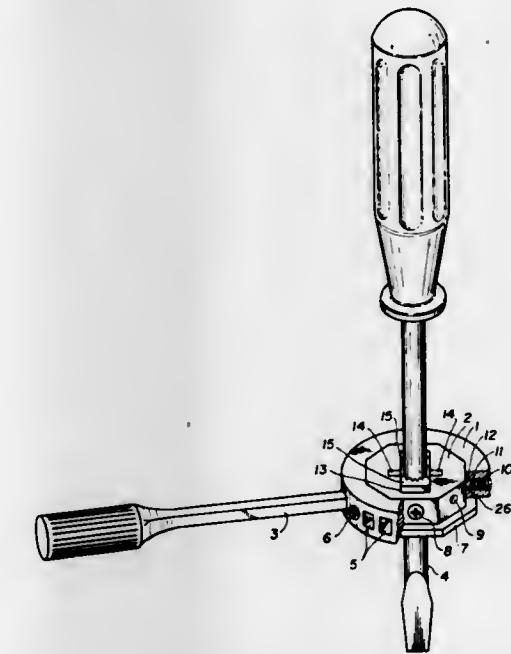
Douglas J. Scott, 62 Lawrence Ave., Smithtown, N.Y. 11787

Filed Oct. 1, 1975, Ser. No. 618,635

Int. Cl.² B25B 13/48

U.S. Cl. 81—180 R

8 Claims



1. Apparatus to increase the torque applied to the shaft of a hand tool comprising:

- a lever arm,
- a generally disc shaped shaft holder with a first hole located at the center of the disc, the axis of said hole being collocated with the axis of revolution of the disc shaped shaft holder, and a plurality of holes located about the periphery of the holder with their axes oriented generally perpendicular to the axis of revolution of said disc shaped shaft holder, each hole of said set of holes adapted to accept one end of said lever arm, said holder being divided into an outer and inner section which are separable, said inner section including said first hole in the center of the holder and the outer section including said plurality of holes about the outer periphery of the holder,
- a first securing means to connect the tool shaft to the holder, said means being located about the periphery of said first hole, and
- a second securing means to connect said inner and outer sections, whereby a single outer section and a lever may be used in conjunction with a variety of different tools, each of which has a separate inner section adapted to accept a particular tool.

4,007,652

CONTINUOUSLY VARIABLE CUTTING APPARATUS FOR ELONGATED SHEET MEMBERS

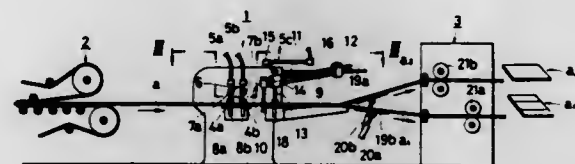
Tsutomu Shinomiya, Iwatsuki, and Sanji Itoh, Tokyo, both of Japan, assignors to Kabushiki Kaisha Tomoku, Otaru, Japan

Filed Jan. 5, 1976, Ser. No. 646,869

Claims priority, application Japan, Jan. 9, 1975, 50-4654
Int. Cl.² B26F 3/00

U.S. Cl. 83-106

5 Claims



1. A continuously variable cutting apparatus for elongated sheet members that are continuously supplied in a longitudinal moving direction thereof and at desired intervals of width; comprising several first projection nozzles connected to a high-pressure liquid source, said first nozzles being disposed to form at least two rows that extend transversely relative to the moving direction; at least one second injection nozzle connected to a high-pressure liquid source, arranged to be driven transversely relative to the moving direction, said second nozzle being provided at a downstream position of the sheet members, below said first nozzles; a holding rod provided above the sheet members in a transverse direction thereof, having guide grooves made in both sides of said rod; and members slidably mounted for adjustment in said grooves; and wherein said first nozzles are individually attached to said members.

4,007,653

PUNCHING DEVICE WITH PUNCH RETAINER

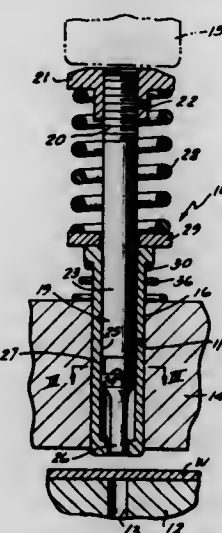
Percy L. Cady, Darien Center, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed July 7, 1975, Ser. No. 593,783

Int. Cl.² B26F 1/14

U.S. Cl. 83-140

5 Claims



1. A punching device comprising:

- a frame having a lower arm on which a die is supported, and an upper arm having a vertical bore aligned therewith;
- a punch guide and stripper sleeve slidably disposed in the bore in said upper arm;
- a punch having a body slidably disposed in said sleeve, said body having a radially opening recess therein directed toward the interior of said sleeve;
- a stripping spring acting between said sleeve and said punch to urge the lower end of said punch into said sleeve;

- a friction member, carried by said body, disposed in said body recess and having a sliding frictional fit with the interior wall of said sleeve greater than that which the punch body inherently has; and
- a lifting spring acting between said sleeve and said upper arm and urging said sleeve away from said die.

4,007,654

SAWING APPARATUS OF THE PULPWOOD SLASHER TYPE

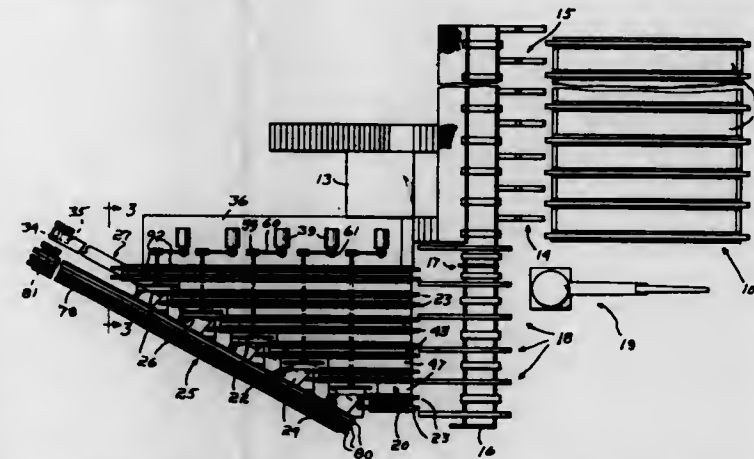
Sumner R. Oleson, 117 W. Pleasant St., Westbrook, Maine 04092

Filed Sept. 25, 1975, Ser. No. 616,674

Int. Cl.² B27B 7/00

U.S. Cl. 83-155

13 Claims



1. A slasher for cutting logs into lengths suitable for use as pulpwood, said slasher including a log-supporting deck and structure supporting said deck in an upwardly inclined position, said deck substantially in the form of a right triangle, a series of parallel circular saws spaced along the upwardly inclined side of the deck that corresponds to the hypotenuse of said triangle, conveying means extending from the lower to the upper end of the deck parallel to the other upwardly inclined side thereof and operable to support a log transversely of the deck and carry that log into engagement with the saws, said saws being so positioned that the distance between each two saws provides the desired length into which the conveyed log is to be cut, that a log is in contact with only one saw at a time, and that each length being cut protrudes from said first named side, and said conveying means includes courses holding each log on both sides of each saw as said log is being cut thereby, the course supporting the protruding end thereof terminating in such relation to the proximate saw as to permit each cut length to drop from the deck immediately upon being cut free.

4,007,655

FLYING CUTTER WITH CONTINUOUS WORK PIECE SUPPORT

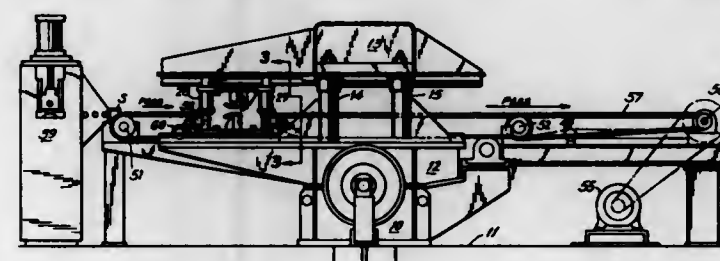
James W. Schuetz, Pittsburgh, and William A. Martin, Volant, both of Pa., assignors to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed July 31, 1975, Ser. No. 600,265

Int. Cl.² B23D 25/04

U.S. Cl. 83-155

4 Claims



1. A flying cutter apparatus for cutting a web into lengths, characterized by

- a cutter carriage;

- a carriage supporting structure including telescopically connected upper and lower platen structures;
- said cutter carriage carried by said supporting structure and movable thereon along a strip pass line through said apparatus between first and second limit positions;
- opposed upper and lower shear blades on said cutter carriage;
- said upper and lower platen structures supporting and confining said cutter carriage and operative upon telescopic closing movement to compress said carriage and actuate said opposed shear blades through a cutting motion;
- a plurality of transversely spaced, longitudinally extending slide elements on said platen structures and said carriage;
- strip conveyor guide means including a plurality of transversely spaced guide belts for conveying strip through said apparatus;
- said strip conveyor guide means including entry-side guide means for supporting the strip upstream of said first carriage limit position, exit-side guide means for supporting the strip downstream of said second carriage limit position, and intermediate strip supporting means between said entry-side and exit-side guide means;
- said intermediate strip supporting means mounted on said carriage for guiding said spaced belts along said pass line to and from points adjacent said shear blades, and in the region between said points guiding said belts below said carriage; and
- said conveyor guide means including means between said lower platen structure and said carriage for guiding said spaced belts between said transversely spaced slide elements.

4,007,656

APPARATUS FOR CUTTING A WEB OF SHEET MATERIAL

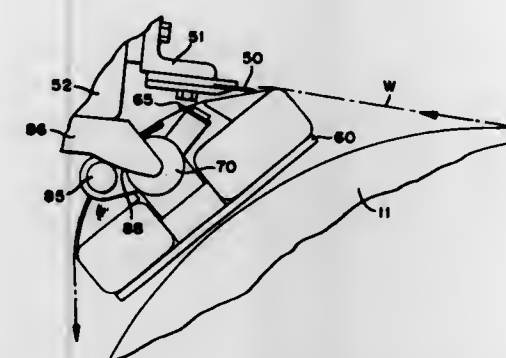
Robert G. Erdody, Wilmington, Del.; Paul E. Harmon, and Richard S. Tetro, both of Fulton, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del. and The Black Clawson Company, Middletown, Ohio, part interest to each

Division of Ser. No. 481,203, June 20, 1974. This application Dec. 11, 1975, Ser. No. 639,988

Int. Cl.² B26D 7/14

U.S. Cl. 83-175

8 Claims



1. Apparatus for cutting a web, particularly a moving web of a material having a high tendency to elongation under stress, comprising:

- base means defining a cutting station and including means for guiding the web through said cutting station,
- a cutting knife mounted for cutting movement with respect to said guide means along a predetermined path through said cutting station,
- seizing means for the web mounted for movement with respect to said guide means to a holding station spaced relatively closely downstream from said cutting station to isolate the portion of the web located between said stations from tension forces downstream thereof,
- drive means for causing said knife and said seizing means to execute said movements thereof in timed relation, and

- said cutting movement of said knife including a component directed along and upstream of said web path to develop tension in said isolated portion of the web.

4,007,657

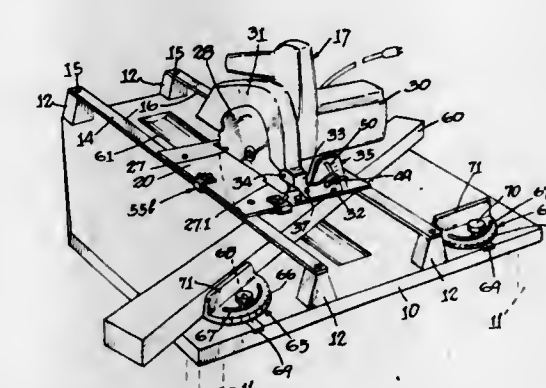
SAW TABLES

Andrew E. Burch, 199 Ohio St. NW., Warren, Ohio 44485
Filed Dec. 5, 1975, Ser. No. 638,190

Int. Cl.² B27B 5/20

U.S. Cl. 83-471.3

10 Claims



1. A saw table for use with a portable power saw of conventional construction, said saw having a motor housing, and a shroud enclosing the upper portion of the rotatable saw, comprising:

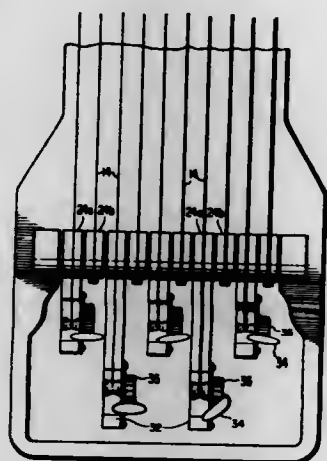
- a base having an upper flat surface upon which work is adapted to be supported,
- a pair of metal guide rails having flat upper surfaces and supported from said base and extending upwardly from said base flat surface with said rail flat surfaces in parallelism therewith, said rails being spaced apart a predetermined distance and providing facing edges which are in parallelism,
- a rigid metal support plate, carrying (adapted to carry) said housing and shroud in position to project from an upper surface thereof, said support plate having a lower flat surface, portions of which overlie and engage against said rail flat surfaces, said support plate also having a slotted opening (a slot adapted) to pass the saw blade so that a lower portion of the latter (thereof) projects below said support plate,
- four guide members secured to said support plate to project from the lower surface thereof, said guide members being spaced from each other and arranged in a square pattern, opposite sides of said square pattern being selectively alignable with the facing edges of said guide rails, said support plate slot being disposed between and parallel to two opposite sides of said square pattern,
- the distance between any adjoining pair of guide members being substantially equal to the spacing between the edge surfaces of said guide rails, and pairs of said guide members at one and (or) the other of opposite sides of said square pattern being selectively engageable with respective edge surfaces of said guide rails to selectively position said support plate and the power saw carried thereby in any one of two positions, which positions are at right angle to each other, whereby said saw may be engaged with said work for crosscutting and ripping operations,
- said support plate and the saw carried thereby being moved from one position to the other by lifting said support plate from said rails to clear the pair of guide members engaged with the edge surfaces of said guide rails and turning said support plate ninety degrees in planar fashion, and then lowering said support plate onto said rails with the other pair of guide members engaged with the side edges of said rails.

4,007,658

STRING MOUNTING AND ADJUSTMENT FOR STEEL GUITARSHarold T. Spain, 1900 Ridgemont Road, Richmond, Va. 23224
Filed Aug. 29, 1975, Ser. No. 608,981Int. Cl.² G10D 3/14

U.S. Cl. 84—312

8 Claims



1. In a steel guitar of the type comprising:
a plurality of parallel strings mounted thereon;
a string-mounting means for mounting and controlling the tensions of said strings comprising first and second string supporting and tensioning assemblies located at opposite ends of said steel guitar, each of said assemblies including elongated displaceable levers between which said strings extend, each lever including an arcuate portion over which an attached string passes, and a string securing means for attaching the end of said string to said lever; and
a lever actuating means for adjustably displacing said levers to selectively vary the tensions of the strings attached to said levers;
the improvement wherein only one of said string securing means for each of said strings includes a rotatable tuning peg about which said string wraps, said tuning peg including a hand gripping portion which can be hand grasped and hand rotated for manual tuning, the rotatable tuning pegs being positioned at opposite ends of said steel guitar for adjacent strings.

4,007,659

FASTENER INSERT WITH IMPROVED ANTI-ROTATION AND PULL-OUT CHARACTERISTICS

Edgar L. Stencel, Huntington Beach, Calif., assignor to VSI Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 396,263, Sept. 11, 1973, which is a continuation of Ser. No. 238,420, March 27, 1972, abandoned, and a continuation-in-part of Ser. No. 448,009, March 4, 1974, abandoned, which is a continuation-in-part of Ser. Nos. 342,875, March 19, 1973, abandoned, and Ser. No. 238,420, March 27, 1972, abandoned. This application Feb. 13, 1975, Ser. No. 549,562

Int. Cl.² F16B 13/10

U.S. Cl. 85—70

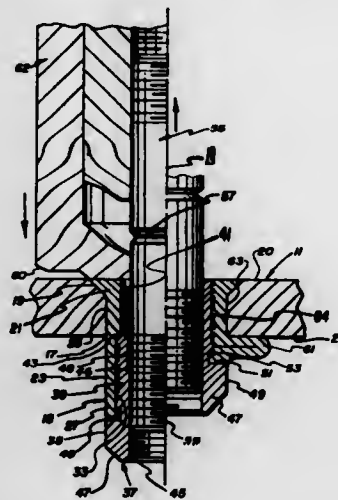
17 Claims

1. A blind fastener system for connecting a threaded member to a relatively thin, plate-like workpiece having a hole and an accessible surface comprising:

- a. an outer relatively ductile deformable cylindrical sleeve having:
 - i. an expansion portion of small inner diameter in the workpiece, and
 - ii. a bulbing portion of a larger inner diameter on the blind side of the workpiece, and
- b. a slidable relatively non-deformable threaded expander member comprising:
 - i. an expander portion for expanding the expansion por-

tion of the sleeve on axial movement of the expander member, said expander portion being of a larger diameter than the inner diameter of the sleeve expansion portion, and having an exterior configured portion at least part of which is movable into said sleeve expansion portion,

- ii. an enlarged head portion for engaging the blind side end of the sleeve for bulbously deforming said sleeve bulbing portion on axial movement of the expander member,
- iii. an axial bore extending into said expander member from the end opposite said enlarged head portion, said



bore being internally threaded over at least an axial portion thereof lying inwardly of said configured portion,

- iv. the minor diameter of the configured portion in at least about 1.23 times the major thread diameter.
- c. said system being characterized by the expander member expander portion having:
 - i. an entry portion having a tapered loading end, and
 - ii. a configured portion rearwardly thereof and having a substantial portion thereof within the workpiece after axial movement.
- d. said sleeve having a tapered shoulder between said inner diameters.

4,007,660

ROCKET RETENTION AND IGNITION ASSEMBLY

Donald Leslie Smith, Ste. Foy, and Donald William Noble, Ottawa, both of Canada, assignors to Her Majesty The Queen in right of Canada as represented by the Minister of National Defense, Ottawa, Canada

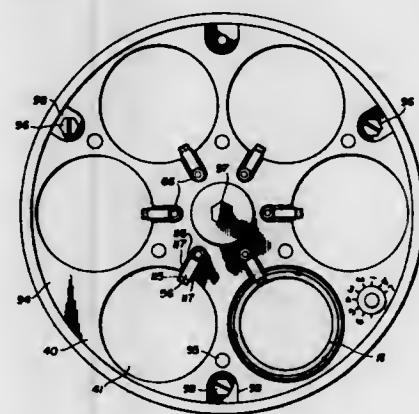
Filed Mar. 1, 1976, Ser. No. 662,921

Claims priority, application Canada, Sept. 29, 1975, 236576

Int. Cl.² F41F 3/04

U.S. Cl. 89—1.807

10 Claims



1. A rocket retention and ignition assembly for a rocket launcher and for a rocket with a retention member outwardly extending from the side of the rear end of said rocket, said

retention member disconnecting from the remainder of said rocket when said rocket is fired, and a first electrical contact on said rear end, said assembly comprising first support means for engaging said retention member when said rocket is placed in a firing position in said rocket launcher and preventing forward displacement of said retention member from the firing position, said first support means having a loading hole formed therein to permit loading of said rocket therethrough into said rocket launcher, said hole being too small to permit passage of said retention member therethrough, second support means for engaging said retention member when said rocket is in said firing position and preventing rearward displacement of said retention member from the firing position, said second support means having an opening formed therein, said opening being located at said rear end when said second support means engages said retention member, a second electrical contact attached to said second support means, and electrical connection means having two parts, one of said two parts being attached to said second support means and electrically connected to said second contact, the other of said two parts being attached to said first support means, wherein by simply placing said rocket in said firing position and orienting said second support means with respect to said first support means in such manner that said two parts are electrically connected to each other when said second support means engages said retention member, said second contact contacts said first contact and an electrical circuit is thereby formed for firing said rocket.

4,007,661

GEAR CUTTING MACHINE

Otto Hildinger, Schwerzenbach, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

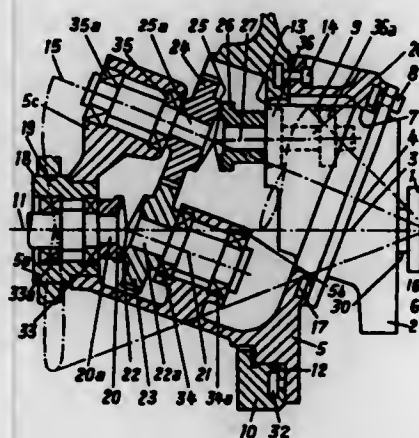
Filed June 2, 1975, Ser. No. 582,749

Claims priority, application Switzerland, June 7, 1974, 7793/74

Int. Cl.² B23F 9/10

U.S. Cl. 90—5

6 Claims



1. In a gear cutting machine comprising a support body, a tool means mounted in the support body and rotatable about a first axis, a head in which there is mounted the support body for angular adjustment about a second axis such that the first axis is movable along a first imaginary cone-shaped shell about the second axis, a headstock in which there is mounted the head for angular adjustment about a third axis in such a manner that the second axis is movable on a second imaginary cone-shaped shell about the third axis, a gear train for driving said tool means, said gear train including two pairs of bevel gears, the cone apex- cone angles of the bevel gears of one pair being equal to the cone apex- cone angles of the bevel gears of the other pair, said cone angles being obtuse, and a pair of spur gears drivingly interconnecting both of the pairs of bevel gears, and said second axis coinciding with the axis of one of said bevel gears in one pair of said bevel gears and said third axis coinciding with the axis of one of said bevel gears in the other pair of said bevel gears, whereby the gear train

operatively interconnects the first axis via the second axis with the third axis.

4,007,662

AXIAL PISTON MACHINE OF OBLIQUE-AXLE CONSTRUCTION WITH TILTABLE CYLINDER DRUM
Horst Deininger, Ulm, Donau, Germany, assignor to Hydromatik GmbH, Ulm, Donau, Germany

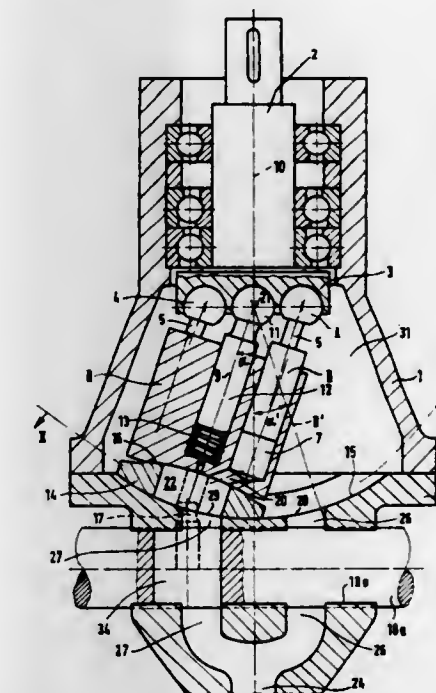
Filed Jan. 2, 1976, Ser. No. 646,404

Claims priority, application Germany, Jan. 17, 1975, 2501867

Int. Cl.² F01B 13/04

U.S. Cl. 91—6.5

6 Claims



1. An axial piston machine of the kind having an oblique-axle construction with tilttable cylinder drum and drive-connected drive pulley stationarily supported in a casing, pistons movable in cylinder bores of the drum being articulated to the drive pulley via ball-and-socket joints and with a control mirror member with control ports which face the outlets of the cylinder bores, a cylindrical back side of the mirror member facing away from the control mirror being supported on a suitably shaped guide surface of the casing, and the control mirror member being tilttable by an adjusting device which tilts the cylinder drum in order to adjust the stroke of the engine, and the bearing surface being provided with orifices connected with suction and pressure ducts for the pressure medium, which orifices are connected with the control ports via conduits penetrating through the control mirror member, characterized in that the control mirror body with the cylinder drum is adjustable in both directions from a middle position with zero speed stroke of the pistons and that the orifice in the guide surface which at a given time is connected with the suction duct and the pressure duct is divided into a pair of orifices connected via connecting ducts with a respective one of the suction and pressure ducts, the pair of orifices being symmetrical in the direction of tilt of the mirror member with its middle position in the guide surface, and that the orifice of each pair which at a given time is located against a momentary tilting direction and not covered by the mirror member is disconnected by a closing device from the associated suction or pressure duct.

4,007,663

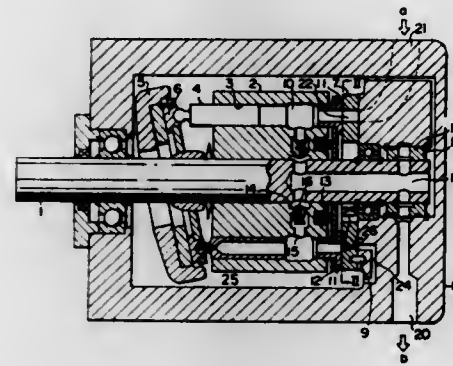
HYDRAULIC PUMP OF THE AXIAL PISTON TYPE
Kuniyasu Nagatomo, and Masato Hiromatsu, both of Chikushino, Japan, assignors to Mitsubishi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1975, Ser. No. 544,388

Claims priority, application Japan, Feb. 1, 1974, 49-13962; Feb. 1, 1974, 49-14056(U)

Int. Cl.² F01B 3/00; F04B 1/12

U.S. Cl. 91-6.5



13 Claims

toward the other end of said cylinder, normally open valve means for establishing communication through said piston from one side to the other thereof, hydraulic fluid return port means communicating with said cylinder adjacent said other end of said cylinder, hydraulic fluid supply port means communicating with said cylinder adjacent said one end thereof, said piston in said passive position thereof being located with respect to said supply port means for flow of hydraulic fluid through said supply port means directly into said cylinder on both sides of said piston so that fluid flows through said supply port means into said cylinder on both sides of said piston not only by flowing through said valve means from one side to the other of said piston but by flowing directly from said supply port means into said cylinder on both sides of said piston and would so flow in said passive position of said piston even if said valve means were closed, and operating means for closing said valve means and moving said piston past said supply port means to a position wherein hydraulic fluid flows through said supply port means into said cylinder only between said piston and said one end of said cylinder.

4,007,665

BRAKE BOOSTER WITH IMPROVED PEDAL FEEL CHARACTERISTICS

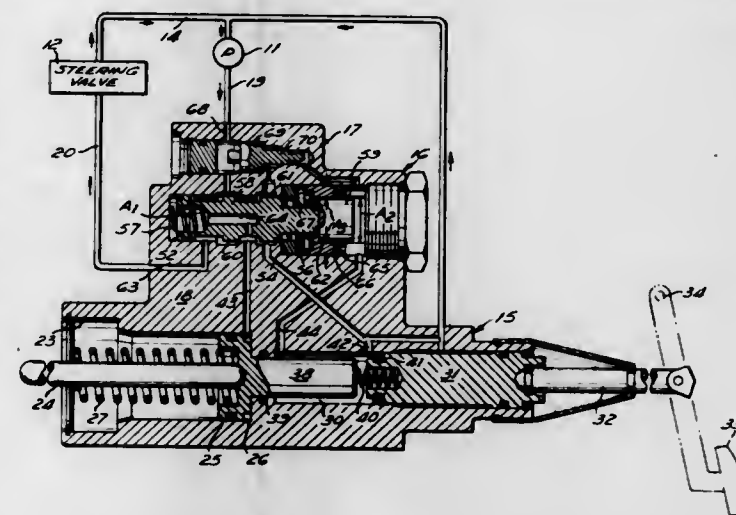
Edward S. Orzel, Parma, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 635,858

Int. Cl.² F15B 13/10, 17/02

U.S. Cl. 91-391 R

16 Claims



1. A hydraulic axial piston pump comprising means defining a plurality of cylinders each having therein a piston reciprocally movable between a top dead center position and a bottom dead center position to effect a compression stroke and a suction stroke, said piston completing its compression stroke at said top dead center position, discharge means for said pump for discharging fluid from said cylinders during the compression stroke of their associated pistons, check valve means within said discharge means, said check valve means comprising a check valve for each of said cylinders adapted to open and allow the associated cylinder to discharge fluid when the pressure within the cylinder has been raised above the discharge pressure of said pump by an associated piston on its compression stroke, passage means for communicating each of said cylinders with a low pressure system during a period in which the piston associated with said cylinder moves from a point preceding its top dead center position to a point past its top dead center position where said cylinder communicates with a suction port of said pump, and pressure reducing means disposed in said passage means.

4,007,664

HYDRAULIC BOOSTER

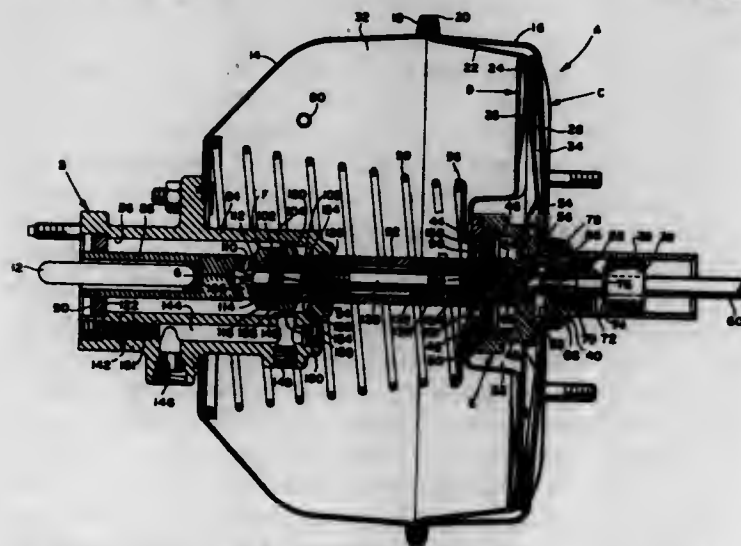
Roger C. Popp, Chesaning, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sept. 26, 1975, Ser. No. 617,198

Int. Cl.² F15B 9/10, 13/06

U.S. Cl. 91-49

10 Claims



1. A hydraulic booster comprising: a cylinder having a piston received therein for movement from a passive position adjacent one end of said cylinder to force output positions

1. In a motor vehicle, a fluid power circuit comprising a pump having an inlet side and an outlet side, a control valve, a brake booster, and conduit means hydraulically connecting said pump and control valve and brake booster; said brake booster including a housing having a bore extending therethrough, a power piston slidably disposed in said bore, a power chamber in said bore on one side of said power piston, a trapped volume chamber in said housing, an output rod on said one side of said power piston extending into said trapped volume chamber and having a predetermined lateral cross-sectional area exposed to a fluid pressure level in said trapped volume chamber, an input rod slidably disposed for movement to and from a deactuated position in said housing and extending into said trapped volume chamber, said input rod having a predetermined lateral cross-sectional area exposed to the fluid pressure level in said trapped volume chamber, said input rod area being substantially greater than said output rod area and being constructed and arranged such that movement of said input rod in said trapped volume chamber results in proportional but larger movement of said output rod when the volume of fluid in said trapped volume chamber remains substantially constant, a brake pedal operatively connected to said input rod for moving said input rod in said trapped volume chamber; said control valve including a control spool bore and a control spool slidably disposed in said control spool bore, brake booster valve means on said control spool movable

toward and away from a fully open position controlling fluid pressure communication between said pump outlet side and said brake booster power chamber, said control spool having first and second opposite lateral end faces, passage means maintaining open fluid pressure communication between said first end face and the fluid pressure of said power chamber under all normal operating conditions, further passage means maintaining open fluid pressure communication between said second end face and the fluid pressure of said trapped volume chamber under all normal operating conditions, said brake booster valve means being constructed and arranged so that said power chamber fluid pressure acting against said first end face urges said brake booster valve means away from said fully open position and so that said trapped volume fluid pressure acting against said second end face urges said brake booster valve means toward said fully open position, control spool modifying means slidably disposed in said control spool bore, said control spool modifying means having a modifying area, said further passage means maintaining open fluid pressure communication between said modifying area and the fluid pressure of said trapped volume chamber under all normal operating conditions, said control spool modifying means having connector means operatively connecting said modifying area to said control spool, said connector means being constructed and arranged to transmit the force of said trapped volume chamber pressure acting against said modifying area to said control spool when the force exerted on said brake pedal is less than a predetermined force to urge said brake booster valve means toward said fully open position, and said control spool modifying means including stop means exterior of said control spool rendering said modifying area inoperable to further increase the force transmitted through said connector means to said valve spool when said force exerted on said brake pedal is greater than said predetermined force.

4,007,666

SERVOACTUATOR

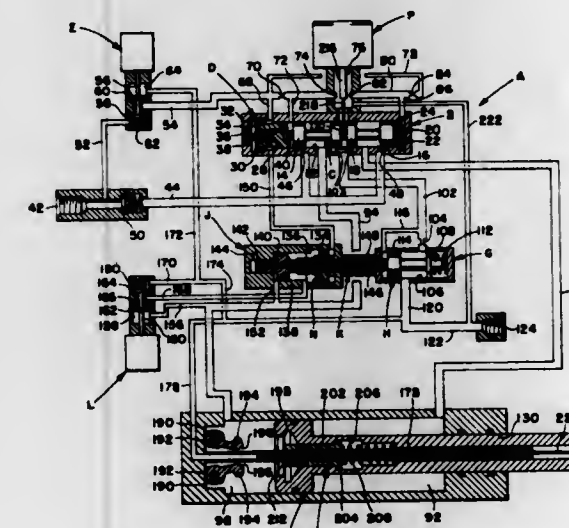
Dan O. Bauer, and Robert M. Salekka, both of Kalamazoo, Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed May 23, 1974, Ser. No. 472,627

Int. Cl.² F15B 13/042; F16K 31/122

U.S. Cl. 91-446

10 Claims



1. In a servoactuator device for controlling the position of a ram having a forward end cavity and a rear end cavity, the improvement comprising servovalve means for selectively connecting a source of high pressure hydraulic fluid to either of said cavities for selectively extending or retracting said ram, vent means for venting one of said cavities to return port means through said servovalve means when the other of said cavities is connected with said source of high pressure hydraulic fluid, ventline pressure responsive rate limiter valve means in series with said return port means for limiting the rate at which fluid is vented from said one cavity during normal operation, differential pressure responsive blocking actuator

means for moving said rate limiter valve means to a blocking position for blocking flow of fluid from said one cavity to said return port means, said differential pressure responsive blocking actuator means being in operatively direct communication with said one cavity and acted upon by the pressure therein in a direction for moving said rate limiter valve means to said blocking position, and selectively operable blocking valve means for connecting said one cavity with said differential pressure responsive blocking actuator means to hold same in place and for connecting said differential pressure responsive blocking actuator means with said vent means thereby permitting said directly communicated fluid pressure from said one cavity acting on said differential pressure responsive blocking actuator means to actuate same and to move said rate limiter valve means to said blocking position.

4,007,667

HYDRAULIC POSITIONING AND SHOCK-ABSORBING APPARATUS

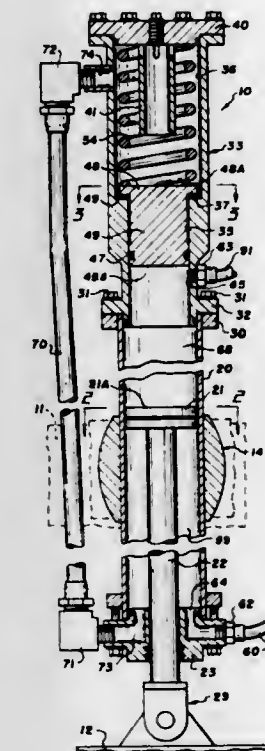
Jacob K. Elias, and Victor G. Eriksen, both of Campbell River, Canada, assignors to Fauchon Engineering Works Limited, Campbell River, Canada

Filed Aug. 15, 1975, Ser. No. 605,169

Int. Cl.² F01B 31/14

U.S. Cl. 92-60

3 Claims



1. Apparatus for positioning a machine part subject to shock loads comprising a main cylinder having a piston and a piston rod therefor, said piston dividing the main cylinder into a head chamber and a rod chamber, fluid circuit means separately connecting the head and rod chambers to a source of fluid pressure whereby the piston rod can be extended or retracted as required to locate and hold the machine part in a selected position, an auxiliary cylinder having a through bore open to the head chamber and a shoulder between said through bore and a chamber within said auxiliary cylinder, a piston in the through bore and having an end flange in the auxiliary cylinder, a compression spring within the auxiliary cylinder chamber biasing the piston thereof towards the main cylinder and normally abutting the end flange against the shoulder, and a conduit connecting the rod chamber to the auxiliary cylinder chamber.

4,007,668

CRIMPER ASSEMBLY

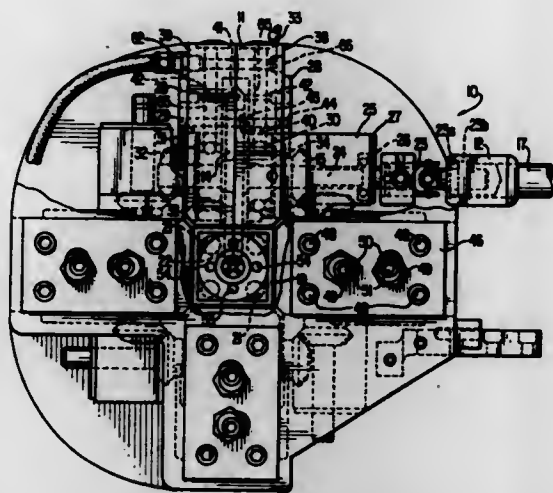
Herbert K. Holden, Bon Air, and Peter W. Mansfield, Richmond, both of Va., assignors to American Filtrona Corporation, Richmond, Va.

Filed Mar. 28, 1975, Ser. No. 562,911

Int. Cl.² B31F 1/10

U.S. Cl. 93-1 C

11 Claims



1. In a crimping assembly for crimping a rod of fibrous material, said assembly having at least one pair of crimping wheels each having embossing means defined on its peripheral surface, means for rotatably supporting each pair of crimping wheels so as to juxtapose their respective embossing means and means for rotating each crimping wheel, the improvement comprising a separate insulated central heater block extending axially through said crimping assembly, said heater block having at least one axially extending cartridge heater conduit located within said heater block for heating said crimping wheels.

4,007,669

APPARATUS FOR REVERSING THE RUNNING DIRECTION OF TUBE SECTIONS IN SACK MACHINES
Fritz Achelpohl, Lengerich, Germany, assignor to Windmoller & Holscher, Germany

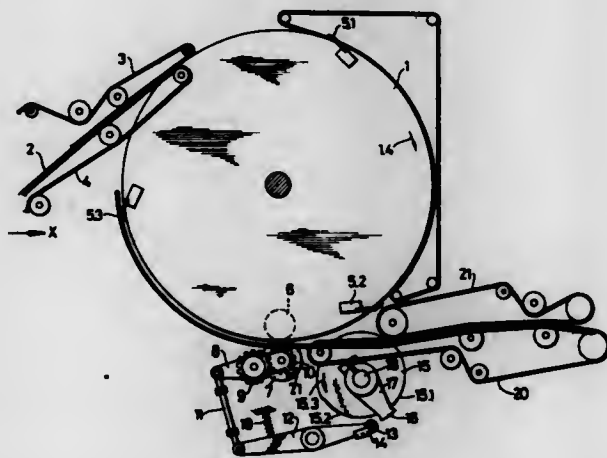
Filed July 2, 1975, Ser. No. 592,668

Claims priority, application Germany, July 4, 1974, 7422818

Int. Cl.² B65H 5/00

U.S. Cl. 93-8 R

11 Claims



1. Apparatus for reversing the running direction of a tube section in a machine for making sacks or bags which are closed by a base at both ends particularly sacks or bags of plastics film, comprising a turning cylinder provided with grippers for engaging the tube sections and a pair of rollers for conveying the tube sections in a direction opposite to said running direction, at least one roller of said pair being mov-

able, and a control for suddenly moving said pair of rollers together to grip the tube sections and to separate the pair of rollers again after transferring the tube sections to an associated feed conveyor.

4,007,670

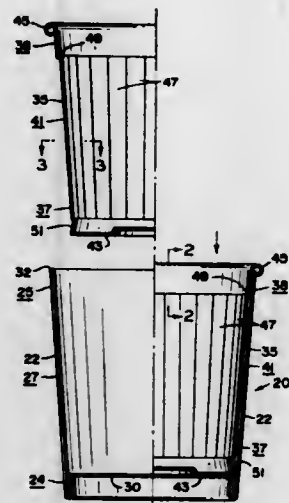
INSULATED CONTAINER

John V. Albano, Oradell, and Donald F. Smith, Clifton, both of N.J., assignors to St. Regis Paper Company, New York, N.Y. Division of Ser. No. 446,703, Feb. 28, 1974, abandoned. This application Feb. 14, 1975, Ser. No. 549,979

Int. Cl.² B31B 7/74

U.S. Cl. 93-36.01

7 Claims



1. The method of making a double wall container including the steps of applying a first paper blank to the sides of a frusto-conically shaped form and a second paper blank to the smaller diameter end of the form and connecting the two blanks together to form the outer hollow member of the double wall container, applying a first adhesive to selected edges of said first paper blank to hold the outer hollow member in its formed shape, applying a second adhesive to the inner surface of the outer hollow member at an upper peripheral portion thereof by means of a member carrying adhesive and moved into the outer hollow member in a generally axial direction, inserting a preformed frusto-conically shaped hollow member formed of a synthetic plastic material into the outer hollow member to form the inner hollow member of the double wall container, exerting a force on the inner hollow member to press the same into place in the outer hollow member whereat it is held in place by said second adhesive.

4,007,671

FOLDING BLANK PRESS WITH MEANS TO SCARIFY BLANK SURFACES INTENDED FOR GLUING

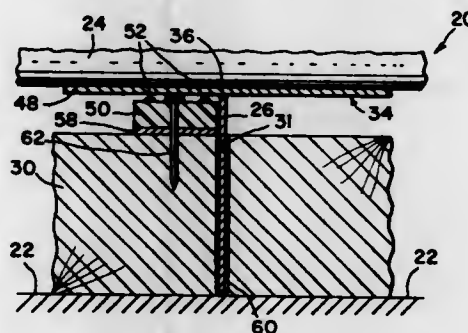
Gordon Duncan, 148-26 87th Ave., Jamaica, N.Y. 11435

Filed Aug. 28, 1975, Ser. No. 608,632

Int. Cl.² B26D 3/08

U.S. Cl. 93-58 ST

9 Claims



1. Scarifying means intended for use in a press, comprising a press bed and pressure applying means for processing at

least one blank of paper, board or the like: comprising scarifying elements which when pressed together with said blank forms a scarified area on at least one portion of a surface of said blank for which an application of adhesive is intended; in which the scarifying means is mounted relative to the press bed with the scarifying elements between the press bed and the pressure applying means with provision for the blank to be held between the pressure applying means and the scarifying elements.

4,007,672

RAFTER VENT

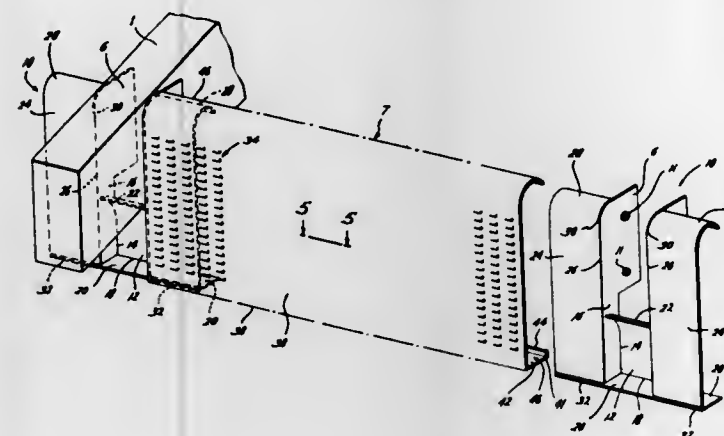
William A. Luckey, P.O. Box 31275, El Paso, Tex. 79931

Filed June 23, 1975, Ser. No. 589,356

Int. Cl.² F24F 13/08

U.S. Cl. 98-37

9 Claims



1. A rafter vent for occupying the space between a first and second adjacent building rafters, comprising:
a first rafter connector having first connecting means for connecting said first connector to such first adjacent building rafter;
a second rafter connector having second connecting means for connecting said second connector to such second adjacent building rafter;
said first and second rafter connectors each including a resilient tongue having a width at least as wide as such first and second adjacent building rafters;
filler means for filling the space between said first connector and said second connector; and
attachment means for attaching said filler means to said first and second connectors.

4,007,673

REGISTER WITH AIR-DRIVEN OSCILLATING LOUVERS

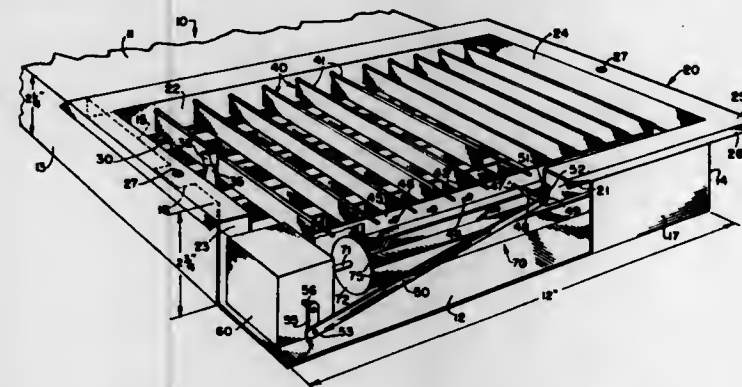
Peter P. Zaloga, 5818 W. Newport, Chicago, Ill. 60634

Filed Nov. 10, 1975, Ser. No. 630,143

Int. Cl.² E06B 7/02; F24F 13/06, 13/08

U.S. Cl. 98-40 V

10 Claims



1. An air register for directing a stream of air from a wall duct of a forced air heating or ventilation system, said register comprising a frame defining an air outlet port through which the associated stream of air may flow, air deflecting means

carried by said frame in said outlet port for movement in the associated stream of air, air-driven rotary windmill means mounted on said frame for rotation by the associated stream of air about an axis disposed substantially perpendicular to the direction of the stream of air, said windmill means comprises an elongated generally cylindrical reel-type turbine coaxial with said axis, said windmill means having a maximum outer diameter of rotation no greater than about one and one-half inches and being disposed behind said air deflecting means and substantially in registry therewith so that all of the air which passes over said windmill means also passes through said air deflecting means, and linkage means operably coupling said windmill means and said air deflecting means to effect movement of said air deflecting means upon rotation of said windmill means by the associated stream of air thereby to vary the direction of the stream of air as it passes through said outlet port.

4,007,674

BEVERAGE HEAT MAINTAINING APPARATUS

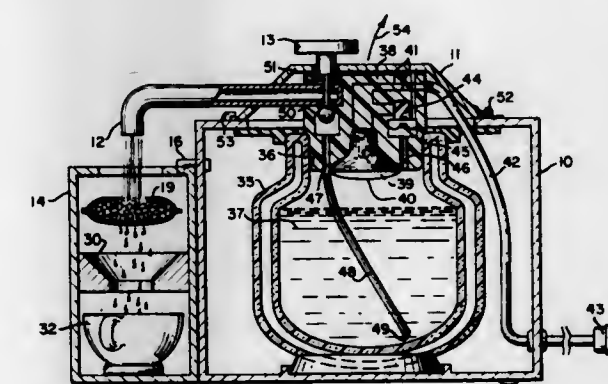
Abraham Lichowsky, Los Angeles, Calif., assignor to Ambitex Corporation and Cendev Corporation, both of Los Angeles, Calif.

Filed Nov. 24, 1975, Ser. No. 634,663

Int. Cl.² A47J 31/00

U.S. Cl. 99-281

6 Claims



1. A beverage heat maintaining apparatus including in combination:

- a container of evacuated double wall construction to provide heat insulation having an open neck for receiving a beverage after the beverage has been heated to a desired temperature;
- a stopper member receivable in said neck, said stopper member incorporating an electric bulb having an exposed surface facing downwardly towards the top surface of said beverage when said container is filled, said electric light bulb being positioned by said stopper within said neck, and being of a size to cover a major portion of the cross-sectional area of said neck; and,
- electrical conductors passing from said bulb through said stopper member and to the exterior thereof for connection to a source of electrical energy to energize said bulb, said bulb being evacuated whereby a major portion of said cross sectional area of the neck portion of said container is vacuum insulated by said bulb and whereby heat radiated by said bulb maintains said beverage in a heated condition.

4,007,675 COFFEE MILL

Serge Leon Louis Cailliot, 38, Rue de Bois de Boulogne, and Leopold Guy Pierre Andre, 26, Boulevard du Chateau, both of, 92200 Neuilly-sur-Seine, France

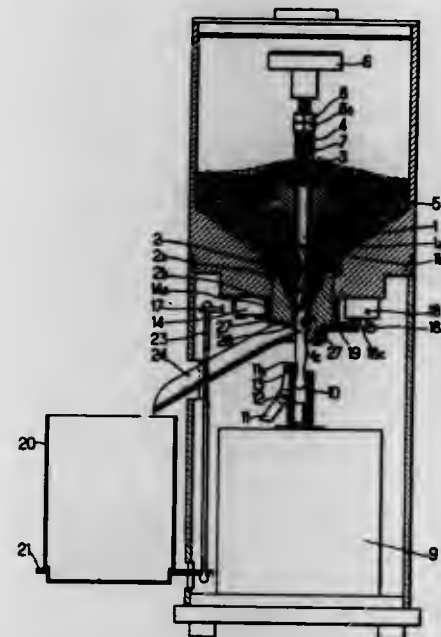
Filed Jan. 13, 1975, Ser. No. 540,539

Claims priority, application France, Jan. 14, 1974, 74.01180; Oct. 11, 1974, 74.34285

Int. Cl.² A47J 31/42

U.S. Cl. 99—286

8 Claims



1. A coffee mill comprising a vertical screw of generally cylindrical form, provided with at least one helical groove and mounted to cooperate with a truncated conical crushing chamber having a substantially elliptical section decreasing in diameter towards a cylindrical bore at the lower end of the said screw, said groove having a pitch which decreases progressively towards its lower end, and a depth which decreases progressively to zero as it approaches its lower end, the cylindrical bore having at least two longitudinally extending diametrically opposed channels in the wall thereof, at least one of said channels communicating with a duct adapted to receive the upper part of a delivery chute for the delivery of milled coffee under gravity.

4,007,676

SEGMENTING KNIFE FOR APPLE SEED CELLING MACHINE

Robert G. Ellis, Richmond, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

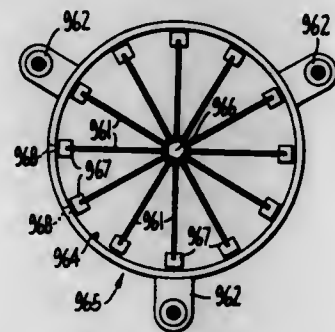
Division of Ser. No. 431,691, Jan. 9, 1974, Pat. No.

3,962,963, and Ser. No. 247,838, April 26, 1972, Pat. No. 3,869,974. This application Apr. 22, 1975, Ser. No. 570,402

Int. Cl.² A23N 3/00; A47J 25/00; B26D 4/00; B26B 3/00

U.S. Cl. 99—545

4 Claims



1. A knife for cutting apples into segments, comprising: an outer circular ring; a hub provided centrally of the ring; a plurality of thin, flat, elongate knife blades each having opposite flat sides and opposite edges and each fixedly secured at

one end to the hub and extending radially between the hub and the ring with the flat sides of each blade lying in planes parallel to the axis of the circular ring, the other end of each knife blade being fixedly secured in a mounting member; and means engaged between the ring and members exerting an axial tension force on the blades to maintain the blades straight upon travel of an apple through the knife.

4,007,677

COMPACTOR DEVICE

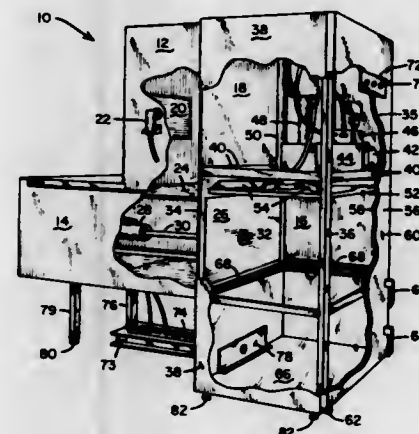
Anthony Fox, 8306 Queen Ave. South, Minneapolis, Minn. 55431

Filed May 22, 1975, Ser. No. 579,783

Int. Cl.² B30B 15/18

U.S. Cl. 100—45

1 Claim



1. A waste compacting apparatus comprising in combination:

- an enclosure defining first and second chambers, said first chamber having an open top through which waste material to be compacted may pass, four side walls and a horizontally movable floor member;
- said second chamber in communication with said first chamber and being disposed at least in part vertically beneath said first chamber, with said horizontally movable floor member defining a communicating port with said first chamber and closing said port when said horizontally movable floor member is in a first position, a horizontally retractable side plate connected to said horizontally movable floor member and a bottom and three additional side members connected together to define a rectangular compartment;
- a third chamber having four sides, a top and a bottom, one of said sides having an opening which is closed by said horizontally retractable side plate when said horizontally movable floor member is in said first position, said top of said third chamber being vertically movable, one other side of said chamber including a latchable access door communicating therewith;
- a first hydraulic actuator disposed in said second chamber and connected to said horizontally retractable side plate;
- a second hydraulic actuator connected to said top of said third chamber;
- control means connected to said first hydraulic actuator which when activated causes said first hydraulic actuator to become operative to move said horizontally movable floor member and said side plate to a second position whereby the waste material falls through said port in said top of said second chamber and to subsequently move said horizontally movable floor member and said side plate back to said first position whereby said waste material is pushed by said side plate through said opening in said third chamber;
- further control means connected to said second hydraulic actuator which when activated causes said second hydraulic cylinder to become operative to move said top of said third chamber vertically downward to apply com-

pressive force to said waste material and to subsequently move said top of said third chamber vertically upward to its rest position;

- a photo-electric sensor is disposed in said first chamber for activating said control means when the waste material in said first chamber reaches a predetermined level; and
- a third hydraulic actuator having a piston oriented in a horizontal plane and passing through the side of said third chamber opposite to said other side including said access door, and manually actuatable control means associated with said third hydraulic cylinder for causing the compacted waste to be pushed horizontally outwardly from said third chamber by way of said access door, said manually actuatable control means including interlock means for preventing actuation of said third hydraulic actuator when said access door is in its latched position.

4,007,678

COMPACTOR PRESS ASSEMBLY

John Kenneth Crister Gustavsson, and Björn Christer Sjögren, both of Sävjo, Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

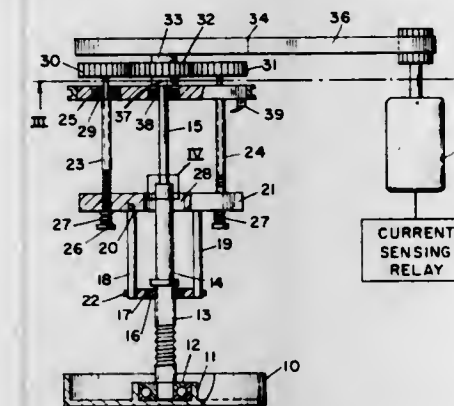
Filed June 11, 1975, Ser. No. 585,850

Claims priority, application Sweden, June 13, 1974, 7407788

Int. Cl.² B30B 15/14

U.S. Cl. 100—52

10 Claims



1. A compactor press assembly provided with a support structure having a lower bed plate comprising a piston adapted to be moved up and down relative to said support structure, a screw rotatably-mounted in said piston, a pair of telescoping drive shafts, a drive means connected to one end of one of said drive shafts and said screw being connected to another end of said drive shafts, an upper support plate rigidly connected to said support structure of the assembly, a vertically movable part having a plurality of threaded holes, a spacer element connected to said vertically-movable part and provided with a threaded hole, a pair of threaded rods each in engagement with a respective threaded hole in said vertically movable part, one end of each of said rods being journaled in said upper support plate, said part upon rotation of said threaded rods being movable vertically whereby said screw runs through the threaded hole in said spacer element thereby causing movement of said piston.

4,007,679

PRESS AND SAFETY LATCH THEREFOR

Bobbie Lee Edwards, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 615,351, Sept. 22, 1975, Pat. No. 3,981,671. This application Mar. 22, 1976, Ser. No.

669,209

Int. Cl.² B30B 1/32

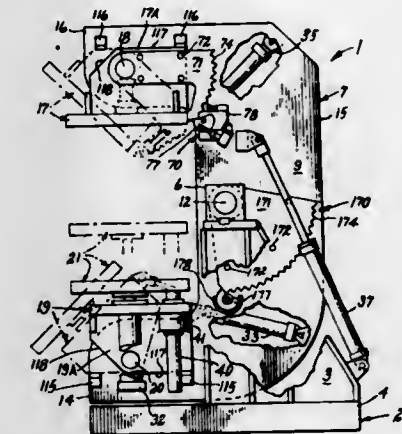
U.S. Cl. 100—53

17 Claims

1. An improved ratchet and pawl machine to prevent one part of a press or like mechanism from accidentally swinging to a home position about a first axis and relative to another part, which machine comprises

a ratchet adapted for securing in fixed relation to said one part and having a plurality of equally spaced teeth arranged along an arc that is coaxial with said first axis;

a pawl adapted for pivoting about a second axis and which is peripherally mainly defined by an arcuate bearing surface coaxial with said second axis, a tooth, and a neutral surface, the tip of said tooth being at a radius from said second axis less than the radius of said arcuate bearing surface; and



a pawl bearing for said pawl and which is fixedly secured to said another part and has an arcuate bearing surface shaped and sized to receive the pawl arcuate bearing surface;

said pawl bearing receiving said pawl arcuate bearing surface and supporting said pawl to revolve about said second axis with its tooth located to engage the teeth on said ratchet;

the sum of the ratchet root radius and the pawl tooth tip radius being greater than the distance between said first axis and said second axis.

4,007,680

GRAVURE PRINTING CYLINDERS

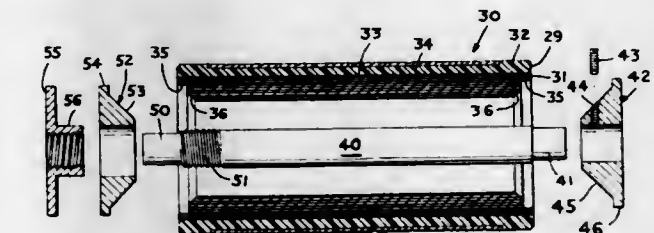
Frank G. Pfleger, 2 Oak Place, Waldwick, N.J. 07463, and Howard Howland, 88 Clinton Place, Hackensack, N.J. 07601

Filed July 3, 1974, Ser. No. 485,551

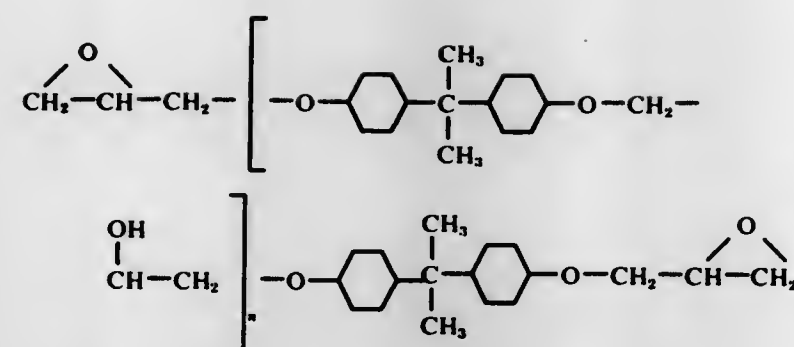
Int. Cl.² B41F 9/00

U.S. Cl. 101—153

5 Claims



1. A gravure printing cylinder particularly for use in a gravure printing press having an impression roller forming with said cylinder a printing bite through which advances the sheet to be printed, and including means for applying printing ink to the surface of the cylinder in advance of such bite, said cylinder comprising a cylindrical body portion having an outer printing layer of hardened resinous material consisting almost entirely of an undiluted mixture of an epoxy resin and an epoxy curing agent, said resinous material having an outer smooth printing surface of uniform diameter in which are provided a multiplicity of ink carrying depressions for producing given printed images and said resinous material being substantially bubble free and having the properties characteristic of a mixture of an unmodified bisphenol-A epoxy resin, such as "Epon No. 828" having the chemical structure



and a viscous polyimide resin such as the "Epon Curing Agent V-40" derived from a dimerized fatty acid and an aliphatic polyamine, in that such mixture has a viscosity at about 70° enabling it to form said printing layer, has good adherence to aluminum, steel and phenolic body portions, and when set can be machined without chipping and then polished to a smooth finish, and that has a capability of maintaining clarity of images made with water based printing inks through prolonged printing operations exceeding 600 hours.

4,007,681

TAPE GUIDE FOR POSTAGE METER PRINTING MACHINE

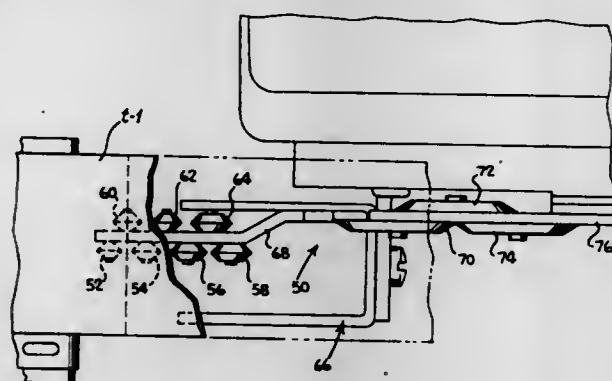
James R. Swaniger, Bridgeport, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed May 16, 1975, Ser. No. 578,328

Int. Cl.² B41F 1/08

U.S. Cl. 101-288

2 Claims



1. A machine for printing indicia on a tape strip of record material having a backing layer of a sticky substance comprising:

- a printing station disposed within the machine,
- a printing means disposed within the machine in predetermined position relative to the printing station for printing indicia on said tape strip,
- means for supporting a length of said tape of said printing station for a printing operation,
- means operable in response to said printing operation at said printing station for advancing the tape strip over said support means a predetermined amount to position the printed-on portion of said tape strip to be detached from the remainder of said tape strip, and
- means for guiding said printed-on portion of said tape to a position for detachment from the remainder of said tape, said tape guide means including a plurality of rollers located adjacent said printing station with the axis of each roller being perpendicular to the direction of said tape advance and each of said rollers being positioned a greater distance from said printing station than the preceding roller, each of said rollers being conical in cross-section to form a knife edge on its circumference to contact the backing layer of said tape, and a portion of said plurality of rollers are of the same diameter but are

connected to an inclined surface so as to deflect said tape strip upwardly along its length as the tape is placed into contact with said rollers.

4,007,682

REVERSE ANGLE MOUNTED INK-SPLITTING DOCTOR BLADE

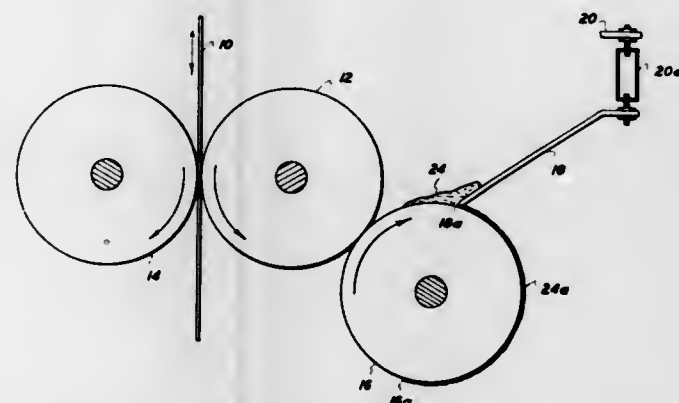
Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 463,487, April 24, 1974, abandoned. This application July 7, 1975, Ser. No. 593,826

Int. Cl.² B41F 31/06

U.S. Cl. 101-348

1 Claim



1. In the method of inking the surface of a cylinder to the desired ink thickness the improvement which comprises:

- a. applying a flexible doctor blade, said blade having a cylindrical edge capable of splitting the ink thereby causing a portion of the ink to flow above the blade and a portion of the ink to flow beneath the blade and said cylindrical blade edge having a radius of curvature one-half of the blade thickness, to the surface of the cylinder and parallel with the axis of rotation of the cylinder to form a nip roughly the thickness of the ink film to be formed, said doctor blade being supported solely by a support member and pressed against the ink film by said support member so that the angle between the cylinder and the blade at their point of nearest approach is greater than 90° and less than 180°;
- b. applying ink having a room temperature viscosity no greater than about 180,000 centipoise and a tack value no greater than about 196 as measured on a Thwing Albert 101 Inkometer to the doctor blade and causing a portion of it to flow over the edge of the blade and onto the surface of the cylinder to form an ink film on said surface which is thicker than the desired ink film thickness; and
- c. providing relative motion between the surface of the cylinder and the doctor blade at a velocity adjusted to interact with the ink viscosity, blade geometry and downward force on the blade to cause the ink to be carried into the nip by such relative motion, whereby its viscous resistance to shear forces creates an upward pressure causing the doctor blade to float over the ink film it produces when a portion of the ink flows above the blade and a portion flows beneath the blade to thereby cause the ink to be applied to the surface in the desired thickness.

4,007,683

AUXILIARY DRIVE AND SPROCKET ADAPTER FOR INK FOUNTAIN ROLLER

Henry R. Dickerson, 741 S. Chase Lane, Lombard, Ill. 60148

Filed May 11, 1976, Ser. No. 685,337

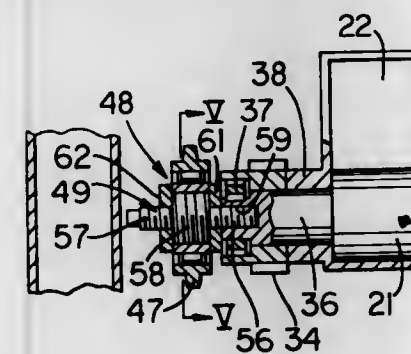
Int. Cl.² B41F 31/06

U.S. Cl. 101-363

1 Claim

1. In an offset lithographic machine having an ink fountain, an ink roller rotatably disposed for association with said fountain, a main drive motor, drive transmitting means connected

between said main drive motor and said ink roller for causing rotation of said roller during operation of said machine, said drive transmitting means including a drive gear element rotatably supported on said roller and a one-way clutch device drivably connected between said driven gear element and said roller, and auxiliary drive means drivably connected to said ink roller for causing continuous rotation thereof whenever said lithographic machine is shut down, said auxiliary drive means including an auxiliary drive motor and power transmitting means drivably connected between said auxiliary drive motor and said ink roller for rotating same, said power transmitting means having disengageable one-way clutch means associated therewith and positionable in an engaged position for drivably rotating said ink roller when the machine is stopped, comprising the improvement wherein said auxiliary drive means is separate and totally independent of said drive transmitting means, said auxiliary drive means including adapter means for mounting said one-way clutch means on the end of said roller so that said clutch means is separate from and totally independent of said clutch device, said adapter means including a one-piece connector shaft fixedly but re-



movably connected to the end of said roller, said connector shaft being coaxially aligned with said roller and including a threaded shaft portion which is threadably received within an opening formed in the end of said roller for fixedly but removably mounting said connector shaft to said roller, said connector shaft also including a hub portion extending outwardly from the end of said roller, said hub portion being spaced axially from said shaft portion and being of larger diameter, said one-way clutch means being concentric with and mounted on said hub portion, said one-way clutch means including an annular driven member fixed to and surrounding said hub portion and an annular driving member concentric to and surrounding said driven member, said clutch means also including overrunning clutch element means disposed between and coacting with said driving and driven member for transmitting torque from said driving member to said driven member, and said power transmitting means including an endless flexible drive element connected between said annular driving member and said auxiliary drive motor, whereby said auxiliary drive means including said connector shaft and said one-way clutch means can be attached to the ink roller of an existing lithographic machine.

4,007,684

INK LIQUID WARMER FOR INK JET SYSTEM PRINTER

Rikuo Takano, Musashino, and Yuji Sumitomo, Nara, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of Japan

Filed Sept. 26, 1974, Ser. No. 509,549

Claims priority, application Japan, Sept. 26, 1973, 48-108778

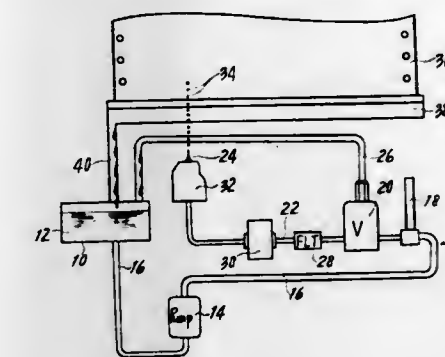
Int. Cl.² B41F 31/02; G01D 15/16

U.S. Cl. 101-366

5 Claims

1. In an ink liquid supply system for an ink jet system printer of the charge amplitude controlling type which emits ink droplets from a nozzle toward a recording paper, selectively deflects said ink droplets by a deflection means, and prints desired symbols on said recording paper with said deflected

ink droplets, said ink liquid supply system being provided with an ink liquid reservoir for containing the ink liquid therein, conduit means for connecting said ink liquid reservoir with said nozzle and means for supporting ink liquid through said conduit to said nozzle, the improvement which comprises warmer means for warming the ink in said ink supply system to a predetermined temperature in order to stabilize the viscosity and surface tension of said ink liquid supplied to said nozzle.



said warmer means being disposed in the path of said conduit means and comprising cavity means for detaining ink liquid therein, inlet means coupled to said conduit means for introducing ink liquid into said cavity means and outlet means coupled to said conduit means for permitting the flow of ink liquid from said cavity means, wherein said cavity means, inlet means, and outlet means are formed in a substantially flat block and said block is sandwiched between a pair of plates, each of said plates containing heater means.

4,007,685

GAS GENERATOR

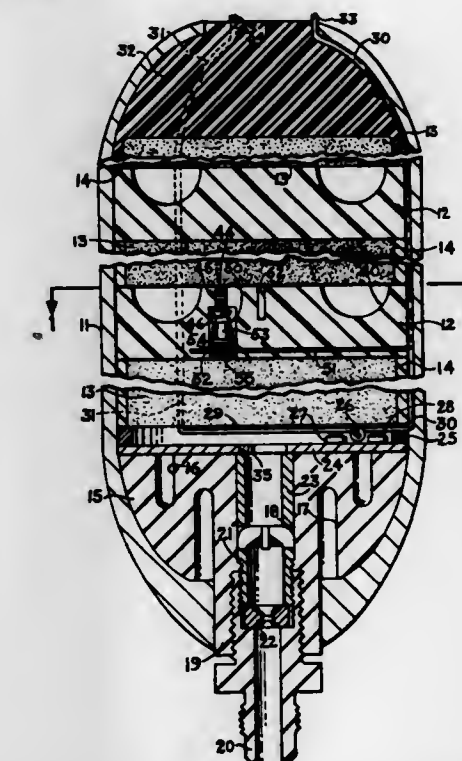
Osyg Nimylowycz, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 30, 1975, Ser. No. 600,349

Int. Cl.² F42B 3/04

U.S. Cl. 102-39

5 Claims



1. In a multi-stage gas generator having a plurality of individual gas generating compartments mounted in tandem and separated from each other by a phenolic partitioning wall, each of said compartments containing a propellant disc, a first one of said compartments at a forward end of said generator and containing a propellant charge, a first electric squib in contact with said propellant charge, and electric wire means in contact with said first squib and extending in substantially opposed directions,

a pair of spaced apart electric lead wires respectively in contact with end portions of said electric wire means and extending longitudinally along substantially opposed side-wall portions of said generator to an outlet remote from said forward end for establishing an electric circuit through said first squib,

each partitioning wall containing a filtering slot in fluid communication with a forward unidirectional gas plug, a propellant charge and an electric squib in contact therewith and in fluid communication with said filtering slot through an annular recess in a rearward surface of the corresponding partitioning wall, each propellant charge and electric squib positioned in the respective partitioning wall annular recess, and means including a pyro-electric switch having a burnable pyrotechnic responsive to propellant gas generated in an adjacent compartment for establishing an electric circuit through the corresponding partitioning wall squib and pyro-electric switch across said pair of lead wires and in parallel with the first squib electric circuit,

so constructed and arranged that selective sequential initiation of said compartment propellant charges is available as a pulsing gas generator.

4,007,686

CARTRIDGE CASING

René Gérard Hugonet, 36, rue Saint-Antoine, 91770 Saint-Vrain, France

Filed Mar. 26, 1975, Ser. No. 562,142

Claims priority, application France, Apr. 8, 1974, 74.12237

Int. Cl.² F42B 5/26

U.S. Cl. 102-44

6 Claims

1. A cartridge case comprising:

a metal head, said head including a cylindrical forward portion, a base portion oriented generally transverse to the axis of said cylindrical portion and a rim portion interconnecting said base and cylindrical portions, said rim portion extending outwardly with respect to said cylindrical portion to define a circular groove facing said axis of said cylindrical portion; and

charge receiving body means, said body means being comprised of thermoplastic material and being of cylindrical shape, said body means having an outer diameter commensurate with said head cylindrical portion inner diameter and being received in said head cylindrical portion, said body means having a thin walled tubular portion which extends forwardly from said head cylindrical portion coaxially therewith, said body means also having a base portion of increased wall thickness which terminates in abutting relationship with said head base portion, said body means base portion having an outwardly extending integral flange which is engaged in said head rim portion circular groove thereby locking said head to said body means.

4,007,687

PRIMING ARRANGEMENT IN A CASELESS POWDER CHARGE FOR SMALL-BORE WEAPONS

Helmut Könike, Rothenbach, Pegnitz, and Anton Politzer, Lauf, Pegnitz, both of Germany, assignors to DIEHL, Nürnberg, Germany

Filed Mar. 5, 1975, Ser. No. 556,337

Claims priority, application Germany, Mar. 6, 1974, 2410622

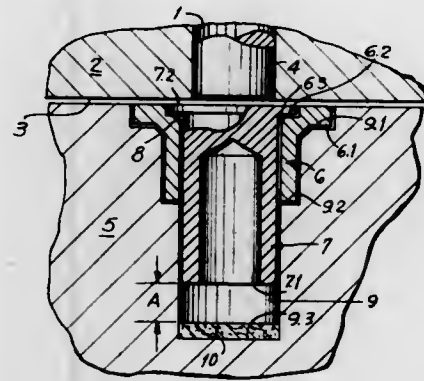
Int. Cl.² F42B 9/16

U.S. Cl. 102-45

6 Claims

1. In a priming arrangement for small-bore weapons, including a powder charge having a bore for receiving a primer cap and a primer pad; and a firing pin; said primer pad being adapted to be exploded by said primer cap responsive to the latter being impacted by said firing pin by movement of said firing pin, the improvement comprising: a cylindrical sleeve in

said bore, said primer cap being slidably located in said cylindrical sleeve, said firing pin being positioned to enter said cylindrical sleeve during firing movement thereof towards said



primer cap, said cylindrical sleeve being constituted by a low heat-conductive, difficultly combustible material to provide insulation of the firing pin from said powder charge thereby preventing ignition of the powder charge during misfire.

4,007,688

TIMED MISSILE FLIGHT TERMINATION SYSTEM

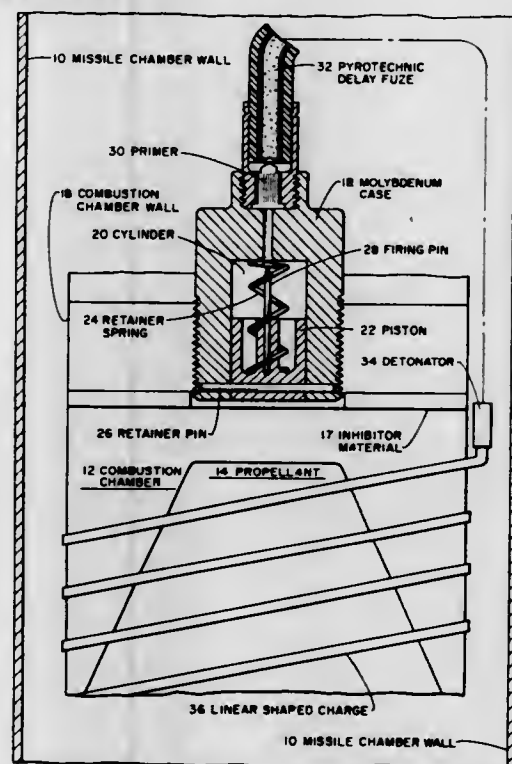
David Bruce Franz, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,604

Int. Cl.² F42C 9/10

U.S. Cl. 102-49.5

9 Claims



1. A pressure activated, timed missile flight termination system comprising:

- a threaded casing means for insertion in a combustion chamber wall of said missile;
- a cylindrical piston disposed within a cylinder formed in said threaded casing means;
- a primer detachably connected to said threaded casing means;
- pin means connected to said cylindrical piston for penetrating said primer and causing said primer to ignite whenever said cylindrical piston is compressed due to a pressure buildup in said combustion chamber;
- a pyrotechnic delay fuse connected to said primer;
- detonation means connected to said primer for causing a detonation when ignited by said delay fuse;
- linear-shaped charge means wrapped around said missile for severing said missile into a plurality of pieces in response to said detonation of said detonation means;

wherein said pressure buildup in said combustion chamber occurs instantaneously upon ignition of said missile and said pyrotechnic delay fuse provides a predetermined delay before ignition of said detonation means so that said missile is automatically destroyed after a predetermined flight period.

4,007,689

BLOCKING MECHANISM FOR AN IMPACT FUZE

Robert Apothéoz, Greifensee, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

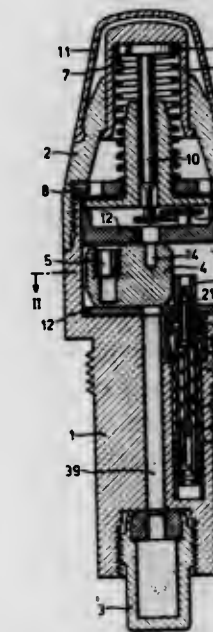
Filed June 14, 1976, Ser. No. 696,067

Claims priority, application Switzerland, June 27, 1975, 8367/75

Int. Cl.² F42C 1/04, 15/24

U.S. Cl. 102-78

4 Claims



1. A blocking mechanism for an impact fuze comprising a fuze housing, a blocking sleeve mounted to be lengthwise displaceable within the fuze housing, means for spring-loading the blocking sleeve, said blocking sleeve being provided with at least one radially movable blocking body, a blocking bolt lengthwise displaceable within the blocking sleeve for bringing the blocking body into a position blocking the blocking sleeve in the fuze housing, means for spring-loading the blocking bolt, said fuze housing having a recess into which there can engage the blocking body for blocking the blocking sleeve in a first position, said fuze housing having a further substantially wedge-shaped recess tapering towards the rear of the fuze housing, said further recess having a wall, the blocking body in a second position of the blocking sleeve being clampable between the wall of the further recess and the blocking bolt for securing the blocking bolt against rearward displacement.

4,007,690

PRACTICE BOMB SIGNAL FOR DAY OR NIGHT OPERATION

John E. Wildridge, Washington, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1975, Ser. No. 634,212

Int. Cl.² F42B 11/16

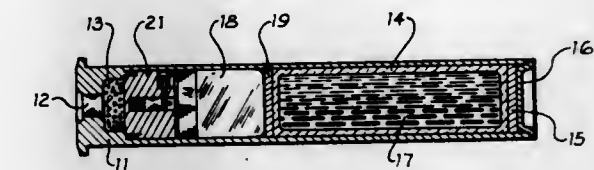
U.S. Cl. 102-87

4 Claims

1. A signal cartridge for use in a practice bomb for indicating a point of impact comprising, a cartridge case, a primer in said cartridge case arranged to be detonated by a first firing pin, an expelling charge adjacent said primer, a quantity of marking material within said cartridge case for forming a signal cloud upon discharge from said cartridge case by said expelling charge.

a percussively-ignitable flashcube within said cartridge case, and

means for flashing said flashcube after said flashcube is expelled from said cartridge case, said means including a



4,007,691

SMOKE MARKER

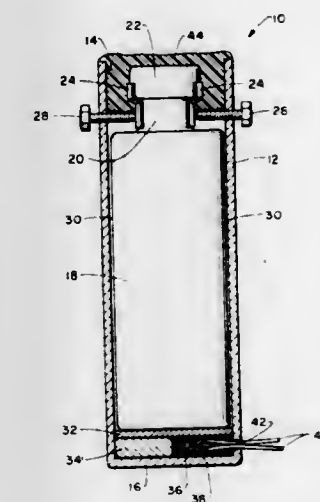
Frederick L. Haake, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1975, Ser. No. 643,713

Int. Cl.² F42B 4/00

U.S. Cl. 102-90

10 Claims



1. A smoke marker comprising:

- a seamless tubular housing having one closed end and one open end, said housing being fabricated from an explosive-proof material;
- a closed, collapsible, tubular container having a neck portion, said tubular container being disposed in said tubular housing, said container being filled with a column of smoke generating chemical;
- means abutting said neck portion of said tubular container for rigidly attaching said tubular container to said tubular housing and for shearing said neck portion of said tubular container from said tubular container when a sufficient force is applied to said column of smoke generating chemical;
- means disposed between said tubular container and said closed end of said tubular housing for generating and applying said sufficient force to said column of smoke generating chemical such that said neck portion of said tubular container and said column of smoke generating chemical are ejected from said tubular container.

4,007,692

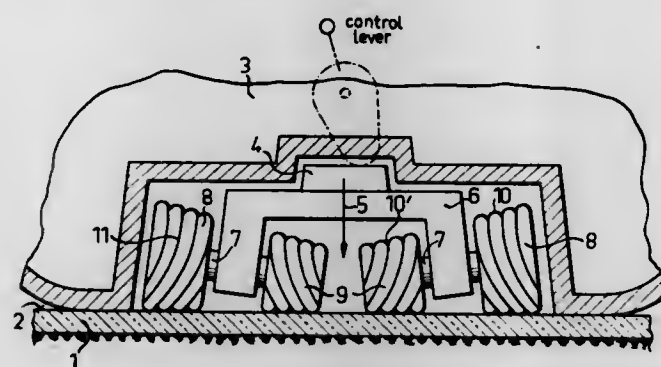
BRAKING DEVICE FOR SLEDS FOR SLIDING PATHS Manfred Kunz, Korbach, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany Filed May 19, 1975, Ser. No. 579,020

Claims priority, application Germany, May 17, 1974, 2424074

Int. Cl.² A63G 21/00

U.S. Cl. 104-134

2 Claims



1. A braking device for use in connection with a sled for a sliding path, which includes in combination: braking means comprising roller means operable to engage the sliding path on which said braking device is to slide, and actuating means operatively connected to said roller means to move said roller means from a non-braking position into a braking position for braking engagement with the sliding path over which a sled equipped with said braking device is to slide, said roller means including at least two rollers and also including shaft means fixedly connected to said rollers, means operatively connected to said shaft means and operable to brake the latter to thereby brake said rollers, the central plane in the circumferential direction of said roller means differing from the desired normal direction of sliding of the sled to be equipped with said braking device, said roller each having a conical running surface, said shaft means including an axle with said two rollers respectively pivotally connected to the two ends of said axle for respectively pivoting about an axis extending in the intended sliding direction of the sled equipped with said braking device, and said actuating means being operatively connected to said two rollers and being operable simultaneously to tilt said two rollers in opposite direction relative to each other about said axes.

4,007,693

TRACKLESS TRAIN SYSTEM

Bernard Desourdy, 309 de Normandie St., Longueuil, Quebec, Canada

Filed Sept. 25, 1975, Ser. No. 616,823

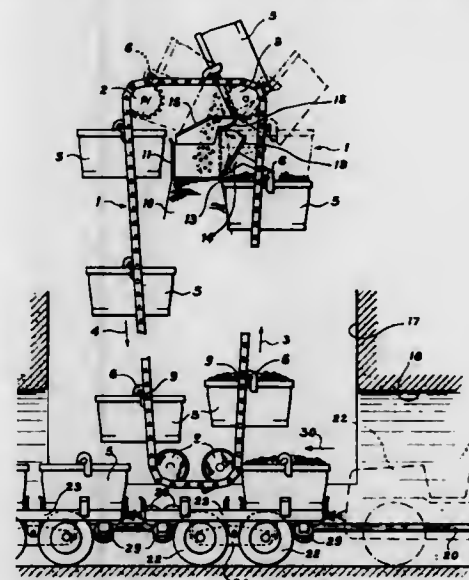
Claims priority, application Canada, July 11, 1975, 231289
 Int. Cl.² B61B 13/04

U.S. Cl. 105-144

2 Claims

1. A transportation system for the evacuation of muck from a tunnel of substantially circular cross-section is a tunneling operation, said tunnel including a utility pipe secured to the wall of the tunnel and extending substantially parallel to the deepest longitudinal portion of the tunnel laterally of said portion and at a substantially constant level above the same, said transportation system comprising a train of interconnected cars, each car including a horizontally disposed frame, at least one open top much-receiving receptacle carried by said frame, a pair of load carrying wheels disposed in a single longitudinal row along the centre line of the frame below the same and adapted to run on suspension connecting the pair of load carrying wheels to the car frame, brackets extending from both end portions of the car frame laterally from one side only of the car frame, and sets of guide wheels rotatably carried by each bracket, said guide wheels having a peripheral groove for receiving said pipe in rolling engagement therewith, first guide wheels of each set rolling on the top of the

pipe and second guide wheels of the set rolling along the bottom of the pipe, said guide wheels laterally guiding the



corresponding car along the deepest longitudinal portion of the tunnel and preventing lateral and longitudinal tilting of the car.

4,007,694

UNITARY PLASTIC PALLET FOR HANDLING HEAVY POWDER LOADS

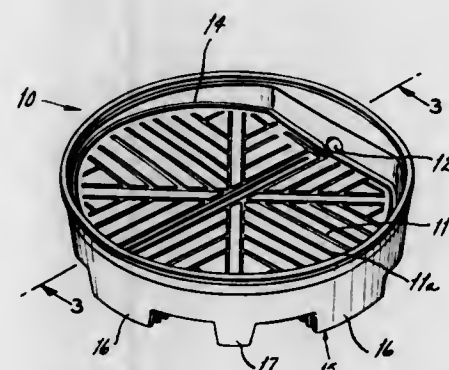
Timothy J. Fowler, St. Louis, Mo., and Paul G. Kanan, Watertown, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 15, 1974, Ser. No. 442,967

Int. Cl.² B65D 19/04

U.S. Cl. 108-55.1

2 Claims



1. A load carrying pallet comprising a hollow, unitary plastic structure having a reinforced, substantially rigid lower deck, a flexible, reinforced and substantially continuous upper deck separated from said lower deck but deformable under normal loads to rest on said lower deck, the reinforcements on said lower deck and said upper deck being disposed in essentially parallel planes but being nonparallel in direction, an exterior wall extending above said upper deck and bridging said upper and lower decks, and a plurality of reinforced legs integrally associated with said lower deck while adapted to permit forklift transport of said pallet, said upper deck and lower deck being substantially parallel to each other but inclined with respect to the bottom surface of the pallet legs.

4,007,695

ROTARY HEARTH FURNACE

Jim Frye, 4304 N.W. 56th St., Oklahoma City, Okla. 73112

Filed Oct. 17, 1975, Ser. No. 623,426

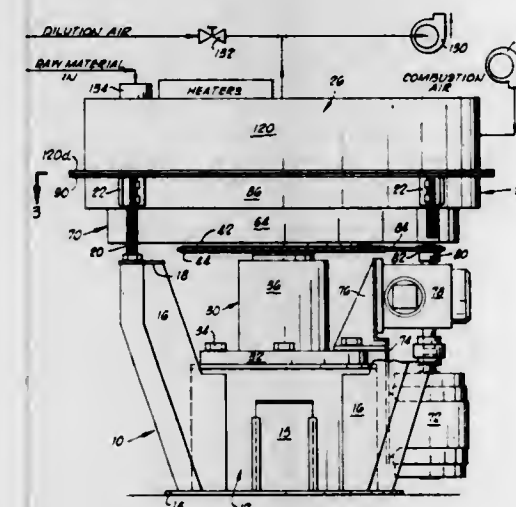
Int. Cl.² F23G 5/00; F23B 1/24; F27B 9/16

U.S. Cl. 110-13

22 Claims

1. A rotary hearth furnace comprising:
 a refractory lined, generally circular turntable having a generally flat upper surface, and having a discharge opening in the center of said upper surface;

drive means drivingly engaging the turntable for driving the turntable in rotation;
 hood means covering the turntable;
 a primary scraper blade positioned over the turntable and within the hood means, said primary scraper blade extending chordally across said turntable at a location spaced radially outwardly from said discharge opening, and said primary scraper blade having a lower edge immediately adjacent the upper surface of said turntable extending part of the way across said turntable from the peripheral outer edge thereof, said primary scraper blade further having a slot therein at the lower side thereon and extending from one end of said lower edge toward a peripheral outer edge of said turntable; and
 a secondary scraper blade positioned over said turntable and within said hood means, said secondary scraper blade extending chordally across said turntable at a location spaced radially outwardly from said discharge opening, and spaced from said primary scraper blade, said second-



ary scraper blade having a lower edge immediately adjacent the upper surface of said turntable and extending part of the way across said turntable, said secondary scraper blade having a pair of slots therein at the lower side thereof, with said slots being spaced from each other by the lower edge of said secondary scraper blade, and with one of said slots positioned to permit material moving on said turntable as said turntable rotates to pass through said one slot and then engage said primary scraper blade at a location spaced therealong from the slot in said primary scraper blade;
 means for depositing waste material to be incinerated through said hood means on said turntable at a location on the opposite side of said primary scraper blade from said secondary scraper blade and adjacent the portion of said primary scraper blade which carries said lower edge; and
 heater means in said hood means for directing heat against a waste material positioned on the upper surface of said turntable for incineration.

4,007,696

SOLID FUEL CONVERSION FURNACE

Richard L. Robertson, Rte. 1 Box 486c, Port Orchard, Wash. 98366

Filed Oct. 1, 1975, Ser. No. 619,141

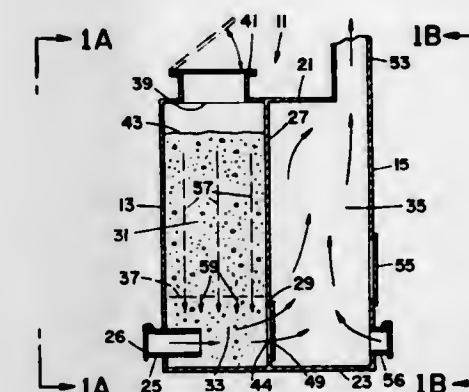
Int. Cl.² C10B 57/00; F23B 1/36

U.S. Cl. 110-31

6 Claims

1. A furnace comprising:
 a. a sealable fuel compartment;
 b. a fire compartment;
 c. a heat exchange compartment;
 d. means for loading fuel into said sealable fuel compartment wherein said fuel is exposed to a non-combustion supporting atmosphere;

e. said heat exchange compartment being in heat exchange relationship with said fuel compartment;
 f. said fire compartment being positioned under said fuel compartment;
 g. said fire compartment including an air inlet and an exhaust outlet;
 h. said exhaust outlet communicating with said heat exchange compartment;
 i. said heat exchange compartment having an exhaust gas flue;



j. said means for loading fuel is sealably connected to said fuel compartment and prevents air from entering said fuel compartment;
 k. heat from said heat exchanger causes solid fuel in said fuel compartment to convert into combustible gases and combustible solids whereby;
 l. said combustible solids are transmitted to said fire compartment by gravity action and said combustible gases are transmitted to said fire compartment by self-generated pressure.

4,007,697

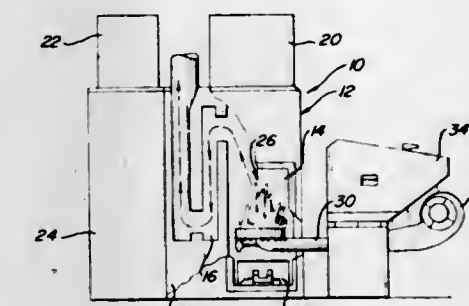
STOKER ACTUATED COAL BURNING APPARATUS LeRoy W. Prill, Ranchester, Wyo., assignor to Prill Manufacturing Company, Sheridan, Wyo.

Filed Oct. 2, 1975, Ser. No. 619,076

Int. Cl.² F23K 3/18

U.S. Cl. 110-45

17 Claims



1. Stoker actuated coal burning apparatus comprising:
 a feed box having a generally horizontal intake port for connection to a fuel-feeding stoker mechanism and a generally vertical discharge port for transmission of coal to a burning zone;
 an annular burner body mounted on the feed box and having a central annular vertically directed delivery ring in coaxial communication with the discharge port, and an annular burner grid connected to the upper end of the delivery ring and sloping outward and downward;
 and an annular ash ring having an inner marginal portion overlying the outer marginal portion of the burner grid and an outer portion extending outward beyond the grid, with the upper surface sloping outward and upward to define with the grid surface an annular recess for retaining burning coal;
 the inner marginal portion of the ash ring resting directly on

the outer marginal portion of the grid to prevent discharge of ashes at their juncture, and the outer marginal portion of the grid serving as a bearing for rotational support of the ring;
the burner body being restrained against rotation;
and the ash ring being rotatable about the vertical axis of the burner body.

4,007,698

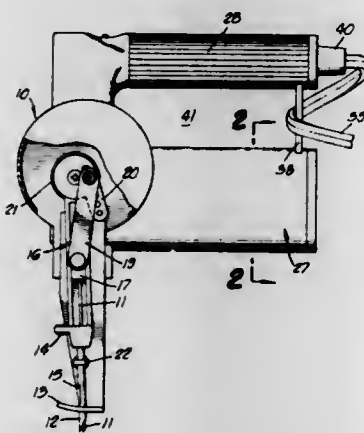
MOTOR DRIVEN TUFTING MACHINE

Fred A. Thaheld, and Fred H. Thaheld, both of Minden, Nev., assignors to Rumpelstiltskin's Craft Shop, Inc., Portland, Ore.

Filed June 25, 1975, Ser. No. 590,325
Int. Cl.² D05C 15/06

U.S. Cl. 112—80

1 Claim



1. In a hand held power operated tufting machine having concentric needles for forming loops of yarn on a backing sheet, the combination of: mechanism for reciprocating and oscillating said needles, an electric motor for driving said mechanism, said motor being mounted within and enclosed by a housing formed of lightweight plastic material, said housing having a plurality of inwardly projecting bosses each formed integrally with said housing, each boss having an opening receiving an internally threaded metal sleeve, an annular metal reinforcing ring completely encircling the projecting end of each boss to confine an annular region thereof between the ring and said sleeve, and threaded fasteners securing said motor to each said internally threaded sleeves.

4,007,699

METHOD AND APPARATUS FOR A DIFFERENTIAL ROLLING-IN OF TUBES

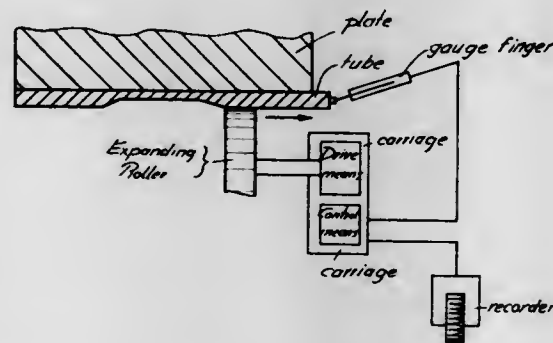
Kurt Clemens, Gummersbach, Germany, assignor to L. & C. Steinmuller GmbH, Gummersbach, Germany

Continuation-in-part of Ser. No. 329,610, Feb. 5, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,257
Claims priority, application Germany, Feb. 4, 1972, 2205281

Int. Cl.² B21D 53/02

U.S. Cl. 113—118 C

17 Claims



5. An apparatus for differentially rolling-in a tube into

plates and walls, especially of heat exchangers, according to which the tube section to be rolled-in is widened, which includes in combination roller means adapted to be introduced into the tube section to be flow expanded, driving means operatively connected to said roller means for actuating the same, and control means operatively connected to said driving means for controlling the latter with regard to the measurement of length of the tube section produced by rolling-in movement of said roller means, said control means including measuring means responsive to elongation of said tube section by said roller means, said roller means widening said tube section to decrease the thickness of said tube, so that said tube section is elongated to actuate said control means.

11. A method for measurement of adherence enlargement by way of material expansion arising during tight rolling-in of tubes in a tube bottom especially for heat exchangers through widening of tube segments to be rolled-in, comprising in combination steps of seal-rolling the tube in several individual increments beginning with the first step along the tube bottom inner side pressing the tube securely against the tube bottom without adherence enlargement and being connected during subsequent steps by way of adherence enlargement sealing unreleasably with the tube bottom, and sensing tube length change by way of an inductive measuring feeler means only as to tube material flow displacement caused on the face side of the tube during every rolling-in step and upon attaining a pre-set intended flow value turning off the roller motor, reversing the same and introducing the next step.

4,007,700

MULTIPLE SEAFLOOR STORAGE AND SUPPLY SYSTEM

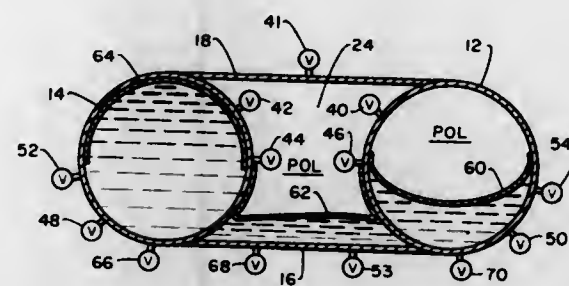
Harvey H. Haynes, Camarillo; Norman D. Albertsen, Ojai, both of Calif., and Lawrence F. Kahn, Ann Arbor, Mich., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 626,386

Int. Cl.² B63B 25/08

U.S. Cl. 114—74 T

13 Claims



1. A mobile seafloor storage structure for storing a storage fluid therein comprising:

- a plurality of cylindrical shaped enclosures having substantially hemispherical-shaped end members, said cylindrical shaped enclosures being adapted to contain said storage fluid;
- means disposed between at least two of said cylindrical shaped enclosures for forming a second enclosure, said second enclosure being adapted to contain said storage fluid;
- valve means for fluidically connecting each said cylindrical shaped enclosure to or fluidically disconnecting each said cylindrical shaped enclosure from said second enclosure such that said storage fluid may be utilized to shift both the center-of-gravity and the center-of-buoyancy of said seafloor storage structure;
- means for injecting said storage fluid into and removing said storage fluid from said cylindrical enclosures and said second enclosure;
- means disposed inside each said cylindrical shaped enclosure and inside said second enclosure for creating an upper compartment and a lower compartment therein, said upper compartment adapted to contain said storage

4,007,702

TOWING ETC. CABLE PROTECTION MEANS

Wilfred Johnson Cave, and Edward George Culver, both of Sheffield, England, assignors to Hallam Polymers & Engineering Limited, United Kingdom

Filed Sept. 5, 1974, Ser. No. 503,456

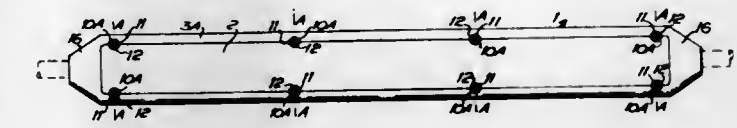
Claims priority, application United Kingdom, Sept. 19, 1973, 43882/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B63B 21/00

U.S. Cl. 114—230

9 Claims



1. Means for protecting a towing or mooring cable comprising an elongated sleeve of resilient wear-resistant material with at least one longitudinally extending external flat face, said sleeve being split longitudinally into individual unitary sleeve parts which define a cable receiving longitudinal guideway therebetween the exposed surface of which is comprised of said resilient wear-resistant material, said sleeve parts including a metal strap bonded and imbedded within each of said sleeve parts behind said exposed surface of said guideway so as to remain out of contact with a cable placed through said guideway, said metal straps being positioned adjacent each end of said elongated sleeve, holes extending through each end of the metal straps, holes extending through said sleeve parts which are coaxial with the holes in said straps, and screw means extending through each coaxial pair of holes to secure said sleeve parts together.

4,007,703

TWO-TONE SOUND GENERATOR

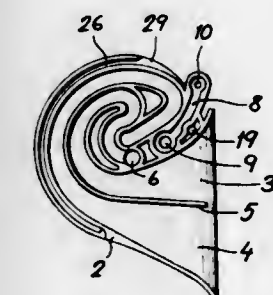
Domenico Frigo, Olmo, Italy, assignor to F.I.A.M.M. Fabbrica Italiana Accumulatori Motocarri Montecchio S.p.A., Montecchio Maggiore (Vicenza), Italy

Filed Feb. 27, 1976, Ser. No. 662,169

Int. Cl.² G10K 9/18

U.S. Cl. 116—142 FP

10 Claims



1. A two-tone signal generator comprising:
- a hollow body divided into two complementary half-shells meeting along a median plane;
 - a curved septum dividing the interior of said body into two convoluted wind channels of different length each bisected by said median plane, said wind channels terminating in a common bell open to the exterior, said half-shells forming a common inlet for said wind channels, said inlet including a central duct bisected by said median plane and two lateral branches with confronting internal shoulders forming a generally T-shaped junction with said duct;
 - a mobile valve member in said junction freely displaceable between said shoulders for blocking either of said branches upon a blowing of air under pressure into the opposite branch; and

fluid, said lower compartment adapted to contain seawater or a gas;

- first valve means for injecting seawater into and removing seawater from said lower compartment of each said cylindrical shaped enclosure and said second enclosure;
- second valve means capable of passing a gas into and out of said lower compartment of each said cylindrical shaped enclosure.

10. A method of raising and lowering a mobile underwater seafloor storage structure comprising a pair of cylindrical shaped enclosures having hemispherical-shaped end members, said cylindrical shaped enclosures being connected by a top, bottom and side members such that a second enclosure is formed between said pair of cylindrical shaped enclosures, the longitudinal axes of said cylindrical shaped enclosures being parallel; comprising the steps of:

- filling both said cylindrical shaped enclosures with a storage fluid bearing said second enclosure empty;
- draining the storage fluid from one said cylindrical shaped enclosure into said second enclosure so that said cylindrical shaped enclosures are disposed vertically;
- attaching a lowering line to said structure;
- placing a ballast in one end of said cylindrical shaped enclosure such that said structure tilts in the water; and
- rendering said structure negatively buoyant.

4,007,701

MARINE VESSEL SCRUBBING DEVICE

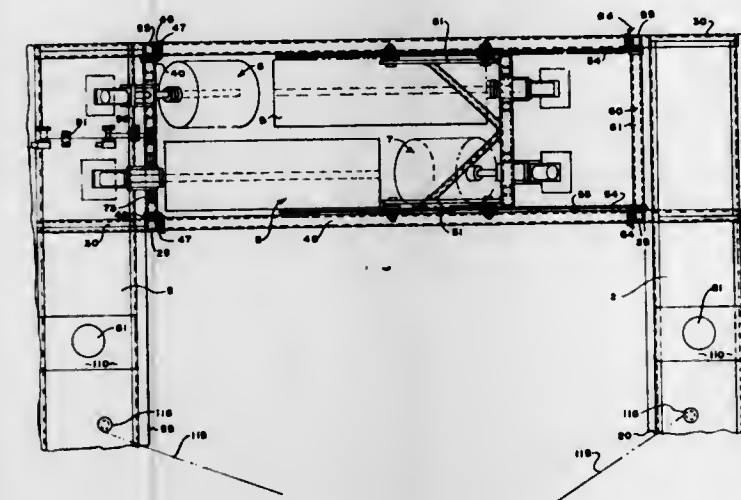
Don G. Fike, 16 Town & Campus Apt., Fulton, Mo. 65251

Filed Nov. 11, 1975, Ser. No. 630,807

Int. Cl.² B63B 59/00

U.S. Cl. 114—222

5 Claims



1. In a marine vessel bottom cleaning device wherein a floating platform has spaced ways between which a vessel to be cleaned passes lengthwise thereof and scrubbing means are supported on said platform, the improvement comprising at least two elongate scrubbing means spaced from one another lengthwise of said ways, extending in a direction generally athwart said ways and toward one another and in at least one position overlapping one another along the lengthwise path of said vessel, and means for moving said scrubbing means relative to one another from said position at which they overlap one another along the lengthwise path of said vessel in a direction outboard of said vessel and away from one another, said moving means being selectively actuable to move said scrubbing means independent of the presence of a vessel between said ways, said platform comprising an outside frame and an inside frame, said inside frame comprising said moving means, being located between said ways and having a traversing scrubbing means support by which at least one of said elongate scrubbing means is carried, and means for moving said inside frame scrubbing means support transversely of the lengthwise path of the vessel to move said elongate scrubbing means toward and away from another elongate scrubbing means.

guide means in each of said half-shells for directing incoming air from said central duct to an end of a respective wind channel remote from said bell.

4,007,704

GASKET MATERIAL APPLICATOR

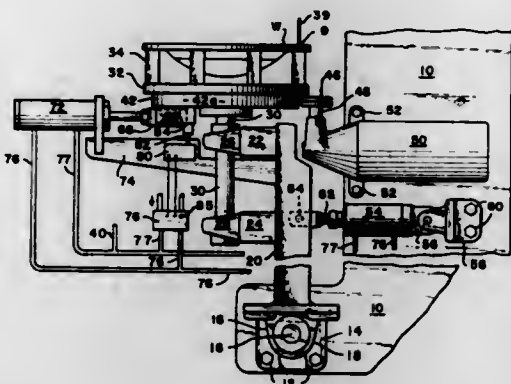
Girard S. Haviland, West Hartford, Conn., assignor to Loctite Corporation, Conn.

Filed Feb. 14, 1975, Ser. No. 549,865

Int. Cl.² B05C 13/00, 5/00

U.S. Cl. 118-6

10 Claims



1. The combination comprising:

a turntable having means for fixedly supporting a work piece;

means supporting said turntable for rotation about a rotational axis and for movement in a plane extending in a direction transverse to said rotational axis, said supporting means including a support arm and means supporting said arm for swinging movement about an axis normal to said plane, said turntable being rotatably supported by said support arm at a location remote from said last mentioned axis;

a cam wheel connected to said turntable for rotation therewith and for movement therewith in said plane; said cam wheel having a peripheral edge surrounding said rotational axis at varying distances therefrom; a drive means having a portion moving at a constant linear speed in driving engagement with said peripheral edge of the cam wheel at a fixed first location in said plane; and means yieldably urging said cam wheel into peripheral driven engagement with said drive means.

4,007,705

APPARATUS FOR TREATING A CYLINDRICAL OBJECT

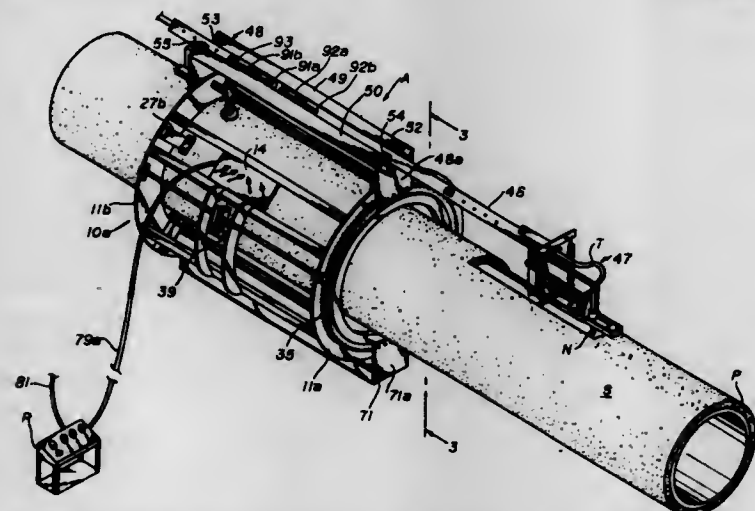
C. Richard Sherer, and Jack Webber, both of Houston, Tex., assignors to DND Corporation

Filed Dec. 20, 1974, Ser. No. 534,661

Int. Cl.² B05C 5/00

U.S. Cl. 118-7

37 Claims



1. Apparatus for temporary positioning about a generally

cylindrical object for indexing a tool across the surface thereof, comprising:

a frame assembly and means for temporarily opening said frame assembly to receive a cylindrical object;

a boom assembly including a boom and a boom head, said boom head including tool mount means adapted to mount a tool for movement with said boom head;

indexing means for moving said boom assembly longitudinally and circumferentially of said pipe surface thereby positioning said tool to perform a designated treatment on said cylindrical object;

said indexing means including rotation hydraulic control means for moving said boom assembly through a pre-designated angular increment and boom hydraulic control means for moving said boom assembly through a pre-designated length of movement in first and second longitudinal directions; and

said index means including intercontrol means operatively interconnecting said rotation hydraulic control means and said boom hydraulic control means for operating said boom assembly for movement longitudinally and circumferentially in any desired time relationship.

4,007,706

APPARATUS FOR TREATING WORK PIECES

Karl Ewald Arvidsson, Dannemoragatan 10, 113 44 Stockholm, Sweden

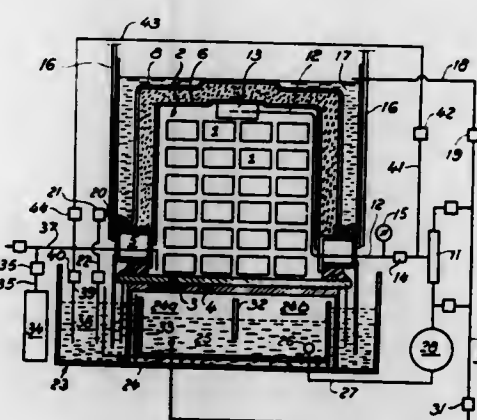
Filed May 6, 1975, Ser. No. 574,962

Claims priority, application Sweden, May 6, 1974, 74-06006

Int. Cl.² B27K 3/10

U.S. Cl. 118-50

13 Claims



1. Apparatus for treating workpieces in an enclosed space, said apparatus comprising:

a. workpiece-supporting means having a workpiece-supporting surface;

b. a rigid framework in proximity to and coextensive with edge portions of said workpiece-supporting surface, said framework having a side facing said workpiece-supporting surface;

c. a collapsible material secured to said framework defining an enclosed space over the workpiece-supporting surface;

d. a plurality of spaced posts secured to said framework; and

e. wall members secured to and supported by said spaced posts extending continuously about said framework, said wall members together with said collapsible material defining between them a liquid-tight chamber.

4,007,707

XEROGRAPHIC DEVELOPMENT APPARATUS HAVING A LARGE RESERVOIR FOR CONTROLLED FLOW THROUGH A NARROW DEVELOPMENT ZONE

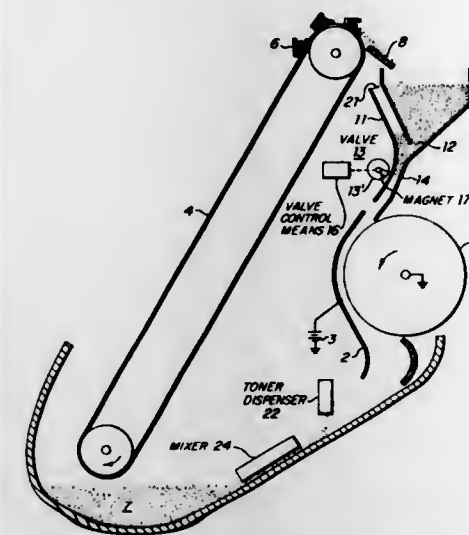
W. Raymond Buchan, Lincoln, and Edward F. Mayer, Acton, both of Mass., James E. Gentle, Newton, Conn., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 21, 1975, Ser. No. 542,886

Int. Cl.² B05B 5/02; G03G 15/00

U.S. Cl. 118-647

4 Claims



1. A xerographic development apparatus for a xerographic machine comprising:

a. a xerographic member capable of carrying an electrostatic image;

b. a development electrode positioned adjacent said member for defining an elongated narrow development zone;

c. a developer reservoir for containing a substantial portion of the entire amount of developer within said xerographic machine;

d. valve means for controlling the flow of developer from said reservoir to said narrow development zone;

e. a developer transport mechanism for transporting developer having travelled through said development zone back to said developer reservoir; and

f. a feed chamber, in communication with a lower portion of said reservoir, which produces a substantially constant pressure head of developer at the entrance of said narrow development zone, thereby to control and maintain a desired flow rate of developer passing through said narrow development zone regardless of the quantity of developer within said reservoir.

4,007,708

ANIMAL LITTER PRODUCT

Catherine L. Yacono, 44 W. 31st Place, Steger, Ill. 60475

Continuation of Ser. No. 478,039, June 10, 1974, abandoned.

This application July 24, 1975, Ser. No. 599,008

Int. Cl.² A01K 29/00; 119/1

U.S. Cl. 119-1

7 Claims

1. An animal litter product including a particulate litter material absorbent for liquids that is harmless to warm blooded animals and which comprises an inorganic absorbent of the nature of clay and an odor inhibiting quantity of vitamin E absorbed therein in an approximate amount of about 0.25-5% by weight of the particulate litter material.

4,007,709

APPARATUS AND PROCESS FOR RAISING LOBSTERS

Frederick B. Wishner, 30 E. 40th St., New York, N.Y. 10016

Filed Mar. 24, 1975, Ser. No. 561,089

Int. Cl.² A01K 61/00

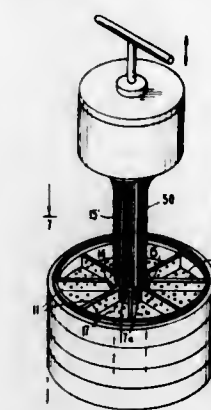
U.S. Cl. 119-2

15 Claims

1. A lobster raising apparatus comprising at least one covered sectioned tray, each tray having a single hollow aeration

and feeding tube passing therethrough, which hollow tube passes through the center of each tray; the sections of each tray being divided by walls which prevent growing lobsters from migrating from one section to another; there being a plurality of holes in said hollow tube and said divider walls and the floors of each tray of a size too small to permit post-larval and larger lobsters to pass therethrough, there being present in said tube a pressure device for introducing air and finely divided particles of lobster diet through said holes in said hollow tube and into said sections of each tray.

9. A process for maintaining and raising lobsters comprising placing a plurality of post-larval lobsters underwater in a sectioned tray in a lobster raising apparatus, no more than one



lobster in a section, said apparatus comprising at least one sectioned tray, each tray having a single hollow tube passing therethrough, which hollow tube passes through the center of each tray; the sections of each tray being divided by walls which prevent growing lobsters from migrating from one section to another; placing a feeding and aeration pressure device in said hollow tube withdrawing said pressure device from said hollow tube as pressure is applied to expel air; and passing bubbles of said air through holes in said hollow tube and in said divider walls and the floors of said trays which holes are too small to permit passage therethrough of said post-larval and larger lobsters thereby permitting the water enveloping each of said lobsters to be suitably aerated.

4,007,710

MILK LINE CHECK VALVE

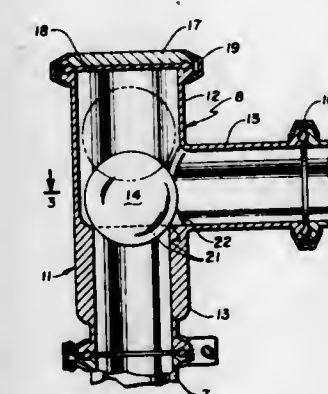
Kendall R. Johnson, Albert Lea, Minn., assignor to Universal Cooperatives, Inc., Albert Lea, Minn.

Filed Feb. 27, 1976, Ser. No. 661,850

Int. Cl.² A01J 5/00

U.S. Cl. 119-14.03

9 Claims



1. In a milk line having a vertically extending portion and a horizontal portion for carrying milk vertically from a milk pump and then horizontally to a more remote location, a check valve disposed within the line comprising:

a. a vertically extending tubular member having a sealed upper end portion and having an open lower end portion constituting a milk inlet;

b. a horizontally extending outlet tube connected to the

- upper end portion of said vertically extending tubular member in milk-receiving relation and extending at right angles outwardly therefrom and having a discharge outlet connected in milk-delivering relation to the horizontal portion of the milk line;
- c. a spherical valve element carried within the bore of said upper end portion of said vertical tubular member and movable vertically therewithin;
- d. said upper end portion having an open bore above said outlet tube sufficiently greater than the diameter of said valve element to permit the latter to move freely upwardly and downwardly therewithin and being sealed at a level above said outlet tube a distance at least substantially as great as the diameter of said valve element and being devoid of valve guide elements;
- e. said lower end portion of said tubular member having a bore which is uniform throughout its length and of lesser diameter than the diameter of said valve element and equal to the bore of said outlet tube and having a milk inlet connected to the vertically extending portion of the milk line in milk-receiving relation;
- f. a cooperative horizontally extending circular valve seat carried by said lower end portion immediately adjacent to said outlet tube and having a diameter smaller than the diameter of said valve element and cooperating therewith to seal off said lower end portion of said tubular member against a return flow from said outlet tube;
- g. said outlet tube having a uniform bore throughout its length and lesser in diameter than said valve element and defining a discharge port in the side wall of said upper portion of said tubular member, said discharge port being of such diameter and constructed and shaped to preclude said valve element from entering said outlet tube and from effectively sealing off the flow of milk upwardly through said lower portion into said outlet tube.

4,007,711

ANTI-PEST PET DISH

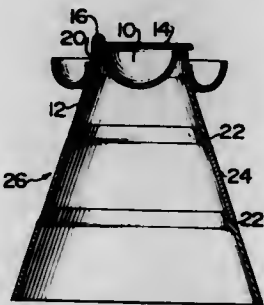
John E. Michael, 2530 Cherry Lane, Walnut Creek, Calif. 94596

Filed May 2, 1975, Ser. No. 573,963

Int. Cl.² A01K 5/00

U.S. Cl. 119—51.5

3 Claims



1. A pet feeding and watering dish comprising:
- a. a central bowl portion for containing pet food;
- b. a lid having one edge thereof hinged to said bowl portion and an edge opposite said one edge which extends beyond said central bowl such that a pet can raise said lid by lifting said extended edge;
- c. stop means on said lid to prevent the raising thereof to a vertical position; and
- d. a removable annular water trough portion surrounding encircling said central bowl portion to provide water accessible to a pet and prevent access to said bowl portion by crawling insects and permit the separation of said water trough portion from said bowl portion for washing.
- e. said central bowl portion having an outwardly tapered skirt and said trough having a complementary tapered radially inner wall such that when placed around said skirt said trough portion is maintained thereon by friction and gravity.

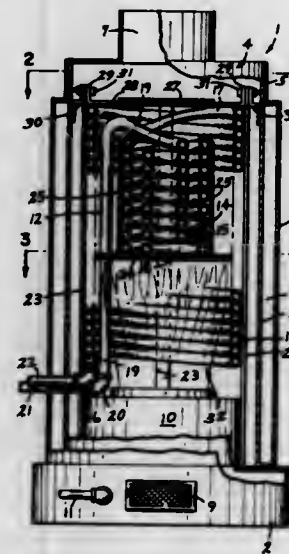
4,007,712
WATER HEATER

John F. Finger, and Merle E. Pochop, both of Beresford, S. Dak., assignors to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Mar. 3, 1976, Ser. No. 663,613
Int. Cl.² F22B 27/08; F23M 9/06

U.S. Cl. 122—250 R

9 Claims



1. A water heater comprising:
- a. a housing including a base portion, a cylindrical body portion, and an upper end member defining an opening for removal of gases of combustion;
- b. a burner disposed at said base portion and disposed to direct a combustion flame upwardly in said housing;
- c. a rigid fluid conduit in said housing;
- d. means for supporting said conduit above the level of said burner;
- e. said conduit being formed to provide an interconnected plurality of concentric helical coils including an outer coil of relatively long axial length and an inner second coil of relatively shorter axial length within said outer coil, said second coil having an upper end disposed near the upper end of said outer coil;
- f. a generally horizontally disposed reticulate baffle having a diameter slightly less than the inner diameter of said outer coil;
- g. and means for supporting said baffle within said outer coil at the lower end of said second coil;
- h. said baffle and the lower end portion of said outer coil cooperating with said burner to define a combustion chamber, said baffle being operative to permit flow of gases of combustion upwardly therethrough while retaining the greater portion of the burner flame within the combustion chamber.

4,007,713
TEST CIRCUIT

Michael J. DeLeonardis, and Donado DeLeonardis, both of Valley Stream, N.Y., assignors to Hydrolevel Corporation, Farmingdale, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,552

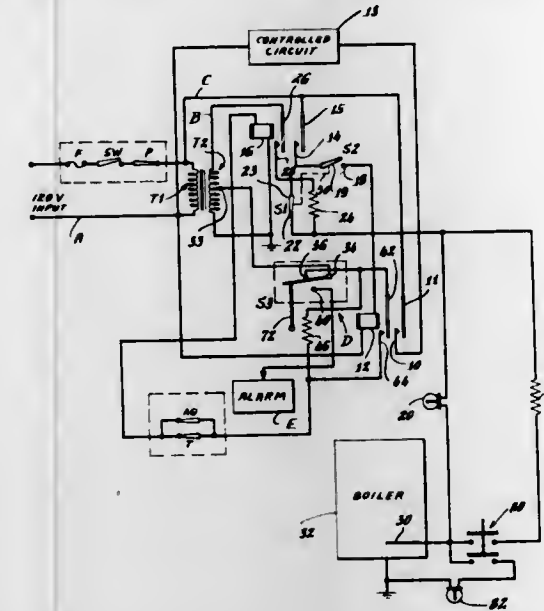
Int. Cl.² F22B 37/42

U.S. Cl. 122—504

5 Claims

1. In a control circuit including a branch having a water path through which electrical current normally flows, the improvement for detecting a short circuit around said water path which comprises: a test switch having normally open first and normally closed second contacts, said normally closed

second contacts being in series with said branch; a voltage indicator; and means connecting said normally open first



contacts and voltage indicator in series across said water path to indicate a potential drop thereacross.

4,007,714

SPARK PLUG AND ROTARY ENGINE COMBINATION

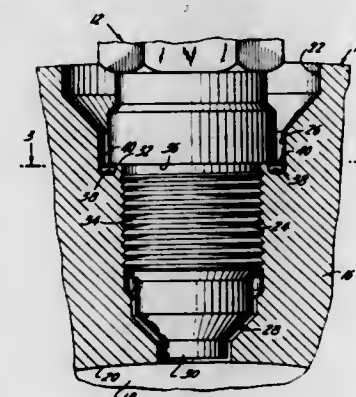
Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Oct. 14, 1975, Ser. No. 622,124

Int. Cl.² F02B 53/12; F02P 13/00

U.S. Cl. 123—8.09

5 Claims



1. An improved combination of a rotary internal combustion engine, having a housing defining a cavity within which a rotor is supported for rotative movement relative to the housing and defining with the housing a plurality of working chambers which successively expand and contract in volumetric size as the rotor rotates, and a spark plug having a threaded shank portion and a spark gap end portion and an electrical terminal opposite end portion, the improved combination comprising:

- a. a bore in said housing extending from the exterior of the housing into communication with the housing cavity;
- b. said bore having a threaded portion to receive the threaded shank portion of the spark plug and having a first abutment means extending in a plane substantially normal to the longitudinal axis of the bore;
- c. said spark plug having a second abutment means extending in a plane substantially parallel to the plane of said first abutment means and so located as to engage said first abutment means and thereby position the spark gap end portion of the spark plug in a predetermined relationship to the housing cavity;
- d. a channel means adjacent said first abutment means to define with the second abutment means a space; and
- e. a seal means disposed in said space to engage in fluid tight relationship said second abutment and channel means

when the first and second abutment means are engaged and thereby prevent gas leakage through the interstices between the spark plug and the bore.

4,007,715

ROTARY ENGINES, COMPRESSORS AND VACUUM PUMPS

Robert Peter Bonnell, West Beach, and Arthur Douglas Northey, Labrador, both of Australia, assignors to Fairey Norbon Pty. Ltd., Adelaide, Australia

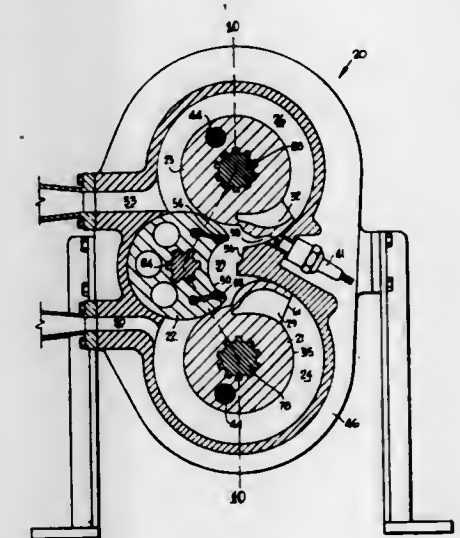
Filed Mar. 24, 1975, Ser. No. 561,555

Claims priority, application Australia, Mar. 28, 1974, 7066/74

Int. Cl.² F02B 53/00

U.S. Cl. 123—8.43

12 Claims



1. A rotary machine having a plurality of rotors rotatable within respective parallel intersecting bores in a stator, at least one of said rotors being a compression rotor and having an axially extending lobe radially outstanding from a rolling surface, which upon rotation sealably co-operates with the curved surface of its respective said bore,
- another said rotor being a gas transfer rotor and having a rolling surface in gas-sealing contiguity with the curved surface of its respective bore and containing an axially extending gas transfer recess which extends radially inward from its rolling surface, the gas transfer bore curved surface having an arcuate portion near the intersection of the bores,
- drive means coupling the compression rotor to rotate in one direction and the gas transfer rotor to rotate in the opposite direction,
- the axes of the rotors being arranged so that, upon rotation, the recess surface is entered by said compression lobe, and when the compression lobe is not within the recess, the rolling surface of the compression rotor lies in gas-sealing contiguity with the rolling surface of the gas transfer rotor,
- the compression lobe and the gas transfer recess being of such complementary shape that at a first position during rotation, the compression lobe more than half fills the recess while its trailing portion is still contiguous with its bore, and the leading face of the compression lobe remains in gas-sealing contiguity with the leading surface of the recess, after said rolling surfaces have separated, the circumferential length of said arcuate portion and the recess size being such that the leading portion of the transfer rotor rolling surface is in gas-sealing contiguity with the arcuate portion while at a second position slightly advanced of said first position, no gas-sealing contiguity exists between said lobe trailing portion and the compression rotor bore or the recess surface while said gas-sealing contiguity between the transfer rotor rolling surface and the arcuate portion is maintained, such that any compressed gas contained in said recess

enters the compression rotor bore only past said lobe trailing portion.

4,007,716

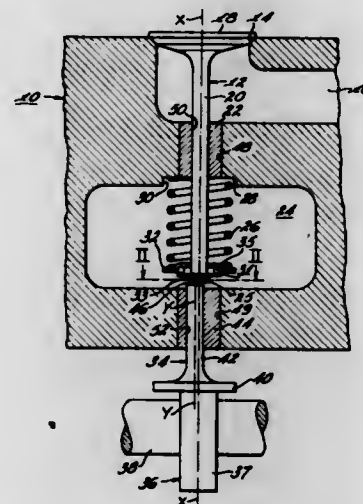
OFFSET VALVE LIFTER EFFECTING VALVE ROTATION
Kenneth R. Jones, Thiensville, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 22, 1975, Ser. No. 606,923

Int. Cl.² F01L 1/32

U.S. Cl. 123-90.28

22 Claims



22. In combination, an engine body for a reciprocating internal combustion engine, a fluid passage in said engine body, said fluid passage terminating in an opening bounded by a valve seat, a reciprocally movable valve movable relative to said valve seat from a closed position in which said opening of said fluid passage is closed to an open position in which said opening of said fluid passage is open, spring means normally biasing said valve to a closed position, said valve comprising a head portion adapted to seat on said valve seat and a stem portion, a first bore in said engine body, said first bore being adapted to guide said valve stem, a second bore in said engine body lying on a common axis with and in axial alignment with said first bore, a guide bushing in said second bore, a valve lifter including a valve lifter stem adapted to engage and move said valve to open position, a rotatable cam mounted on a cam shaft and adapted to engage said valve lifter during the cycle of rotation of said cam whereby to cause said valve lifter to move said valve to open position, the central plane of said cam as measured in the lengthwise dimension of the cam shaft on which said cam is mounted being offset relative to the axis of said valve lifter stem whereby rotation of said cam imparts rotation to said valve lifter, a bore in said guide bushing for receiving and guiding the movement of said valve lifter stem, said bore in said guide bushing being eccentric relative to said common axis, whereby the axis of said valve lifter stem is eccentric relative to the axis of said valve stem, said valve lifter being engageable with said stem portion of said valve during the cycle of rotation of said cam whereby to impart rotation to said valve relative to said valve seat.

4,007,717

GOVERNOR FOR TWO-CYCLE ENGINES

William A. Scott, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed May 23, 1975, Ser. No. 580,425

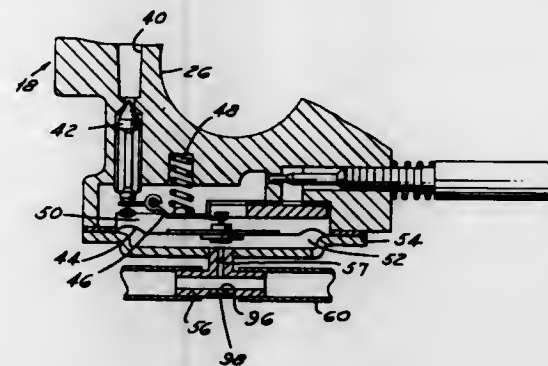
Int. Cl.² F02D 11/08

U.S. Cl. 123-103 R

3 Claims

1. In combination,
a. an internal combustion engine having a housing and a cooling fan rotor in said housing,
b. a diaphragm carburetor arranged to furnish a fuel and air mixture to said engine having a diaphragm chamber on one side closed by a retaining plate on the dry side of said diaphragm,
c. a connector in said plate leading to the outside,

d. means connecting said connector to the inside of said engine housing to transmit pneumatic pressure developed by said fan rotor in said housing to said diaphragm,
e. said carburetor being mounted adjacent said engine and having a mixing passage and a throttle valve in said mixing passage, and



f. means connecting said plate connector to said mixing passage between said throttle and said engine to permit the reduced pressure on said mixing passage created by the closing of the throttle valve to counteract the pressure of said engine fan rotor.

4,007,718

DEVICE FOR CORRECTING THE AIR/PETROL RATIO FOR AN INTERNAL COMBUSTION ENGINE

Bernard R. Laprade; Xavier J. Laprade, both of 64 - Arudy, and Pierre J. Gele, Route de Lourdes, 65 - Odos Tarbes, all of France

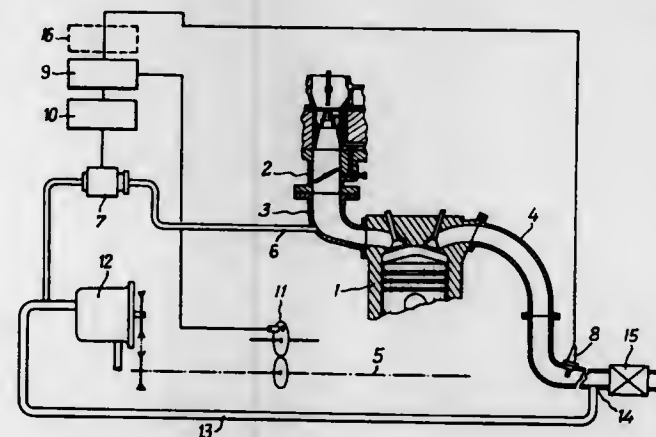
Filed July 17, 1973, Ser. No. 380,109

Claims priority, application France, Aug. 2, 1972, 72.27792

Int. Cl.² F02M 25/06; F01N 3/00; F02B 75/10

U.S. Cl. 123-119 D

7 Claims



1. A device for correcting the proportioning of the air-petrol mixture furnished by a proportioning member to an internal combustion engine having an intake pipe connected from the proportioning member and an exhaust pipe for burnt gases, the device comprising at least one auxiliary air inlet tapped into said intake pipe downstream of the member determining the proportioning of the air-petrol mixture, means for providing auxiliary air to said at least one auxiliary air inlet at overpressure with respect to the pressure prevailing in the intake pipe, at least one valve controlling the air inlet or inlets, a probe arranged in the exhaust pipe for delivering an electric signal which is a function of the composition of the burnt gases, and electronic means releasing electrical pulses controlling the opening of the valve or valves in synchronism with the engine so as to introduce into the mixture a quantity of air predetermined at each cycle of the engine in response to the information from the probe which the concentration of oxygen in the burnt gases is lower than a predetermined value (or the concentration of CO is higher than a predetermined value).

4,007,719

APPARATUS FOR THE DETOXIFICATION OF EXHAUST GASES

Johannes Brettschneider, Ludwigsburg-Pflugfelden; Lorenz Bundesen, Flensburg, and Heinrich Knapp, Leonberg-Silberberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation of Ser. No. 476,231, June 4, 1974, abandoned.

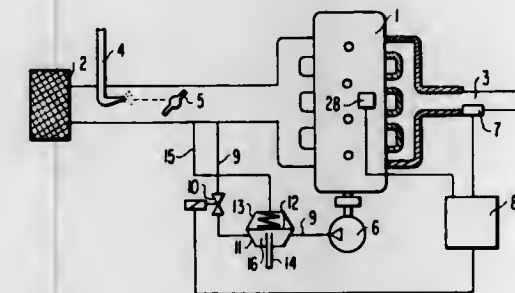
This application Dec. 30, 1975, Ser. No. 645,385

Claims priority, application Germany, June 29, 1973, 2333082; Oct. 3, 1973, 2349559

Int. Cl.² F02M 7/00

U.S. Cl. 123-119 D

17 Claims



1. In an apparatus for the detoxification of exhaust gases of an internal combustion engine having (a) a suction tube for air intake to the engine, (b) an air quantity measuring device disposed in said suction tube, (c) fuel metering means for metering out fuel corresponding to the air quantity measured by said air quantity measuring device so as to achieve slightly enriched fuel-air mixture, (d) an exhaust system for the exhaust gases of the engine, and (e) an oxygen sensing means disposed in said exhaust system, the improvement comprising: (f) a secondary pump, (g) means including a secondary air line connected between said secondary air pump and an inlet to said suction tube downstream of said air quantity measuring device, and (h) means connected to and controlled by said oxygen sensing means and connected to said means including said secondary air line for controlling the admission of secondary air from the secondary air pump to the suction tube through said secondary air line, until such time as an optimum value of air number is reached, wherein said means for controlling the admission of secondary air includes:

- a magnetic valve means disposed within said secondary air line; and
- a control device electrically disposed between said magnetic valve means and said oxygen sensing means for amplifying the output voltage of said oxygen sensing means and cyclically controlling said magnetic valve means proportionally to said amplified output voltage, wherein the opening point of said magnetic valve means is cyclically controlled by said control device at a frequency proportional to the engine rpm, in dependence on a signal fed to said control device by an engine rpm measuring means, and wherein the duration of opening of said magnetic valve means is controlled by said control device in dependence on the output voltage of said oxygen sensing means.

4,007,720

FUEL METERING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Johannes Brettschneider, Ludwigsburg; Lorenz Bundesen, Flensburg, and Heinrich Knapp, Leonberg-Silberberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

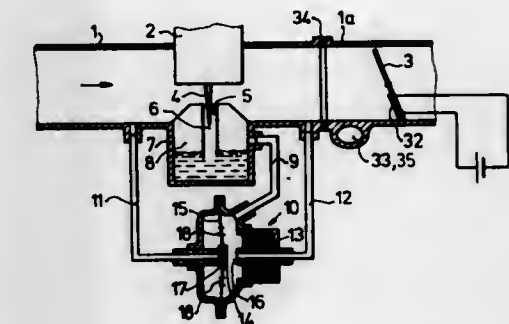
Filed July 11, 1975, Ser. No. 595,168

Claims priority, application Germany, July 30, 1974, 2436558

Int. Cl.² F02M 31/00

U.S. Cl. 123-122 R

5 Claims



1. In a fuel metering system, for use with an internal combustion engine, the system including:
A. an air induction tube containing a throttle valve;
B. an exhaust pipe;
C. a fuel container connected by an air conduit with the induction tube of the engine;
D. sensor means, for determining the chemical composition of the exhaust gas of the engine and providing an output signal; and
E. valve means, located in said air conduit, for changing the effective flow cross section thereof and controlled by the output signal from said sensor means; the improvement in the fuel metering system comprising:
F. an electric heating element mounted on at least a portion of the upstream surface of the throttle valve in the induction tube for supplying heat thereto to vaporize fuel droplets condensed on said upstream surface; and
G. heating means located adjacent and upstream of the throttle valve, for heating up a portion of the interior wall of the induction tube in the immediate region of the heating means, said electric heating element and said heating means cooperating to prevent the condensation of fuel on the surface of the throttle valve and on the interior walls of the induction tube region lying immediately upstream of the throttle valve.

4,007,721

FUEL METERING APPARATUS FOR A CARBURETOR
Jose E. Regueiro, Muskegon, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 17, 1974, Ser. No. 471,345

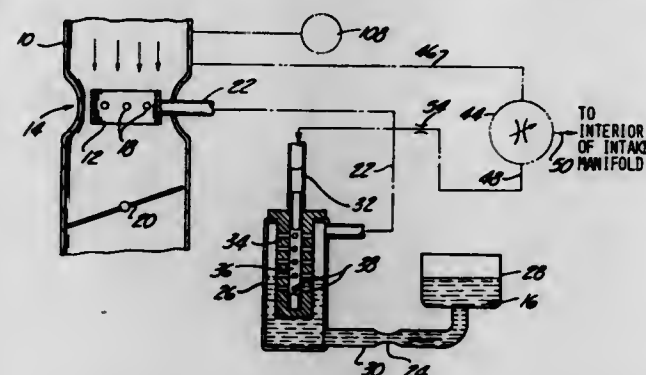
Int. Cl.² F02M 17/22

U.S. Cl. 123-134

7 Claims

1. In combination: an internal combustion engine having an intake manifold, an air induction pipe, a venturi throat disposed within said air induction pipe, a fuel reservoir, a fuel nozzle means connecting said fuel reservoir and said fuel nozzle means including an emulsifying well disposed intermediate said fuel reservoir and said fuel nozzle means, said fuel nozzle means disposed in said venturi throat for introducing fuel into a stream of air flowing through said air induction pipe, said emulsifying well including a passage means for directing air into the fuel whereby the fuel delivered to said venturi throat is mixed with air, means in communication with the interior of said intake manifold for sensing the pressure therein; and valve means connected intermediate said air induction pipe,

upstream of said fuel nozzle means, and said emulsifying well, said valve means being connected to and responsive to said manifold pressure sensing means to regulate air flow through an outlet to said emulsifying well to decrease the amount of air introduced into said fuel upon a predetermined increase in the pressure in said intake manifold and to increase the amount of air introduced



into said fuel upon a predetermined decrease in the pressure in said intake manifold whereby a predetermined optimum air/fuel mixture is provided for said internal combustion engine over a wide range of engine speeds and loads said valve means comprising a tubular member having apertures therein connecting the interior thereof in the area adjacent said manifold pressure sensing means to said outlet.

4,007,722

FUEL INJECTION SYSTEM

Heinrich Knapp, Leonberg-Silberberg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

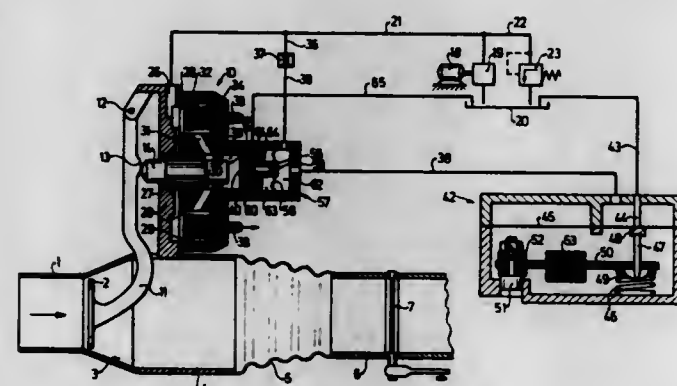
Filed Sept. 10, 1975, Ser. No. 611,846

Claims priority, application Germany, Sept. 18, 1974, 2444598

Int. Cl.² F02M 69/00

U.S. Cl. 123-139 AW

5 Claims



1. In a fuel injection system for externally ignited internal combustion engines including:

- a suction tube for air intake to the engine;
- an air sensor disposed in said suction tube;
- an arbitrarily operable throttle valve disposed in said suction tube in series with said air sensor;
- a fuel supply conduit;
- a control pressure conduit;
- a fuel metering valve connected to said fuel supply conduit and said control pressure conduit for continuously injecting fuel into said suction tube, said fuel metering valve having a pressure chamber defined therein;
- a control plunger, serving as the movable member of said fuel metering valve, said control plunger being acted upon on one end by said air sensor, and on an opposite end, which extends into said pressure chamber, by a return force provided by liquid under constant but arbitrarily variable pressure delivered by said control pres-

sure conduit, for metering a fuel quantity that is proportionate to the quantity of air flowing through the suction tube and measured by said air sensor; and

- a pressure control valve connected to the control pressure conduit for varying the pressure in said control pressure conduit in dependence on at least one operating parameter of the engine, said pressure control valve having a temperature-dependent control element disposed therein, the improvement comprising:
 - a relief valve connected to the control pressure conduit and the pressure chamber, said relief valve having a housing connected to the fuel metering valve, in the wall of which there is defined a relief conduit between the control pressure conduit and the pressure chamber, which is effective when a sudden acceleration occurs during the warm-up phase of the engine operation to reduce the pressure in the pressure chamber for a short period of time, and wherein in the course of the above pressure reduction the pressure control valve causes the pressure in the control pressure conduit to be reduced; and
 - means forming part of said relief valve and defining a damping throttle mounted in said housing, said damping throttle being disposed between the control pressure conduit and the pressure chamber so that said relief valve is controllable in dependence on the pressure drop at said damping throttle.

4,007,723

ENGINE FRONT DISTRIBUTOR DRIVE SYSTEM

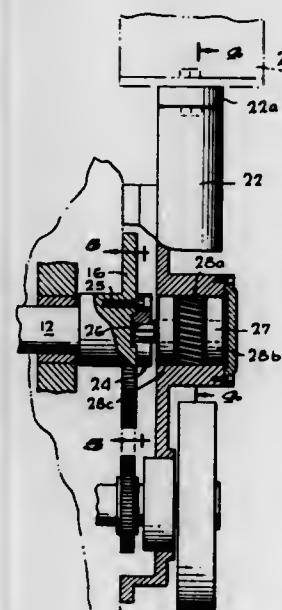
Kenneth Laughton, 15661 Rosales, Sylmar, Calif. 91342

Filed Nov. 5, 1975, Ser. No. 629,114

Int. Cl.² F02P 7/02

U.S. Cl. 123-148 R

2 Claims



1. A system for driving the distributor of an engine from the front thereof, comprising:

- a drive disc adapted to be concentrically affixed to the front face of the timing gear of said engine, said drive disc having a central, geometrically shaped bore therein,
- a cover adapted to be attached to the front of said engine, said cover having an integral mounting platform for said distributor, together with a cylindrical bore extending to said platform,
- a drive rod for said distributor journaled within said mounting platform bore,
- a gear set mounted within said cover and including one gear member affixed to said drive rod and a cooperating gear mounted for coaxial alignment with said timing gear and drive disc, and
- an adaptor shaft coaxially attached to said cooperating gear, said shaft having a correspondingly geometrically shaped projection adapted for mating insertion into said drive

disc bore so that rotation of said timing gear and drive disc will rotationally drive said distributor via said adaptor shaft, said gear set and said distributor drive rod, said shaped projection being axially unattached to said drive disc so as to permit relative axial movement therebetween, whereby said timing disc and distributor will be driven in synchronism regardless of axial displacement or twisting of the engine cam shaft to which said timing gear is attached.

4,007,724

C. D. IGNITION SYSTEM WITH NOISE REJECTION MEANS

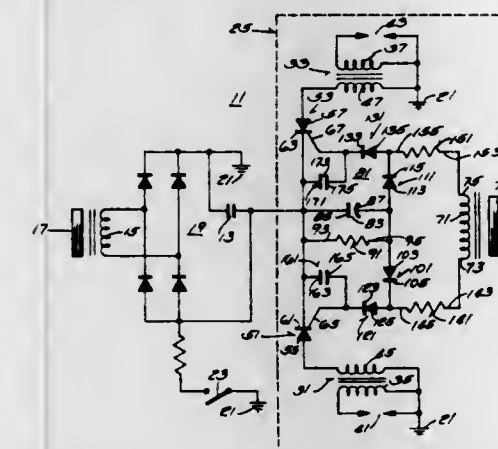
Richard J. Mura, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 21, 1975, Ser. No. 634,072

Int. Cl.² F02P 1/00

U.S. Cl. 123-148 CC

6 Claims



1. An engine ignition system comprising a charge capacitor, means for periodically charging said capacitor, first and second ignition coils respectively including first and second primary windings and first and second secondary windings connected respectively to first and second spark plugs, first and second electronic switches respectively including first and second anodes connected respectively to said first and second primary windings, first and second cathodes connected to said charge capacitor, and first and second control elements operable, upon application thereto of a trigger pulse, to cause said first and second switches to be conductive, means including a relatively rotatable magnet and coil for generating trigger pulses in response to engine rotation, said coil having first and second ends respectively connected to said first and second control elements, and means for preventing false triggering of said switches comprising a second capacitor having a first plate connected to said first and second cathodes and having a second plate, a resistor having a first end connected to said first and second cathodes in parallel with the connection of the first plate of said second capacitor to said first and second cathodes, said resistor having a second end, a first diode having an anode connected to said second plate of said second capacitor and to said second end of said resistor and a cathode connected to and between said first end of said coil and said first control element, and a second diode having an anode connected to said second plate of said second capacitor and to said second end of said resistor, and a cathode connected to and between said second end of said coil and said second control element.

4,007,725

ROTARY VALVING UNIT FOR AN INTERNAL COMBUSTION ENGINE

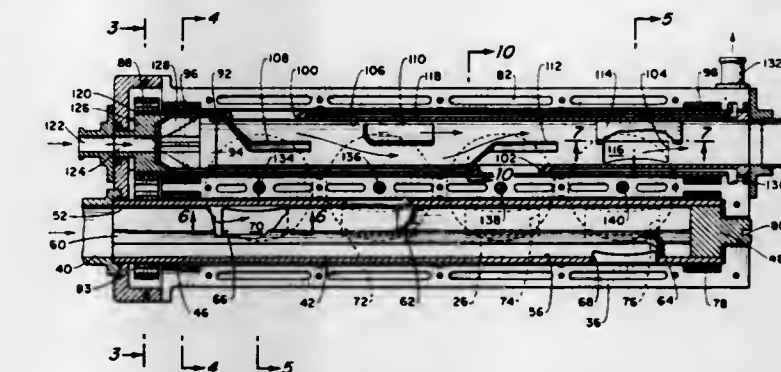
Robert R. Weaver, 1407 Manitou Drive, Santa Barbara, Calif. 93105

Filed Mar. 5, 1975, Ser. No. 555,543

Int. Cl.² F01L 7/00

U.S. Cl. 123-190 A

7 Claims



1. In combination with an internal combustion engine, said engine including an engine block, said engine having a plurality of separate spaced apart chambers located within said block, an inlet port and a separate exhaust port formed within said engine block for each said combustion chamber, a piston movably mounted within each said combustion chamber, gases being adapted to ignite and expand within each said combustion chamber causing said piston to be forcibly moved, the improvement comprising:

a valving unit for supplying an ignitable gas mixture through said inlet port and for removing burned gases out through said exhaust port, said valving unit being mounted within a housing, said housing attached to said engine block, an inlet valve rotatably mounted within said housing, an exhaust valve rotatably mounted within said housing, both said inlet valve and said exhaust valve being cylindrical in configuration, said inlet valve having an interior inlet chamber being divided into a plurality of separate chambers with each said separate chamber connecting with a said combustion chamber inlet port through an inlet opening, each said separate chamber terminating just after its respective said inlet opening, said exhaust valve having a single interior exhaust chamber connecting with all said combustion chambers, said exhaust valve having a plurality of exhaust openings with each said exhaust opening connecting with a said exhaust port, both said inlet port and said exhaust port being non-circular in configuration and assuming an irregular shape resembling generally a rectangle to achieve even flow therethrough; drive means interconnecting said exhaust valve and said inlet valve to rotate such in the same direction at the same rotational velocity, said drive means operates in conjunction with the speed of said engine so that the gases are supplied through said inlet ports at the appropriate instance and the exhaust gases are discharged at the appropriate instance through said exhaust ports.

4,007,726

FORCED AIR ASSEMBLY FOR SPACE HEATER

Thomas F. Kenchel, Huntsville, Ala., assignor to Martin Industries, Inc., Huntsville, Ala.

Filed Feb. 11, 1976, Ser. No. 657,069

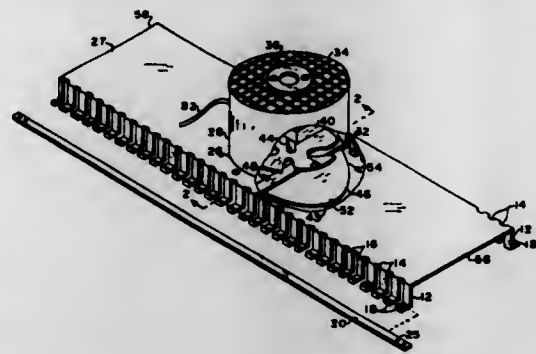
Int. Cl.² F24H 3/06

U.S. Cl. 126-67

6 Claims

1. A forced air assembly for a space heater comprising: an elongated channel having open ends, a top region, and spaced serrated side regions, whereby said channel may be selectively deformed to conform, and be attached to, the curved side wall of a space heater; a cylindrical housing, open at both ends, attached to and extending outwardly normal to said top region of said channel, and forming with an opening in said top region an air passageway through said channel;

a fan mounted in said housing and oriented to blow air into said channel, which air then passes through said channel



and out the ends of the channel when mounted on a said space heater; and means for attaching said channel to a said space heater.

4,007,727

OVEN DOOR WINDOWS

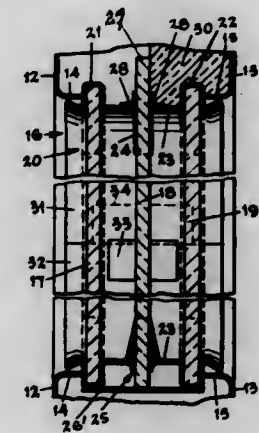
Jacob Krebs, St. Clair Shores, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Aug. 6, 1975, Ser. No. 602,241

Int. Cl.² F23M 7/04

U.S. Cl. 126—200

6 Claims



1. An oven door, comprising a body portion having front and back metal door panels provided with a substantially rectangular opening therein, a window unit mounted in said opening including a substantially rectangular frame formed with spaced channel portions connected by an integral spacer portion, said spacer portion at the top and bottom of the frame being provided with aligned slots, three spaced, parallel glass panels, the inner and outer glass panels being fixedly mounted in said channel portions of the frame and the center glass panel being loosely inserted through the aligned slots in said spacer portion, and means for supporting said center glass panel in said slots.

4,007,728

SOLAR COLLECTOR

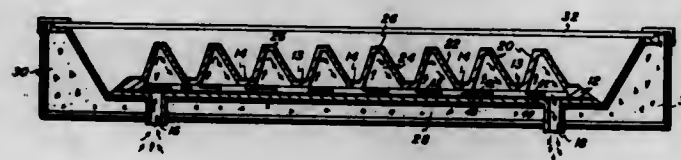
Peter Guba, 786 Malibu Lane, Indianantic, Fla. 32903

Filed Jan. 6, 1975, Ser. No. 538,912

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

11 Claims



1. Apparatus for collecting heat of radiation comprising: a hollow member having a panel with a substantially flat exterior surface, said panel capable of absorbing radiation incident to said surface and transferring heat from said radiation to a fluid passing through said member; a reflector body extending from said surface, said body having an exterior surface for reflecting radiation incident thereto towards said flat surface of said panel; said reflector body having a hollow interior immediately above the interior of said hollow member; and means directing said fluid into the reflector body wherein said fluid circulating through said hollow member likewise circulates through the interior of said reflector body.

tion incident to said surface and transferring heat from said radiation to a fluid passing through said member; a reflector body extending from said surface, said body having an exterior surface for reflecting radiation incident thereto towards said flat surface of said panel; said reflector body having a hollow interior immediately above the interior of said hollow member; and means directing said fluid into the reflector body wherein said fluid circulating through said hollow member likewise circulates through the interior of said reflector body.

4,007,729

MEANS OF INCREASING EFFICIENCY OF CPC SOLAR ENERGY COLLECTOR

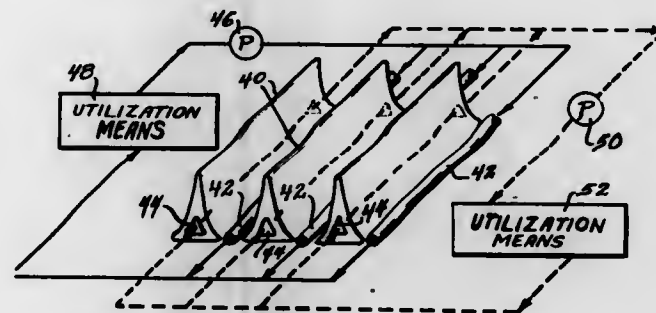
Bei Tse Chao, Urbana, and Ari Rabl, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 27, 1975, Ser. No. 590,980

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

7 Claims



1. In a first cylindrical radiant energy collector having a primary energy absorber and a reflective wall extending parallel to a reference axis for directing incident radiation onto said absorber, the wall having a reflective side and a non-reflective side substantially opposed to the reflective side, a device for reducing the energy loss from the wall, comprising:

a channel aligned parallel to the reference axis and positioned on the same side of the wall as the nonreflective side of the wall, said channel containing a heat transfer fluid, pump means coupled to said channel for circulating said fluid through said channel, said channel being such distance from the wall that a portion of the energy incident on and absorbed by the wall is transferred to said fluid, said absorber absorbing energy directed thereto by said wall, said absorber includes a pipe coupled to said pump means, said pump means circulating said fluid through said channel and said pipe, said pipe being so positioned that a portion of the energy directed thereto by said wall is transferred to said fluid in said pipe, said utilization means being coupled to said pipe and thereby utilizing the heat transferred to said fluid in said channel and said pipe heat transferred to said fluid and absorbed by said absorber.

4,007,730

FIREPLACE DAMPER

Fredrick Heebink, 1370 Eighth Ave., Baldwin, Wis. 54002

Filed May 30, 1975, Ser. No. 582,381

Int. Cl.² F23L 11/00

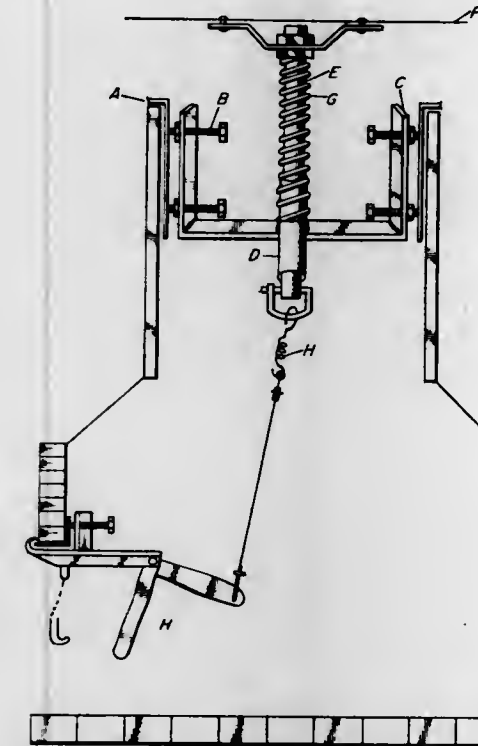
U.S. Cl. 126—286

3 Claims

1. A chimney top damper assembly including:

- A. a damper plate adopted to cover the top of a chimney flue,
- B. a supporting rod attached to the center of said plate normal to the plane thereof,
- C. said rod being slidably attached to a holding bracket, said bracket being adapted to engage the sides of said chimney flue,
- D. spring means engaging said bracket on one end and said

plate on the opposite end positioned to urge said plate upwardly,
E. spring means attached to the lower end of said rod, said spring providing stronger resistance to extensive force than said first spring,
F. cable means attached to said spring and adapted to extend downwardly to the bottom of said chimney,



G. means for attaching the lower end of said cable to a fireplace,
H. said later attaching means being provided with pivotable means for extending said cable to close said damper plate and releasing said cable to open said damper plate.

4,007,731

MEANS AND TECHNIQUES FOR ESTABLISHING HEARING DEFICIENCIES

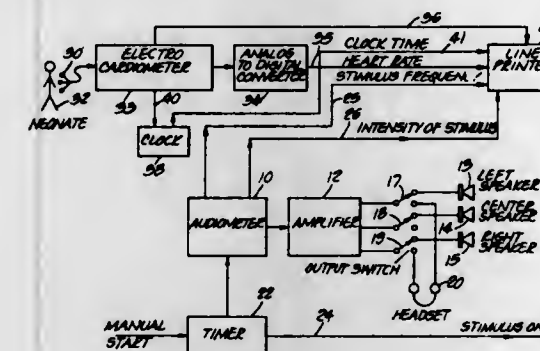
Ciwa Griffiths, c/o Hear Center, 301 E. Del Mar Blvd., Pasadena, Calif. 91101, and Dean O. Thompson, c/o Two:Dot Enterprises, 4438 Hendrickson Road, Ojai, Calif. 93023

Filed Aug. 14, 1975, Ser. No. 604,898

Int. Cl.² A61B 5/12

U.S. Cl. 128—2 Z

8 Claims



1. In a system for determining hearing capability, means producing a sound stimulus for a subject whose hearing capability is being established; said means being located in sound range of said subject with such sound stimulus being applied to said subject having the capability of producing changes in activity of the heart of said subject; means attached to said subject when said sound stimulus is being so applied to said subject and producing a first signal representative of the heart beat rate of said subject; means producing a second signal representative of the heart beat of said subject; clock means developing a third signal representative of elapsed time; recording means; means applying said first signal, and said third signal to said recording means for producing a recording

representative of said heart beat rate and elapsed time and means applying said second signal to said clock means to initiate said third signal.

4,007,732

METHOD FOR LOCATION AND REMOVAL OF SOFT TISSUE IN HUMAN BIOPSY OPERATIONS

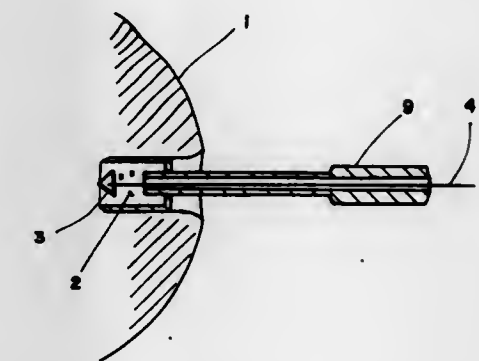
Robert Carl Kvavle, Rte. 2 Box 157A, Hillsboro, Oreg. 97123, and William Chester Awe, 15035 NW. Perimeter Drive, Beaverton, Oreg. 97005

Filed Sept. 2, 1975, Ser. No. 609,296

Int. Cl.² A61B 10/00

U.S. Cl. 128—2 B

2 Claims



1. A method of location and removal of a biopsy specimen comprising: locating evidence of early cancer by radiography techniques, positioning and implanting an x-ray opaque target in the suspect area as the patient is subject to x-ray examination, extending a locating means from said target outwardly to and through the skin surface, mounting and guiding a cutting means on said locating means, rotating said cutting means to cut a biopsy specimen, and cutting and detaching the bottom of said specimen with a knife.

4,007,733

POSTURE TRAINING DEVICE

Victor Celeste; David Charles Drum, and Brian Joseph Nelson, all of Toronto, Canada, assignors to Vaxar Ltd., Toronto, Canada

Filed Feb. 23, 1976, Ser. No. 659,989

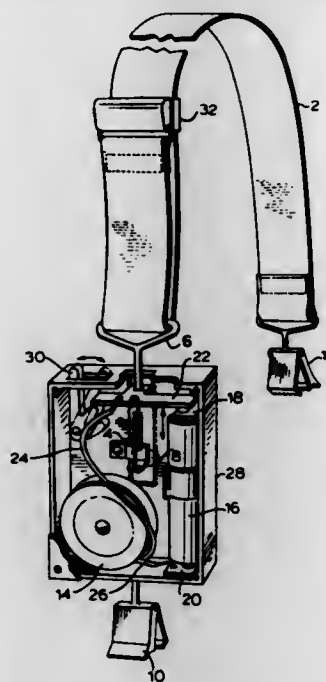
Int. Cl.² A61B 5/00

U.S. Cl. 128—2 S

10 Claims

1. A posture training device comprising a shoulder strap whose length is adjustable and resiliently extensible, means at each end of the shoulder strap for releasably connecting it to substantially diagonally opposite points on a waistband of

clothing of a user, a device providing a warning signal sensible by the user, and means connected into the strap and to said



signalling device to disable the latter in response to maintenance of a predetermined minimum tension in the strap.

4,007,734

BLOOD PRESSURE INDICATOR

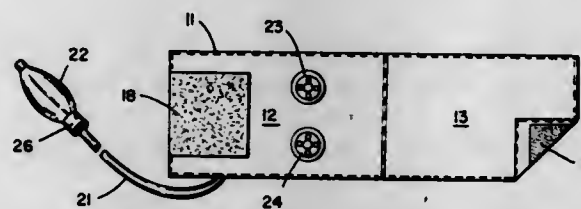
Rudolph W. Peters, 5786 Balmoral Drive, Oakland, Calif. 94619

Filed June 2, 1975, Ser. No. 582,637

Int. Cl.² A61B 5/02

U.S. Cl. 128-2.05 G

9 Claims



1. A device for indicating blood pressure, comprising a cuff adapted to be secured about a limb, said cuff including an inflatable bladder, means for inflating and deflating said bladder, and at least one pressure sensing switch secured to said cuff; said pressure sensing switch including plunger means resiliently biased to impinge on said bladder, and sound emitting means actuated by said plunger means for signalling a predetermined pressure exerted by said bladder on said plunger means and the limb.

4,007,735

CERVICAL DILATION VIBRATOR

Bengt Uno Gunnar Magnusson, Enkoping, Sweden, assignor to Svedia Dental-Industri AB, Sweden

Filed Aug. 29, 1975, Ser. No. 609,086

Claims priority, application Sweden, Aug. 29, 1974, 7410967

Int. Cl.² A61H 1/00

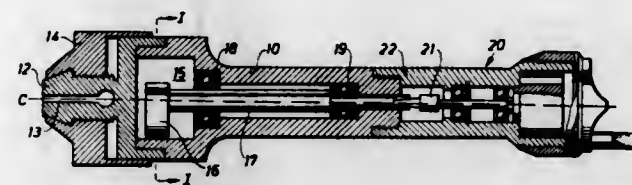
U.S. Cl. 128-37

6 Claims

1. A vibrator for internal use on a human body, especially for dilation of cervical musculature, comprising:

- a substantially bar-shaped holder having a handle portion for manual holding and guiding of the vibrator;
- a vibratable solid probe of elongated configuration to extend into the body to be applicable to said musculature and extending in the longitudinal direction of said holder;
- coupling means rigidly detachably interconnecting one end of said holder and said solid probe;

- an eccentric vibrator body rotatable about the longitudinal axis of and situated within said holder axially between said handle portion and said coupling means in the immediate vicinity of said coupling means;
- a motor disposed in the opposite end of said holder and rotatably coupled to said eccentric body; and



- the vibrator having a center of gravity lying closer to the motor end of said holder than to said one end of said holder;

whereby the rigid system formed by said holder and said probe is given an oscillatory movement about the longitudinal axis of said holder with its minimum oscillating peak situated in the region of said handle portion.

4,007,736

FLUIDIC CONTROLLED VENTILATOR

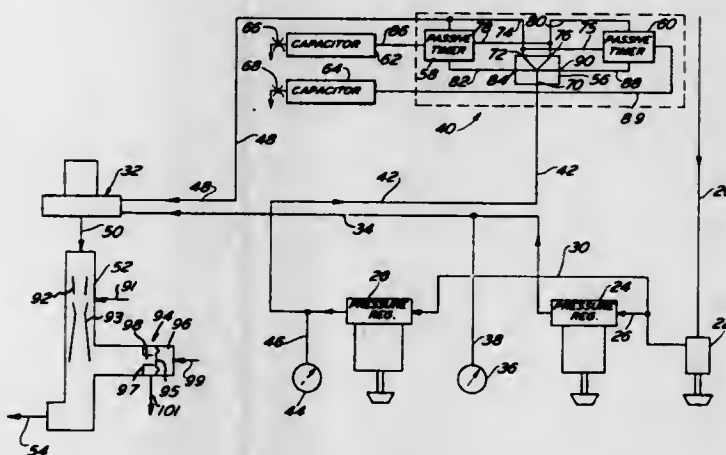
Peter J. Schreiber, Zionsville, Pa., assignor to N.A.D., Inc., Telford, Pa.

Filed Mar. 12, 1975, Ser. No. 557,745

Int. Cl.² A61M 16/00

U.S. Cl. 128-145.8

12 Claims



1. A power unit for a ventilator having a fluid operated timing control, said timing control having input means connected to a fluid source via means for varying the input pressure of said fluid to said timing control, and display means including graduations calibrated to read respiratory frequency which is responsive to said input pressure, said timing control being changeable in state for controlling the period of inspiratory time and expiratory time, said timing control including means responsive to said input pressure for controlling the frequency of the change of state of said timing control in accordance with said input pressure so that respiratory frequency can be controlled and monitored by varying said input pressure and viewing said display means.

4,007,737

ANESTHESIA BREATHING SYSTEM

Bernard R. Paluch, 1607 E. Cedar Lane, Mount Prospect, Ill. 60056

Continuation of Ser. No. 437,033, Jan. 28, 1974, abandoned.

This application Apr. 7, 1975, Ser. No. 565,536

Int. Cl.² A61M 17/00

U.S. Cl. 128-188

10 Claims

1. An anesthesia breathing system utilized in connection with systems for the administration of inhalation anesthetic agents, including a source of gas for inhalation positioned at one end of the system and patient-supported inhalation-exha-

lation means at the opposed end of the system, the improvement comprising in combination,

a concentrically oriented double tubular inhalation-exhalation tube extending from one end of said system to the opposed end of said system and having one of said tubes positioned interiorly of the other of said tubes, one of said tubes carrying inhaled gas and the other of said tubes carrying exhaled gas,

spacer means for supporting and maintaining said concentrically oriented tubes and spaced in relatively spacial relation,

first unidirectional valve means mounted within said inhalation gas tube extending across the diametric dimension of said one of said tubes providing flow only in the direction from said one end of said system to said opposed end of said system and positioned adjacent the patient-supported inhalation-exhalation means for providing unidirectional gas flow therethrough,

and second unidirectional valve means mounted within said exhalation gas tube and extending across the diametric dimension of the annular fluidic path between said concentric tubes for providing flow only in the direction from said opposed end of said system to said one end of said



system and positioned adjacent the patient-supported inhalation-exhalation means for providing unidirectional gas flow therethrough,

said first and second unidirectional valve means each comprising a valve seat and a flexible membrane seatable against said valve seat, said membrane allowing fluid to flow by flexure and movement of the membrane in one direction of applied fluidized pressure, and seatable against said valve seat thus not allowing flow when fluidized pressure is applied in the opposed direction,

at least said inhalation line being formed of a flexible material rapidly permeable to heat transfer and the gas flow in said exhalation gas tube being countercurrent with respect to the gas flow in said inhalation gas tube, thereby to stabilize and maintain the temperature of the gas within said gas inhalation tube, without any extraneous source of heat, whereby gas suitable for patient inhalation enters said system through said inhalation tube and through said first unidirectional valve means to the patient while exhaled gas flows through said second unidirectional valve means in countercurrent relation with respect to the gas along said gas inhalation tube for exhaustion and/or purification from said system.

4,007,738

MECHANISM FOR ALLOWING BLOOD BAGS TO COMMUNICATE WITH EACH OTHER

Motohiro Yoshino, Fujinomiya, Japan, assignor to Terumo Corporation, Tokyo, Japan

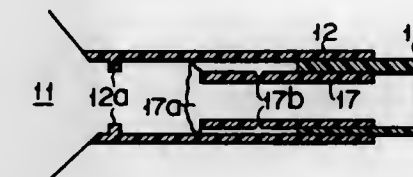
Filed July 1, 1975, Ser. No. 592,171

Claims priority, application Japan, July 31, 1974, 49-91544

Int. Cl.² A61M 5/14

U.S. Cl. 128-214 D

5 Claims



1. A mechanism for allowing blood bags to communicate with each other, comprising:

- a flexible connection pipe having first and second ends, said first end being connected to and communicated with a first blood bag;
- a connection tube having a first end connected to and communicated with a second blood bag and a second end which is inserted into, and secured to, the second end of said connection pipe;
- a communication pipe of hard plastic material having an open end portion and a sealed end portion, said communication pipe being positioned within said connection pipe; and
- a small thickness section formed in the communication pipe between the sealed end portion and the open end portion, whereby the communication between the first and second blood bags is rendered effective by breaking apart the communication pipe at the small thickness section.

4,007,739

FLUID-OPERATED HYPODERMIC SYRINGE

Dan Bron, 36 Palmah St. Romema, Haifa, and Amatzia Arazi,

Doar Nah, Medigo, both of Israel

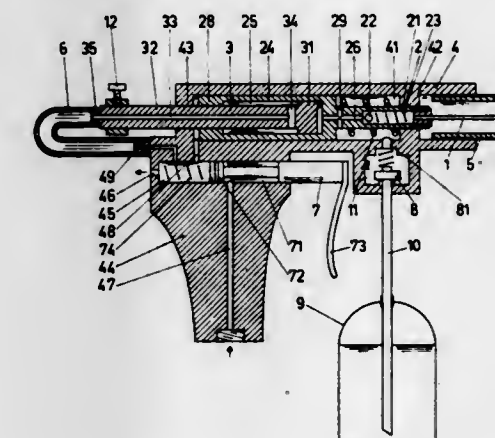
Filed July 18, 1975, Ser. No. 596,975

Claims priority, application Israel, Aug. 2, 1974, 45391

Int. Cl.² A61M 5/00

U.S. Cl. 128-218 R

7 Claims



1. A hypodermic syringe for operation by a fluid under pressure which comprises (a) an outer casing having a longitudinal cylindrical hollow space provided with a first port at its "front" or "needle" end for drawing a medicament from a container through a duct and a check-valve, and a second port at its rear end for admitting or releasing pressurized fluid, (b) a front differential piston unit, the large-diameter, rear portion of which is slidably arranged in the hollow space of the casing, while the small-diameter, front portion protrudes out of the casing through an opening in its front cover and carries an injection needle in its foremost part, the large-diameter portion being furthermore hollow in the shape of a cylinder which

is firstly connected to the needle by a duct containing a check valve, and secondly by at least one opening to a front annular space formed between the casing and the small-diameter portion, (c) pressure means adapted to bias the front differential piston unit to the rear of the casing, (d) a rear differential piston unit having its front portion of larger diameter slidably arranged in the medicament cylinder of the front differential piston unit, while its rear, longitudinal portion of a smaller diameter penetrates through the rear cover of the medicament cylinder and through the rear of the casing into the open, the latter portion being longitudinally perforated by a fluid duct which at its front end is provided with at least one opening connecting it to the rear annular space formed between the wall of the medicament cylinder and the rear portion of the rear differential piston, (e) manually operated valve means adapted to primarily admit fluid under pressure to the front differential piston unit so as to drive the needle forward and to transfer medicament from the front annular space to the medicament cylinder through the openings provided between these spaces and, upon further actuation of the valve, to admit pressurized fluid to the rear annular space so as to drive the rear differential piston unit in forward direction and to eject the medicament through the needle.

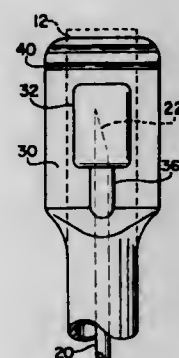
4,007,740 CANNULA COVER

Robert A. Owen, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 11, 1976, Ser. No. 657,000
Int. Cl.² A61M 5/00

U.S. Cl. 128—221

17 Claims



1. A cover for an elongated cannula having a sharpened distal end, said cover including an elongated tubular member concentrically disposed around a substantial portion of the length of said cannula with one end of said cover engaging said cannula in encircling arrangement intermediate its length, the second end of said cover extending beyond the sharpened distal end of said cannula and providing a sealed chamber, the walls of said chamber being formed by one or more bubble-like pockets in said cover spaced from the sharpened distal end of said cannula and said one or more pockets being completely sealed around the periphery of said chamber with one wall, intermediate the extremities of said cover, intimately engaging and conforming to said cannula at a point adjacent to but spaced from said sharpened tip.

**4,007,741
TRANSURETHRAL RESECTION APRON SYSTEM**
Rayburn C. Waldrop, Rte. 3, Box 280, Manor Road, Clinton, Tenn. 37716, and Richard G. Brantley, Sparks Road, Knoxville, Tenn. 37921

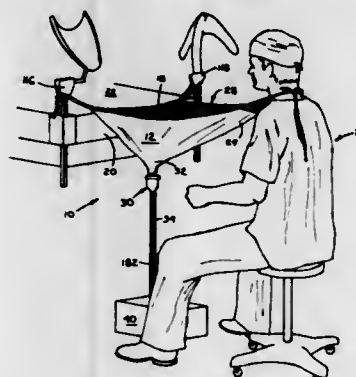
Filed Apr. 11, 1975, Ser. No. 567,428
Int. Cl.² A61F 13/16

U.S. Cl. 128—292

4 Claims

1. Apparatus for capturing fluids and resected material purged from the bladder of a patient on a urological table during a transurethral resection performed by a surgeon and for separating resected particles entrained in said fluids comprising

flexible apron means defining a fluid capture region adjacent one end of said urological table, said apron means including a forward end and a rear end, connecting means adapted for releasably connecting said forward end of said apron to one end of said urological table adjacent to said patient, connecting means adapted for positively and releasably connecting said rear end of said apron to the neck region of said surgeon, said apron means being unsupported by external means in the region between its forward end and its rear end and comprising a plurality of flexible pentagonal panels, each of which includes a top edge, a front edge joined to one end of said top edge and forming an obtuse angle therewith, a rear edge joined to the other end of said top edge



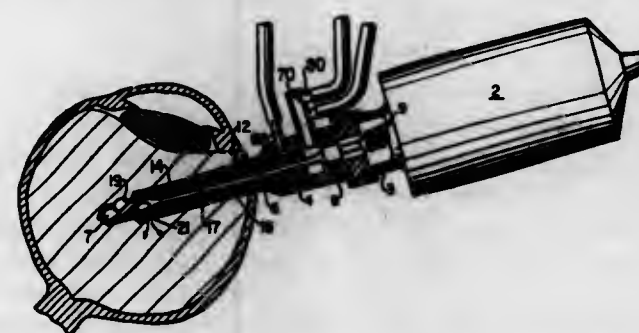
and forming an obtuse angle therewith, a bottom forward side, and a bottom rear side, said bottom forward and said bottom rear sides being joined to respective ones of said front and bottom rear edges except at the junction of said edges whereby when said apron is pulled taut by reason of a force applied to its opposite ends, said apron opens to form an upwardly opening capture region, receptacle means releasably connected with said apron means and in fluid communication therewith, strainer means removably held in said receptacle means for collecting said resected material entrained in said fluid passing to said receptacle means, and hose means in fluid communication with said receptacle means for conducting fluids from said receptacle to a remote depository.

**4,007,742
SURGICAL SYSTEM FOR CONTROLLING THE INFUSION OF FLUID TO AND THE EVACUATION OF FLUID AND MATERIAL FROM AN OPERATING FIELD**
Anton Banko, Bronx, N.Y., assignor to Surgical Design Corporation, Long Island City, N.Y.
Continuation-in-part of Ser. No. 475,398, June 3, 1974, Pat. No. 3,920,014. This application Nov. 17, 1975, Ser. No. 632,767

Int. Cl.² A61M 1/00

U.S. Cl. 128—230

8 Claims



1. In combination, a system for use with a surgical instrument of the type having an operative portion at an operating site with the operative portion including a first means for

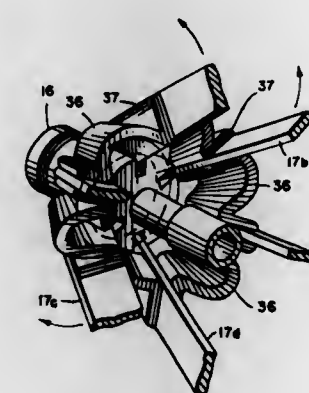
delivering an infusion fluid to the operating site and a second means for removing material from the operating site, a source of infusion fluid, means for supplying infusion fluid from said source to said first means of said instrument, means producing a pressure differential condition at said second means of the instrument with respect to the pressure of the infusion fluid at said first means to provide removal of material from the operating site, means including first control means for selectively providing infusion fluid to said second means of said instrument, and means for selectively operating said pressure differential producing means and said first control means in first and second conditions wherein in the first condition material is removed by said second means of the instrument and infusion fluid is blocked from said second means by said first control means, and in a second condition wherein said removal of material by said second means is blocked and operates said first control means to supply infusion fluid to said second means of the instrument at the same time said first means is receiving infusion fluid.

**4,007,743
OPENING MECHANISM FOR UMBRELLA-LIKE INTRAVASCULAR SHUNT DEFECT CLOSURE DEVICE**
Larry W. Blake, Costa Mesa, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 20, 1975, Ser. No. 623,788
Int. Cl.² A61B 17/04

U.S. Cl. 128—334 R

14 Claims



1. In an umbrella-like expansive device for closing intravascular shunt defects and the like, said device having a central hub, a plurality of struts movably mounted on the hub and movable between a first, collapsed position in which the struts extend generally parallel to the axis of the hub and a second, expanded position in which the struts extend generally radially from the hub, and closure material extending between the struts and secured thereto, an improved expansion means for moving the struts from the first position to the second position comprising a foldable, resilient strip extending between each pair of adjacent struts and secured thereto, each strip being folded between the struts when the struts are in the first position, whereby the folded resilient strips bias the struts from the first position toward the second position.

**4,007,744
GRAIN ACCELERATOR PRECLEANER**
J. Lyle Shaver, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

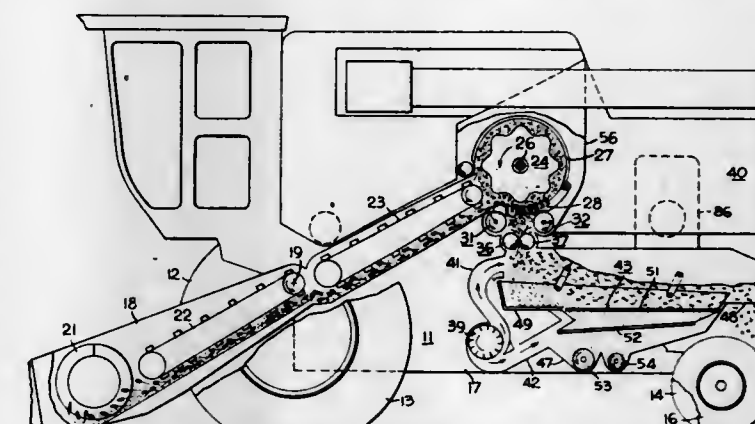
Filed July 2, 1975, Ser. No. 592,713
Int. Cl.² A01F 12/24

U.S. Cl. 130—27 Q

9 Claims

1. In a grain harvester having a threshing cylinder, and a concave on the underside of said cylinder, the combination comprising:
a shaker shoe assembly including a grain pan at its forward end disposed beneath said concave,

a pair of side by side accelerator rolls disposed above said grain pan and in underlying relation to said concave, said accelerator rolls being disposed on horizontally spaced parallel axes and receiving therebetween threshed material from said concave, power means driving said accelerator rolls in opposite directions whereby threshed material passing between said



rolls is accelerated downwardly toward said grain pan, and air delivery means directing a predetermined horizontal rearward flow of air through and transverse to the accelerated threshed material passing from said accelerator rolls to blow the chaff and straw particles rearwardly from the kernels of grain which pass downwardly to the grain pan.

4,007,745 FILTER

John Courtright Randall, and Charles Herbert Keith, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 127,386, March 23, 1971, abandoned. This application Mar. 12, 1974, Ser. No. 450,530
Int. Cl.² A24D 1/06

U.S. Cl. 131—261 R

2 Claims



1. A cigarette filter comprising a gathered web of substantially longitudinally aligned continuous, crimped, opened cellulose acetate filaments, said web having a series of longitudinally extending substantially rectangular grooves along the surface thereof said grooves forming a multitude of triangular shaped channels for smoke.

4,007,746

METHOD FOR PREPARING CELLULOSE ACETATE FIBER RODS

Hideo Sawada, Osaka, and Motoharu Kotani, Sakai, both of Japan, assignors to Daicel, Ltd., Osaka, Japan
Filed June 2, 1975, Ser. No. 582,635

Claims priority, application Japan, June 21, 1974, 49-71062
Int. Cl.² A24C 5/50

U.S. Cl. 131-267

9 Claims

6. A tobacco smoke filter comprising a bundle of from 3,000 to 100,000 substantially longitudinally extending cellulose acetate fibers each having a filament denier of 1 to 16, said fibers being substantially uniformly coated with from 1 to 20 percent by weight, based on the weight of said fibers, of a plasticizer comprising 1,4-butanediol diacetate.

4,007,747

N-MONOSUBSTITUTED INDOANILINES AS DYESTUFFS FOR KERATINIC FIBERS

Grégoire Kalopissis, Neuilly-sur-Seine; Andrée Bugaut, Boulogne-sur-Seine, and Françoise Estradier, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Dec. 9, 1974, Ser. No. 530,975

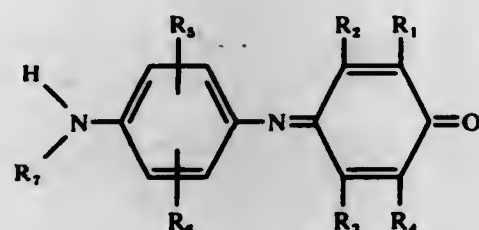
Claims priority, application Luxembourg, Dec. 12, 1973, 68988

Int. Cl.² A61K 7/13; A45D 7/02

U.S. Cl. 132-7

16 Claims

1. A composition for dyeing keratin fibers which comprises a dyeing effective amount of an indoaniline compound of the formula



or a tautomeric form thereof wherein R₁ and R₄ each independently represent a member selected from the group consisting of hydrogen, halogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, acetylamino and ureido,

R₂ and R₃ each independently represent a member selected from the group consisting of hydrogen, halogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, amino, N-alkylamino, N-(hydroxyalkyl)-amino, N-(carbonylalkyl)-amino, acetylamino and ureido, each of said alkyl moieties containing 1 to 6 carbon atoms,

R₅ and R₆ each independently represent a member selected from the group consisting of hydrogen, halogen, alkyl having 1 to 6 carbon atoms and alkoxy having 1 to 6 carbon atoms with the proviso that when R₅ and R₆ are both other than hydrogen at least one is in a meta-position relative to the NHR₉; and

R₇ represents a member selected from the group consisting of alkyl, hydroxyalkyl, acetylaminoalkyl, mesylaminoalkyl, carbamylalkyl, aminoalkyl and morpholinoalkyl, each of said alkyl moieties containing 1 to 6 carbon atoms and a compatible vehicle.

4,007,748

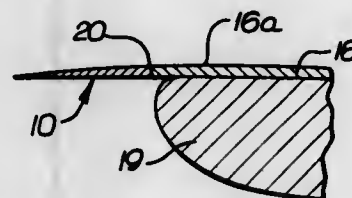
FINGERNAIL EXTENSION

Eve Matranga, West Los Angeles, and Yosh Hokama, Torrance, both of Calif., assignors to Eve-N-Tips Industries, Gardena, Calif.

Continuation of Ser. No. 557,765, March 12, 1975, abandoned. This application Feb. 13, 1976, Ser. No. 657,767
Int. Cl.² A45D 29/00

U.S. Cl. 132-73

1 Claim



1. In combination with a natural fingernail, a solid artificial fingernail attached to said natural fingernail having a forward-most generally convex peripheral edge, said artificial fingernail comprising

- a thin plastic sheet element sized to provide a forward extension of the natural fingernail,
- said element having a generally concave rearward-most peripheral edge peripherally abutting in edge-to-edge relation the major extent of said convex forward-most edge of the natural fingernail and adhesively bonded thereto only at said edges, the element rearward-most edge contacting the fingernail only at said forward-most edge thereof.

4,007,749

AUTOMATIC POOL CLEANER SYSTEM WITH TIMER DEVICE

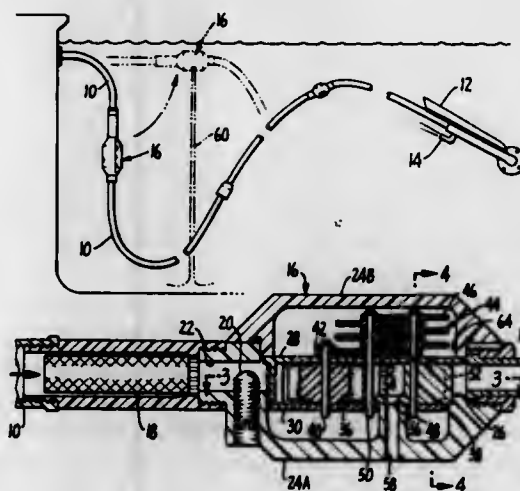
Andrew L. Pansini, 200 Golden Gate Ave., Belvedere, Calif. 94920

Filed Apr. 7, 1975, Ser. No. 565,805

Int. Cl.² B08B 3/02, 9/00

U.S. Cl. 134-56 R

5 Claims



1. In combination with a swimming pool cleaner comprising a transporter, movable about a pool under the influence of jet drive means, and a water supply hose, provided with a pool-side connected end and a free end, having its free end connected to said jet drive means to supply water thereto and to, in turn, be towed thereby: a control device connected to said supply hose operable to control said transporter by controlling the flow of water through said hose to said jet drive means, said device comprising a housing having an inlet and an outlet conduit, first means associated with said housing between said conduits operable to automatically control the flow of water to said jet drive means by alternately shutting off and turning on the flow of water to said jet drive means, and second means associated with said housing between said conduits and driven by water flowing in said housing to operate said first means.

4,007,750

CONTINUOUS SHEET PICKLING APPARATUS

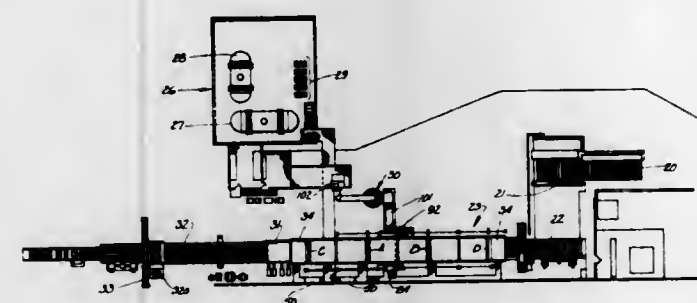
John W. Galloway, South Point, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed July 14, 1975, Ser. No. 595,690

Int. Cl.² B08B 3/04

U.S. Cl. 134-83

16 Claims



1. A continuous sheet pickling line and apparatus therefor which comprises: a pickling tank adapted to contain a bath of pickling acid, said tank being comprised of an acid resisting, steel supported material having expansion characteristics differing from that of the steel; a plurality of horizontally disposed, parallel roll shafts disposed in said tank; a plurality of sheet bearing donuts mounted on each of said shafts; means to drive at least some of said shafts; the said means to drive said shafts including submerged shaft bearings and a gear train located within said tank; a drive shaft extending over said tank to said gear train; power means located outside of said tank and connected to said drive shaft; means to maintain a level of bath acid which is above that of the sheets passing there-through on said donuts; and means to introduce sheets into said tank and onto said donuts.

4,007,751

APPARATUS FOR WASHING VEGETABLES, FRUITS AND THE LIKE FOODSTUFFS

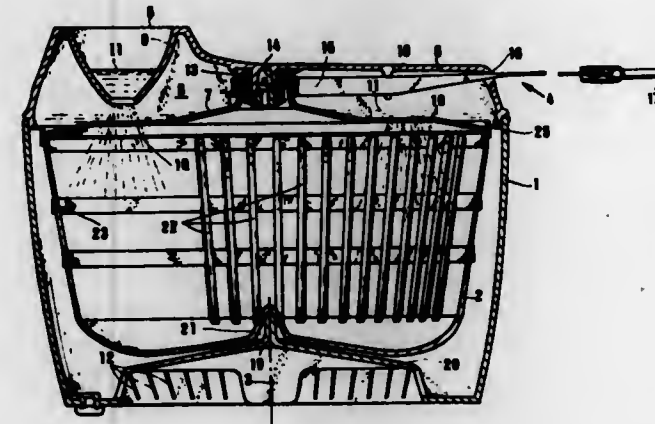
Michel Commiant, Brussels, Belgium, assignor to Compagnie Generale Belge des Isolants (COGEBI), St. Gilles-lez-Brussels, Belgium

Filed Feb. 25, 1976, Ser. No. 661,415

Claims priority, application Belgium, Feb. 25, 1976, 825939
Int. Cl.² B08B 3/02

U.S. Cl. 134-140

7 Claims



1. Apparatus for washing vegetables, fruits and the like foodstuffs, comprising: a vessel having a central vertical axis; a basket, within said vessel, for containing said foodstuffs; means in said vessel and on said basket for mounting said basket in said vessel for rotation about said vertical axis; means driving said basket into rotation in said vessel, and means to distribute and spray water over said foodstuffs as said basket is rotated; said driving means comprising a cover fixed over said vessel; a disc as a removable part of said basket and means mounting said disc on said cover for rotation relative to said cover and about said vertical axis; means remov-

ably fastening said disc to said basket along the respective peripheries thereof and means, operable from outside said vessel, to rotate said disc and basket; wherein an apertured chamber is provided on said cover and at least one hole is formed through said disc and positioned to register with the aperture of said chamber during rotation of said basket whereby water poured into said apertured chamber during rotation of said basket flows through said hole and washes said foodstuffs therein.

4,007,752

TELESCOPIC UMBRELLA

Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Canada

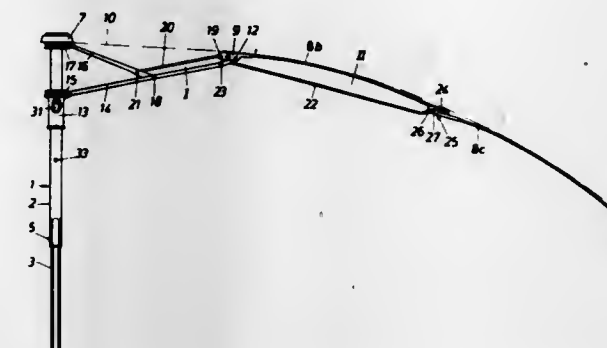
Filed May 8, 1975, Ser. No. 575,748

Claims priority, application Germany, May 8, 1974, 2422209

Int. Cl.² A45B 19/04, 19/10

U.S. Cl. 135-25 R

2 Claims



1. A collapsible umbrella having an umbrella stick, a crown at the end of the stick, a runner slidably mounted on the stick, stretcher members, each pivotally mounted at one end thereof to said runner, dome ribs pivotally connected to each stretcher member at free ends thereof, and each dome rib extending in a direction away from the crown, strut members, each hinged at one end to a support member on the stick at the other ends, each to a respective one stretcher member at a hinge point intermediate the ends of said stretcher member, each dome rib including an inner section and an outer section hinged to the outer end of the inner section, said inner section being spaced from said crown, said stretcher member being connected to the inner section thereof, a first control link member hinged to the strut at a point intermediate the ends of the strut member, said first control link hinged to an extension of the inner section of the dome rib inwardly of the hinge point with the stretcher member forming a parallelogram linkage with the stretcher member, the first control link member, the extension of the inner dome rib section and the portion of the strut member between the stretcher and the first control link; a second control link means hinged at one end to the stretcher member between the ends thereof and at the other end to an extension of the outer dome rib section extending inwardly of the hinge point with the inner dome rib section, whereby as the runner is moved on the stick to open and close the frame, the first and second control link means act in tension and compression respectively to urge the outer section to pivot about said hinge point at the outer end of the inner dome rib section.

4,007,753

FOLDING UMBRELLA

Joseph H. DeMarco, 60 Seaman Ave., New York, N.Y. 10034
Filed Jan. 22, 1976, Ser. No. 651,475

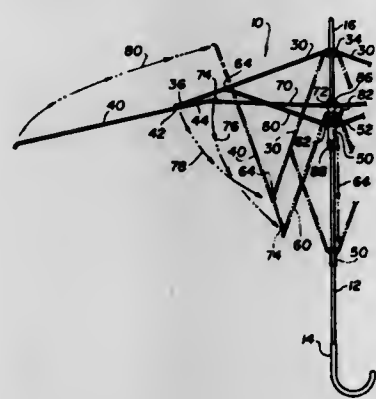
Int. Cl.² A45B 19/10

U.S. Cl. 135-25 R

2 Claims

1. An improved folding umbrella comprising a rod having at opposite ends a handle and an operative distal end and defining a path of movement therealong between said handle and

distal end, a folding and unfolding cover for said umbrella, a first set of plural circumferentially spaced umbrella cover-supporting ribs each operatively pivotally mounted at one end adjacent said distal end of said rod and presenting opposite operative ends, a second set of similarly circumferentially spaced plural umbrella cover-supporting ribs cooperating with said first set by serving as a radial extension thereof which are each at locations spaced from one end to provide a fulcrum pivotally attached to a cooperating operative end of one said rib of said first set, upper and lower slide members disposed on said rod for sliding movement therealong, a first set of plural braces pivotally connected in spanning relation in the plane of said first and second sets of ribs between a cooperating rib of said first set of ribs and said lower slide member so as to partake of pivotal umbrella opening and closing movements in response to ascending and descending sliding movements respectively of said lower slide member, a second set of plural



braces each pivotally connected substantially in said same plane as said first set of braces in spanning relation between said fulcrum end of a cooperating rib of said second set of ribs and said upper slide member so that during initial descending sliding movement of said lower sliding member preparatory to umbrella closing movement of said first and second sets of ribs there is caused a corresponding initial sliding movement in said upper sliding member effective to initiate clockwise pivotal movement in said fulcrum ends of said second set of ribs, each brace from said first set having a criss-crossing relation with a brace from said second set in said open condition of said umbrella, and at each said location where said cooperating braces criss-cross one said brace has a slot formed therein and said other brace has an operative position projected through said slot, whereby in response to continued descending sliding movement of said lower sliding member said first and second sets of ribs close upon each other as well as upon said umbrella rod.

4,007,754

FLOW CONTROL SYSTEM

Maurice Sidney Beck, Ilkley, and Robert Malcolm Henry, Sowerby Bridge, both of England, assignors to National Research Development Corporation, London, England
Filed Apr. 2, 1975, Ser. No. 564,653

Claims priority, application United Kingdom, Apr. 9, 1974, 15764/74

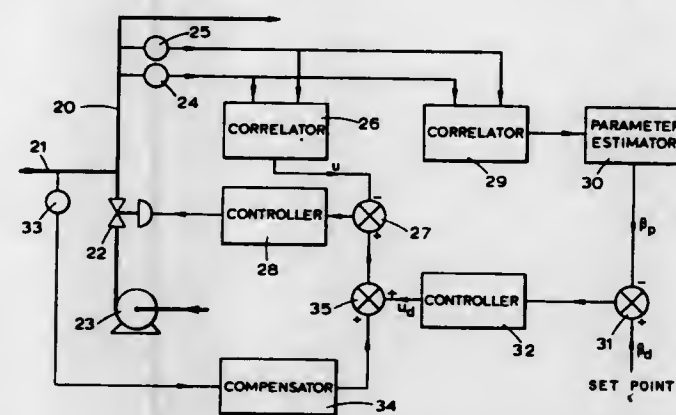
Int. Cl.² G01F 1/00

U.S. Cl. 137-2

11 Claims

1. A process for controlling the flow of particles conveyed by means of a flowing fluid comprising obtaining first and second electrical signals by sensing the passage of naturally occurring random disturbances in the flow of particles respectively past first and second points separated by a known distance along a path for the flow of particles, producing a cross-correlation function of said first and second electrical signals over a predetermined integration time deriving from the correlation function a third electrical signal which is a function of the spread of particle velocities in the particle velocity spectrum in the system, providing a fourth electrical signal which

is a function of the desired spread of particle velocities, comparing the third and fourth signals to derive an error signal and



varying the velocity of said fluid in response to said error signal.

4,007,755

COMPONENT INJECTION SYSTEM

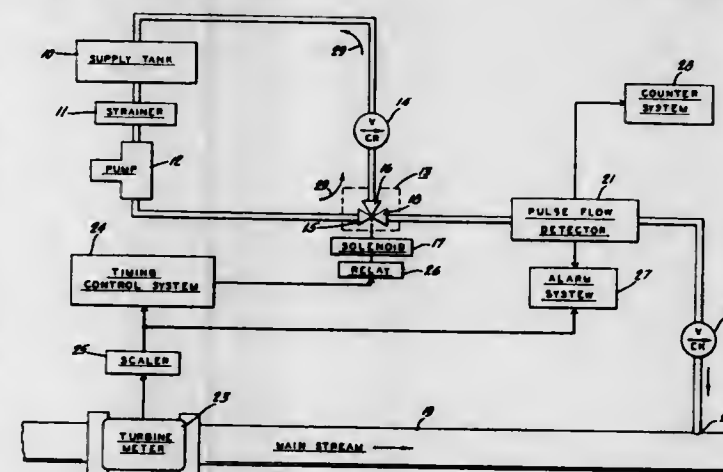
Julius Lerner, Broomall, and Robert Mayer, Ardmore, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 434,535, Jan. 18, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 556,026

Int. Cl.² G05D 11/13

U.S. Cl. 137-101.21

12 Claims



1. System for introducing a predetermined amount of a first fluid into a main stream of a second fluid in an intermittent fashion, so that a predetermined concentration of the first fluid in the second fluid is obtained, said predetermined amount being determined without a flowmeter, said system comprising:

- means for providing a circuitous path through which the first fluid can be circulated;
- pumping means for continuously circulating the first fluid through the circuitous path at a predetermined rate;
- means for diverting the flow of the first fluid from said circuitous path into the main stream of the second fluid, said diverting means having a first mode wherein the first fluid is circulated only through the circuitous path and a second mode wherein the first fluid flows only from the circuitous path into the main stream;
- means for measuring the flow rate of the main stream of the second fluid and producing signals related to the flow rate; and
- means, responsive to the signals produced by the measuring means, for maintaining a predetermined concentration of the first fluid in the second fluid, by controlling the diverting means so that it is moved from its first mode to its second mode, and back to its first mode after a predetermined length of time has elapsed, thereby permitting a predetermined amount of the first fluid to be introduced into the main stream of the second fluid after a predeter-

mined amount of the second fluid has flowed through the measuring means.

4,007,756

AIR CONTROL APPARATUS FOR AN ENGINE EXHAUST GAS PURIFICATION SYSTEM

Hideo Umino, Nagaokakyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

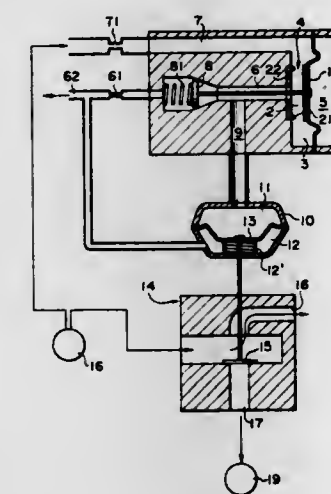
Filed Aug. 20, 1975, Ser. No. 606,122

Claims priority, application Japan, Sept. 2, 1974, 49-101121

Int. Cl.² G05D 11/00

U.S. Cl. 137-115

1 Claim



1. Air control apparatus for an engine exhaust gas purifier, comprising:

- air supply means for supplying air at super-atmospheric pressure for selective application of the air to an exhaust gas purifier of an engine;
- an air control valve for operation to selectively connect air, supplied by the supply means, to the purifier and to the atmosphere, for said selective application of the air;
- a differential-pressure responsive device for operating the valve, the device having a casing, a movable member dividing the casing into first and second compartments, means for applying to the first compartment a suction of an intake manifold of the engine, means defining a connector passage for applying a control pressure to the second compartment and for thereby providing a pressure differential acting on the movable member, and means connecting the movable member to the air control valve for moving the valve by the member in response to the differential;
- a differential-pressure responsive unit for controlling the differential-pressure responsive device, the unit having a housing and having, disposed therein, a diaphragm member dividing the housing into a first portion and a second portion, and means for applying a constant pressure to the first portion and to a first side of the diaphragm member therein;

means for applying variable pressures to the second portion of the housing and to a second side of the diaphragm member therein, comprising (a) a fixed partition in the housing, having a valve seat thereon and disposed in the second portion of the housing to divide the second portion into a pressure chamber surrounding the valve seat and a suction chamber surrounded by the valve seat if the diaphragm member contacts the valve seat, the diaphragm member being enabled by predetermined differentials between the constant and variable pressures selectively to effect the contacting of the valve seat and to move to positions remote from the valve seat, (b) a pressure passage in the housing for applying air at super-atmospheric pressure, supplied by the air supply means, to the second portion of the housing, outside of the valve

seat, (c) a suction passage in the housing for applying the suction of the intake manifold to the second portion of the housing, inside of the valve seat, and (d) a suction shut-off valve in the housing, connected to the diaphragm member and disposed in the suction passage to open that passage if the diaphragm member contacts the valve seat, and progressively to close the passage if the diaphragm member progressively moves to positions remote from the valve seat; and

means establishing communication of the suction passage in the housing with the connector passage to the second compartment of the casing of the differential-pressure responsive device to provide the control pressure acting on the movable member in that device for moving the air control valve;

whereby the selective connecting of air to the purifier can be performed by the air control valve while the suction of the intake manifold varies, and also while the suction remains uniform.

4,007,757

VALVE SHIFTING MECHANISM

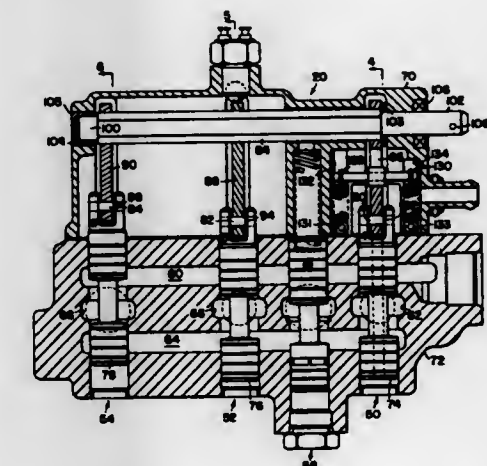
Robert Wayne Emmert, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 16, 1975, Ser. No. 623,086

Int. Cl.² F16K 31/524

U.S. Cl. 137-315

3 Claims



1. In a valve having a plurality of passages therein and first and second spool means therein selectively shiftable to connect and disconnect the passages, a spool means shifting mechanism comprising: a control shaft having a portion of hexagonal cross-section rotatably mounted in the valve proximate one end of the first and second spool means and having means therein for orienting the shaft relative to the valve; first cam means having a first hexagonal hole provided therein for nonrotatably and slidably mounting the first cam means on the shaft and further having indicia means therein for orienting the first hole relative to the orienting means in the shaft, the first cam means including first cam surface means therein positioned in a predetermined relationship to the first hole; the first cam surface having a first predetermined working profile with displacement towards and away from the first hole; second cam means having a second hexagonal hole provided therein for nonrotatably and slidably mounting the second cam means on the shaft and further having indicia means therein for orienting the second hole relative to the orienting means in the shaft; the second cam means including second cam surface means therein positioned in a predetermined relationship to the second hole; the second cam surface means having a second predetermined working profile with displacement towards and away from the second hole; first and second cam follower means connected respectively to the one ends of the first and second spool means and operatively associated with the first and second cam means, respectively, to limit sliding thereof on the shaft, said first and second cam

follower means respectively following the first and second cam surface means when the first and second cam means are rotated by the control shaft whereby rotation of the shaft will shift the first and second spool means in a predetermined sequence.

4,007,758

RESPIRATOR PRESSURE-DEMAND EXHALATION VALVE

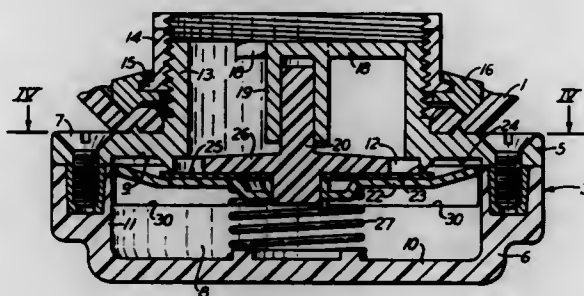
Robert E. Gray, Pittsburgh, and Leslie F. Boord, Elizabeth, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jan. 14, 1976, Ser. No. 648,915

Int. Cl.² F16K 17/20

U.S. Cl. 137-472

8 Claims



1. A pressure-demand exhalation valve for a respirator facepiece, the valve comprising a case provided with a chamber having spaced end walls surrounded by a side wall, one of said end walls being provided with an inlet port for exhaled air, a valve seat surrounding said port and spaced inwardly from said side wall, a sealing member having one side normally engaging said seat, a rigid disc engaging the opposite side of the sealing member and connected thereto, the diameter of the disc being nearly as great as the diameter of said chamber, a valve stem secured to the central portion of said disc and extending through said port, guide means for the valve stem connected with the case, and a spring in said chamber compressed between said disc and the other end wall of the chamber for normally pressing the sealing member against said seat, the disc being spaced from said one wall of the chamber far enough for the marginal portion of the disc that extends laterally out beyond the valve seat to be inclined toward said one wall but spaced therefrom, the side wall of said chamber being provided with a plurality of exhaust slots extending around said disc and having inner walls adjacent said one wall of the case lying in a plane substantially coinciding with the plane in which lies the edge of the disc that is closest to said one wall of the case, and the space between said valve seat and the side wall of the case always being open to said slots.

4,007,759

PRESSURE STABILIZER FOR HYDROCARBON STORAGE FACILITIES

William R. Martin, Willow Grove, and Stewart W. Nystrom, Malvern, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 15, 1975, Ser. No. 613,141

Int. Cl.² F16K 15/04

U.S. Cl. 137-550

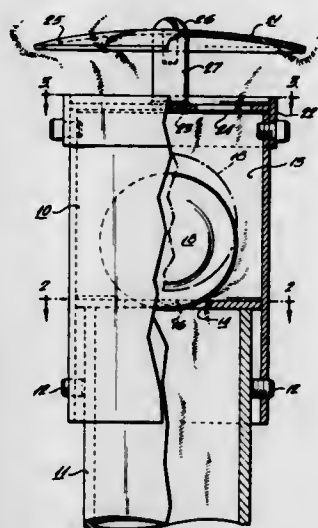
5 Claims

1. A pressure stabilizer system for use on a vent line from a hydrocarbon storage facility, said stabilizer designed to maintain an orifice open to the atmosphere, to release any pressure above a predetermined amount, and to minimize the effect of weather conditions on its operation, and comprising:

- a stabilizer housing, having means for connection to the vent line and a valve seat;
- a movable valve member having a given weight to provide said member with a specific gravity greater than one, so that a predetermined amount of pressure applied under

the movable member will displace it upward from its normal position; and

- a plurality of support members spaced from each other for maintaining the movable valve member away from the valve seat in its normal position so that an orifice having a predetermined area is formed between the movable



member and the valve seat and so that the contact by the valve seat with the movable member is eliminated and the contact by the maintaining means with the movable member is minimized to reduce the possibility of the movable member becoming frozen in its normal position, thereby being unable to be displaced upward if the pressure to be relieved reaches the predetermined amount.

4,007,760

FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

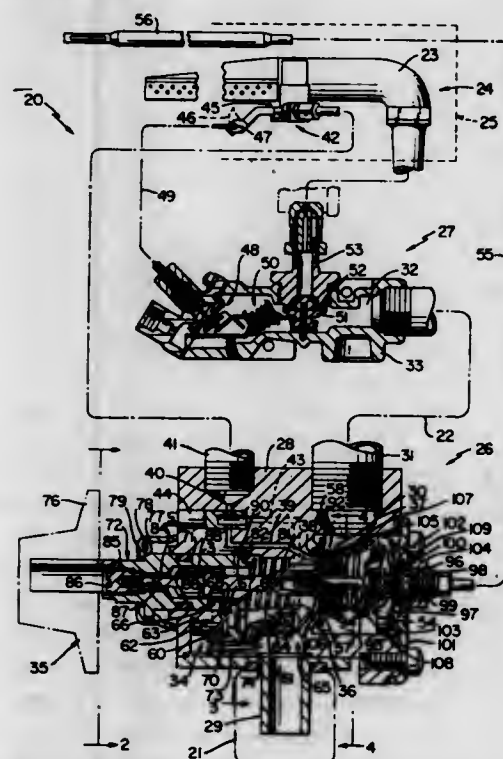
Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 530,605, Dec. 9, 1974, Published Application No. B530,605, and a continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,389, July 18, 1973, abandoned. This application Aug. 15, 1975, Ser. No. 604,928

Int. Cl.² F23N 1/00

U.S. Cl. 137-614.13

18 Claims



1. In a fuel control system for a fuel burning apparatus or the like having a source of fuel adapted to be interconnected by passage defining means to main burner means of said appa-

ratus, a fuel control device disposed in said passage defining means and having poppet valve means that is directly manually operated for opening and closing said passage defining means so as to control the flow of fuel from said source to said main burner means, said control device having a selector means operatively interconnected to said poppet valve means to operate the same, said control device having throttle valve means downstream from said poppet valve means for throttling fuel flow through said passage defining means to said burner means, said selector means also being operatively interconnected to said throttle valve means to operate the same, the improvement wherein said selector means of said control device is provided with a cam means, said poppet valve means of said control device being operatively associated with said cam means of said selector means to be moved from a closed position thereof to an open position thereof as said selector means is moved between an off position thereof and a certain other position thereof in one direction and to be moved from said open position thereof to said closed position thereof as said selector means is moved between said certain other position and said off position thereof in an opposite direction to said one direction, said selector means being further movable in said one direction from said certain other position to a third position and from said third position back to said certain other position in said opposite direction, said selector means operating only said throttle valve means during its movement between said certain other position and said third position, said selector means being rotatable and including a rotatable shaft means, said shaft means having said cam means thereon, said poppet valve means of said control device being moved transversely to the axis of rotation of said shaft means by said cam means as said shaft means is being rotated to open or close said poppet valve means of said control device, said throttle valve means being axially movable and being threadedly interconnected to said shaft means to be axially moved thereby as said shaft means is rotated and thereby changing its threaded relation with said throttle valve means.

4,007,761

PREPACKAGED SHIRRED TUBULAR CASING ARTICLE

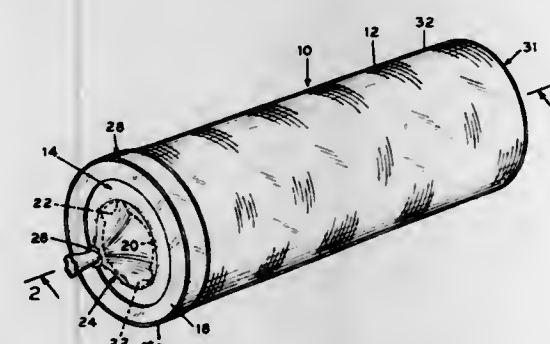
John Heller Beckman, La Grange Park, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,253

Int. Cl.² F16L 11/00

U.S. Cl. 138-103

17 Claims



1. A prepackaged shirred tubular casing article comprising a shirred casing length having an internal bore, an unshirred portion and having a sizing means confined within said unshirred portion of said casing length, said sizing means having an outer perimeter larger than the inner perimeter of unshirred casing length.

4,007,762

SELVAGE FORMING DEVICE FOR A WEAVING LOOM

Cornelis van Donk, Mortel, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

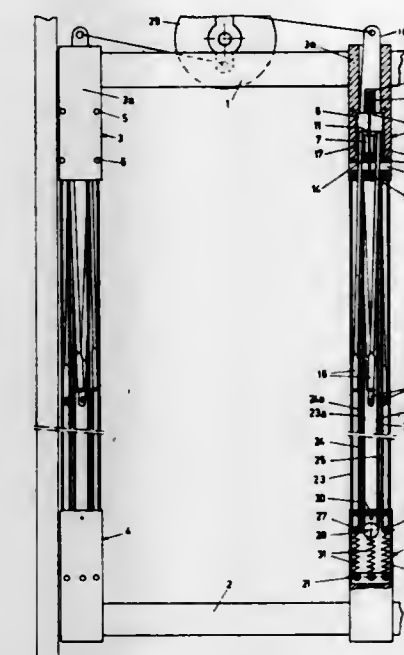
Filed Dec. 24, 1975, Ser. No. 644,021

Claims priority, application Netherlands, Mar. 17, 1975, 7503167

Int. Cl.² D03C 11/00

U.S. Cl. 139-54

3 Claims



1. A selvage forming device comprising a frame adapted to be connected to a heald of a loom and to guide at least one warp thread, wherein the improvement comprises two superimposed members rockably mounted in the frame, and an actuating arm secured to one member for rocking said member, the members being hinged together so that rocking of one member causes the other member to rock in the opposite sense, each member carrying one of a cooperating pair of needles for guiding binding threads, the rocking motion of the members being such as to cause scissors motion of the pair of needles in a plane transverse to the warp threads, and the frame being provided with a plurality of vertical wires under tension for guiding the warp threads.

4,007,763

NARROW FABRICS

John Sellers, Chorley; Mary Griffiths, Heywood, and Thomas Harry Dyer, Manchester, all of England, assignors to Thomas French & Sons Limited, Manchester, England

Filed Mar. 20, 1975, Ser. No. 560,169

Claims priority, application United Kingdom, Mar. 21, 1974, 12747/74

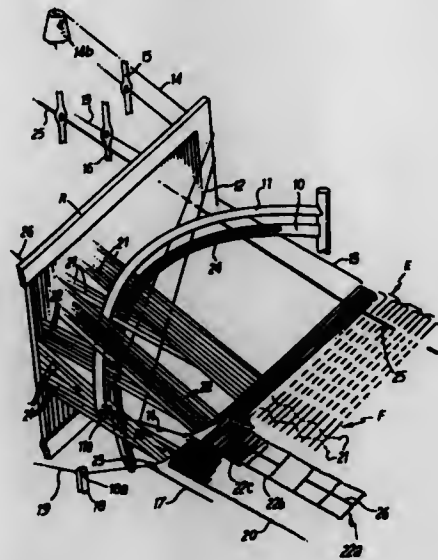
Int. Cl.² D03D 49/50, 47/08, 1/06

U.S. Cl. 139-116

23 Claims

1. The method of weaving a narrow fabric having a first weft of relatively stiff form, a second weft which has a high coefficient of friction relative to said first weft, and a multiplicity of warp yarns, including the steps of creating a shed, inserting a weft into said shed, beating-up the inserted weft, changing the shed and inserting a successive weft, beating-up the said successive weft, and repeating the steps to produce a woven fabric, the said weft insertion steps comprising inserting said first weft in certain warp sheds only and said second weft only

in the other warp sheds, the said warp sheds being successively formed in the same plane thereby to enable said first and said



second wefts to be contained in a common single weft plane in the fabric.

4,007,764

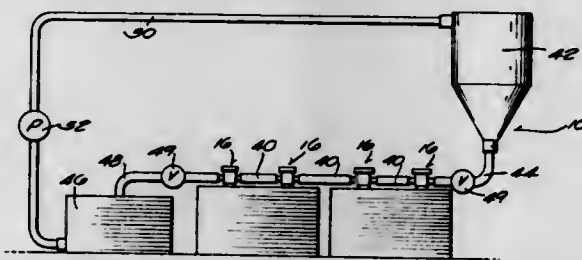
AUTOMATIC FLUID FILLING DEVICE FOR BATTERIES
Royal F. Bandemor, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 9, 1976, Ser. No. 656,516

Int. Cl.² B65B 3/26

U.S. Cl. 141-35

9 Claims



1. An automatic fluid filling device for maintaining fluid at a desired level in a battery cell having a cell opening, said device comprising a member which is removably insertable into the battery cell, said member including wall means having a first portion sealingly engaging the battery cell opening, said wall means also having a second portion located above said first portion, said second portion partially defining a generally air-tight chamber located above the battery cell opening, said second portion including an aperture and a removable cap which sealingly engages said aperture for allowing access to the fluid in the battery cell, said wall means further having a third portion partially defining a passage located below and in communication with said chamber and in communication with the battery cell for affording fluid flow from said passage to the battery cell, said third portion including an inlet for affording flow of a fluid into said passageway and also including an outlet for affording flow of the fluid out of said passageway, said member also including a fluid level control tube having an upper opening extending into and being in communication with said chamber and having a lower opening extending into the battery cell to the general level at which the fluid is desired to be maintained in the battery cell.

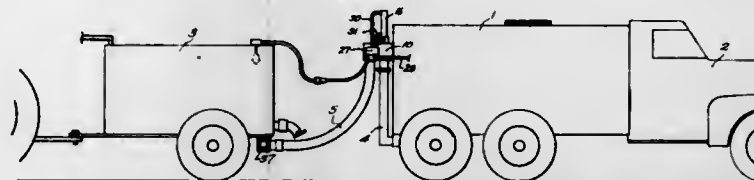
4,007,765
SHUT OFF AND VENTING SYSTEM FOR A CONDUIT TRANSFER LINE

Paul M. Bellows, P.O. Box 511, Battle Ground, Wash. 98604
Filed Nov. 7, 1975, Ser. No. 629,778

Int. Cl.² B65B 31/00

U.S. Cl. 141-59

7 Claims



1. A shut off and venting system simultaneously stopping fluid flow in one conduit segment and venting a remaining communicating conduit segment of a conduit system extending between two tanks, said shut off and venting system comprising,

a fluid receptacle in communication with both conduit segments, said receptacle having a vent and fluid intake and discharge openings,
a valve assembly simultaneously closing said vent and opening said intake opening in one position whereby fluid is communicated from one conduit segment to the remaining conduit segment and in a second position closing the intake opening of the receptacle and opening the vent thereby venting said remaining conduit segment,
switch means actuated upon the level of a tank being filled by the conduit system reaching a desired height, and
valve means in circuit with said switch means and operable to control a pressure responsive motor actuating said valve assembly whereby said assembly is positioned automatically.

4,007,766

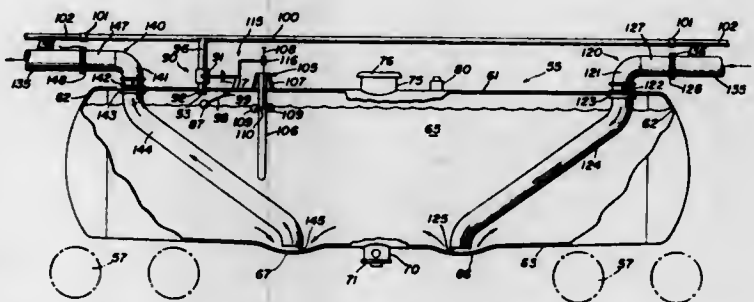
VAPOR VENT COLLECTION LINE FOR TANK CARS
Doug Hurst, Montreal West, Canada, assignor to General American Transportation Corporation, Chicago, Ill.

Filed Feb. 25, 1976, Ser. No. 661,098

Int. Cl.² B65B 3/04

U.S. Cl. 141-98

8 Claims



1. A railway tank car for interconnection in fluid communication with associated tank cars by flexible connecting conduits for accommodating consecutive loadings, unloading, and transportation of expandable ladings, said tank car comprising a wheeled chassis structure provided with chassis coupling means for coupling to the chassis of associated cars, a tank mounted on said chassis structure, two lading conduits respectively coupled to said tank in fluid communication therewith, each of said lading conduits having an outer end extending outwardly from said tank adjacent to the top thereof and an inner end extending into said tank and terminating near the bottom thereof, a gas vapor vent coupled to said tank in fluid communication therewith for venting gas vapor from said tank, valve means positioned in said gas vapor vent for sealing said vent to trap gas vapor in said tank, means for sensing the level of liquid lading in said tank during the filling thereof through one of said lading conduits, and control means responsive to said level sensing means for operating said valve means to close said valve means when the liquid lading

reaches a predetermined level, continued filling of said tank through said one lading conduit after the closing of said valve means causing compression of gas vapor trapped above said liquid lading to a pressure at which occurs outflow of the liquid lading through the other of said lading conduits at a rate equal to the rate of inflow of liquid lading through said one lading conduit, whereby said tank may be loaded and unloaded through either lading conduit.

4,007,767

HIGHSPEED ROTARY BRANDING PROCESS HAVING INCREASED DIE LIFE

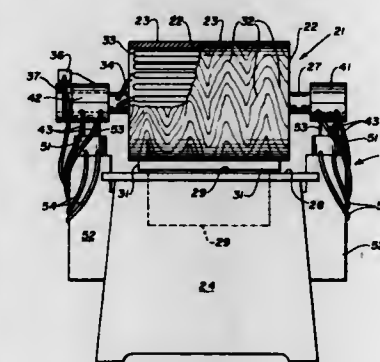
Gary C. Colledge, Compton, Calif., assignor to Colledgewood, Ltd., Compton, Calif.

Continuation-in-part of Ser. No. 440,481, Feb. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 332,298, Jan. 14, 1973, Pat. No. 3,791,290, which is a division of Ser. No. 216,061, Jan. 7, 1972, Pat. No. 3,730,081. This application July 24, 1975, Ser. No. 598,772

Int. Cl.² B44B 5/02; B27M 1/06

U.S. Cl. 144-328

6 Claims



1. In a process of highspeed rotary branding of pattern into a material such as hardboard, particle board, lumber or the like including the step of branding said material by passing the same under a heated rotary die at a speed effecting discoloration of the material impressed with said die, the improvement comprising the steps of:

selecting a rotary die having a pattern thereon comprised of a plurality of intricate protrusions dimensioned to brand a pattern having fine details into said material; and
maintaining the temperature of said die in the range of about 800° F. to about 900° F. during said branding step.

4,007,768

TIGHTENING DEVICE FOR THREADED SCREW PART
Ryuzo Matsushima, Tokyo, Japan, assignor to Yuugen Kaisha Matsushima Seisakusho, Tokyo, Japan

Filed June 27, 1975, Ser. No. 591,035

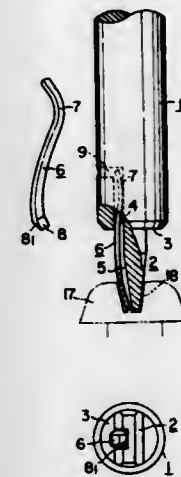
Claims priority, application Japan, July 3, 1974, 49-78859
Int. Cl.² B25B 15/00

U.S. Cl. 145-50 D

1 Claim

1. A screw driver which comprises in combination:
a shank with one end portion thereof fitted to a holder or a handle, and with an opposite end portion thereof provided with a flat plane or surface in the direction substantially perpendicular to the axis of said shank;
an engaging means in the shape of a symbol — to be engaged with a threaded screw, and projecting from said flat plane of said shank;
a narrow groove formed along an engaging surface of said engaging means extending in the direction substantially parallel to the axis of said shank;
a small passage formed in said shank substantially parallel to but offset radially from the axis of said shank, one end of said passage being blind within said shank, and the other end thereof being open at said flat end surface of said shank contiguous an end of said narrow groove;
a small port formed in said shank in the direction substan-

tially perpendicular to the axis of the shank, one end thereof meeting the blind position of said small passage, and the other end thereof being open at the peripheral surface of said shank; and



a bow-shaped plate spring extending from the blind portion of said small passage up to the tip of said engaging means along said groove, and being held in the blind portion of said small passage by means of self-resiliency.

4,007,769

TIRE AND WHEEL ASSEMBLIES

Leslie Vernon Powell, Lichfield, and Reginald Harold Edwards, Sutton Coldfield, both of England, assignors to Dunlop Holdings Limited, London, England

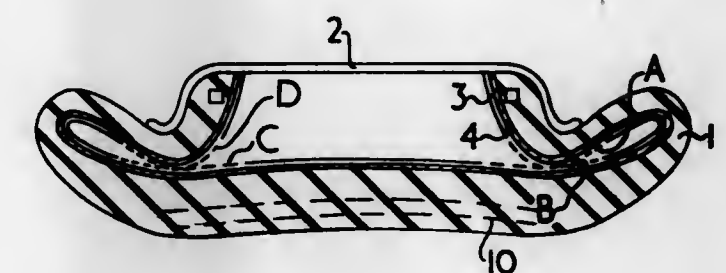
Continuation of Ser. No. 443,530, Feb. 19, 1974, abandoned, which is a continuation of Ser. No. 150,558, June 7, 1971, abandoned. This application Oct. 29, 1975, Ser. No. 626,707
Claims priority, application United Kingdom, June 20, 1970, 30034/70

The portion of the term of this patent subsequent to June 19, 1990, has been disclaimed.

Int. Cl.² B60C 17/00

U.S. Cl. 152-330 RF

18 Claims



1. A pneumatic tire and wheel assembly capable of running in a completely deflated condition in which opposing portions of the interior of the tire contact each other when run in that condition, said tire and wheel assembly comprising:

a wheel having a wheel rim with a pair of annular flanges, a pair of bead seats adjacent said flanges and a well to permit a tire to be mounted on the rim, means on said rim for physically restraining the beads to prevent the tire beads from falling into the well;

a pneumatic tire on said rim, said tire having a pair of beads each of which has a toe, a tread portion whose width is greater than the width of the wheel rim measured between the flanges, a breaker, an aspect ratio between 30% and 75%, a smoothly curved curvilinear interior surface extending from one bead toe to the other bead toe, the entire interior surface of the tire being free of intermediate protruding supporting structure;

said rim and said tire defining a single open inflation chamber therebetween, said chamber being free of intermediate supporting structure so that said tire can be run in a completely deflated condition on the rim with opposing

portions of the interior of the tire in contact with each other;

an immobile coating of lubricating material disposed on the interior surface of the tire so that when the assembly is run in a completely deflated condition relative movement of contacting portions of the interior surface of the tire will be facilitated, without generation of an undue amount of heat, by the coating of lubricating material therebetween; and

the combination of said tread portion, whose width is greater than the width of the wheel rim measured between the flanges, said breaker, said aspect ratio, said single open inflation chamber, the immobile coating, and said means for physically restraining the beads provides a tire and wheel assembly which will run in a completely deflated condition.

4,007,770

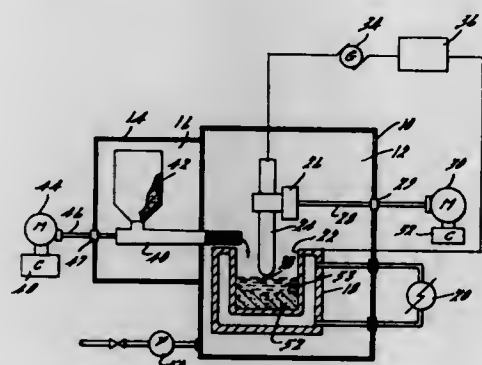
SEMI-CONSUMABLE ELECTRODE VACUUM ARC MELTING PROCESS FOR PRODUCING BINARY ALLOYS
George A. Timmons, Ann Arbor, Mich., assignor to Amax Inc., New York, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,608

Int. Cl.² B22D 27/02; C22B 4/06

U.S. Cl. 164-52

12 Claims



1. A process for forming homogeneous binary alloys composed of a major amount of a first element having a melting point below the liquidus of said binary alloy and a minor amount of a second element having a melting point substantially above the liquidus of said binary alloy which comprises the steps of separately feeding said first element into a mold at a controlled rate, forming said second element into an electrode having one end thereof positioned within said mold adjacent to said first element, discharging a high energy electric arc between said electrode and said first element to effect a melting of said first element and said second element forming a molten pool, and feeding said first element and said second element to said mold at rates which are proportional to their concentration in the binary alloy desired.

4,007,771

PROCESS FOR THE PRODUCTION OF ALUMINUM
Matthias Welsch, Dammstr. 1, 415 Krefeld-Uerdingen, Germany

Filed Jan. 13, 1975, Ser. No. 540,189

Claims priority, application Germany, Jan. 15, 1974, 2401654

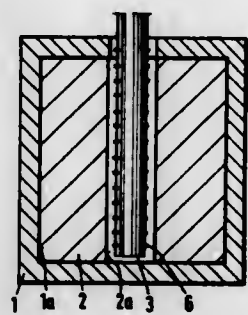
Int. Cl.² B22D 13/00, 27/04

U.S. Cl. 164-56

5 Claims

1. A method for the production of aluminum by refining an aluminum alloy by centrifuging with controlled cooling which comprises melting an Al-X alloy, wherein the X-component of said alloy has a higher specific weight than aluminum and forms an eutectic mixture with aluminum whereby the composition of the starting melt is on that side of the eutectic mixture

rich in aluminum, and radially cooling said melt from the inside to the outside by blowing a cooling medium onto the



inner surface of said melt while being under the effect of the centrifugal force.

4,007,772

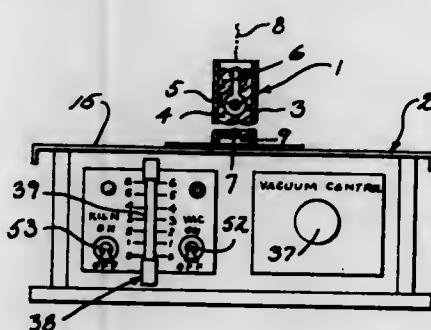
APPARATUS FOR VACUUM PRECISION CASTING
Donald O. Laedtke, 2400 W. Roberts Ave., and Myron W. Jackson, 430 S. Christine, both of Appleton, Wis. 54911

Filed Nov. 6, 1974, Ser. No. 521,272

Int. Cl.² B22D 27/16

U.S. Cl. 164-151

10 Claims



1. An apparatus for investment casting comprising a support having a vacuum opening means located centrally of the support, an investment casting means to be located in overlying relationship to said opening means, and a high volume flow, low pressure level vacuum source having means for establishing a continuous flow and connected to said opening means to create a low level vacuum on the investment casting, said source establishing a vacuum on the order of 600 mm of water gauge and a flow on the order of 3.9×10^3 CM³/s.

4,007,773

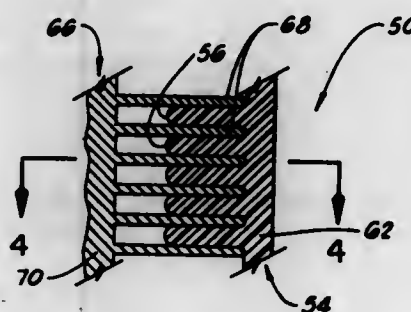
METHOD FOR ENGINE DAMPENING
Eugene C. McCormick, P.O. Box 706, Wellington, Kans. 67152

Division of Ser. No. 469,427, May 13, 1974, Pat. No. 3,926,156. This application May 19, 1975, Ser. No. 578,401

Int. Cl.² F02F 1/30

U.S. Cl. 165-1

2 Claims



1. A method of dampening vibrations of the cooling fins of an engine having cooling fins on the cylinder thereof, including the steps of:

- inserting a wedge-like member or the like between adjacent cooling fins thereby spreading the cooling fins from their normal spaced relation;
- inserting a tooth of a cross sectionally comb-like resilient member having a width greater than the normal spaced gap between the cooling fins between the outer portion of the cooling fins;
- removing said wedge-like member from between the cooling fins thereby releasing the cooling fins to compressibly hold said tooth of said resilient member between the cooling fins; and
- repeating the above steps until all of the teeth of said comb-like resilient members are received between the adjacent cooling fins.

4,007,774

HEAT EXCHANGE APPARATUS AND METHOD OF CONTROLLING FOULING THEREIN

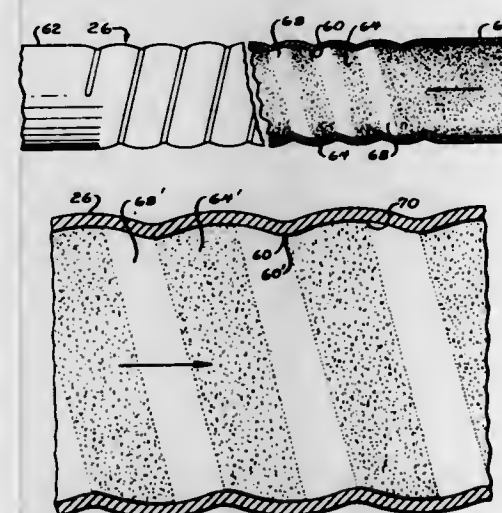
James G. Withers, Jr., Dearborn, Mich., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 23, 1975, Ser. No. 617,453

Int. Cl.² F28F 27/02, 1/14

U.S. Cl. 165-1

4 Claims



1. A method for reducing the loss in thermal conductivity caused by tubeside fluid fouling in a heat exchanger in which fluid capable of fouling the tube walls is circulating comprising fitting the heat exchanger with internally ridged tubing having an integral internal ridge shape which turbulates the fluid so as to resist deposits of a fouling layer on the upstream side of the ridging; and periodically reversing the flow direction of the tubeside fluid through the internally ridged tubing to remove at least a substantial part of the fouling layer from the portions of the tube which were previously downstream of the ridging.

4,007,775

HEAT EXCHANGE SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR HAVING MOTION FEEDBACK MEANS

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 517,740, Oct. 24, 1974, Pat. No. 3,973,619, and a continuation-in-part of Ser. No. 419,606,

Nov. 28, 1973, Pat. No. 3,880,229. This application Dec. 15, 1975, Ser. No. 640,685

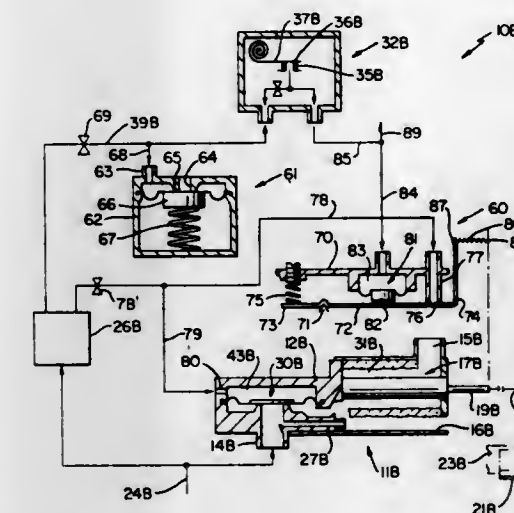
Int. Cl.² G05D 23/00

U.S. Cl. 165-1

3 Claims

1. A method for operating a heat exchange system for a zone comprising the steps of providing a source of heat exchange output fluid for effecting a heat exchange function in said zone, providing a source of return fluid resulting from said output fluid providing its heat exchange function in said zone, controlling the amount of flow of said output fluid from said source that is to be utilized for said heat exchange function in said zone by a thermally operated means in relation to

the temperature of said thermally operated means, sensing the temperature effect of said heat exchange function in said zone with a sensing means in relation to a predetermined temperature that said heat exchange system is to provide in said zone, directing one of said output fluid and said return fluid to said thermally operated means by control means under the control



of said sensing means to cause the same to change the amount of flow of said output fluid when said temperature effect in said zone deviates from said predetermined temperature a certain amount, and causing said control means to operate said thermally operated means in a modulating manner with means of said control means.

4,007,776

HEATING AND COOLING SYSTEM UTILIZING SOLAR ENERGY

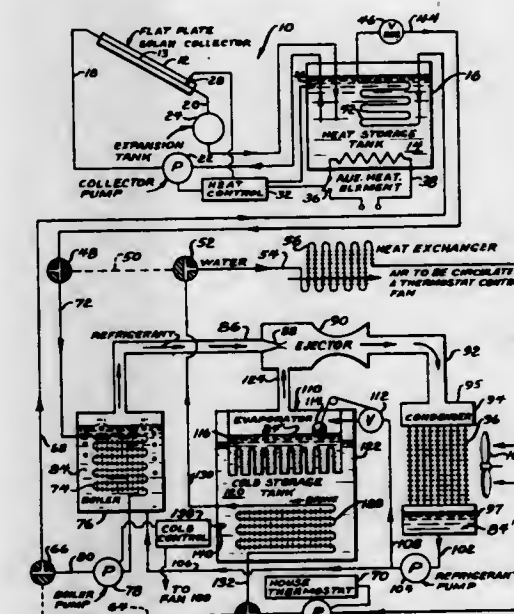
Kalil A. Alkasab, Wheaton, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 23, 1974, Ser. No. 535,252

Int. Cl.² F24D 11/00; F25B 29/00, 27/00

U.S. Cl. 165-18

3 Claims



1. In a solar heating and cooling system for an enclosed space, a solar energy collector and collector fluid circulating means to carry heated fluid from said solar energy collector to a heat storage tank and return cooled fluid from said tank to said collector; a closed circuit fluid circulating conduit means including a heat exchange portion within said heat storage tank and a plurality of valve members for selectively connecting said closed circuit fluid circulating conduit means in either a heating mode in direct circuit with heat exchange means for heating said enclosed space, or in a cooling mode in direct circuit with a heat exchange means for heating a refrigerant

boiler which forms part of a closed refrigerant circulating system wherein refrigerant vapor produced by said refrigerant boiler is expanded in an ejector, cooled in a condenser, and used to lower the vapor pressure and temperature of refrigerant in an evaporator which is connected to the ejector, said evaporator being in heat exchange relationship with fluid in a cold storage tank, said heat exchange means for said enclosed space being in heat exchange relationship with the fluid in said cold storage tank during said cooling mode.

4,007,777

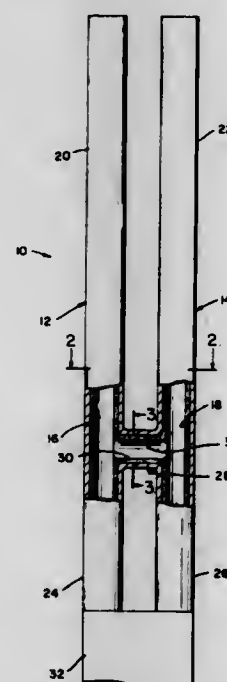
SWITCHABLE HEAT PIPE ASSEMBLY

Tsu Hung Sun, Torrance, and Algerd Basiulis, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 2, 1975, Ser. No. 592,448
Int. Cl.² F28D 15/00

U.S. Cl. 165—32

7 Claims



7. A switchable heat pipe assembly comprising at least two heat pipe condensers coupled to means for defining a heat pipe evaporation space, means for defining wicks therein, and means for defining working fluid therein sufficient for saturating only said wick means of one of said condensers and said evaporation space means.

4,007,778

HEAT EXCHANGE SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR HAVING MOTION FEEDBACK MEANS

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

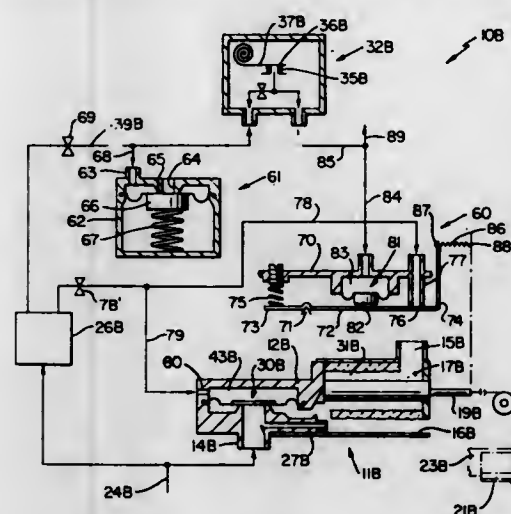
Division of Ser. No. 517,740, Oct. 24, 1974, Pat. No. 3,973,619, and a continuation-in-part of Ser. No. 419,606, Nov. 28, 1973, Pat. No. 3,880,229. This application Dec. 15, 1975, Ser. No. 640,683
Int. Cl.² G05D 23/00

U.S. Cl. 165—34

7 Claims

1. A control unit for a heat exchange system or the like comprising a housing means having means adapted for receiving heat exchange output fluid from a source thereof that is to be utilized for effecting a heat exchange function in a zone and for receiving return fluid resulting from said output fluid providing its heat exchange function in said zone, thermally operated means carried by said housing means adapted to control the amount of flow of said output fluid from said source that is to be utilized for said heat exchange function in said zone in relation to the temperature of said thermally operated means, and control means adapted to be controlled by a zone temperature sensing means for directing one of said

output fluid and said return fluid to said thermally operated means to cause the same to be adapted to change the amount of the flow of said output fluid when the temperature effect of said heat exchange function in said zone deviates from a



predetermined temperature a certain amount, said control means having means adapted to cause said control means to operate said thermally operated means in a modulating manner.

4,007,779

HEAT EXCHANGE SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR HAVING MOTION FEEDBACK MEANS

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

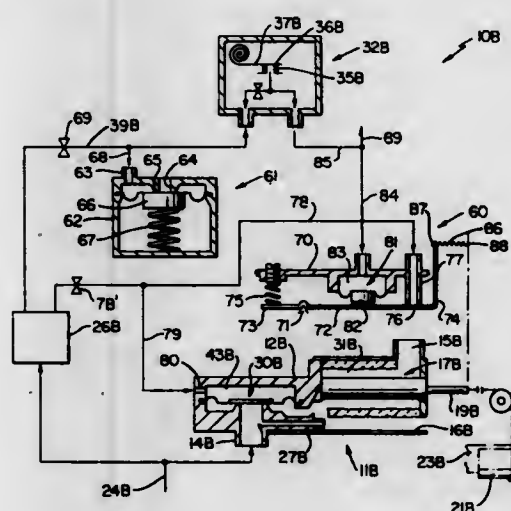
Division of Ser. No. 517,740, Oct. 24, 1974, Pat. No. 3,973,619, which is a continuation-in-part of Ser. No. 419,606, Nov. 28, 1973, Pat. No. 3,880,229. This application Dec. 15, 1975, Ser. No. 640,684

The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.² G05D 23/00

U.S. Cl. 165—34

4 Claims



1. A heat exchange system comprising a zone to be treated, a source of heat exchange output fluid for effecting a heat exchange function in said zone, a source of return fluid resulting from said output fluid providing its heat exchange function in said zone, thermally operated means for controlling the amount of flow of said output fluid from said source that is to be utilized for said heat exchange function in said zone in relation to the temperature of said thermally operated means, sensing means for sensing the temperature effect of said heat exchange function in said zone in relation to a predetermined temperature that said heat exchange system is to provide in said zone, and control means controlled by said sensing means

for directing one of said output fluid and said return fluid to said thermally operated means to cause the same to change the amount of flow of said output fluid when said temperature effect in said zone deviates from said predetermined temperature a certain amount, said control means having means that causes said control means to operate said thermally operated means in a modulating manner.

4,007,780

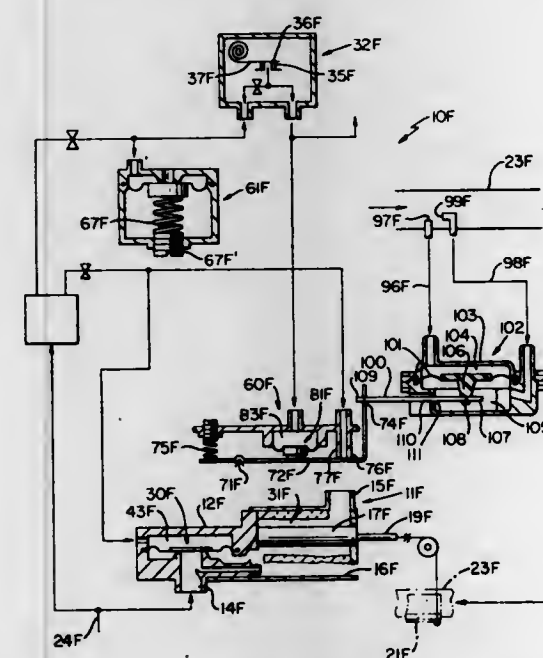
HEAT EXCHANGE SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR

Edward N. Caldwell, and Douglas R. Scott, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 24, 1975, Ser. No. 625,647
Int. Cl.² B60H 1/00

U.S. Cl. 165—39

40 Claims



1. A heat exchange system comprising a zone to be treated, a source of heat exchange output fluid for effecting a heat exchange function in said zone, a source of return fluid resulting from said output fluid providing its heat exchange function in said zone, thermally operated means for controlling the amount of flow of said output fluid from said source that is to be utilized for said heat exchange function in said zone in relation to the temperature of said thermally operated means, sensing means for sensing the temperature effect of said heat exchange function in said zone in relation to a predetermined temperature that said heat exchange system is to provide in said zone, and control means controlled by said sensing means for directing one of said output fluid and said return fluid to said thermally operated means to cause the same to change the amount of flow of said output fluid when said temperature effect in said zone deviates from said predetermined temperature by a certain amount, said control means having means that causes said control means to operate said thermally operated means in a modulating manner, said means of said control means comprising velocity responsive means responsive to the velocity of said flow of said output fluid from said source.

4,007,781

HEAT EXCHANGE SYSTEM

Richard M. Masters, 1 Burns Road, Lexington, Mass. 02173
Division of Ser. No. 313,934, Dec. 11, 1972, Pat. No. 3,863,710. This application Nov. 15, 1974, Ser. No. 524,057

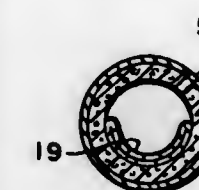
Int. Cl.² F28F 7/00

U.S. Cl. 165—46

4 Claims

1. A fluid conveying means in the form of a pipe comprising a tubular core of thermal insulation material; an outer layer on said core of a fluid and wear resistant material;

an inner layer within said core of a vapor impermeable material, only the inner layer of said conveying means being capable of substantially completely collapsing



under conditions wherein a minimum pressure difference exists between the pressure external to said pipe and the pressure within said inner layer.

4,007,782

PARKING DEVICE FOR BLOWOUT PREVENTER

Reidar Oivind Nybo, Hvalstad, and Geir Eik, Ski, both of Norway, assignors to Finn Tveten & Co. A/S and A/S Akers Mek. Verksted, both of, Norway

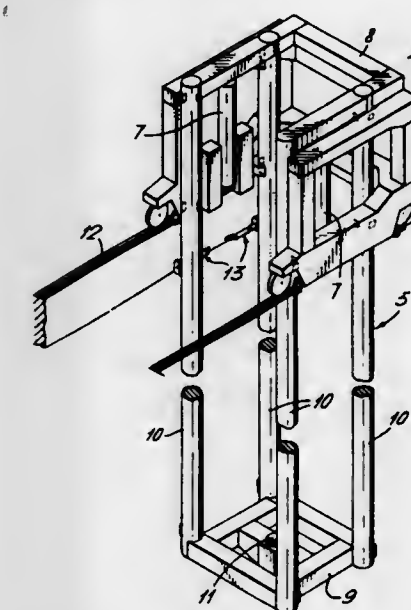
Filed Mar. 17, 1975, Ser. No. 558,684

Claims priority, application Norway, Mar. 18, 1974, 740953; Mar. 11, 1975, 750804

Int. Cl.² E21B 33/03

U.S. Cl. 166—79

10 Claims



1. A parking device for a blowout preventer mounted for movement aboard a floating drilling station, the device comprising: a parking frame adapted to hold the blowout preventer with the center of gravity of the blowout preventer lying above the points at which the blowout preventer is supported on said parking frame, said parking frame at its lower portion is equipped with a testing block upon which the blowout preventer can rest, thereby allowing functional testing of the blowout preventer in a non-installed position; and control drive means for moving the blowout preventer as a unit back and forth between a parked position and an installed position for utilization on the drilling station, said control drive means including first drive means for raising and lowering said parking frame and second drive means for moving said parking frame sideways.

4,007,783

WELL PLUG WITH ANCHOR MEANS

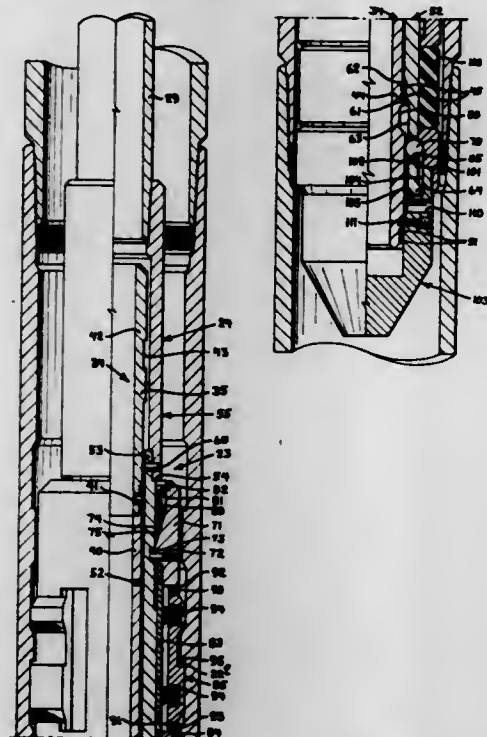
Amareswar Amancharla, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 533,935, Dec. 18, 1974, Pat. No. 3,946,807. This application Mar. 18, 1976, Ser. No. 668,287

Int. Cl.² E21B 33/12

U.S. Cl. 166—135

5 Claims



1. An expendible plug for use in a well bore to isolate a lower portion of said well bore below said plug from an upper portion of said well bore above said plug, said plug comprising: an inner mandrel having an upper end adapted to be engaged by a running tool and having spaced external seals at a lower end thereof and an annular release recess between said seals along said lower end; an outer mandrel concentrically disposed around said inner mandrel; locking means carried by a lower end portion of said outer mandrel; locating and locking keys supported on said outer mandrel for locating said plug at a landing nipple and locking said plug against upward movement in said nipple; outer mandrel locking means supported on said outer mandrel coupled with said locating and locking keys for holding said outer mandrel at an upper position relative to said keys; an expandable seal on said outer mandrel below said locating and locking keys; a seal expander ring on said outer mandrel below said seal, said seal expander ring being engageable by said locking means on said outer mandrel for compressing said seal between said locating and locking keys and said seal expander ring responsive to upward movement of said outer mandrel within said locating and locking keys and said seal; releasable means coupling said locating and locking keys with said outer mandrel for holding said outer mandrel at a first position at which said seal is contracted and for releasing said outer mandrel for upward movement to expand said seal; a lower end cap connected with said seal expander ring and releasably secured with said inner mandrel for closing the lower end of said plug, said inner mandrel being initially held at a first position within said outer mandrel at which said locking means on said outer mandrel is held in engagement with said seal expander ring, and said inner mandrel being releasable from said plug in said outer mandrel for downward movement to align said release recess around said inner mandrel with said locking means on said outer mandrel to release said seal ring for contraction of said seal responsive to a downward force applied to the upper end portion of said inner mandrel; said lower end cap having port means communicating to an annulus defined between said inner and outer mandrels located between said spaced seals on said inner mandrel for equalizing pressure across said plug responsive to a downward force on said inner mandrel positioning the upper one of said seals on said inner mandrel at a lower non-sealing relationship within said outer mandrel.

4,007,784

WELL PISTON AND PARAFFIN SCRAPER CONSTRUCTION

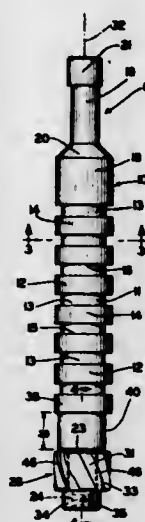
Willie L. Watson, Box 54, Fredericksburg, Ohio 44627, and Lonnie R. Watson, 347 Nold Ave., Wooster, Ohio 44691

Filed Oct. 14, 1975, Ser. No. 621,698

Int. Cl.² E21B 37/02

U.S. Cl. 166—170

12 Claims



1. Piston construction adapted for vertical movement within a well tube, including
 - a. an elongated tubular body having upper and lower ends with said lower end having a smooth shaft portion;
 - b. radially extending ring means formed on the tubular body, said ring means having a diameter complementary to the diameter of the well tube to assist in scraping paraffin from the tube during movement of the piston within the tube;
 - c. rotor means having an annular member formed with a smooth internal bore and a grooved outer surface, with the outer surface having a diameter complementary to the diameter of the well tube;
 - d. the rotor means internal bore being engageable with the smooth shaft portion of the tubular body to rotatably mount the rotor means on the lower end of said tubular body and spaced a predetermined distance below the ring means forming a turbulence zone in the space between the ring means and rotor means; and
 - e. the grooved outer surface of the annular member forming vane means for rotating the rotor means upon upward movement of the piston construction in the well tube for forming a turbulence in the turbulence zone which provides a sealing effect with the well tube to assist gas pressure in the well in moving the piston construction upwardly in the well tube.

4,007,785

HEATED MULTIPLE SOLVENT METHOD FOR RECOVERING VISCOUS PETROLEUM

Joseph C. Allen, Bellaire; Charles D. Woodward, Houston; Alfred Brown, Houston, and Ching H. Wu, Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,106

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.² E21B 43/24

U.S. Cl. 166—263

21 Claims

1. A method for recovering viscous petroleum including bitumen from subterranean, viscous petroleum containing formations including tar sand deposits, the formation being penetrated by at least one well in fluid communication therewith comprising:

- a. injecting a normally gaseous hydrocarbon solvent heated to a temperature from about 100° F to a value less than the boiling temperature of the normally gaseous solvent

at the injection pressure and greater than ambient temperature into the formation at a pressure at which the heated normally gaseous solvent is essentially all in the liquid phase;

- b. injecting a normally liquid hydrocarbon solvent heated to a temperature from about 100° F to a value less than the boiling temperature of the normally liquid solvent at the injection pressure and greater than ambient temperature into the formation at a pressure at which the heated normally liquid solvent is essentially all in the liquid phase, said normally liquid solvent being selected from the group consisting of paraffinic hydrocarbons having from five to ten carbon atoms, mononuclear aromatic hydrocarbons, naphtha, natural gasoline, and mixture thereof;
- c. reducing the pressure in at least a portion of the petroleum formation contacted by the solvents to a value at which the normally gaseous solvent will be at least partly in the gaseous phase; and
- d. recovering a solution of the petroleum and the injected normally liquid solvent from the formation.

4,007,786

SECONDARY RECOVERY OF OIL BY STEAM STIMULATION PLUS THE PRODUCTION OF ELECTRICAL ENERGY AND MECHANICAL POWER

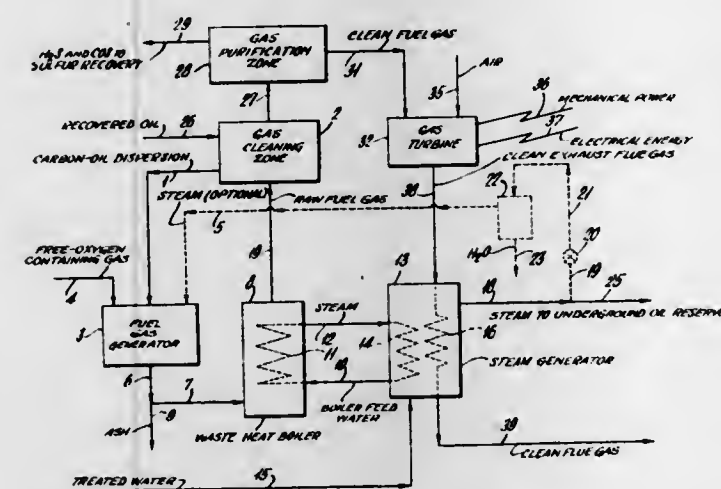
Warren G. Schlenger, Pasadena, Calif., assignor to Texaco Inc., New York, N.Y.

Filed July 28, 1975, Ser. No. 599,909

Int. Cl.² E21B 43/24; F02B 43/12

U.S. Cl. 166—266

17 Claims



wellbore is formed at a rate to prevent plugging of said second section, and recovering said mobilized bitumen via said third section of said wellbore.

4,007,789

ACIDIZING WELLS

Richard L. Clappitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 10, 1975, Ser. No. 612,080

Int. Cl.² E21B 33/138, 43/27

U.S. Cl. 166—281

7 Claims

1. An acid stimulation treatment process for improving hydrocarbon production from a producing well in fluid communication with a hydrocarbon-bearing subterranean formation by the introduction of alternate slugs of acid and an aqueous gel component which comprises the steps of:

- a. injecting a slug of an acid into a wellbore penetrating a subterranean formation at sufficient pressure to force at least a portion thereof into the formation into contact with the exposed faces of the formation to effectuate a controlled attack by the acid on the calcareous formation,
- b. injecting into said borehole a slug of a fluid comprising an aqueous gel, said gel comprising water to which there has been added a water-thickening amount of a water-soluble cellulose ether, a sensible amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which is sufficient to gel said water when the valence of at least a portion of said metal is reduced to said lower valence state, and an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state, and maintaining said gel in said borehole for a period of time sufficient for said gel to enter said formation and develop sufficient gel strength to remain in place in said formation and form a gel in that portion of the formation into which the acid of step (a) flowed,
- c. repeating steps (a) and (b) until the desired levels or zones of the formation have been acidized, and
- d. recovering hydrocarbon fluids from the subterranean formation.

4,007,790

BACK-OFF APPARATUS AND METHOD FOR RETRIEVING PIPE FROM WELLS

Jack A. Henning, P.O. Box 158, Refugio, Tex. 78377

Filed Mar. 5, 1976, Ser. No. 664,194

Int. Cl.² E21B 23/04

U.S. Cl. 166—299

18 Claims

1. An apparatus for locating and applying a jarring or hammering force to a threaded connection joining sections of a string of drill pipe, comprising:

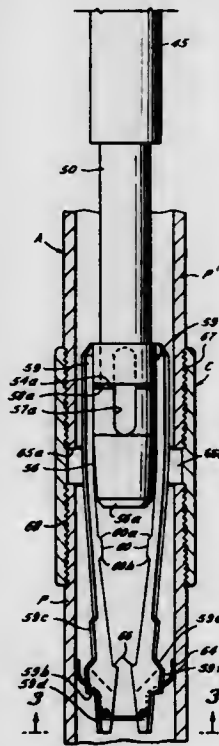
- a. an elongated tool means for lowering in a well from a wireline;
- supporting means with the tool means operable for allowing downward movement of the tool means through the drill string until the tool means has been raised upwardly to a releasable locking position engaging the supporting means with a threaded connection to support the tool means and to thereafter prevent further downward movement of the tool means in the drill string;
- locating means with the supporting means and operable upon an upward movement of the tool means for locating a selected connection which is to be released to position the supporting means in the releasable locking position;
- explosive means with the tool means operable by manipulation of the wireline for exerting an explosive force adjacent to the connection for imparting a jarring force to the threaded collar connection for effecting release of the threaded upper portion of the connection by reason of

the explosion and a back-off torque which is applied to the drill string;

- a. wireline actuated jar connected to the wireline and adapted to be manipulated by the wireline to detonate the explosive means and to impart an explosive jarring blow to the connection to be released; and
- said supporting means preventing downward release from the locking position during repeated jars with said wireline actuated jar to thereby assure that when the explosion detonates, it occurs in proximity to the connection to be released.

11. A method for locating and applying a jarring or hammering force to a threaded connection joining sections of a string of drill pipe, comprising:

- lowering a back-off apparatus having a wireline actuated jar through a drill string with a wireline;



releasing a locking support means with the back-off apparatus from a non-engaging position for lowering through the pipe string by manipulating the wireline;

engaging and releasably locking the support means with the back-off apparatus with a recess formed by a connection to prevent further lowering of the apparatus upon lowering of the wireline and to support the back-off apparatus with the connection to sustain repeated jars from the jar; and

manipulating the wireline for discharging an explosive with the back-off apparatus for exerting the explosive force to the support means and connection to impart a jarring or hammering force to the connection through the support means for effecting release of the threaded connection when a back-off torque is applied to the drill string.

4,007,791

METHOD FOR RECOVERY OF CRUDE OIL FROM OIL WELLS

Charles M. Johnson, Little Rock, Calif., assignor to J. Carroll Baisch, Whittier, Calif.

Filed Aug. 7, 1975, Ser. No. 602,900

Int. Cl.² F21B 43/22; E21B 43/24

U.S. Cl. 166—300

4 Claims

1. A method for recovery of crude oil from depleted oil wells, comprising:

- confining water and a solvent which will float on the water in the casing of an oil well;
- introduction of a chemical into the well casing which will pass through the solvent and reach the water and will react with the water to produce heat and pressure within the well to force the water and solvent out of the well casing and into the crude oil bearing formation into which

the well casing penetrates to thin out the crude oil in the formation and increase its fluidity; and releasing the



pressure in the well casing so that the thinned crude oil will enter the well casing.

4,007,792

HYDRAULIC FRACTURING METHOD USING VISCOSIFIED SURFACTANT SOLUTIONS

John J. Meister, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1976, Ser. No. 654,435

Int. Cl.² E21B 43/26, 43/27

U.S. Cl. 166—308

4 Claims

1. A method for fracturing a formation around a borehole comprising

- A. introducing a composition of matter comprising in admixture
 - a. a fluid consisting essentially of
 - aa. 10-90 weight percent of water,
 - bb. 90-10 weight percent of chloroform,
 - b. 1-5000 ppm of a cationic surfactant,
 - c. 1-5000 ppm of an anionic surfactant,
 - d. 50-20,000 ppm acid in a quantity sufficient to reach a pH of ≤ 4.5 in the aqueous phase, and
 - e. 50-20,000 ppm buffer salt in mol ratio of buffer salt to: acid component (d) in the range of 0.1:1 to 5:1, the ppm values being based on the combined weight of water and chloroform.
- B. raising the pressure in the borehole to a range in which the rock fractures,
- C. maintaining a pressure for a period of 1/2 hour to 6 hours,
- D. releasing the pressure, and
- E. removing the composition from the borehole.

4,007,793

FIRE FIGHTING APPARATUS

Fred M. Hux, 1816 Lewis St., and Thomas Hudson, 300 Howard Ave., both of Tarboro, N.C. 27886

Filed Aug. 25, 1975, Ser. No. 607,851

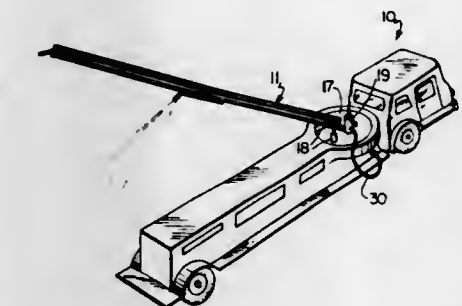
Int. Cl.² A62C 27/00; B05B 1/30, 1/12

U.S. Cl. 169—25

6 Claims

1. A fire fighting system mounted on relatively movable sections of an aerial ladder of a fire truck and comprising a first nozzle means mounted on one section of the ladder and a second nozzle means mounted on another section of the ladder, said first nozzle means including a first frame mounted on said one ladder section, a first elongated tubular member carried by said first frame, means for supplying water under pressure to one end of said first tubular member, a first nozzle mounting means movably connected to the other end of said first tubular member, first remotely controlled fluid operating means for moving said first nozzle mounting means in at least one direction, a first adjustable nozzle carried by said first

nozzle mounting means for discharging water under pressure, second remotely controlled fluid operating means for adjusting said first nozzle to vary the intensity of the water being discharged, said second nozzle means including a second frame mounted on the other ladder section in spaced relationship to said first nozzle means, a second elongated tubular member carried by said second frame, means for supplying water under pressure to one end of said second tubular member, a second nozzle mounting means movably connected to the other end of said second tubular member, third remotely controlled fluid operated means for moving said second nozzle



mounting means in at least one direction, a second adjustable nozzle carried by said second nozzle mounting means for discharging water under pressure, fourth remotely controlled fluid operating means for adjusting said second nozzle to vary the intensity of the water being discharged, whereby said first nozzle mounting means may be adjusted from a remote position to direct the water being discharged from said first nozzle to a first portion of a fire and said second nozzle mounting means may be adjusted from a remote position to direct the water being discharged from said second nozzle to another portion of the fire.

4,007,794

TOP DESICCATION OF CROP PLANTS

Ricks H. Plueneke, Forth Worth, Tex., and Willis G. Dykes, Vicksburg, Miss., assignors to Lasco, Inc., Vicksburg, Miss.

Filed Jan. 29, 1976, Ser. No. 653,542

Int. Cl.² A01M 21/00; A01D 91/00

U.S. Cl. 171—1

7 Claims

1. A method for facilitating the harvestability of a root crop, such as potatoes, beets, onions, carrots, and the like, comprising the steps of:

- a. allowing said root crop to substantially mature,
- b. contacting the above-ground portions of said root crop with a high-voltage source of electricity so that the above-ground portions of said root crop are desiccated but so that the tubular portions thereof are not harmed, and
- c. harvesting said root crop several days after contacting of the above-ground portions of said root crop with high-voltage electricity.

4,007,795

ATTACHMENT FOR A ROTARY-HAMMER TOOL

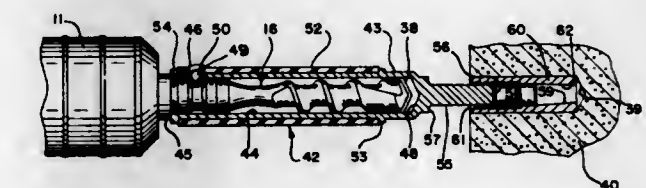
Alex F. Gawron, and William E. Dillon, both of Chicago, Ill., assignors to Skil Corporation, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 658,029

Int. Cl.² A01B 33/00

U.S. Cl. 173—50

16 Claims



1. An attachment in combination with a power hammer and an associated drill bit,

said hammer being of the type including a powered hammering mechanism,
 said hammer having a nose portion adjacent an opening arranged to receive the shank portion of said drill bit when the latter is operatively attached to the power hammer,
 a first formation adjacent said nose portion and accessible from the exterior of said hammer,
 said first formation being connected with said hammering mechanism such that the former receives impact blows developed by the latter,
 said attachment comprising,
 an elongated member having a longitudinally extending bore communicating with at least one end of said member thereby to receive said drill bit,
 said elongated member having a second formation adjacent said one end thereof in abutting engagement with said first formation such that hammer blows are transmitted to said elongated member longitudinally thereof and through the area of engagement of said first and second formations,
 said bore having an axial extent such that the end thereof remote from said one end of said elongated member is in spaced relationship with the working end of said drill bit when said first and second formations are in abutting engagement with each other,
 said elongated member including a special hammering formation at the other end thereof and adapted to perform a special hammering function upon operation of said power hammer, whereby said special hammering function may be brought about without removing said drill bit from the power hammer.

the firing circuit means including the first and second electrical conductors.

4,007,797

DEVICE FOR DRILLING A HOLE IN THE SIDE WALL OF A BORE HOLE

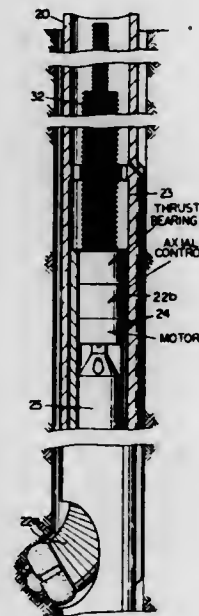
John D. Jeter, Iowa Park, Tex., assignor to Texas Dynamatics, Inc., Dallas, Tex.

Filed June 4, 1974, Ser. No. 476,328

Int. Cl.² E21B 7/08

U.S. Cl. 175—26

19 Claims



1. A device for drilling a hole in the side wall of an existing bore hole having an axis extending in a generally lateral direction from the longitudinal axis of the existing bore hole comprising: a housing for moving through the bore hole to the desired location for the lateral hole, said housing having a longitudinal bore and an opening, an inherently curved, resilient lateral drill string conductor located in the housing with a hollow drill bit rotatably attached to one end thereof, means for moving the conductor between a first position inside the longitudinal bore of the housing for movement with the housing through the bore hole to the desired location of the hole in the side wall, and a second position with a portion of the conductor bent so that it curves out of the opening in the housing to guide a drill string moving through the conductor and hollow bit to and into the side wall of the bore hole to drill a hole therein, a lateral drill string, a portion of its length being resilient, located in the housing, means to rotationally drive said hollow bit to drill an access hole for said conductor as said conductor extends from the first position to the second position, and means for moving the drill string through the conductor and hollow bit, from the housing to and into the earth when the conductor is in the second position to drill a lateral hole in the earth.

4,007,798

HYDRAULIC JAR

Imre I. Gazda, Saginaw, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

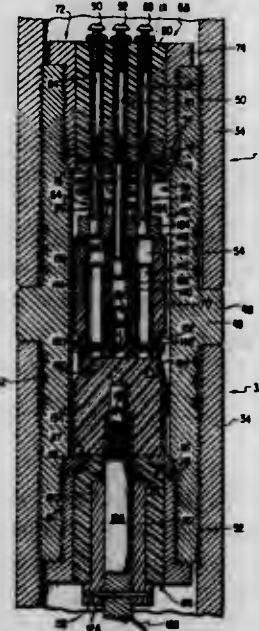
Filed Oct. 6, 1975, Ser. No. 619,852

Int. Cl.² E21B 1/10

U.S. Cl. 175—297

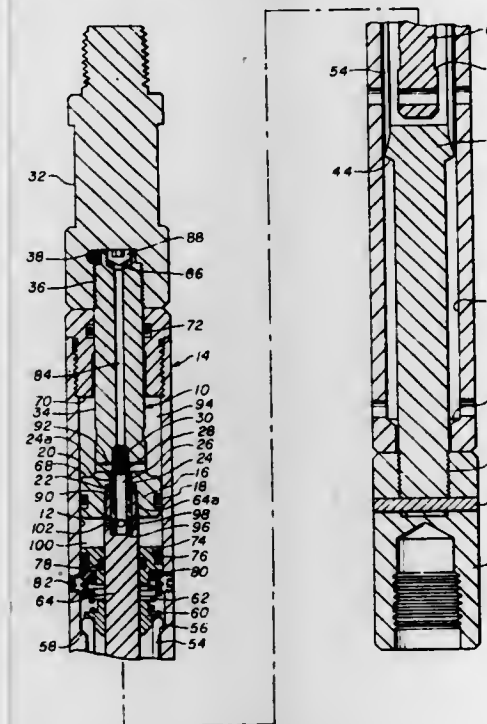
26 Claims

1. A hydraulic jar comprising:
 tubular housing means including a cage means portion, hammer means, and a cylinder means portion;
 piston means axially movable within said cylinder means portion;
 bleed passage means through said piston means;
 bypass passageway means through said piston means;
 check valve means in said bypass passageway means limiting flow to one direction therethrough;
 anvil means disposed within said cage means portion;



11. An explosively operated well tool comprising an elongate housing, runable into a well, carrying an electrically fireable explosive device having a pair of electrical terminals;
 firing circuit means including first and second elongate electrical conductors for electrically firing the device; means associated with the device for electrically separating the terminals from contact with the first and second electrical conductors thereby disarming the device; and means for arming the device in the well including means for placing the terminals of the device in circuit with

first sub means connected to said anvil means and adapted for connection to tool means;
 second sub means attached to said piston means and adapted for attachment to tool string means; and



means for releasably maintaining said housing means in a position with said hammer means spaced from said anvil means until said piston means moves to a select, extended position and then releasing said housing means to permit striking of said anvil means by said hammer means.

4,007,799

RAISE DRILL WITH REPLACEABLE STEM

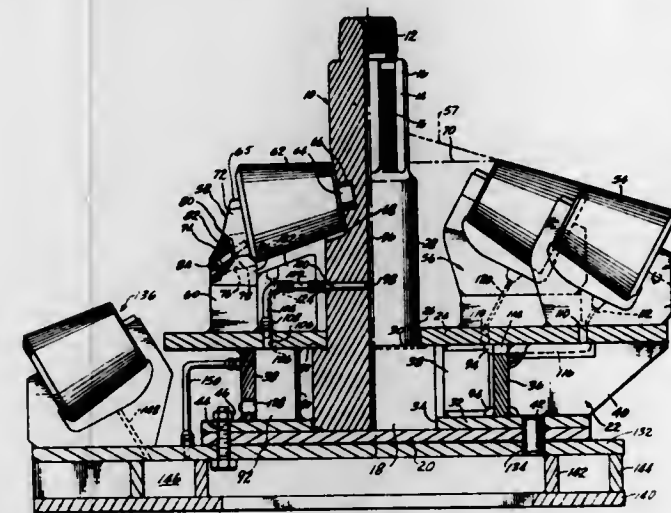
Robert L. Dixon, Brea, and Robert E. Allison, Whittier, both of Calif., assignors to Smith International, Inc., Irvine, Calif.

Filed July 7, 1975, Ser. No. 593,839

Int. Cl.² E21B 9/08

U.S. Cl. 175—340

18 Claims



1. A raise drill comprising:
 a drive stem having coupling means at the top end of the stem for connection to a drill string;
 a torque plate secured to the bottom end of the stem;
 an upwardly facing shoulder on the stem intermediate its ends above the torque plate;
 a cutter assembly including a frame plate having a central hole therein of diameter larger than said one end of the shaft but smaller than the shoulder, whereby the frame plate can fit on the end of the shaft and against the shoulder for transmitting only axial loads therebetween, and a plurality of mounting yokes mounted on the frame plate around the central hole each mounting yoke supporting a shaft and rotary cutter journaled on the shaft; and

detachable means securing the frame plate to the torque plate for transmitting torque from the stem through the torque plate to the cutter assembly.

4,007,800

FORCE MEASURING DEVICE

Walter Janach, Morges, and Peter Kipler, Jegenstorf, both of Switzerland, assignors to Haenni & Cie Aktiengesellschaft, Bern, Switzerland

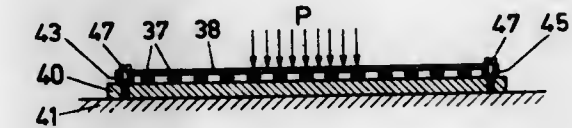
Filed July 15, 1975, Ser. No. 596,143

Claims priority, application Switzerland, July 17, 1974, 9922/74

Int. Cl.² G01G 5/04, 3/00

U.S. Cl. 177—209

3 Claims



1. A weight measuring device, comprising a base adapted to rest on the ground and having a plane upper face; an assembly of a plurality of regularly-spaced tubular spring elements arranged on said plane upper face of said base, said tubular spring elements being equal to each other in every respect, having a substantial elliptic cross-section, and being elastically deformable, and a smaller axis extending perpendicular to said base; a pressure transmitting plate having a plane lower face overlapping said assembly and contacting each of said tubular spring elements over its full length and being secured to the edges of said base and being adapted to be loaded by said weight for transmitting it to said tubular spring elements; a gauge, secured to one side of said base; connecting means, connecting the hollow insides of said tubular spring elements together and to said gauge; the system consisting of said tubular spring elements, said connecting means and said gauge being liquid tightly closed; a liquid completely filling said system; said gauge being adapted to measure a change of volume of said liquid in said gauge, resulting from a deformation of one or a plurality of said tubular spring elements upon application of said weight on said transmitting plate, said gauge being calibrated in units of weight and said deformations of said tubular spring element remaining in the linear domain of the spring characteristic of said tubular spring elements at least in the calibrated range of weight.

4,007,801

SUSPENSION FOR VEHICLES

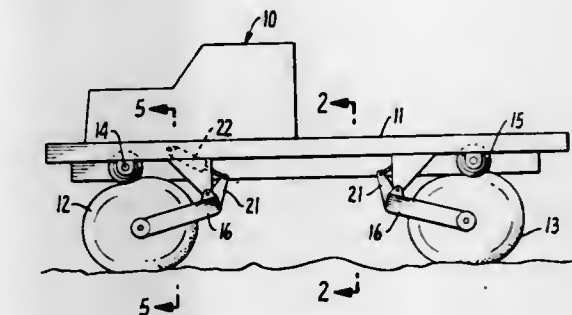
Charles R. Vincent, San Francisco, and William H. Albee, Pleasant Hill, both of Calif., assignors to Crowley All Terrain Corporation, San Francisco, Calif.

Filed Feb. 6, 1976, Ser. No. 655,864

Int. Cl.² B60K 23/00

U.S. Cl. 180—74

12 Claims



1. A vehicle for travel over off-road terrain, said vehicle having a frame; a fluid distensible roller engageable with the ground; means for rotatably mounting said roller to said frame while allowing relative vertical movement therebetween; a

support roll rotatably mounted to said frame and positioned generally above said roller to contact said roller and be supported thereon, the axis of said roll being parallel to the axis of said roller and positioned vertically offset by an angle between 5° and 19° measured from the vertical; means including a fluid cylinder for resiliently biasing said roller relative to said frame to maintain a preselected contact pressure between said roll and roller; and means for selectively adjusting the contact pressures between said roller and roll to accommodate the various road and operating conditions.

4,007,802

REMOTE CONTROL DEVICE FOR SAFETY HARNESS WEBBING WINDER

Daniel de Rosa, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault and Societe Anonyme dite: Automobiles Peugeot, Paris, both of, France

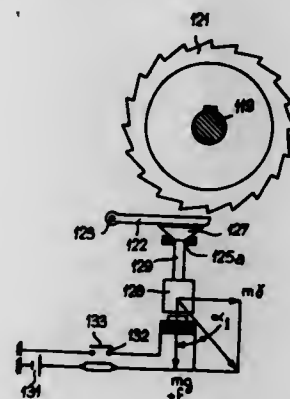
Filed July 17, 1975, Ser. No. 596,627

Claims priority, application France, July 24, 1974, 74.25687

Int. Cl.² B60R 21/00

U.S. Cl. 180—82 C

2 Claims



1. Electric remote control device for operating the winders of safety harness webbing of the type comprising a winder incorporating a webbing unwinding means and a member for locking said unwinding means mounted on a movable component of the vehicle body, an inertia member adapted mechanically to control said locking member and a solenoid adapted to be energized electrically, the electromagnetic force of said solenoid being adapted to modify temporarily the operation of said inertia member, this device being characterized in that said solenoid induces an electromagnetic force acting with a certain time-lag and substantially in the same direction as the gravity force applied to said inertia member.

4,007,803

EXPANDING DETONATION CHAMBER MULTI-SHOT GAS EXPLODER

Tom Patterson Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 19, 1976, Ser. No. 650,370

Int. Cl.² G01V 1/12

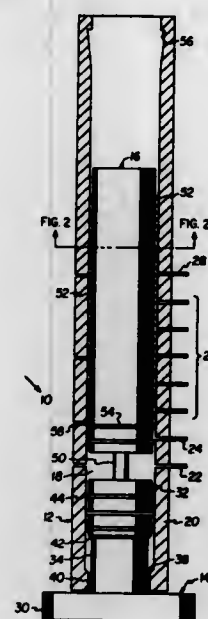
U.S. Cl. 181—117

8 Claims

1. A multi-shot seismic gas exploder comprising:

- a rigid upper and a rigid lower member disposed in telescoping relation so as to define an expansible enclosed combustion chamber therebetween;
- means for sequentially injecting a plurality of charges of combustible gas mixture into said combustion chamber at timed intervals; and
- means for separately igniting said plurality of charges to establish a like number of successive detonation fronts

within said combustion chamber during the continuous expansion thereof adapted collectively to separate said



upper and lower members in a single, noncyclic, vertical movement.

4,007,804

APPARATUS FOR REMOVAL OF CONDENSATION FROM A MARINE GAS EXPLODER DEVICE

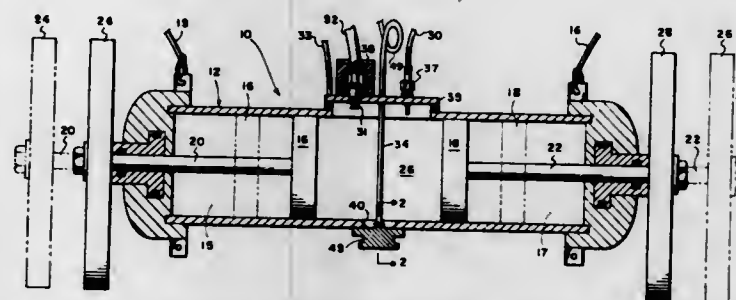
Jack E. Hardison, Garland, and Alpheus A. Franklin, Dallas, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 6, 1975, Ser. No. 619,926

Int. Cl.² G01V 1/02, 1/10, 1/38

U.S. Cl. 181—118

7 Claims



1. In a marine gas exploder having a combustion chamber formed within a vertically extending enclosed cylinder above a movable piston, said combustion chamber being charged with an explosive gas mixture adapted on ignition to produce gaseous and liquid combustion products, the improvement comprising:

- a sump formed within a face of said piston communicating with said combustion chamber and adapted to collect said liquid combustion products therein by gravity flow and
- an exhaust tube introduced within said combustion chamber, the lower end of said exhaust tube extending into said sump so that said gaseous combustion products flow through said sump into said lower end and said liquid combustion products are entrained therewith.

4,007,805

CAVITY PRODUCING UNDERWATER SOUND SOURCE

Rufus K. Reber, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1960, Ser. No. 5,565

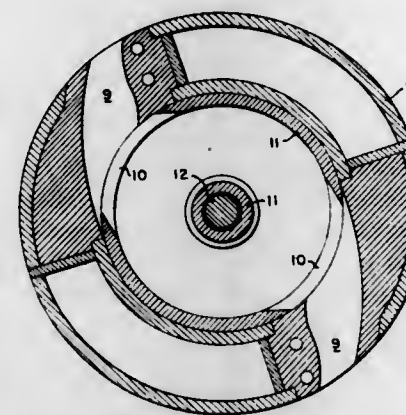
Int. Cl.² G01V 1/04, 1/38; H04B 1/30

U.S. Cl. 181—120

14 Claims

1. An acoustical source for minesweeping operations comprising a stator having outer and inner surfaces which are

surfaces of revolution and an open port connecting said outer and inner surfaces, an external rotor adapted to be rotated around said outer surface of said stator and having outer and inner surfaces which are surfaces of revolution with at least one open port of non constant cross-section connecting said



inner and outer surfaces, said port being substantially larger in cross-sectional area at said inner surface than its cross-sectional area at said outer surface and, said rotor having appreciably greater thickness between said inner and outer surfaces than said stator; and drive means for rotating said rotor at a predetermined speed.

4,007,806

HEATED STETHOSCOPE

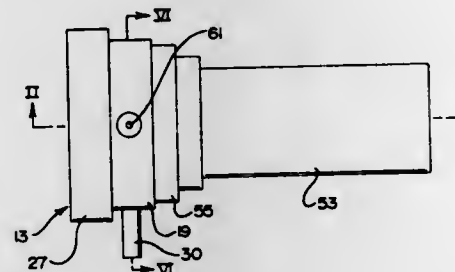
Eugene R. Nobles, Jr., 4184 Gwynne Road, Memphis, Tenn. 38117

Filed Apr. 7, 1976, Ser. No. 674,652

Int. Cl.² A61B 7/02

U.S. Cl. 181—131

12 Claims



1. A stethoscope for conveying sounds from within a patient's body to a medical examiner, said stethoscope comprising:

- head means for being selectively pressed against the patient's body, said head means including a body member having a hollow interior and having an opened end communicating with said hollow interior, said head means including a diaphragm member extending across said opened end of said body member for selectively contacting the patient's body to pick up sounds from within the patient's body;
- transfer means attached to said head means for transferring any sound picked up by said diaphragm member of said head means to the medical examiner;
- heating means mounted within said hollow interior of said body member of said head means substantially adjacent said diaphragm member thereof for heating said diaphragm member;
- a source of electrical power communicatively attached to said heating means for causing said heating means to heat said diaphragm member of said head means.

4,007,807

LADDER STABILIZER

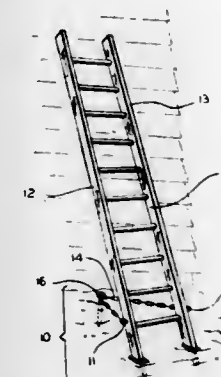
Kenneth W. Pogwizd, 16 W. 709 56th Place, Clarendon Hills, Ill. 60514

Filed May 27, 1975, Ser. No. 580,664

Int. Cl.² E06C 7/42, 5/36

U.S. Cl. 182—109

4 Claims



1. A universal ladder stabilizer system for straight ladders having side rails, comprising: anchor means, flexible connecting means, said flexible connecting means extending between a ladder and said anchor means; means to removably couple said connecting means to the side rails of said ladder; and slip preventing means, said slip preventing means fixedly attached at the lowermost portion of each said side rail, said slip preventing means comprising non-skid surface means at said lowermost portion of each said side rail to prevent slippage of said ladder on non-penetrable surfaces and alternatively positionable ladder prong means which are positionable directly under said non-skid surface means in abutment therewith to more effectively prevent slippage of said ladder on penetrable surfaces.

4,007,808

LINE SECURING DEVICE

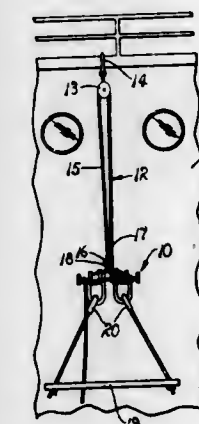
George R. Conley, and Gerald F. Conley, both of 2436 S. Holloway St., Fresno, Calif. 93725

Filed Jan. 8, 1975, Ser. No. 539,346

Int. Cl.² E04G 1/18

U.S. Cl. 182—142

4 Claims



1. In combination with a block and tackle assembly including a pulley block, adapted for attachment to a means of support, and a line, having a securing portion and a free portion, operably extended through the block and back upon itself, a line securing device comprising a rigid metal rod extended to form a substantially straight first portion, bent substantially normal to itself and then return bent to form a workload supporting first loop, extended back past the first portion and return bent to form a second loop to which the

securing portion of the line is adapted to be fastened, extended back past the first portion and return bent to form a workload supporting third loop laterally spaced from the first loop and bent substantially normal to itself to form a substantially straight second portion in substantial axial alignment with the first portion; a cross piece borne by the second loop of the rod in substantial axial alignment with the first and second portions of the rod and against which the free portion of the line is adapted to be constrained, the free portion then being looped over the first and second straight portions in succession to secure the line in supporting relation to a workload borne by the first and third loops; and a pair of line retaining rings, having spring closures, individually fastened on the rod between the first portion and the second loop and between the second loop and the second portion.

4,007,809

SYSTEM FOR HANDLING GOODS IN SELF-SERVICE SHOPS

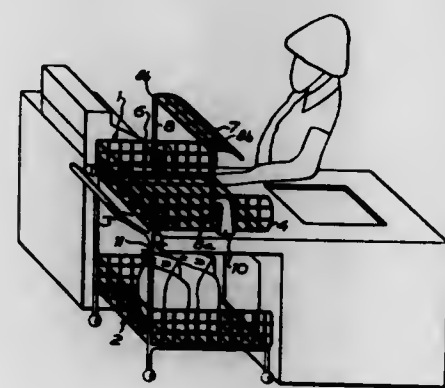
Pehr-Gunnar Heine Göransson, Malmö, Sweden, assignor to Bag System AB, Sweden

Filed Aug. 27, 1975, Ser. No. 608,180

Int. Cl.² A47F 10/00

U.S. Cl. 186-1 AC

4 Claims



1. A system for handling goods in self-service shops, comprising a shopping trolley and a cash counter, at least one basket, mounted on said trolley and consisting of a bottom and a plurality of side walls, mounting means for mounting one of said side walls of said basket for pivotal movement between a lowered closed position and a raised open position, means defining a compartment in said cash counter, corresponding to the size of said trolley and designed to receive said trolley, and control means, mounted on said cash counter for co-operation with said trolley to move said pivotable side wall from the lowered to the raised position as said trolley is introduced into said compartment, said mounting means comprising two levers, means for pivotally mounting said levers each on respectively one of two side walls of said basket, being adjacent to said pivotable side wall, and means for rigidly connecting said levers to said pivotable side wall, and in which said control means include arms for abutting and turning said levers and consequently entraining said pivotable side wall from lowered to raised position as said trolley is introduced into the compartment in said cash counter.

4,007,810

HEATER ASSEMBLY FOR A ROTATING CAFETERIA TYPE FOOD SERVICE COUNTER

Elmer R. Weddendorf, Cincinnati, Ohio, assignor to B/W Metals Company, Inc., Fairfield, Ohio

Filed Nov. 17, 1975, Ser. No. 632,459

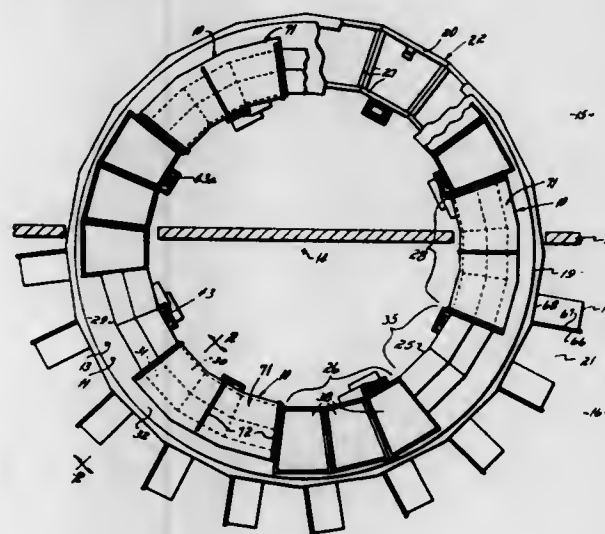
Int. Cl.² E04H 3/04

U.S. Cl. 186-1 R

7 Claims

1. A rotating cafeteria type food service counter apparatus having an improved overhead heater assembly, said apparatus comprising a generally circular food service counter adapted to rotate

about a fixed center axis, said counter including a counter top adapted to receive food in a hot food section; at least two step sections provided on said counter top in said hot food section, a plurality of infrared type radiant heater rod elements disposed generally concentrically relative to said fixed center axis above said hot food section, the number of said heater rod elements being at least equal to the number of step sections in said hot food section, and each of said rod elements extending from one end to the other of said hot food section, a plurality of radiant heat reflectors, one of said radiant heat reflectors being positioned above each of said heater rod elements to direct the radiant heat onto said step sections, at least two of said radiant heat reflectors being configured to focus radiant heat on the same portion of said counter top,



at least one light bulb adapted to illuminate the food in said hot food section, said light bulb being positioned in a light bulb channel interposed between two of said concentric heater rod elements, said light bulb being separately controlled relative to said heater rod elements, said heater rod elements, heat reflectors and light bulb being combined in a single overhead unit, a separate control switch in an electric circuit for each of said heater rod elements, said separate control switches permitting each of said heater rod elements to be energized as desired by an operator to vary the amount of radiant heat focused on different portions of said hot food section, and structural arm means connecting said overhead unit and said counter top.

4,007,811

CONTROL FOR ELEVATOR

Yasuhiko Ozawa, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 24, 1975, Ser. No. 552,206

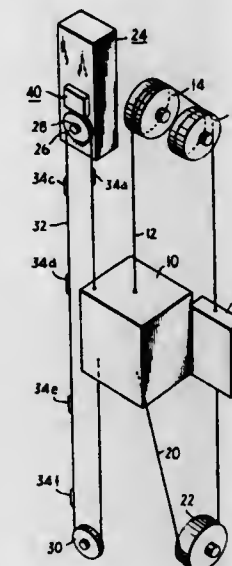
Int. Cl.² B66B 1/40

U.S. Cl. 187-29 R

3 Claims

1. In combination with an elevator car operable upwardly and downwardly, a control device for controlling the accurate stopping of the elevator at the various floors comprising, a flexible strip carrier movable longitudinally in opposite directions synchronously and directly proportional to the upward and downward travel of the elevator and in response to said travel, means on said strip carrier comprising floor-indicator elements spaced apart thereon at distances corresponding to distances the elevator car must travel between floors and be stopped accurately at the level of said floors and travelling with said strip carrier, sensing means at a sensing position detecting the arrival of said floor-indicator elements at said sensing position for developing a command signal to stop said elevator car upon sensing and detection of individual floor-

indication elements at said sensing position, thereby to land said elevator car accurately on the floor corresponding to the floor-indication element, and means for automatically moving the sensing means away from said sensing position and to



restore said sensing means to said sensing means when a sensing of the floor-indication elements is to take place in dependence upon impending arrival of said car at a floor corresponding to a given floor-indication element and whose arrival at said sensing position is impending.

4,007,812

ELEVATOR SYSTEM

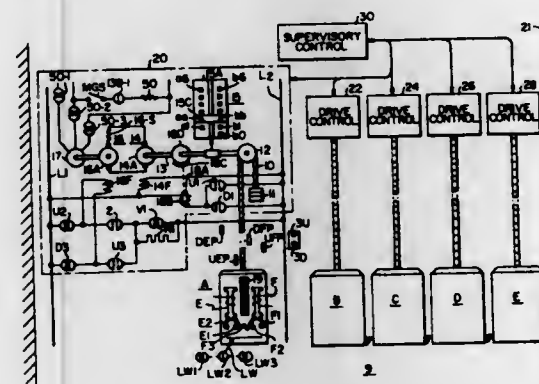
Clarence W. Nelson, Jr., Park Ridge, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 7, 1975, Ser. No. 593,815

Int. Cl.² B66B 1/18

U.S. Cl. 187-29 R

11 Claims



1. An elevator system, comprising: a building having a plurality of floors, means dividing the floors of said building into at least first, second and third zones, at least four elevator cars, means mounting said elevator cars for movement in the building to serve the floors, call registering means for registering calls for elevator service, demand means for registering a plurality of demands for elevator service in response to predetermined conditions, availability means conditioning each of the elevator cars in response to predetermined conditions to be available for assignment, means providing a plurality of graded assignment levels in each of said first, second and third zones, with an elevator car entering the highest vacant assignment level of the zone it is located in when it becomes available, and assignment means assigning available cars to demands registered by said demand means, with the available car assigned to each demand being selected in a predetermined

order from available cars in the graded assignment levels of all of the zones, with the predetermined selection order being responsive to the specific demand.

4,007,813

DRUM-TYPE SERVICE AND EMERGENCY BRAKE

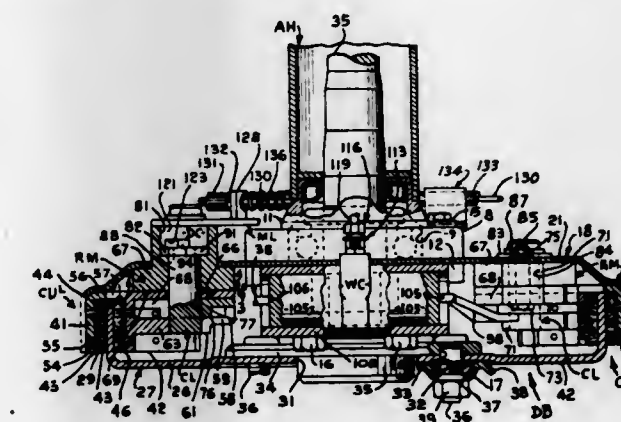
Glenn Talley Randol, 3 E. 2nd Ave., Mountain Lake Park, Md. 21550

Filed Dec. 10, 1974, Ser. No. 531,242

Int. Cl.² F16D 53/00

U.S. Cl. 188-76

12 Claims



1. A drum-type brake for motorized vehicular equipment, having a drum provided with a peripheral braking flange defining opposed outer and inner friction faces and corotatable with a vehicle road wheel, a stationary support member mounted on a portion of the vehicle, a caliper unit characterized by radial-operating outer and inner lined brake shoes in circular ring sector profile which straddle-mount the drum's flange to brake the same, wherein the improvement comprises structure defining: reciprocal mechanism including a pair of interfitting members connected to said shoes, respectively, and movable relative to each other to draw said shoes toward each other into frictional braking engagement with the friction faces, respectively, on said drum's flange, a rotatable shaft journaled in said mechanism, a rotatable cam-lever carried on the inner end of said shaft and having operative interposition with respect to confronting working portions on said interfitting members, respectively, to force the latter apart and thereby drawing said shoes into braking engagement as aforesaid, and an elongated arm projecting from said cam-lever; a wheel-cylinder having a piston engageable at one end with the free end of said cam-lever arm to rotate the same in one direction, a variable pressure control chamber continuously communicating with the other end of said piston, a source of pressurized fluid communicable with said control chamber to operatively energize said piston to effect service braking, a normally compressed spring operably disposed in said control chamber to continuously react on said piston to maintain said shoes in nonbraking contact with the friction faces, respectively, on the drum's flange when the brake is in released condition whereby a high level of frictional coefficient is maintained by wiping away materials having a friction-reducing effect, and automatic take up is effected by said spring to compensate for lining wear to prevent delayed braking action; a manually-operated lever journaled on the outer end portion of said shaft exteriorly of said support member; a one-way mechanical drive operably incorporated between the outer end portion of said shaft and manual lever whereby the latter is effective to rotate said shaft in said one direction; and a manual control mechanically-linked to the free end of said manual lever to rotate the same and shaft-connected cam-lever to effect emergency (parking) braking in cooperation with or independently of operative energization of the wheel-cylinder piston to effect service braking.

4,007,814

CARBON BRAKE DISK WITH CAST KEYSLOT REINFORCEMENT MEMBERS

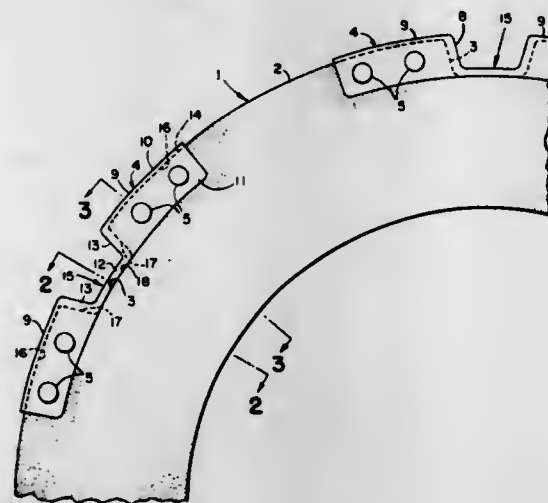
Robert E. Berger, North Canton, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Feb. 5, 1976, Ser. No. 655,582

Int. Cl.² F16D 65/12

U.S. Cl. 188—218 XL

12 Claims



1. A brake disk comprising:
 - A. an annular friction disk means of carbon based material having;
 1. a plurality of substantially U-shaped keyslots spaced around one periphery of the disk and extending transversely therethrough;
 - B. a plurality of cast keyslot reinforcement members fixedly attached to the disk means at said keyslots each member having;
 1. a substantially U-shaped center portion substantially conforming to the contour of the keyslot and in intimate contact therewith;
 2. a pair of channel shaped end portions integrally formed with the center portion and receiving within the channel of each end portion, a portion of the sides and periphery of the disk means adjacent to each side of the keyslot, the walls of the end portions intimately contacting the disk means;
 3. at least part of the walls of the center portion being substantially thicker than the walls of the end portions;
 - C. means fixedly attaching the keyslots to the disk means.

4,007,815

RELEASABLE LOCK FOR BRAKES

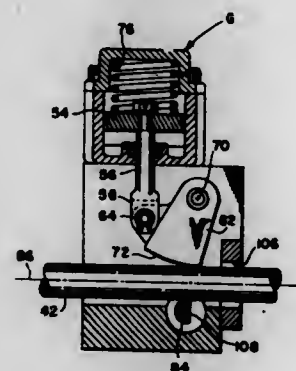
Leon R. Acre, Ovid, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 12, 1975, Ser. No. 640,175

Int. Cl.² B60T 17/16

U.S. Cl. 188—265

4 Claims



1. A locking device for a reciprocating rod brake actuator movable between brake applying and brake releasing positions, said locking device including a pivoted pawl having a

pawl surface engageable with said rod by moving in an arcuate path toward and away from said rod between rod locking and releasing positions, said pawl in said locking position thereof being in engagement with said rod for releasably locking same against movement in a direction from said brake applying position toward said brake releasing position while providing free movement thereof in a direction from said brake releasing position to said brake applying position, yieldable biasing means for normally biasing said pawl to said locking position, fluid pressure means operative when pressurized for moving said pawl to said releasing position against the force of said biasing means, pressure relief means for selectively relieving pressure in said fluid pressure means, and selectively operable releasing means separate from said fluid pressure means and located generally on the opposite side of said rod from said pawl for releasing said rod for movement from said brake applying position to said brake releasing position when said pawl is in said locking position by moving said rod away from and out of engagement with said pawl.

4,007,816

PORTABLE SALVAGE LIFT APPARATUS

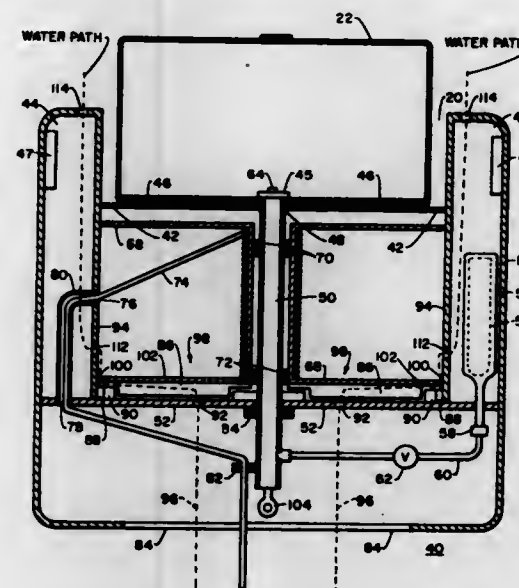
John H. Bayles, and Theodore J. Roster, both of Oxnard, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 505,815, Sept. 13, 1974, Pat. No. 3,940,814. This application Aug. 28, 1975, Ser. No. 608,436

Int. Cl.² B16D 57/06

U.S. Cl. 188—290

6 Claims



1. A braking apparatus for imparting a slowing force to a rotating member located underwater comprising:
 - a water pump having a housing inlet means, restricted outlet means and an impeller rigidly connected to said rotating member whereby the water passing through said water pump exerts a slowing force on said rotating member due to forces created on said impeller when said water pump attempts to expel water through said restricted outlet means, said impeller including impeller blades rigidly attached to a flange that is rigidly attached to said rotating member, said flange forming an upper portion of said water pump housing, said upper portion of said water pump housing being capable of rotating with respect to a lower portion of said water pump housing.

4,007,817

ROADWAY FOR SUPPLYING POWER TO VEHICLES AND METHOD OF USING THE SAME

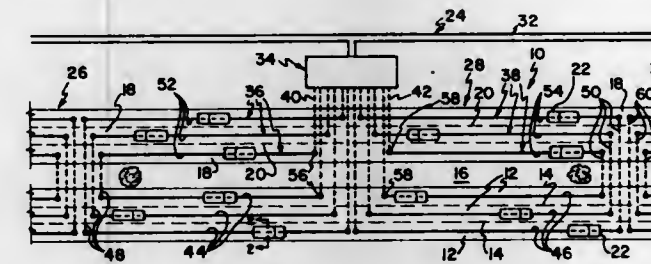
John G. Bolger, Jr., 460 Tahos Road, Orinda, Calif. 94563

Continuation of Ser. No. 345,332, March 27, 1973, abandoned, which is a continuation of Ser. No. 146,213, May 24, 1971, abandoned. This application Jan. 9, 1974, Ser. No. 431,924

Int. Cl.² B60J 9/00

U.S. Cl. 191—10

8 Claims



1. A roadway having a surface layer of traffic bearing material, a first lane for traffic moving in a first direction, a second lane for traffic moving in the opposite direction, and means for inductively coupling power to vehicles on the roadway comprising
 - a power supply,
 - a power source having one section for coupling energy to vehicles moving in the first direction and another section for coupling energy to vehicles moving in the opposite direction, each power source section comprises a source core having a central section in the traffic bearing material and a pair of lateral sections adjacent the surface of the traffic bearing material providing a recess therein, and a source conductor disposed in the recess, and means connecting the ends of the source conductor in circuit with the power supply for passing electrical energy through the power source.

4,007,818

NEW OR IMPROVED TORQUE LIMITING CLUTCH

Olaf John Barclay Orwin, Birmingham, England, assignor to Gib Precision Limited, Cirencester, England

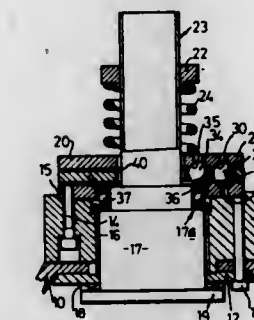
Filed June 12, 1975, Ser. No. 586,279

Claims priority, application United Kingdom, June 13, 1974, 26229/74; Apr. 5, 1975, 14050/75

Int. Cl.² F16D 43/20

U.S. Cl. 192—56 R

20 Claims



1. A torque limiting clutch comprising opposed first and second members mounted for relative rotational and axial movement, a third member positioned between and mounted for rotational movement relative to the first and second members and for axial movement relative to at least one of the first and second members, the third member being provided with a torque transmitting element receiving aperture, a torque transmitting rolling element being positioned in the aperture in the third member, the first member comprising a driven member and being provided with a torque transmitting abutment for torque transmitting engagement with said torque transmitting element, another of said members comprising a driving member and being provided with a torque transmitting

abutment for torque transmitting engagement with said torque transmitting element, resilient loading means to bias resiliently the first and second members towards one another and the arrangement being such that when the clutch is transmitting torque the torque transmitting element is engaged with a driving member abutment and a driven member abutment so as thereby to prevent relative rotation between the driving and driven members and so that, on the torque to be transmitted exceeding a predetermined value, the torque transmitting element dis-engages from the abutment of at least one of the driving and driven members to permit of the members rotating relative to one another and including a spacer element received in an opening in the third member and positioned between a first track axially located relative to one of the members and a second track axially located relative to another one of the members, a spacer element receiving means provided on at least one of the tracks and of such dimensions as to maintain the spacer element out of pressure contact with the tracks during torque transmittal so as to ensure the torque transmitting element is maintained in pressure contact with the driven and second members, and a torque transmitting element receiving means provided on one of said driven and second members, whereby on disengagement of the torque transmitting element from the torque transmitting abutment in the driven member the third member is caused to rotate relative to the driven member and hence cause circumferential movement of the spacer element out of the spacer element receiving means and subsequently to cause the torque transmitting element to be engaged and maintained within the torque transmitting element receiving means with the driven and second members spaced apart by the spacer elements, the torque transmitting element receiving means being of such dimensions that the torque transmitting element is maintained out of pressure engagement with the driven and second members and relative rotation between the driving and driven members is permitted when the torque transmitting element is engaged in the torque transmitting element receiving means, and wherein there are means operative only during re-setting of the clutch to move the torque transmitting element into engagement under pressure with the member of the first and second members which is unprovided with a torque transmitting element receiving means.

4,007,819

FAN DRIVE FLUID CIRCULATION APPARATUS

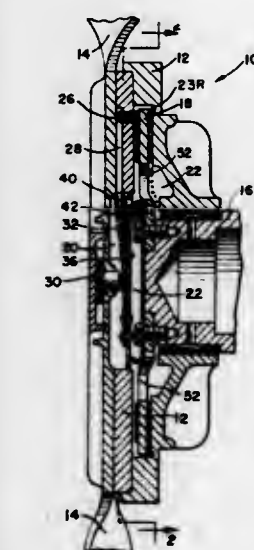
Raymond James Maci, Indianapolis, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed June 20, 1975, Ser. No. 588,692

Int. Cl.² F16D 35/00, 43/25

U.S. Cl. 192—58 B

5 Claims



1. A viscous fluid fan drive assembly of the type adapted for use with the cooling system of an internal combustion engine, the fan drive assembly including a housing, the housing including a chamber, the chamber being divided by a partition into

a driving chamber and a reservoir chamber, a rotary drive disc received within the drive chamber and secured to a shaft rotatably mounted within the housing, at least one aperture in the drive disc, a viscous shear liquid within at least one of said driving and reservoir chambers, a fluid passageway between the radially outermost portion of the driving chamber and the reservoir chamber, a fluid port in the said partition, thermally responsive means for regulating the amount of shear liquid passing through the fluid port of the partition, the improvement comprising deflector means carried by the said drive disc to direct shear liquid from said reservoir chamber through the said drive disc aperture to the rear face of said drive disc when said fluid port is at least substantially closed, said deflector means extending at least partially axially of said disc aperture.

4,007,820

WHEEL HUB CLUTCH

Tooru Kagata, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

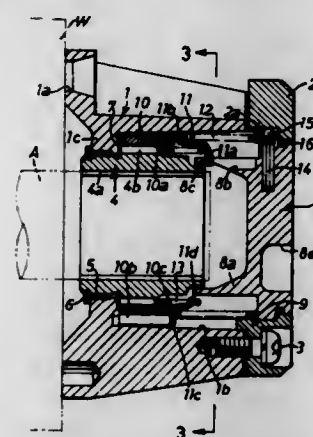
Filed July 28, 1975, Ser. No. 599,715

Claims priority, application Japan, Aug. 6, 1974, 49-90618

Int. Cl.² F16D 11/04

U.S. Cl. 192-67 R

5 Claims



1. A wheel hub clutching mechanism comprising:
 - a body provided therein with internal splining and to be attached to a wheel hub;
 - a pinion journaled within said body to be mounted on a driveable axle and provided thereon with external splining;
 - a clutch ring splined to said body and axially movable from a free position in which it is disengaged from said pinion to a lock position in which it is engaged with said pinion;
 - a follower ring splined to said body and engaged with said clutch ring;
 - a compression coil spring assembled within said body to urge said follower ring toward said clutch ring and urge said clutch toward the lock position;
 - manually operated cam means movable in one direction to retract said follower ring against the urging force of said compression spring to move said clutch ring to the free position and movable in the opposite direction to permit said follower ring to move said clutch ring to the lock position by the urging force of said compression spring; and
 - a connecting coil spring disposed radially concentrically with said compression spring for resiliently connecting said clutch ring with said follower ring, said spring having a substantially constant length during both the lock and free positions of said mechanism.

4,007,821

CONCRETE DELIVERY APPARATUS

Richard A. Schiffelbein, 3727 SE. 21st St., Topeka, Kans. 66605

Filed May 5, 1975, Ser. No. 574,745

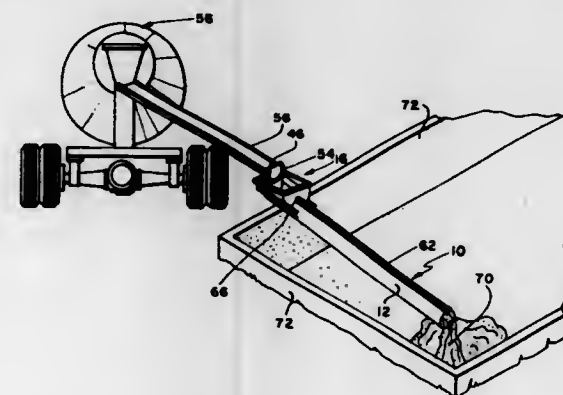
Int. Cl.² B65G 11/02

U.S. Cl. 193-4

1 Claim

1. A concrete delivery accessory for use with the discharge

chute of conventional concrete mixer trucks comprising an elongated tubular member having an inlet and an outlet respectively at its front and rear ends, said inlet end of the tubular member being integrally and sealingly fixed to and opening into the rear end of an upstanding and open-topped rigid hopper having a bottom wall, said tubular member being of circular cylindrical configuration with a semicylindrical forwardly projecting extension thereof constituting the bottom wall of the hopper, said bottom wall having a semicircular forward edge sealingly secured to an upstanding front end wall, said hopper including a rear end wall sealingly secured to the front end of the tubular member and projecting upwardly therefrom, said hopper additionally including a pair of upwardly divergent side walls having front and rear edges seal-



ingly secured to the front and rear walls of the hopper and also having lower edges sealingly secured to upper edges of the semicylindrical bottom wall, said tubular member and the semicylindrical extension thereof having interiors entirely free of obstructions whereby gravitational flow of material from the hopper to the tubular member is subject to only minimal opposition, means carried by the hopper for detachably suspending the same from a concrete delivery chute, said front, rear and side walls having upper edges that terminate in a rectangular configuration in a common plane that is forwardly and downwardly inclined relative to the tubular member, and said means for suspending the hopper comprising an elongated flexible element having one end secured to one side of the hopper and its other end detachably secured to the other side of the hopper.

4,007,822

STRAND GUIDING MEANS TO BE USED IN A CONTINUOUS CASTING PLANT

Werner Scheurecker, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 19, 1976, Ser. No. 668,587

Claims priority, application Austria, Mar. 25, 1975, 2266/75

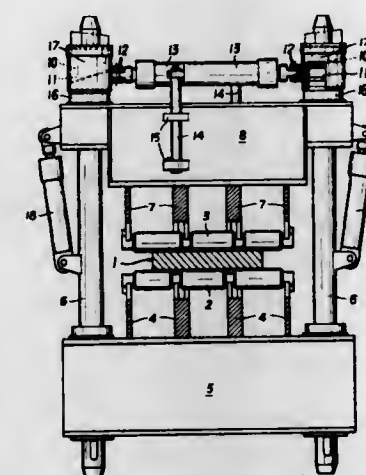
Int. Cl.² B22D 11/12

U.S. Cl. 193-35 R

6 Claims

1. A strand guiding means to be used in a continuous casting plant comprising:
 - at least one first framing part;
 - at least one second framing part, the at least one first framing part and the at least one second framing part being arranged in pairs opposite each other;
 - drawing anchors connecting said at least one first framing part and said at least one second framing part;
 - strand guiding rollers supported by said at least one first framing part and said at least one second framing part;
 - bushing means for each of said drawing anchors adjacent said second framing part, each of said bushing means including an outer bushing fixedly connected to the drawing anchor and an inner bushing supported on said second framing part, said outer bushing and said inner bushing having corresponding mating helical sliding faces with an angle of inclination smaller than the pertaining angle of friction; and

a pressure medium cylinder for each of the bushing means arranged to rotate said inner bushing relative to said outer



bushing, whereby said second framing part is movable to bring the strand guiding rollers accommodated thereby into and out of engagement position.

4,007,823

TYPEWRITER CORRECTION MATERIAL EMPLOYING ADHESIVES

Victor Barouh, 935 Plum Tree Road West, Westbury, N.Y. 11590, and Robert Glenn, 70-20 108th St., Forest Hills, N.Y. 11375

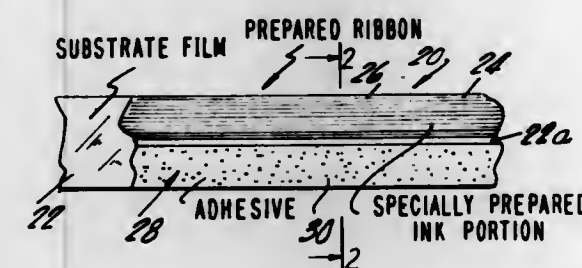
Filed July 5, 1973, Ser. No. 376,886

The portion of the term of this patent subsequent to Aug. 14, 1990, has been disclaimed.

Int. Cl.² B41J 29/16

U.S. Cl. 197-181

3 Claims



1. Typewriter correction material comprising a base strip of thin light transmitting non-inked material, spaced parallel coatings of adhesive on said base strip, a correction strip comprising an elongated strip of material coated with an adhesive material, a transfer strip of fluid impervious thin plastic material coated with a transfer material, said correction strip and said transfer strip being bonded to said base strip by said parallel coatings, a light transmitting wax like coating overlying said adhesive material and said transfer material, and wherein said transfer strip and said correction strip are arranged in spaced parallel relationship with said transfer strip and said correction strip each being arranged along a respective edge of said base strip with a central light transmitting window therebetween for facilitating proper alignment for correction of typewritten impressions.

4,007,824

DEVICE FOR EQUALIZING THE SPACING OF SUCCESSIVE STREAM-FED PRINTED PRODUCTS

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed May 6, 1975, Ser. No. 574,941

Claims priority, application Switzerland, May 28, 1974, 7235/74

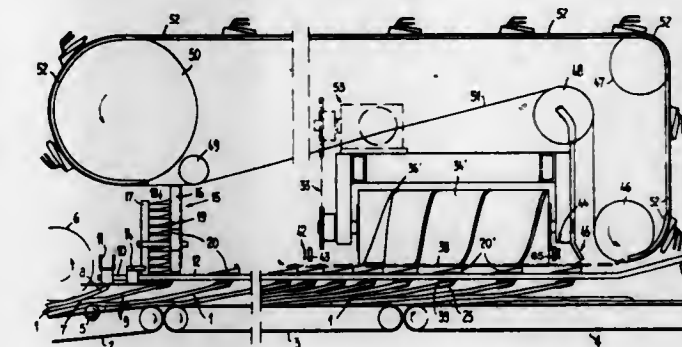
Int. Cl.² B65G 47/31

U.S. Cl. 198-462

12 Claims

1. A device for equalizing the distance between the leading

edges of successive printed products in an imbricated stream of such products, said device comprising transport means defining a transport path for the products; a plurality of spacers, each comprising driving stop means, leading abutment means and trailing abutment means; guide means for guiding said spacers in a freely movable manner in a path parallel to said transport path; storage means for storing said spacers in overlying relation and for directly delivering the lowermost of



said spacers to said guide means when the driving stop means of said lowermost spacer is engaged by the leading edge of a printed product, whereby each delivered spacer is pushed by the printed product along said guide means; and brake means disposed at a distance downstream of said storage means for ensuring that each spacer abuts with its leading abutment means against the trailing abutment means of the preceding spacer.

4,007,825

VIBRATORY PARTS FEEDER DRIVEN BY ROTATING ECCENTRIC WEIGHTS

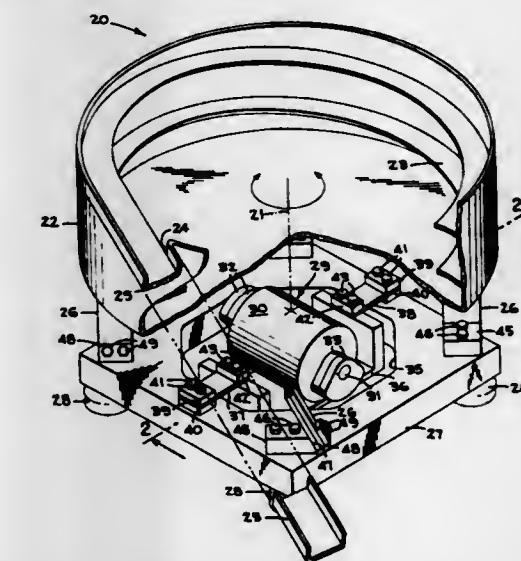
William V. Spurlin, Indiana, Pa., and Patrick J. Carroll, Up-land, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Aug. 5, 1975, Ser. No. 602,060

Int. Cl.² B65G 27/00

U.S. Cl. 198-770

11 Claims



1. A vibratory parts feeder with a central vertical axis comprising a base mass being supported upon vibration isolators, a feeder bowl mass being supported above the base mass, a plurality of inclined leaf springs having one end of each spring connected to the base mass and the opposite end of each spring connected to the feeder bowl mass for supporting and guiding the feeder bowl mass above the base mass, said leaf springs being arranged to move one of the masses vertically in response to rotational twisting of one of the masses relative to the other mass about the central vertical axis, a driver being mounted on one of the masses and having a substantially horizontal shaft with a plurality of eccentric weights mounted at the end portions of the shaft for rotation therewith, a plurality of directional constraints supporting said driver for trans-

mitting to the mass upon which the driver is mounted horizontally acting forces and isolating from that mass vertical acting forces to impart to that mass oscillating rotational impulses about the central vertical axis of the feeder.

4,007,826

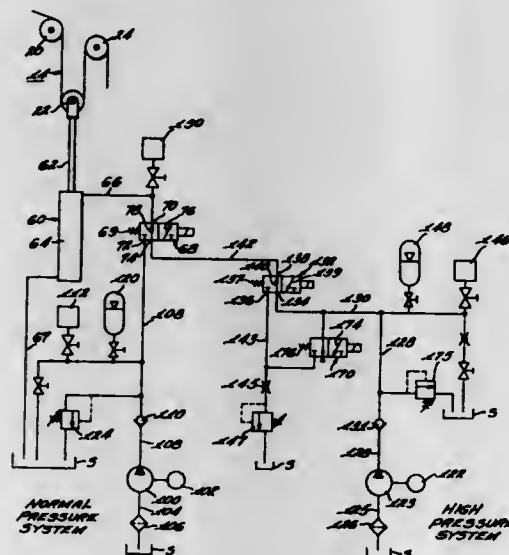
DUAL PRESSURE TAKE-UP APPARATUS AND SYSTEM FOR DUAL BELT CONVEYOR-ELEVATOR

Scott L. Brown, Jr., and Klaus Bremer, both of Aurora, Ill., assignors to Stephens-Adamson, Inc., Aurora, Ill.

Filed Apr. 2, 1976, Ser. No. 673,201
Int. Cl.² B65G 15/30

U.S. Cl. 198-813

23 Claims



1. A dual belt conveyor-elevator for conveying loose bulk material from one level to a higher level, comprising first and second endless belt conveyors extending between respective pairs of pulleys disposed contiguous the respective levels and providing for each conveyor a forward run and a return run, the forward run of the first belt conveyor including an upwardly facing substantially horizontal entry portion, the forward run of the second belt conveyor including a downwardly facing entry portion defining with a portion of said entry portion of said first belt conveyor a bight between the conveyors to receive loose bulk material therebetween and to be elevated thereby, the respective forward runs of said first and said second belt conveyors being normally maintained in fact-to-face edge sealing engagement substantially from the region where the loose bulk material is received between said belt conveyors at said bight to a discharge of said belt conveyors at said high level, and means for applying two different tensioning modes to said first belt conveyor including a first tensioning mode in which a normal tension is applied to said first belt conveyor during normal operation of said dual belt conveyor-elevator, and a second tensioning mode in which a substantially higher tension than said normal tension is applied to said first belt conveyor effective substantially immediately upon loss of motive power to said conveyor-elevator, whereby to substantially prevent accumulation of slack in said first conveyor belt upon said loss of motive power and thereby minimizing spillage of material from between said belt conveyors upon said loss of motive power.

4,007,827

MODULAR CONVEYOR

David W. Mattos, 1501 Stone Creek Drive, San Jose, Calif. 95132

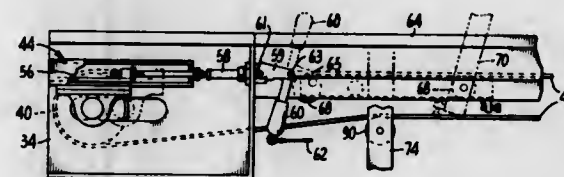
Filed May 22, 1975, Ser. No. 580,048
Int. Cl.² B65G 15/60

U.S. Cl. 198-862

4 Claims

1. A conveyor comprising
 - a. a frame,
 - b. a drive roller mounted at one end of the frame,

- c. a driven roller mounted at the other end of the frame movable toward the drive roller,
- d. a belt entrained over said rollers for conveying material,
- e. incremental adjusting means for moving the driven roller toward the drive roller by an incremental distance to shorten the length of the belt path by a predetermined distance, and
- f. a plurality of support rollers supporting the top course of the belt, and elevational adjusting means for moving at least one of said support rollers to an elevated position increasing the length of the belt path by a distance equal



to said predetermined distance and for lifting the belt clear of said non-elevated support rollers while maintaining it in driving contact with said drive and driven rollers whereby easy access for cleaning is thereby provided, the elevational adjusting means for said one support roller including a pair of arms connected at one end to said roller and pivotally connected at the other end to said frame for pivotal motion in the direction of travel of the upper belt course and through an angle between 90 degrees and 135 degrees whereby the pressure exerted by the belt retains said one support roller in its elevated position.

4,007,828

CONTAINER AND CLOSURE

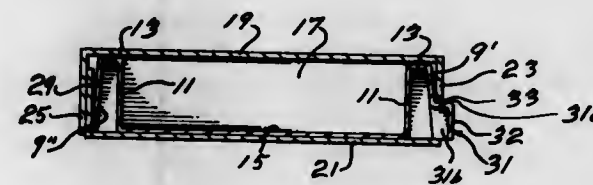
Edward Mayled, 133 Duke of Kent, Pointe Claire, Quebec, Canada

Filed Dec. 23, 1974, Ser. No. 536,923

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Int. Cl.² B65D 5/38, 13/06

U.S. Cl. 206-1.5

4 Claims



1. An improved package comprising a container and an enclosure having at least one open end; the container adapted to be inserted into the enclosure through the at least one open end thereof; the container and the enclosure being of substantially equal dimensions and having cooperating means on at least one pair of adjacent walls, the cooperating means comprises projection means situated on at least one wall of the container and retaining means located in at least one adjacent wall of the enclosure, the projection means including a continuous surface portion extending outwardly therefrom, the retaining means comprising an opening situated in at least one side wall of the enclosure, the continuous surface portion of the projection means adapted to releasably engage edges of one of the at least one opening forming the retaining means, whereby engagement between the continuous surface portion and the edges of one of the at least one opening provide a positive connection between the projection means and the retaining means whereby depression of the projection means out of engagement with the retaining means must be effected in order to disengage the cooperating means.

4,007,829

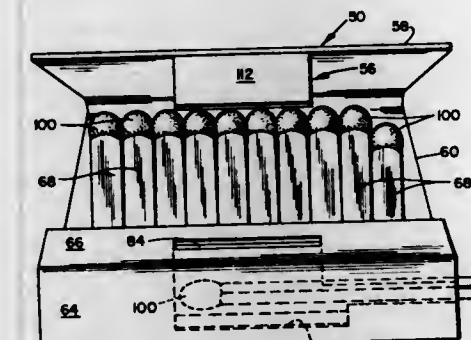
SAFETY MATCH PACK

Danny W. Earnhardt, Rte. 7, Box 32, Hickory, N.C. 28601
Filed Nov. 13, 1975, Ser. No. 631,645

Int. Cl.² A24F 77/00

U.S. Cl. 206-108

7 Claims



4. In a safety match pack, having a cover formed with a back cover portion and a front cover portion folded over the back cover portion and a group of matches arranged between said front and back cover portions and attached to said cover, said front cover portion being selectively displaceable between a raised position to provide access to the matches in said group and a closed position covering said group of matches, the improvement comprising an ignition chamber positioned on said cover composed of a body formed separately of said cover and fixed to the back cover portion, a passageway formed in said body and opening at its outer end at an outer wall surface of said body to provide for the partial head first insertion of a match to be ignited into the chamber, a striking surface in the chamber offset from the line of entry of a match in the said chamber by way of said passage, a slot in said body opening into said chamber, and a means for effecting contact between the striking surface and the match head in the chamber comprising a member affixed to said front cover portion and located to extend through said slot to engage and press the match head into the chamber against said striking surface upon selectively displacing the front cover portion to the closed position.

ing cushioning pockets along the outer surface of each of said main panels.

4,007,831

CARTRIDGES CONTAINING SELF-SETTING MIXES

Frederick William Bernhardt, 39 Algernon St., Oatley, New South Wales 2223, Australia

Continuation of Ser. No. 371,653, June 19, 1973, abandoned.

This application Oct. 8, 1975, Ser. No. 620,602

Int. Cl.² B65D 25/08, 31/12

U.S. Cl. 206-219

8 Claims



1. A cartridge containing first and second inter-active components of a self-setting mix, said cartridge comprising a first container filled with a first component of said self-setting mix so that first container assumes a generally circular cross-sectional shape, said cartridge further comprising a second container partially filled with a second component of said self-setting mix such that said partially filled second container assumes a generally convex outer surface and a generally concave inner surface, said containers extending longitudinally and lying in a side-by-side relationship, said second container being formed into a generally convex-concave shape with said second container being positioned against a circumferential portion of said first container and adhesive means contacting said containers to join said containers to form a cartridge.

4,007,832

ELECTRONIC THERMOMETER

Seymour Paul, Natick, and Michael J. Marino, Lynn, both of Mass., assignors to Roi Corporation, Peabody, Mass.

Filed Apr. 10, 1975, Ser. No. 566,714

Int. Cl.² B65D 85/08

U.S. Cl. 206-306

6 Claims



1. A probe cover for a probe of a medical electronic thermometer, wherein said probe has a substantially uniform diameter cylindrical shape along its length including a cylindrical tip at one end containing a sensor, said probe cover comprising an elongated hollow metal sleeve of uniform thickness along its length closed at one end and open at the other end, and having successive first, second and third segments with said first segment extending from said one end having the same circular cross section along its length and having an internal diameter dimensioned just larger than but close to the diameter of the cylindrical tip of the probe to provide a frictional slide fit between said first segment and said cylindrical tip, said second segment having the same circular cross section along its length and having an internal diameter greater than the diameter of said first segment and also greater than the diameter of said probe by an amount at least on the order of the thickness of the cover for providing a cylindrical air passage to said first segment when the cover is fitted on the probe, and said third segment having the same circular cross section along its length and having an internal diameter greater than the internal diameter of said second segment, said first, second and third segments of said sleeve all being constructed of a like metal material and being integrally formed.

4,007,830

ARTICLE CARRIER PARTITION INSERT

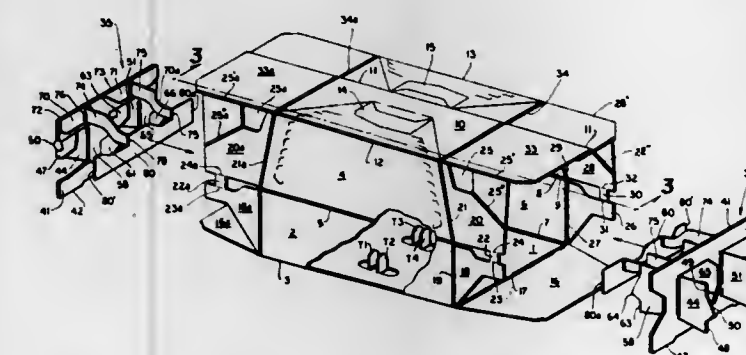
Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 17, 1975, Ser. No. 632,226

Int. Cl.² B65D 75/52

U.S. Cl. 206-175

21 Claims



1. A carrier partition insert for cushioning articles arranged in two rows of at least two articles each, said insert comprising a pair of vertically disposed main panels arranged for back-to-back disposition between the rows of articles, at least one partition tab foldably joined to each of said main panels, and a horizontally disposed spacer panel foldably joined along its side edges to the bottom edges of said main panels by serpentine fold lines to establish a spaced relation between the bottom portions of said main panels which defines article receive-

4,007,833

BUILDING SYSTEM

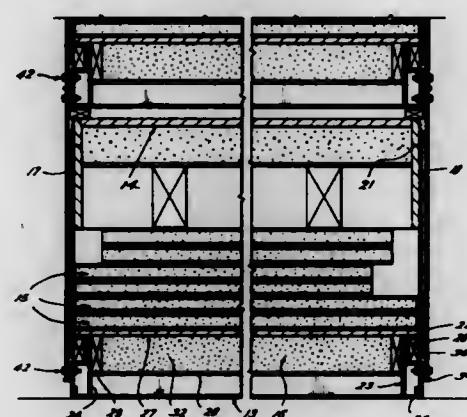
Floyd E. Bigelow, Jr., P.O. Box 7064, Houston, Tex. 77008

Filed July 10, 1975, Ser. No. 594,764

Int. Cl.² B65D 85/46, 19/00; E04B 1/34; E04H 1/12

U.S. Cl. 206—321

4 Claims



1. A knock-down building shipping package comprising, a plurality of stacked building modules, each including a spaced apart roof and skid with building parts sandwiched between the skid and roof;
- a protective member extending between the skid and roof, and surrounding said building parts,
- each skid including runners extending along the periphery of opposite sides of the modules and not extending beyond the ends thereof and including at points spaced therealong a vertically extending section and horizontally extending upwardly and downwardly facing surfaces projecting from said section,
- a plurality of stacking racks between each pair of skids each having a downwardly facing surface engaging said upwardly facing surface and an upwardly facing surface engaging said downwardly facing surface to support an upper module upon a lower module, and
- means removable securing the stacking racks to the skids.

4,007,834

FASTENER PACKAGE

Egil Borgersen, Stockholm, Sweden, assignor to Nordisk Kartro Aktiebolag, Sweden

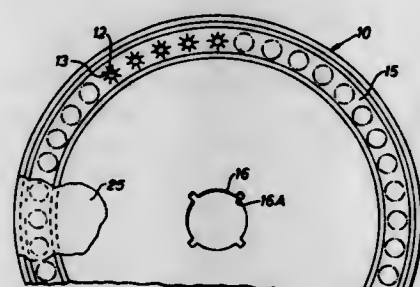
Filed Apr. 2, 1974, Ser. No. 457,220

Claims priority, application Sweden, Apr. 5, 1973, 7304805

Int. Cl.² B65D 85/24

U.S. Cl. 206—338

4 Claims



1. A fastener package for use in a fastener applicator, said package comprising:
 - a. a disc-shaped carrier of cardboard having a single series of evenly spaced holes arranged on a circular line of

uniform radius along the peripheral portion of said carrier, said carrier being adapted at its center for driving interfit with the fastener applicator;

- b. a plurality of fasteners, each having an elongated shank and a head, the shanks respectively being disposed in said holes and extending completely through said carrier, and the heads resting on said carrier on their undersurfaces to support the fasteners; and
- c. a foil cover on the upper surface of said disc-shaped carrier, said cover covering at least the heads of the fasteners in order to secure the fasteners to the carrier.

4,007,835

FUSE AND FOLD FABRIC

William M. Klothe, Rye, N.Y., assignor to Pellon Corporation, New York, N.Y.

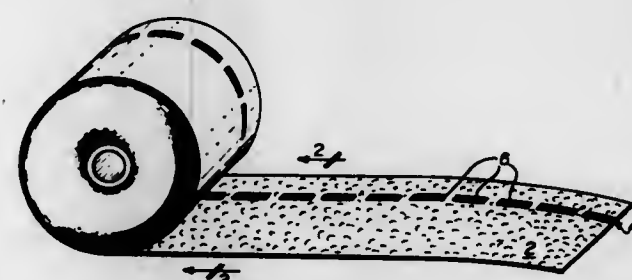
Division of Ser. No. 553,940, Feb. 28, 1975. This application

Aug. 26, 1975, Ser. No. 607,985

Int. Cl.² A41D 27/02; B65D 85/67

U.S. Cl. 206—411

11 Claims



1. A roll for facilitating the folding over of an edge of a continuous width of textile fabric to which the material of the roll is adhesively secured to define a rounded straight line fold characterized by outer layers of juxtaposed textile fabric and a pair of inner layers of roll fabric consisting essentially of a heat sensitive strip of a monolayer of a non-woven synthetic textile fabric of short staple fibers which fabric has on only one side thereof a heat actuable adhesive, said fabric having a constant width and at least one longitudinally running perforated line of perforations each of which has a longer longitudinal dimension than a transverse direction, which perforated lines runs parallel with a side edge of said fabric, said fabric being free of any surface interruptions other than perforated lines running parallel with a side edge, whereby when said strip of non-woven textile fibers is unwound from said roll, disposed over said textile fabric and thermally adhesively secured thereto there is provided a linear zone non-supported by said strip and a zone on each side of said perforated line supported by said strip whereby said textile fabric can be accurately and rapidly folded over at said linear zone of non-support to form a folded article having a reduced tendency to return to its original shape and having an upper and lower layer of textile fabric and a pair of juxtaposed non-woven strips therebetween secured to the resultant facing sides of the upper and lower layers of said textile fabric.

4,007,836

CORRUGATED-PAPERBOARD WRAPPER FOR PACKAGING ELECTRIC LAMPS, AND RESULTING LAMP PACKAGE

Edward J. Getz, Irvington; Thomas Barbieri, Peapack, and Robert J. Stauffer, Cranford, all of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 292,238, Sept. 25, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,739

Int. Cl.² B65D 85/42

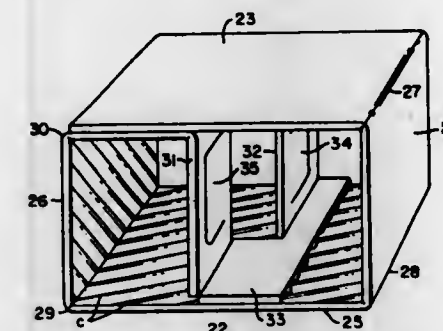
U.S. Cl. 206—422

16 Claims

1. A wrapper for protectively packaging an electric lamp bulb or a similar fragile article, said wrapper consisting essentially of an elongated open-ended sleeve that has a plurality of

connected walls and is composed of single-face corrugated paperboard the corrugations whereof constitute the inner surfaces of said sleeve and extend obliquely across the respec-

ing edges, said U-shaped edges serving to delay flow of liquid in the packet by capillary action along the insides of said side seams from reaching the upper ends of said side seams, to facilitate effectuating seaming of the upper end of the packet



tive walls thereof at an angle of from about 10° to 35° relative to the transverse axis of the wrapper so that both the compressive strength and frictional article-retaining ability of the wrapper are enhanced.

to form said top seam before said liquid in the packet flows to the upper ends of said side seams by capillary action and reaches the portions of said front and rear walls that form the top seam when sealed.

4,007,837

BOTTOM EDGE SUPPORT FOR AN ARTICLE SHIPPING RACK

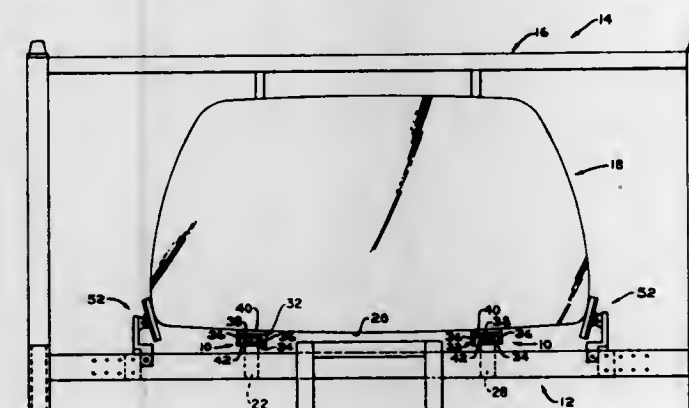
James R. Rowley, Freeport, and Stephen R. Sokol, Cheswick, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1975, Ser. No. 618,607

Int. Cl.² B65D 5/48

U.S. Cl. 206—448

10 Claims



1. In a rack for shipping sheets wherein the rack is of the type having a backwall secured to a base; edge supports securely mounted on the base for supporting the sheets on edge in a generally vertical position; and end restraints to prevent longitudinal movement of the sheets, the improvement comprising:

each of the edge supports, comprising: a rigid elongated member having a first end and an opposite second end; and means for pivotally mounting said member on the base about a line generally normal to the backwall and parallel to the base with the first end of said member adjacent the backwall.

4,007,838

FLEXIBLE SEALED LIQUID CONTAINING PACKET

Nagi M. Awad, 80 Riverdale Ave., Yonkers, N.Y. 10701

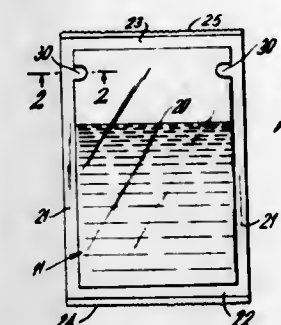
Filed Oct. 1, 1975, Ser. No. 618,448

Int. Cl.² B65D 75/00

U.S. Cl. 206—484

12 Claims

1. A packet comprising front and rear walls, sealed at its lower end by a lower seam, at its sides by side seams, at its upper end by a top seam, liquid in the packet, and said side seams, each having inner edges inside said packet, one extending upwardly from the lower seam and one extending down from the top seam, and a U-shaped edge interconnecting said upwardly and downwardly extending inner edges, and disposed transversely of said upwardly and downwardly extend-



4,007,839

THREE-LEVEL FULL SLIDE-ON CONTAINER

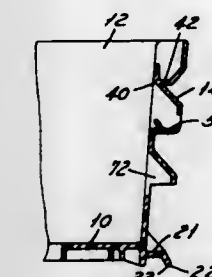
Edward L. Stahl, Richmond, Mich., assignor to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Filed Sept. 29, 1975, Ser. No. 617,592

Int. Cl.² B65D 21/02, 21/00

U.S. Cl. 206—503

18 Claims



1. A stacking container comprising a generally rectangular bottom wall, first and second side walls extending upwardly from opposite sides of said bottom wall, means providing stacking supports at a plurality of levels above said bottom wall comprising a generally horizontal rail on each side wall at each level, said rails extending substantially from front to rear of said side walls, and feet adjacent the bottom of said side walls spaced apart substantially the same distance as the rails at each level, the feet of said container being adapted to slidably engage the rails of a lower container of identical construction of each of said levels adjacent the front of said rails to enable said container to be slid rearwardly to a stacked position with respect thereto at each of said levels and to be slid forwardly for unstacking, the front of said container being open sufficiently to permit stacking and unstacking as aforesaid.

4,007,840

SELECTION AND RETRIEVAL SYSTEM

Alfred H. Parsons, 18 Hawthorne Road, Sea Cliff, N.Y. 11579

Filed June 24, 1975, Ser. No. 589,747

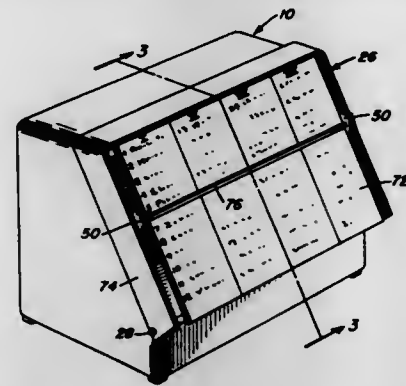
Int. Cl.² B07C 5/12

U.S. Cl. 209—80.5

8 Claims

1. A selection and retrieval system for use in conjunction with multiple independently retrievable stored components comprising, a magnetic selector, magnetically attractable areas provided at generally differing predetermined positions on the components, a carrier positioned adjacent said components and mounting said selector, means for moving said selector on and relative to said carrier for a selective alignment of the selector with the magnetically attractable area on each of said components, said magnetic selector, upon align-

ment with each of said magnetically attractable areas on said components, effecting a direct magnetic interlock therewith and independently of the components provided with magnetically attractable areas at different predetermined positions for a selection and retrieval of each component independently of



the components provided with magnetically attractable areas at different predetermined positions, and means for moving said carrier, with the magnetic selector mounted thereto, away from said stored components for a retrieval and separation of all components directly magnetically interlocked to the selector independently of the remaining components.

4,007,841

ARTICLE DISPLAY RACK

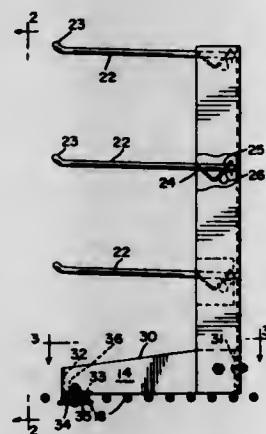
Thomas E. Seipel, Sun Prairie, Wis., assignor to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Feb. 12, 1973, Ser. No. 332,024

Int. Cl.² A47F 5/00

U.S. Cl. 211—59.1

1 Claim



1. A display rack for mounting on shelves formed of wire rods comprising a pair of end uprights formed of right angle members with one leg of each extending forwardly and with the other legs of said uprights extending inwardly toward each other in approximately the same plane, a plurality of support bars extending horizontally between said end uprights, a plurality of article supporting rods mounted at their rear ends on said horizontal support bars and projecting forwardly therefrom, a pair of foot members each of which is attached at its heel to the bottom of one of said uprights so as to extend forwardly therefrom, and clamping means at the distal end of each foot for clamping the distal end to at least one of said wire rods of a shelf, each of said foot members having a vertical right-angle formation at said heel thereof interfitting the upright to which it is attached, each of said clamping means having an upstanding J-bolt, a clamp member carried on the lower end of each said bolt and adapted to be drawn up under at least one wire rod so as to clamp the same between the underside of said foot member and said clamp member, each of said foot members being a sheet metal stamping with a vertical fore-and-aft main section and a second vertical right angle formation on the distal end of each foot member, said fore-and-aft main section providing one leg of each of said

first and second right angle formations and the remaining legs of said formations on each foot member extending inwardly toward the other foot member, and the J-formation on each bolt hooking downwardly in a notch in the upper edge of one of said fore-and-aft main sections.

4,007,842

ROTARY GRAIN DISTRIBUTOR

Richard Murray Hough, Sunfield, Mich. 48890

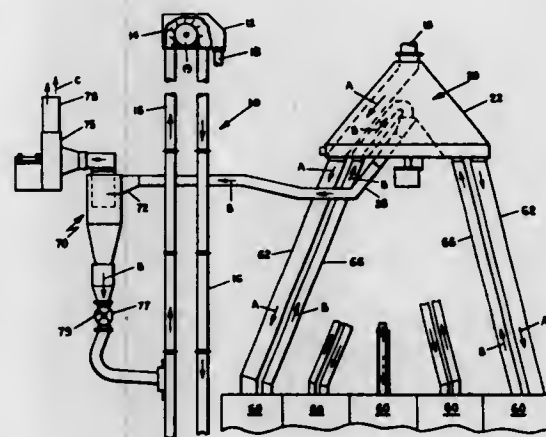
Filed July 23, 1975, Ser. No. 598,368

The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.

Int. Cl.² B65G 65/00

U.S. Cl. 214—16 R

6 Claims



2. A rotary grain distributor comprising:
a housing including a conical shell with a grain inlet at the top, an air outlet and a floor including a plurality of grain inlet apertures and air inlet apertures formed there-through in spaced rings;
an annular cover plate including an outlet aperture and an inlet aperture;
means supporting said plate in said housing adjacent said floor for rotation with respect to said floor such that said apertures in said cover plate selectively align with a pair of grain outlet and air inlet apertures of said floor while covering the remaining pairs of apertures in said floor;
means for rotating said plate to selectively align said apertures therein with a desired pair of apertures in said floor; and
a grain filling chute extending between said grain inlet and said grain outlet aperture in said plate and an evacuation chute extending from said air inlet aperture in said plate to said air outlet.

4,007,843

MULTI-AISLE WAREHOUSE SYSTEM WITH MOBILE LIFT HAVING CONTROL MEANS FOR AN ARTICLE TRANSFER VEHICLE

LeRoy Lubbers; William K. Stubbs, both of Grand Rapids, and Howard A. Zollinger, Ada Township, Kent County, all of Mich., assignors to Rapistan, Incorporated, Grand Rapids, Mich.

Division of Ser. No. 272,287, July 17, 1972, Pat. No. 3,880,299. This application Nov. 8, 1974, Ser. No. 521,950

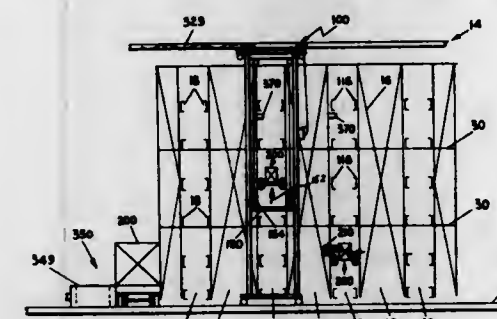
Int. Cl.² B65G 1/06

U.S. Cl. 214—16.4 B

12 Claims

1. A materials handling system comprising: a multi-level storage rack having a plurality of storage bins arranged in arrays on each level along a plurality of access aisles, pairs of horizontally spaced rails extending along and coupled to facing ends of storage bins on opposite sides of each aisle at each storage bin level, said rails extending adjacent the storage bins, a mobile vertical lift movable across the ends of the access aisles and alignable with a desired aisle, said mobile vertical lift including a lifting platform movable in a vertical direction to reach any desired storage bin level; a plurality of

self-powered mobile transfer vehicles each including drive and support wheels and independently movable along an access aisle at a selected single storage bin level, each of said mobile transfer vehicles including means thereon for transferring articles between said mobile transfer vehicle and a storage bin at the same level as said mobile transfer vehicle, said mobile vertical lift being adapted to transport said mobile transfer vehicle thereon to a desired aisle and storage bin level and dispatch said mobile transfer vehicle therefrom, wherein each of said rails of said pairs of rails includes end stops pivotally mounted to obstruct the movement of said mobile transfer



vehicle beyond said end stops when said end stops are in a first position, and wherein said mobile vertical lift includes camming means engaging said end stops of a selected aisle and aisle level for moving said end stops to a second position permitting a mobile transfer vehicle to be transferred between said mobile vertical lift and guide rails of a selected aisle and aisle level; and wherein said lifting platform of said mobile vertical lift includes a pair of horizontally spaced guide rails for supporting said mobile transfer vehicle thereon and wherein said camming means includes bridge means for coupling said guide rails on said lifting platform to said guide rails of said selected aisle and aisle level.

4,007,844

SELF FOLDING PLATFORM

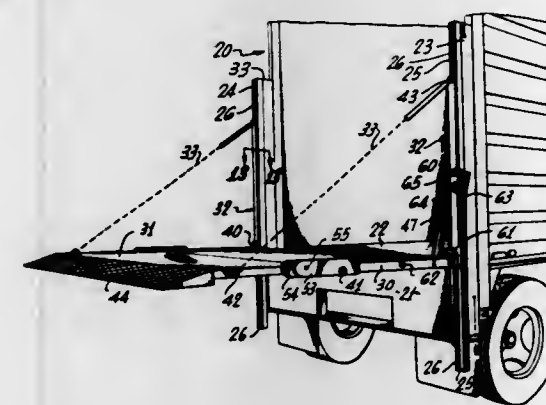
William V. Perkins, Monrovia, Calif., assignor to Maxon Industries, Inc., Huntington Park, Calif.

Filed Feb. 2, 1976, Ser. No. 654,334

Int. Cl.² B60P 1/44

U.S. Cl. 214—75 T

21 Claims



8. In a platform lift having a horizontal hinge interconnecting inner and outer platform sections for folding the unfolded sections out of a common horizontal load bearing plane into vertically extending superposed relationship of the undersides of the folded sections, a vertically elongate runner assembly to whose lower end the forward edge of the inner platform section is horizontally pivotally connected, the runner assembly being vertically movably mounted on a supporting framework, the improvement comprising:

a finite length of a flexible member having one end connected at the rear edge of the outer platform section and having another end connected to the upper end of the runner assembly;
means intermediate the inner platform section and the

framework to translate vertical movement of the runner assembly on the framework into folding or unfolding movement of the inner platform section;
and means defining a rigid rearward extension of the inner platform section for contacting and seating an intermediate portion of said flexible member for effecting folding and unfolding movement of the outer platform section as a function of the corresponding folding or unfolding movement of the inner platform section.

4,007,845

SWING MECHANISM

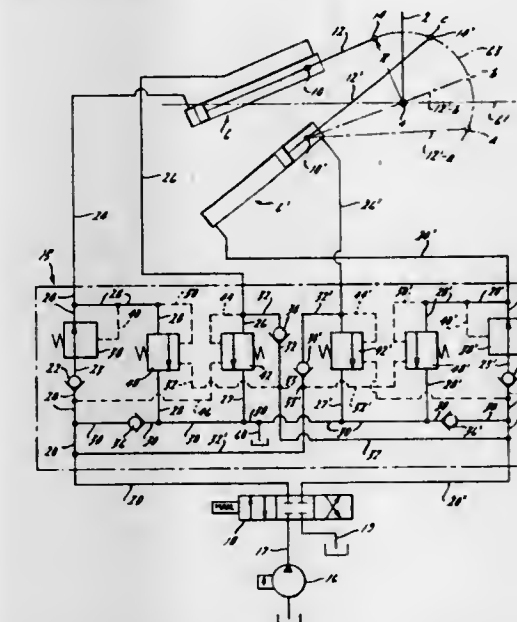
David L. Worback, Highland, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Mar. 17, 1975, Ser. No. 559,271

Int. Cl.² G02F 3/32

U.S. Cl. 214—138 D

22 Claims



20. A hydraulic system for operating backhoe swing apparatus and the like comprising: a pair of hydraulic lines; a normally open pressure reducing valve controlling one of said hydraulic lines and operable to limit pressure in said one hydraulic line to a predetermined maximum pressure, a first normally closed, metering valve controlling said other hydraulic line and operable to permit flow of hydraulic fluid through said other hydraulic line only when a predetermined minimum pressure exists in said one hydraulic line in response to said flow in said one direction through said one hydraulic line, a second normally closed, metering valve operable to control flow of hydraulic fluid in the opposite direction through said one hydraulic line only when a predetermined minimum pressure exists in said other hydraulic line; and check valve means for preventing flow through said pressure reducing valve in said opposite direction.

4,007,846

AUTOMATED METHODS FOR HANDLING TOTE PANS

George R. Pipes, Salt Lake City, Utah, assignor to Kenway Engineering, Incorporated, Bountiful, Utah

Continuation of Ser. No. 417,167, Nov. 19, 1973, abandoned, which is a division of Ser. No. 336,109, Feb. 26, 1973, Pat. No. 3,809,259. This application Nov. 13, 1974, Ser. No. 520,519

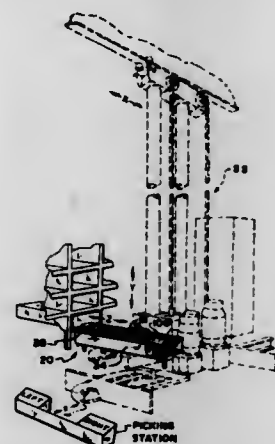
Int. Cl.² B65G 47/00

U.S. Cl. 214—152

1 Claim

1. An automated method of moving tote pans each having an inverted U-shaped handle on the exposed end wall of the tote pan, normally stored in vertical rows of storage bins on each side of an aisle to a merchandise picking site using an automated vehicle which moves essentially axially back and forth along the aisle and comprises an operator-controlled tote pan retractor equipped with a first tote pan engaging finger and also equipped with a second tote pan-engaging finger, the steps of:

moving the vehicle along the aisle to a predetermined vertical row of storage bins;
vertically locating the operator-controlled tote pan retractor at a predetermined bin elevation;
extending the first tote pan-engaging finger of the retractor transverse of the aisle outwardly at said bin elevation;
elevating said first finger to engage the inverted U-shaped handle on the exposed end wall of the tote pan;



pulling on the handle of said predetermined tote pan to displace the pan from its storage bin onto the retractor the pulling step comprises pulling on the handle with said first finger until the handle is centrally disposed on the retractor and, thereafter, elevating the second finger of the retractor into said handle, lowering the first finger out of the handle and pulling on the handle with said second finger until the tote pan is entirely upon the retractor; and moving the vehicle along the aisle to a merchandise picking site.

4,007,847

INTERLOCK ARRANGEMENT FOR USE WITH SIDELOADER FORK LIFT TRUCK

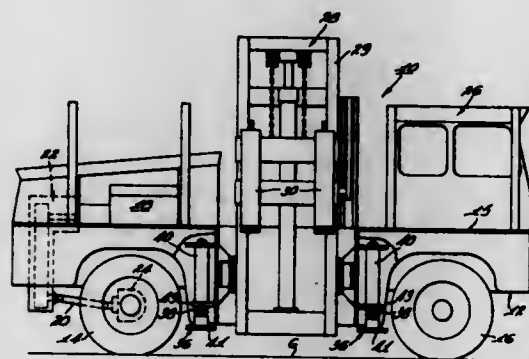
George P. Marco, Homewood, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 30, 1975, Ser. No. 627,141

Int. Cl.² B66F 9/10

U.S. Cl. 214-670

7 Claims



1. In combination, a side loader vehicle having means for handling material from at least one side of the vehicle which extends lengthwise of the vehicle, means for propelling said vehicle including an engine connected to drive wheels of the vehicle through a hydraulic power shift transmission, pump means hydraulically connected to said hydraulic power shift transmission for supplying a pressurized hydraulic fluid thereto, at least one stabilizing jack mounted on said vehicle, said stabilizing jack having a piston portion movable from a ground engaging stabilizing position to a retracted nonstabilizing position in which said piston portion does not engage the ground, and interlock means comprising means effective when said piston portion of said jack is not in a predetermined retracted position to hydraulically connect the output of said pump means to a sump, whereby to render said hydraulic

power shift transmission ineffective to transmit motive power from said engine to said drive wheels.

4,007,848

ANTI-MISSILING BOTTLE STRUCTURE

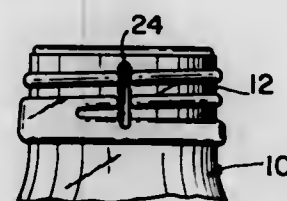
William Joseph Snyder, Brockton, Pa., assignor to Zapata Industries, Inc., Frackville, Pa.

Filed May 9, 1975, Ser. No. 576,207

Int. Cl.² B65D 51/16

U.S. Cl. 215-31

27 Claims



1. An improved container of the type having a neck provided externally with circumferential beads including threads for receiving a threaded cap to contain pressurized fluids, the improvement comprising means including at least one venting channel extending transversely into at least one of said beads for providing release of fluid pressure from beneath said cap sufficient to prevent missiling of the cap when the cap is initially turned to remove it from said container, the channel traversing at least one of the turns of the threads, the depth of the channel perpendicular to the surface of the container being greater than the thread depth.

4,007,849

SAFETY CONTAINER

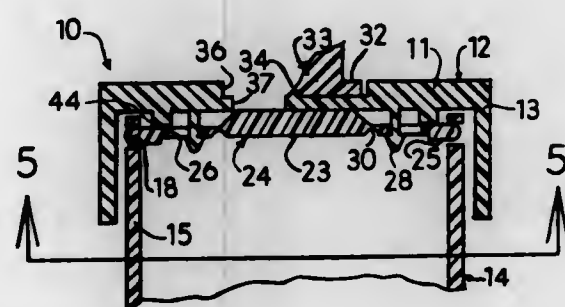
Donald B. Hinkle, 12151 Brougham, Sterling Heights, Mich. 48077

Filed Mar. 29, 1976, Ser. No. 671,481

Int. Cl.² B65D 55/02, 85/56; A61J 1/00

U.S. Cl. 215-213

10 Claims



1. Improvement in a safety container for medicine having a cap and bottle, said cap constructed in relation to the bottle such that in one position thereof the cap can be lifted off the bottle and in another position thereof the cap cannot be removed from the bottle, said improvement comprising detent means associated with the cap, said detent means moveable in respect to said cap and having a lock and unlock position in respect thereto, cooperative means on the bottle capable of engaging with said detent means to lock said cap on the bottle, and manually actuatable handle means on the cap capable of moving said detent means between lock and unlock positions thereof, said detent means being flexible, said handle means operative during actuation thereof upon said detent means to flex the same to move it between its lock and unlock positions.

4,007,850

SAFETY CLOSURE FOR MEDICINE BOTTLES AND THE LIKE

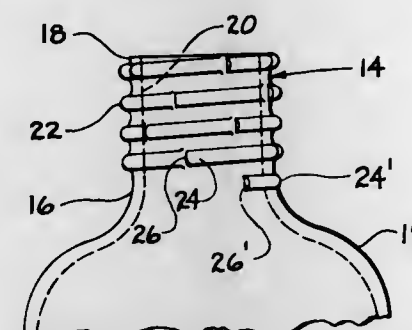
Eugene L. Beaugrand, 1224 Seville, Pacifica, Calif. 94044

Filed Dec. 4, 1975, Ser. No. 637,803

Int. Cl.² B65D 55/02, 85/56; A61J 1/00

U.S. Cl. 215-216

6 Claims



1. A safety closure for a container of the type that includes a generally cylindrical neck having a proximate end integral with the container and a distal end defining a mouth opening for communicating with the interior of the container comprising a helical thread formed on said neck and projecting therefrom and having a plurality of convolutions of uniform profile intermediate said distal end and said proximate end, said thread having a plurality of teeth formed therein throughout the length thereof, said teeth each defining an abutment residing wholly within the profile and extending transverse to the thread and facing in a direction toward said proximate end, a cap having a cylindrical body and an end plate spanning one end of said cylindrical body, said cylindrical body defining interior thereof a helical thread groove complementally engageable with the thread on said neck, a pawl secured to said cylindrical body adjacent the end thereof remote from said end plate, said pawl having a radially extending tooth surface radially movable into said groove for engagement with the abutments on said neck thread to prevent rotation of said cap toward the distal end, means for radially resiliently biasing said pawl relative to said cylindrical body and into said groove for engagement with said abutments, and means affording a grip on said pawl for moving said pawl radially outward against said biasing means to effect disengagement between said pawl and said abutments to permit substantially unimpeded removal of said cap from said neck.

4,007,851

ANTI-MISSILING BOTTLE CLOSURE

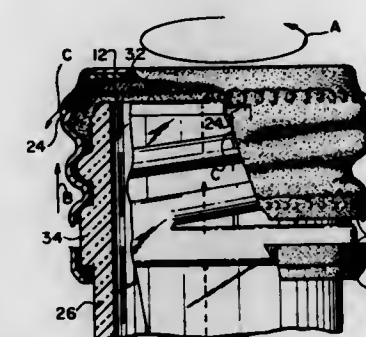
Rocco David Walker, Hazleton, Pa., assignor to Zapata Industries, Inc., Frackville, Pa.

Filed May 9, 1975, Ser. No. 576,206

Int. Cl.² B65D 51/16

U.S. Cl. 215-307

29 Claims



1. An improved closure of the type having a shell with integral top and side walls, a knurl region adjacent to the top wall, and with rolled-on threads provided on the side wall for engagement with the threaded neck of a bottle to contain pressurized fluids, the threads being limited to about 1 1/4 turns, the improvement comprising means including venting openings in said side wall contiguous to the knurl region for releas-

ing the pressure within said closure sufficiently to prevent missiling of the closure when the closure is initially turned to unthread it from the bottle.

4,007,852

KNOCKOUT WINDOW MEANS

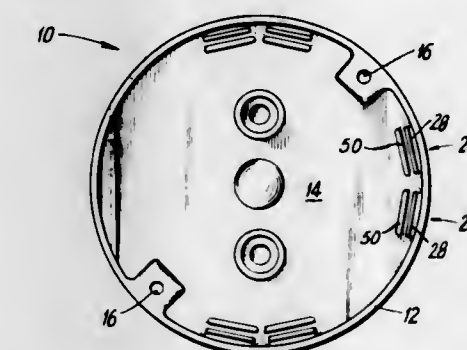
Paul D. Gernhardt, Newton, Kans., assignor to Slater Electric Inc., New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,043

Int. Cl.² H02G 3/12

U.S. Cl. 220-3.2

13 Claims



1. In an electrical assembly box having a backwall and upstanding sidewalls defining a generally open front face at their front edges, knockout window means which comprises: at least one knockout port formed primarily in one of said sidewalls, said port having its front end defined by a first edge of said sidewall and its sides defined by side edges of said sidewall; a knockout panel for each of said knockout ports, generally superposed over said knockout ports from the inside of said sidewall, and adapted to substantially closeoff said knockout port, said panel dimensioned with its front edge extending slightly forward of said first edge of said sidewall and its back edge extending at least to a plane defined by the outside surface of said backwall, said panel being connected to said box only at its front and back ends such that knockout panel removal slot means which are accessible by a wedge-like tool from both inside and outside said box are formed at said front end and at said back end of said knockout panel.

4,007,853

ANTI-THEFT DISPENSING RACK

Vern A. Bahneman, Detroit, Mich., assignor to Marvin Hoffmann, Birmingham, Mich., a part interest

Filed Aug. 1, 1975, Ser. No. 601,236

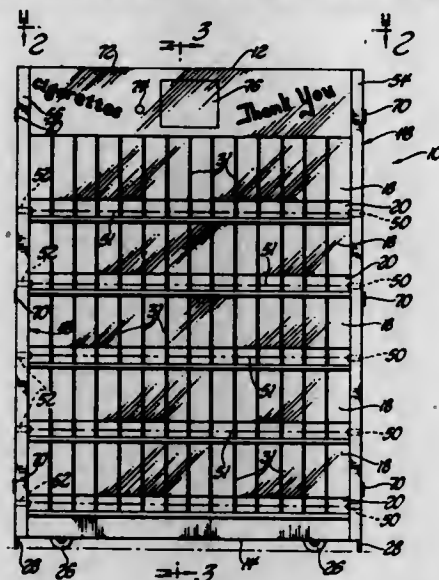
Int. Cl.² A47F 3/024

U.S. Cl. 221-3

13 Claims

1. A dispensing rack assembly comprising: enclosure means defining a plurality of side by side compartments for storing items to be dispensed, an access opening extending across and communicating with the interior of said compartments through which items may be withdrawn, means associated with said access opening for allowing only one-at-a-time manual removal of items from each compartment through said access opening and detection means associated with said access opening for detecting the withdrawal of items from said compartments; said detection means including radiant energy emitting means for directing a beam of radiant energy across said access opening and forward of said compartments, receiving means associated with said emitting means for receiving said beam of radiant energy, and circuit means associated with said receiving means including control

means responsive to a change in the beam received by said receiving means and signal means actuatable by said control



means whereby withdrawal of an item from any one of said compartments changes said beam and actuates said signal means.

4,007,854

APPARATUS FOR FEEDING ARTICLES IN SERIAL ORDER

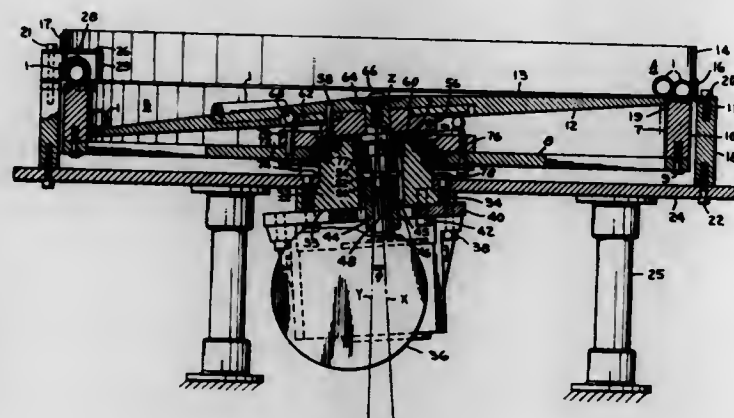
Albert W. G. Irvine, Bridgeport, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Oct. 8, 1975, Ser. No. 620,706

Int. Cl.² B65H 9/00

U.S. Cl. 221-167

7 Claims



1. Apparatus for feeding articles in serial order, comprising in combination:

a disc having an upper working surface which is a non-planar upwardly-convex surface of revolution symmetrical about an axis of revolution thereof;

a rim extending circumferentially about said disc and having an upper working surface which is a surface of revolution symmetrical about an axis of revolution thereof;

means supporting said disc and said rim for rotation each about its own axis of revolution, with the axis of revolution of said rim extending substantially vertically and the axis of revolution of said disc being inclined to the vertical;

the periphery of said working surface of said disc extending to at least substantially the same elevation as an adjacent region of said working surface of said rim at one fixed peripheral location constituting an article transfer station, and extending to a substantially lower elevation than an adjacent region of said working surface of said rim at another fixed peripheral location to define a reservoir for articles within said rim, said working surface of said disc being inclined at a greater slope in said reservoir than at said transfer station;

said disc and rim being constructed and arranged, upon rotation thereof, to distribute articles from said reservoir

outwardly against said rim, to elevate the distributed articles from said reservoir and deliver them serially onto said rim at said transfer station, and thence to convey a series of said articles away from said transfer station on said working surface of said rim;

and rail means extending circumferentially about said rim and being interrupted at an article discharge station spaced circumferentially about said rim from said transfer station in the region of said reservoir, said rail means being spaced outwardly from said rim to retain an aligned series of articles on said rim and to permit free conveyance of said aligned series by said rim from said transfer station to said discharge station while permitting excess and misaligned articles to be returned from said rim to said reservoir prior to arrival at said discharge station.

4,007,855

LIQUID DISPENSER OF THE METERING TYPE

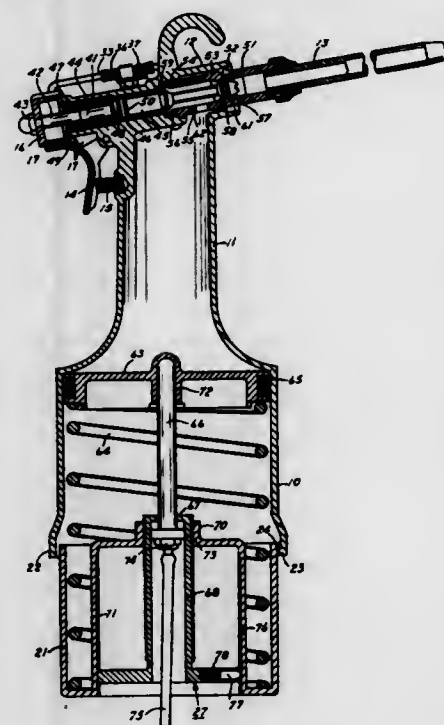
Leonard L. Hierath, Denver, and W. Kendall Holmes, Aurora, both of Colo., assignors to Joseph M. Magrath, McCook, Nebr.

Filed Mar. 24, 1975, Ser. No. 561,535

Int. Cl.² G01F 11/06

U.S. Cl. 222-26

6 Claims



1. In a liquid dispensing device of the type comprising a cylinder and a piston therein and means for biasing the piston toward its minimum volume position in the cylinder at one end thereof, said device having a liquid pressure inlet and a tubular discharge outlet arranged in communication with said cylinder and including a single valve means for alternatively admitting liquid to the cylinder from the inlet for overcoming said biasing means and charging the cylinder and utilizing the biasing means for discharging the liquid from the cylinder through the outlet, the improvement which comprises means for biasing the valve means toward its liquid discharge position, means for manually moving said valve means to its liquid inlet position against the force of said valve biasing means for charging said cylinder with liquid, and a spring pressed trigger mounted on said device and positioned for engaging and latching said valve means in its liquid inlet position whereby upon movement of said trigger against the pressure of said spring said valve means is released and said liquid inlet is closed and said valve means is moved to its liquid discharge position and the liquid charge in said cylinder is discharged by operation of said piston biasing means.

said improvement including an adjustable stop means mounted on the other end of said cylinder in the path of said piston for engaging said piston and limiting the movement of said piston against said piston biasing means and

for selecting the amount of liquid to be stored in and discharged from said cylinder,

said piston having a central guide shaft rigidly attached thereto and slidably mounted in said stop means for guiding the axial movement of said piston in said cylinder, and said improvement further including an end closure detachably secured to said other end of said cylinder and comprising a double walled cup opening outwardly, and having spaced inner and outer walls opening inwardly, said biasing means comprising a spring and said cup providing a seat for said spring, said spring having a portion within said walls about said inner wall, said cup having a threaded opening in its inner end and said stop means being threaded therein and comprising a tube having one end opening outwardly and the other end closed and having an opening for slidably receiving said guide shaft.

4,007,856

APPARATUS FOR DISPENSING WATER AT DIFFERENT TEMPERATURES

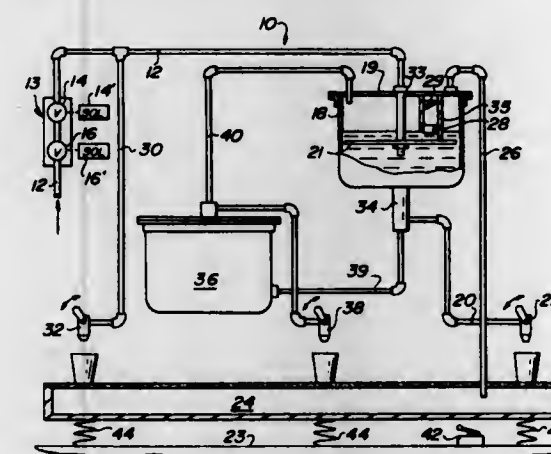
William V. Murphy, Philadelphia, and Charles Walter Albrecht, Warminster, both of Pa., assignors to Refreshment Machinery Incorporated, Warminster, Pa.

Filed July 23, 1975, Ser. No. 598,514

Int. Cl.² B67D 5/08

U.S. Cl. 222-67

10 Claims



1. Dispensing apparatus comprising a water supply conduit for supplying water under pressure, at least one valve in said conduit, a refrigerated reservoir, said conduit being connected to said reservoir downstream from said valve, a liquid level detection means in said reservoir and connected to said valve to open and close said valve depending upon liquid level in said reservoir, a dispensing valve connected to an outlet conduit on said reservoir for dispensing cold water, an ambient supply conduit connected to said water supply conduit at a location between said at least one valve and said reservoir, a dispensing valve connected to said ambient supply conduit for dispensing water at ambient temperature, a hot water heater tank having an inlet communicating with said water supply conduit downstream from said at least one valve and by way of said reservoir, and a dispensing valve connected to an outlet on said tank for dispensing hot water.

4,007,857

SAFEGUARD CAP STRUCTURE PARTICULARLY FOR BOTTLES

Umberto Tomiati, Via D. Filippini, 19, Verona, and Walter Boldrini, Via Monreale, 10, Milan, both of Italy

Filed Oct. 14, 1975, Ser. No. 621,923

Claims priority, application Italy, Apr. 10, 1975, 22236/75

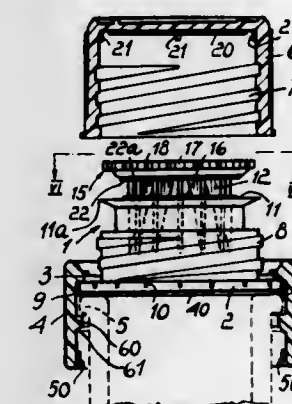
Int. Cl.² B67D 5/00

U.S. Cl. 222-153

17 Claims

1. A safeguard cap structure particularly for bottles, comprising a cylindrical hollow body which can be associated in sealing engagement with the neck of a bottle, a threaded

portion along the outer surface of said hollow body, a plurality of flexible reeds extending longitudinally in said hollow body in the proximity of the free edge thereof, a shut off disc supported by said reeds and forming with said free edge, outlet ports for a liquid contained in said bottle, said shut off disc being adapted to abut on said free edge in contrast to the force exerted by said reeds, a covering hood which may be screwed onto said threaded portion, said cap structure being characterized in that it comprises a plurality of short and rigid appendages and a plurality of long and flexible appendages arranged



between the short ones, said appendages extending radially from the periphery of said shut off disc, projections being provided peripherally along the inner bottom of said covering hood and adapted to engage said long and substantially flexible appendages during the rotation of said covering hood.

16. A safeguard cap structure according to claim 1, characterized in that said covering hood is manufactured as a single component together with said collar for assembling the cap to the neck of a bottle, the lower edge of said hood being connected to said collar by means of tear away spot bridges.

4,007,858

SQUEEZE-BOTTLE-TYPE POWDER DISPENSER

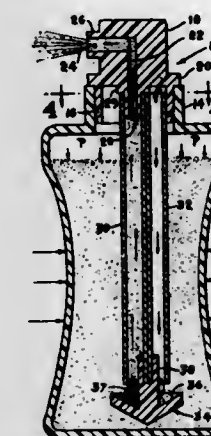
Joseph John Shay, Manchester, N.H., assignor to Summit Packaging Systems, Inc., Manchester, N.H.

Filed Feb. 17, 1976, Ser. No. 658,587

Int. Cl.² B67D 5/54; B05B 11/04

U.S. Cl. 222-193

12 Claims



1. A powder dispenser comprising a container adapted to contain powder and having resilient sidewalls and a dispensing head having a discharge orifice therein, first conduit means extending inside the container and communicating from the orifice to a point adjacent the lower end of the container, second conduit means extending inside the container from adjacent said point up to second point adjacent the upper end of the container, and generally horizontal baffle surface means spaced proximately below the lower end of the second conduit means, whereby squeezing the resilient walls of the container instantly pressurizes the upper end of the container to drive air down the second conduit means to mix with powder immediately above the baffle surface means and fluidize the powder.

moving the air-powder mixture into and through the first conduit means and out the orifice, the squeezing of the walls moving powder inward toward the baffle and reducing the cross section of the container and driving upward the level of powder to increase the hydrostatic pressure of the powder at the first point and forcing a portion of the air down through the powder to urge powder between the baffle and the lower end of the second conduit.

4,007,859

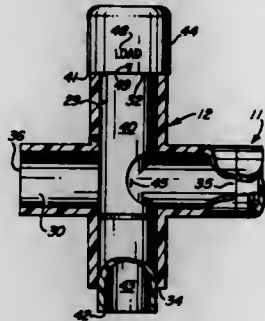
AUXILIARY HOPPER APPARATUS FOR RELOADING PRESS

Stanley A. Dandrea, 3735 W. Townley, Phoenix, Ariz. 85021
Filed Dec. 24, 1975, Ser. No. 644,192

Int. Cl.² G01F 11/28

U.S. Cl. 222-443

2 Claims



1. An auxiliary hopper apparatus for holding a reserve quantity of granular ammunition reloading material and for selectively providing a continuous supply of said material to the primary hopper of the reloading press, said auxiliary hopper apparatus comprising:

- a. a receptacle for holding a quantity of said granular material and having a gravity flow discharge port proximate the bottom thereof;
- b. a delivery conduit having opposite inlet and outlet ends, said inlet end communicating with said discharge port and said conduit extending downwardly therefrom to said outlet end; and
- c. valve means associated with said delivery conduit at said outlet end, said valve means including:
 - i. a body having a first elongate bore therethrough and a second elongate bore having inlet and outlet ends and extending therethrough and intersecting said first bore;
 - ii. a spool rotatably and slidably carried within said first bore having a body member with a longitudinal bore extending therethrough having an open end and a closed end, and said body member defining an aperture extending radially from said longitudinal bore through said member;
 - iii. said spool being selectively movable to a first open position wherein said aperture is aligned with said second bore and directed toward said inlet end thereof for providing communication between said inlet of said second bore and said open end of said spool; a second open position rotatable from said first position wherein said aperture is aligned such that said inlet end of said second bore communicates with said outlet end of said second bore and a closed position placing said aperture at a location remote from said second bore thereby selectively and operatively controlling the flow of granular material.

4,007,860

METHOD AND APPARATUS FOR MAKING BOWS

Herbert C. Giesmann, Omaha, Nebr., assignor to Ward Paper Box Company, Kansas City, Kans.

Filed Dec. 15, 1975, Ser. No. 640,898

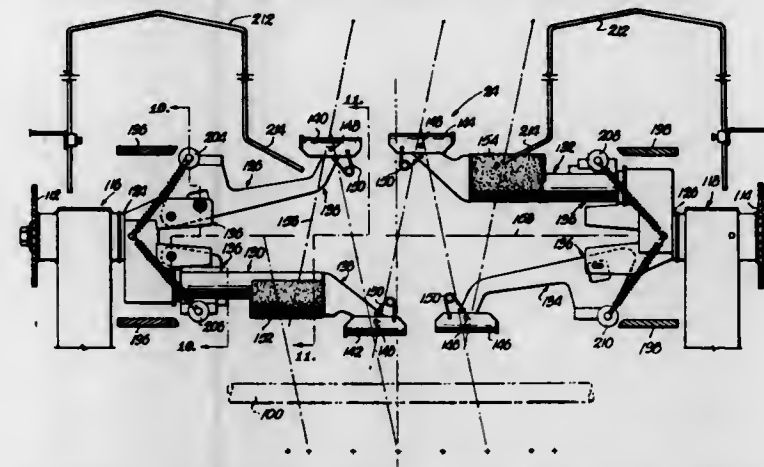
Int. Cl.² A41H 43/00

U.S. Cl. 223-46

30 Claims

1. Apparatus for making a ribbon bow comprising: a ribbon feeder assembly;

winding mechanism for receiving a length of ribbon from the feeder assembly and winding said length of ribbon into an extended helix, said winding mechanism including a plurality of simultaneously rotatable arms for receiving said length of ribbon from the feeder assembly, each of said arms having a pad swingably mounted thereon,



an assembly for gathering said extended helix of ribbon at substantially the horizontal center thereof whereby to define the loops of said bow; and
means for securing said loops at their point of gathering whereby to create the finished bow.

4,007,861

HANGER CONNECTOR

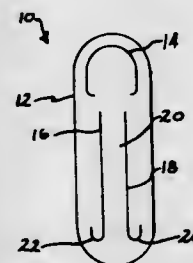
Everett L. Duester, Holland, and Judd F. Garrison, Grand Rapids, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.

Filed Dec. 24, 1975, Ser. No. 644,118

Int. Cl.² A47J 51/084

U.S. Cl. 223-85

3 Claims



1. A detachable and reusable device for supporting one hook suspended garment hanger from another in a vertically spaced relationship, comprising:

an elongated strip of flexible sheet-like plastic material having tension sustaining characteristics, said strip including an opening adjacent one end defined by a slit extending transversely and longitudinally of said strip for receiving the hook of an upper hanger, said strip further including a pair of spaced parallel slits defining a strap spaced from the lateral edges of the strip and from the other end thereof for forming an attachment for the hook of a lower hanger, the lower, terminal portion of each said spaced slits extending outwardly and upwardly in a hook-like shape.

4,007,862

CAR RACK FOR HOLDING SURFBOARDS OR THE LIKE

Rex Walter Heftmann, Pacific Beach, Calif., assignor to Rex Works, Inc., Encinitas, Calif.

Filed Mar. 13, 1975, Ser. No. 557,940

Int. Cl.² B60R 11/00

U.S. Cl. 224-42.1 B

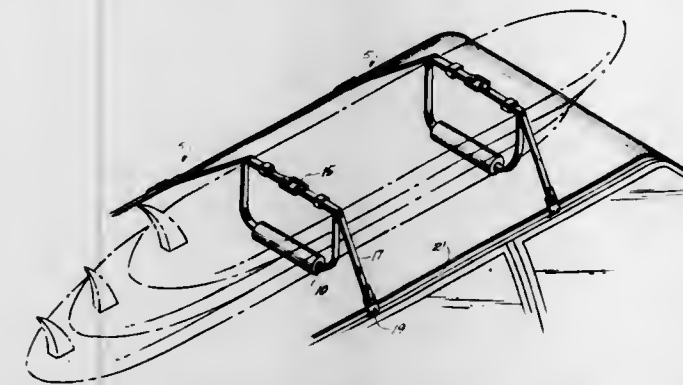
10 Claims

1. An accessory detachably securable on a mounting surface of a car in spaced relationship with an identical accessory to form a rack for supporting an elongated object such as a surfboard, the accessory comprising:

an elongated support pad to be disposed between the object and the mounting surface, the support pad being compressible so as to preclude marring the finish on the mounting surface or object;

a frame member;

strap means for tautly spanning the mounting surface and including first and second lengths of strap extending from opposite ends of the support pad to slidably pass through the frame member and fold back to extend away there-



from to opposite remote ends of the strap means, said first and second lengths cooperating with the support pad and with the frame member to form a loop that is adjustable to tightly gird the object and secure the object in a fixed position between the mounting surface and the frame member when the strap means tautly spans the mounting surface; and

separate anchor means attached to each remote end of the strap means for connection to a fixed point at an edge of the mounting surface so as to maintain the tightness of the loop.

4,007,863

PICKUP TRUCK SPARE TIRE, JACK AND LUG WRENCH HOLDER

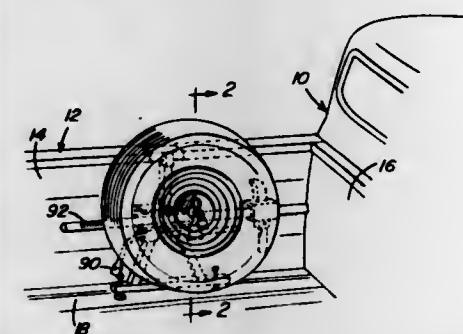
Oscar L. Norris, Rte. No. 1, Bennington, Okla. 74723

Filed Aug. 5, 1975, Ser. No. 603,374

Int. Cl.² B62D 43/08

U.S. Cl. 224-42.24

10 Claims



1. A spare tire bracket assembly comprising an upright frame including upper and lower portions, said lower portion including widely spaced opposite end portions, said upper portion including a central uppermost portion, said opposite end portions including widely spaced depending foot portions adapted to rest upon spaced marginal portions of the flooring of a pickup truck load bed, said central uppermost portion including an upwardly projecting abutment adapted to be engaged under the upper inwardly projecting ledge of a side wall of said load bed extending along said marginal portions for anchoring said bracket in said load bed, a vertical mid-portion of said frame including lockable clamp means adapted to clamp a vehicle wheel and tire against one side of said frame and means defining a horizontal recess which opens outwardly of said one side of said frame for receiving an elongated jack member therein, said clamp means being operative to clamp said tire against the opposite ends of said jack member to hold the latter, as well as said tire, tightly in position relative to said bracket assembly.

4,007,864

CARRIER FOR AUTOMOBILE

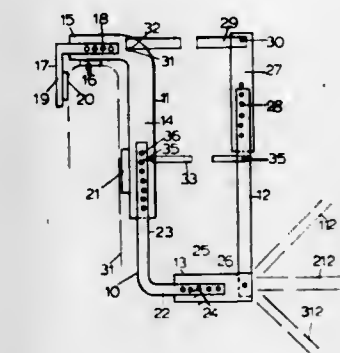
Emanuel Hreha, 348 E. 27th St., Erie, Pa. 16504

Filed Mar. 5, 1975, Ser. No. 555,371

Int. Cl.² B60R 9/02

U.S. Cl. 224-42.46 R

4 Claims



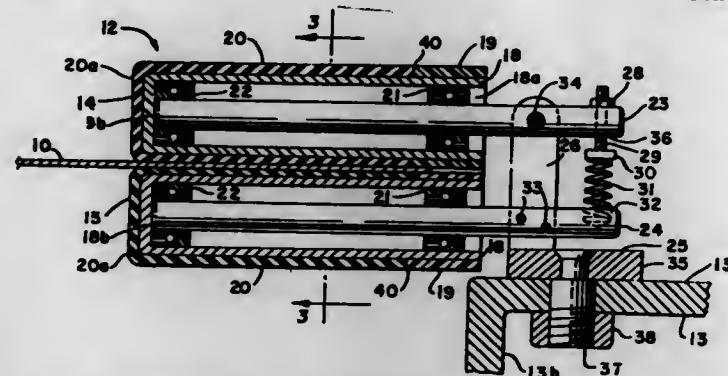
1. A carrier for an automobile comprising, a generally z-shaped first side member and a second side member, means supporting said second side member on said first side member providing a generally U-shaped space therebetween, said first side member having an intermediate member and a first end member and a second end member, said first end member being fixed to said intermediate member at the upper end thereof and extending therefrom generally perpendicular thereto, said second end member being fixed to said intermediate member at the end thereof opposite said first end member and extending therefrom in a direction opposite said first end member, said second side member being supported on the end of said second end member at the end thereof remote from said intermediate member, the upper end of said second side member having means securing it to said first side member, said second side member being pivotally supported on said second end of said second end member, said second end member comprising an intermediate member fixed to said second end member providing adjusting means for adjusting the space between said second side member and said first side member, said first side member comprising means for adjusting the length of said first side member, said first side member comprising a first L-shaped member, said first L-shaped member having one leg that is adapted to extend downwardly inside the door of an automobile, a second leg of said first L-shaped member being adapted to overlie the upper edge of said door, said second end member comprising a second L-shaped member, said second L-shaped member having a first leg adjustably secured to said intermediate leg of said Z-shaped member, a second leg extending perpendicular to said intermediate leg of said L-shaped member, and said second L-shaped member having spaced holes therein adapted to receive a fastening means for adjustably securing said L-shaped member to said intermediate leg of said first side member and to means for adjusting the width of the space between said first side member and said second side member.

4,007,865

WEB GUIDING AND CENTERING APPARATUS
Nelson B. Crandall, Edenton, N.C., assignor to Cape Colony Manufacturing, Inc., Edenton, N.C., a part interest
Continuation-in-part of Ser. No. 512,302, Oct. 4, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,205
Int. Cl.² B65H 25/26

U.S. Cl. 226-17

25 Claims



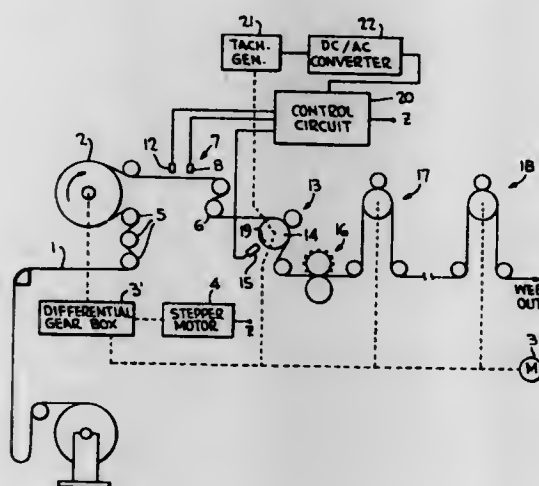
1. In a web guiding device for guiding a moving web, a pair of co-acting rolls for engaging an edge portion of the web on its opposite faces, adjustable means for mounting said pair of co-acting rolls in engagement with the edge of a moving web at a predetermined angle to and at a predetermined distance from a selected center line for the moving web, means supporting one of said rolls for rotation about a fixed axis, means pivotally supporting the other of said rolls to swing in a single plane normal to the web and common to both rolls toward and away from said one roll, resilient means for biasing said pivotally supported roll to swing toward said one roll, at least one of said rolls having cylindrical inboard and outboard roll portions, said inboard roll portion being relatively soft and of a high coefficient of friction, said outboard roll portion being relatively hard and of a low coefficient of friction.

4,007,866

WEB TRANSPORT ARRANGEMENT
John E. Traise, Lewiston, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.
Filed July 11, 1975, Ser. No. 595,062
Int. Cl.² B65H 23/18

U.S. Cl. 226-31

12 Claims



1. A web transport arrangement for transporting a web material along a web path, the arrangement comprising in combination:

variable drive means for supplying a web material from a feed area to the web path and maintaining the web under a low tension while passing through the feed area;
first sensor means arranged in operative relationship with the low tension area for providing a first series of signals dependent upon the feed rate of the web material through the low tension area;
processing means for processing the web material in a processing area and maintaining the web material under a high tension while passing through the processing area;

a second sensor means arranged along the web material path at a position within the processing area for providing a second series of signals dependent upon the processing rate of said processing means;

control means including comparison means for comparing said first and second series of signals and providing at its output a first series of control signals when signals of one of said first and second series of signals precedes the other and output means for providing a series of control output signals in response to said first series of control signals;

reset sensor means for generating a series of reset signals to said output means of said control means for controlling the rate at which said control output signals are provided; and,

means for coupling said control output signals to said variable drive means for varying the feed rate in response to said control output signals in order to synchronize the feed rate with the processing rate.

4,007,867

METHOD OF MAKING RESILIENTLY COMPRESSED LAMINATED CORE FOR A DYNAMOELECTRIC MACHINE

Warren Pierce Wielt, and Luis Alberto Estrada, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 503,269, Sept. 5, 1974, Pat. No. 3,940,648. This application Nov. 12, 1975, Ser. No. 631,295
Int. Cl.² H02K 15/02; B23K 19/00

U.S. Cl. 228-179

7 Claims



1. A method of manufacturing a dynamoelectric machine magnetic core assembly comprising the steps:

1. providing a stack of generally flat, insulated metal laminations arranged in face-to-face relationship to define a rotor-receiving bore,

2. providing first and second clamping annuli and positioning said annuli respectively at opposite ends of said stack with an inner portion of each annulus over the stack and an outer portion of each annulus extending radially outward from the stack,

3. providing a pair of stepped rings and accurately positioning said rings with their respective inner diameters in alignment with the inner diameter of the laminations defining said bore, each of said rings being provided with a base surface portion and first and second annular steps disposed radially outward from the base portion with the step lands facing said annuli,

4. positioning the periphery of each annulus against the rise of the second step on the ring abutting it, thereby to also position the axially outer surface of each annulus on the land of the first step of the ring abutting it,

5. applying and holding an axial compressive force to the axially outer surfaces of said rings, thereby to compress said stack of laminations and deflect said respective inner portions of the annuli axially outward into the space defined by the rise of the first step and the base portion of the ring abutting it,

6. providing a plurality of elongated bars, and positioning said bars between said annuli with the longitudinal axes of the bars substantially parallel to the longitudinal axis of said stack, and with the ends of said bars respectively adjacent said annuli,
7. welding the respective ends of each bar to the adjacent annuli thereby to rigidly fix the spacing between the outer portions of said annuli,
8. releasing the axial compressive force applied to said rings, and removing said rings.

4,007,868

CONTAINER FOR CARD

Yukio Kusunoki, Toyama, Japan, assignor to Taiyo Package Co. Ltd., Japan

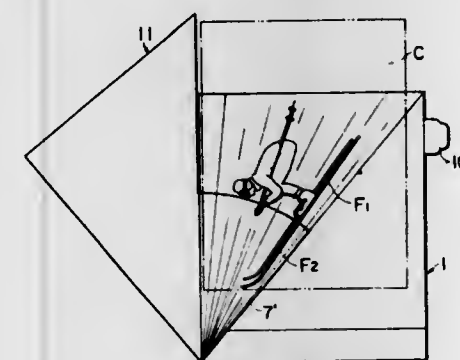
Filed Sept. 8, 1975, Ser. No. 611,432

Claims priority, application Japan, Oct. 8, 1974, 49-121637[U]

Int. Cl.² B65D 5/38

U.S. Cl. 229-20

3 Claims



1. A container for card which comprises a container body and a lid in combination, said container body comprising an end wall, first and second inner walls and a bottom flap of the first inner wall, said end wall being folded inwardly along a fold line, the second inner wall being folded inwardly along a central fold line and being connected to a back side of said end wall, and said first and second inner walls each being provided with a linear slit, each said slit extending obliquely from a corner in a lower part of the inner wall and being of a length approximately one half that of a diagonal line drawn from that corner, said lid comprising a first free end, first and second inner walls contiguous to each other, a second free end and an outer end flap, each of said inner walls comprising a projection and a lug at spaced portions thereof adjacent to the associated free end, the outer end flap being folded inwardly along a fold line and being connected by adhesive to an end portion of the first inner wall, said each inner wall being folded along a central fold line and having a projection, a curved edge and a linear edge meeting with a corresponding linear edge at the top of the central fold line, said container body and said lid being combined in use with each curved edge of the lid being inserted into each linear slit of the container body, such that each curved edge of the lid may slide over a terminating point of the linear slit so that, when the lid is opened the associated projection is rotated with the lug functioning as a fulcrum and so that during said rotation said projection engages the terminating point so as to prevent further rotation.

4,007,869

CORRUGATED CARTON CONSTRUCTIONS

Walter J. Stolkin, Chicago, and Alan M. Sax, Arlington Heights, both of Ill., assignors to Stolmar Corporation, Chicago, Ill.

Filed Jan. 14, 1976, Ser. No. 648,886

Int. Cl.² B65D 5/08, 5/10

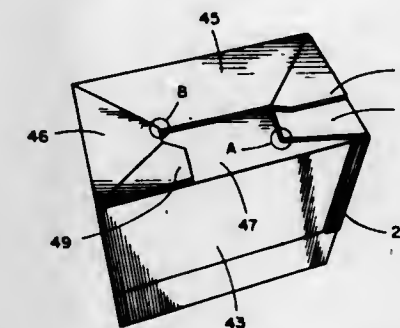
U.S. Cl. 229-41 B

10 Claims

1. In a corrugated container of the type having a bottom which automatically deploys to a locked configuration upon

opening said container, said container being formed from a blank having four side panels and four bottom panels depending downwardly from said side panels, the improvement comprising:

at least one pressure flap located on one of said bottom panels for engaging and pressing against an adjacent bottom panel during opening and closing of said container to oppose said opening and closing whereby the container is opened by manual application of sufficient pressure to overcome the force of said pressure flap and will thereafter remain in the open position without tending to collapse due to the force of said pressure flap opposing such collapse.



and wherein one of said bottom panels overlaps an opposite bottom panel, said pressure flap being located on one of the remaining two bottom panels, said blank further including:

a relief flap located on the other of said remaining panels, said relief flap being dimensioned relative to said pressure flap, to permit said opposite bottom panel to deploy prior to said overlapping bottom panel, whereby the overlapping and the opposite bottom panels are prevented from bridging during movement to the open position.

4,007,870

NEWSPAPER DELIVERY BOX SIGNAL

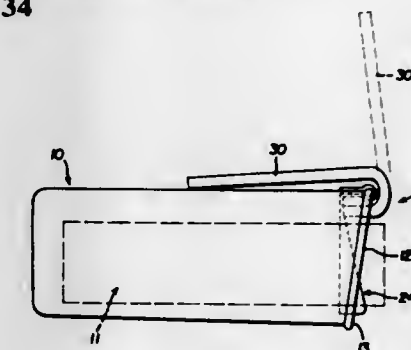
John L. Hankis, Greenville, Mich., assignor to Roy A. Hankis, Troy, Mich.

Filed Dec. 3, 1975, Ser. No. 637,366

Int. Cl.² A47G 29/12

U.S. Cl. 232-34

7 Claims



1. In a newspaper delivery box signal for mounting within a horizontally elongated, roughly tubular shaped box having an open forward end to receive a newspaper and the like, comprising: a flap sized to fit within said box and biased for normally being generally vertical for thereby blocking the box open end; a horizontally arranged U-shaped clamp for receiving and resiliently clamping to the upper, central edge portion of the box forward end for removable attachment thereto, and so that one leg of the clamp is thereby arranged within the box; hinge means connecting said clamp to the flap, whereby the flap may pivot inwardly and upwardly relative to the box forward end; and an elongated signal flag means, said signal flag means extending upwardly and then rearwardly of the box so that a major portion of the flag means is normally arranged above and roughly parallel to the upper surface of the box; the improvement comprising:

said clamp being positioned vertically above said flap;
said hinge means being positioned intermediate said clamp and said flap and being permanently attached to both said clamp and said flap; and
connection means vertically beneath both said clamp and said hinge means for securing said signal means to said flap so that said signal flag means aids in biasing said flap generally vertically,
said connection means including a stud portion formed integral with said flap near the upper end portion thereof, and a socket formed in one end of said flag means for receiving said stud, and means for locking the stud within the socket;
whereby the insertion of a newspaper or the like into the box through the open forward end thereof will pivot the flap inwardly of the box and thereby cause the flag means to swing upwardly relative to the box to a signal position and whereby the flag means normally, in the absence of or withdrawal of a newspaper from the box, will hang upright so that the signal means remains roughly horizontal in the non-signal position.

4,007,871

CENTRIFUGE FLUID CONTAINER

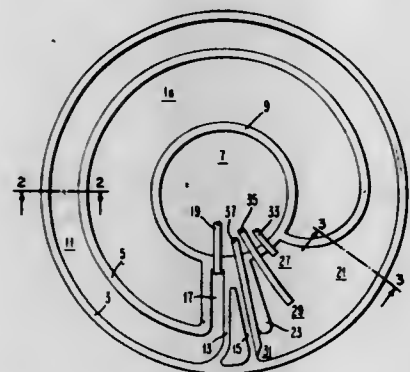
Alan Lytton Jones, and Robert Melroy Kellogg, both of Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,546

Int. Cl.² B04B 15/06

U.S. Cl. 233-27

4 Claims



1. A flexible collapsible blood processing container for centrifuging whole blood to separate it into fractions according to density, comprising,
an outer fluid channel having opposite ends and comprising an interrupted annulus having an elliptical cross section when filled,
a central opening in said container, and
a plurality of tubing connections extending radially outward from said central opening to opposite ends of said fluid channel, the openings of said tubing connections in said channel having different radial distances from said central opening.

4,007,872

FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 530,605, Dec. 9, 1974, Published Application No. B530,605, and a continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a

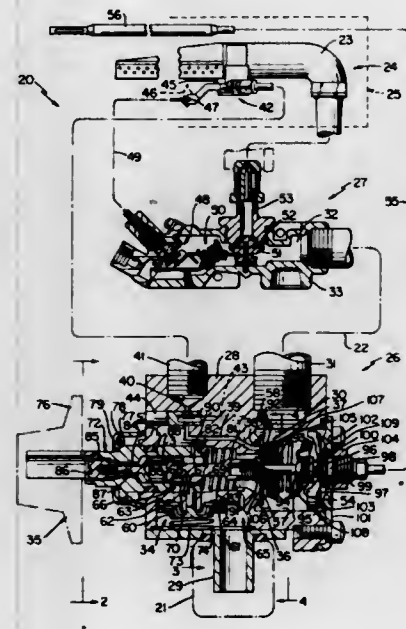
continuation-in-part of Ser. No. 380,389, July 18, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,863
Int. Cl.² F16K 31/143, 31/363

U.S. Cl. 236-15 A

23 Claims

1. In a fuel control system for a fuel burning apparatus or the like having a source of fuel adapted to be interconnected

by passage defining means to burner means of said apparatus, a pair of control devices disposed in said passage defining means in series relation and respectively having poppet valve means for opening and closing said passage defining means, said poppet valve means of one of said control devices being a main directly manually operated on-off valve means for said system, said one control device having a thermostatically operated valve means for controlling the flow of fuel through said passage defining means intermediate said poppet valve



means, said one control device having a selector means operatively interconnected to said main poppet valve means and said thermostatically operated valve means to operate the same, the improvement wherein said selector means comprises a rotatable shaft having a longitudinal axis of rotation, said main poppet valve means being opened and closed by said shaft in a direction of movement substantially transverse to said longitudinal axis, said thermostatically operated valve means being moved in a direction of movement substantially the same as the direction of said longitudinal axis.

4,007,873

PNEUMATIC THERMOSTAT

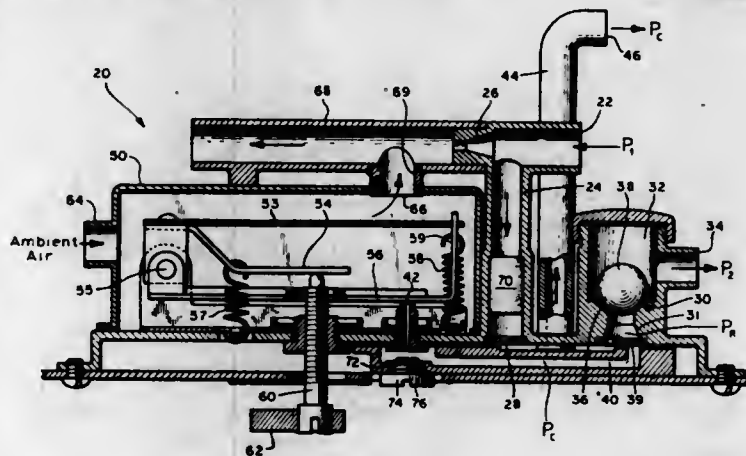
Ernest J. Duchek, Mount Prospect, Ill., assignor to Powers Regulator Company, Skokie, Ill.

Continuation-in-part of Ser. No. 472,337, May 22, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,387

Int. Cl.² F24F 11/02

U.S. Cl. 236-49

7 Claims



1. In an air flow distribution apparatus having a means for supplying pressurized air, a means for diffusing said air into an enclosed area, and a means for regulating the air flow to said diffusing means from said supply means in response to an air pressure signal indicative of temperature within the enclosed

area, the improvement comprising: a pneumatic thermostat capable of generating from a variable pressure air supply said air pressure signal indicative of ambient temperature, said thermostat including a pressure reducing chamber having a lower and an upper section; said lower section adapted to receive from said air flow distribution apparatus upstream from said regulating means said variable pressure air supply and said upper section having a first outlet port in communication with the air flow distribution apparatus downstream from said regulating means; means for intermittently bleeding said lower section to said upper section to produce a constant pressure within said lower section; restriction nozzle adapted to continuously bleed from said lower section to a pressure transmitting chamber a substantially constant pressure air flow, said pressure transmitting chamber communicating with an exhaust nozzle which vents to a thermometric chamber, said thermometric chamber having an inlet port to receive ambient air from the enclosed area and a second outlet port; means disposed within said thermometric chamber and adjacent said exhaust nozzle for variably inhibiting the air flow from said exhaust nozzle automatically in response to changes in ambient temperature thereby producing a pressure within said pressure transmitting chamber indicative of said ambient temperature, a third air outlet port in communication with said pressure transmitting chamber to thereby transmit said pressure signal to said regulating means; and means for aspirating said thermometric chamber disposed adjacent to said second air outlet port, said aspirating means in communication with said variable pressure air supply and adapted to utilize said air supply to aspirate ambient air through said thermometric chamber.

4,007,874

HEATING SYSTEM

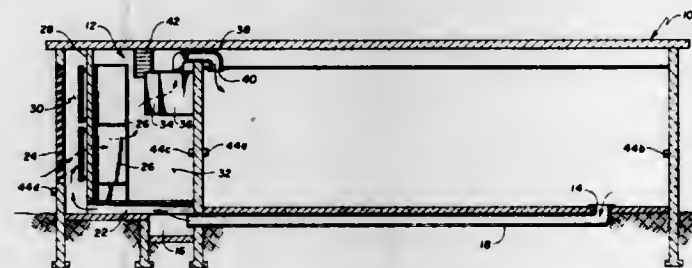
Wilbert Laudner, Rockwell, Iowa 50469

Filed Aug. 14, 1975, Ser. No. 604,797

Int. Cl.² G05D 23/00

U.S. Cl. 237-2 B

10 Claims



1. A building heating system for buildings containing freezers comprising: A compressor housing for the freezers, external to the area to be heated; means within the area to be heated for collecting cold building air and conveying the cold air to said compressor housing; means operably secured to said compressor housing for selectively adding supplemental cold make-up air to the cold building air; means operably secured in proximity to the compressors for forcing the cold air through the compressors; means for selectively cooling said compressor housing; means operably secured to said compressor housing for conveying heated air out of said compressor housing into the building; means operably secured to said compressor housing for selectively adding supplemental heat to the heated air; and control operably secured to said supplemental cooling said compressor housing, and to said means for adding supplemental heat to the heated air means for controlling the heating system.

4,007,875

INSTALLATION FOR VENTILATING THE INTERIOR SPACE OF A MOTOR VEHICLE

Albert Stolz, Tubingen, Germany, and Axel Stehle, Nanuet, N.Y., assignors to Daimler-Benz Aktiengesellschaft, Germany

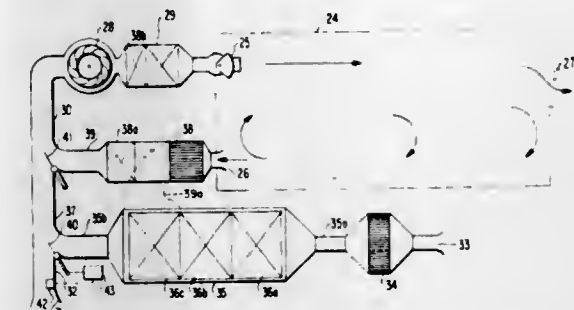
Filed Apr. 3, 1975, Ser. No. 564,920

Claims priority, application Germany, Apr. 6, 1974, 2416805

Int. Cl.² B60H 1/02

U.S. Cl. 237-12.3 A

44 Claims



1. An installation for ventilating the interior space of a passenger motor vehicle which includes air inlet and air discharge aperture means terminating in the atmosphere, at least one fresh air channel means leading from the air inlet aperture means into the interior space, fan means and at least one air filter insert means arranged in the fresh air channel means and adapted to be traversed by fresh air for filtering at least one of mechanical and chemical air contaminations, characterized in that at least one air channel means is extended along a space means accessible by way of a large continuous surface means, said one air channel means being enlarged within the area of this space means in a housing-like manner for receiving the air filter insert means and being provided with an opening means for the exchange of the air filter insert means, said opening means being of relatively large surface and adapted to be closed, a heat-exchanger for preheating the fresh air in the fresh air channel means is arranged upstream of the air filter insert means, as viewed in the flow direction, and in that a recirculating line means terminates in the fresh air channel means downstream of the air filter insert means, as viewed in the flow direction.

20. An installation for ventilating the interior space of a passenger motor vehicle which includes air inlet and air discharge aperture means terminating in the atmosphere, at least one fresh air channel means leading from the air inlet aperture means into the interior space, fan means and at least one air filter insert means arranged in the fresh air channel means and adapted to be traversed by fresh air for filtering at least one of mechanical and chemical air contaminations, characterized in that at least one air channel means is extended along a space means accessible by way of a large continuous surface means, said one air channel means being enlarged within the area of this space means in a housing-like manner for receiving the air filter insert means and being provided with an opening means for the exchange of the air filter insert means, said opening means being of relatively large surface and adapted to be closed, a heat-exchanger for preheating the fresh air in the fresh air channel means is arranged upstream of the air filter insert means, as viewed in the flow direction, a recirculating line means has a first end terminating in the fresh air channel means, with a second end thereof communicating with the vehicle interior space, interchangeable means for a moisture removal are arranged in the recirculating line means and are traversed by the recirculating air, a variable throttle means at least partly closing the flow cross-section is provided at least in one of the two channel means consisting of the fresh air channel means and of the recirculating line means, a by-pass channel means by-passing the air filter insert means and terminating directly in the atmosphere, terminates in the fresh air channel means downstream of the air filter insert means as

viewed in the flow direction, a further throttling means for partly closing the flow cross-section and enabling a shifting of the main flow is arranged within the area of a discharge of the by-pass channel means in the fresh air channel means.

22. An installation for ventilating the interior space of a passenger motor vehicle which includes air inlet and air discharge aperture means terminating in the atmosphere, at least one fresh air channel means leading from the air inlet aperture means into the interior space, fan means and at least one air filter insert means arranged in the fresh air channel means and adapted to be traversed by fresh air for filtering at least one of mechanical and chemical air contaminations, characterized in that at least one air channel means is extended along a space means accessible by way of a large continuous surface means, said one air channel means being enlarged within the area of this space means in a housing-like manner for receiving the air filter insert means and being provided with an opening means for the exchange of the air filter insert means, said opening means being of relatively large surface and adapted to be closed, and in that a recirculating line means terminates in the fresh air channel means downstream of the air filter insert means, as viewed in the flow direction.

4,007,876

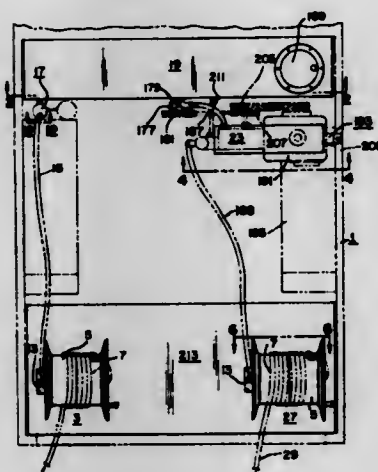
SPRAY EQUIPMENT AND METHOD

James S. Stevenson, 4230 St. Andrews Road, Oakland, Calif. 94605

Division of Ser. No. 315,295, Dec. 15, 1972, Pat. No. 3,856,274. This application Oct. 10, 1974, Ser. No. 513,747
Int. Cl.² B05B 7/30; B67D 5/08, 5/56

U.S. Cl. 239-10

10 Claims



1. Spray equipment comprising a hose having one end available for connection to the discharge end of a spigot, a tank, means flow coupling the other end of said hose, to said tank, a second hose means flow coupling said second hose, at one end, to said tank, said second hose terminating at its other end for discharge, a source of spray ingredient at substantially atmospheric pressure, and means responsive substantially proportionally to flow velocity of liquid through said first hose to said tank, for introducing into said first hose for flow with said liquid to said tank, a flow of said ingredient.

4,007,877

ADJUSTABLE STEM SPRINKLER DROP

Jimmy Jackson, Macon, and William D. Roquemore, Musella, both of Ga., assignors to James C. Hays, Macon, Ga., a part interest

Filed May 18, 1976, Ser. No. 687,487

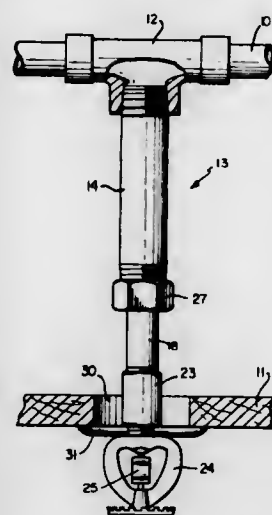
Int. Cl.² B05B 15/08; A62C 37/10; F16L 27/12

U.S. Cl. 239-209

5 Claims

1. An adjustable stem sprinkler drop for a fire protection sprinkler system comprising sleeve means connected at one end to a source of water under pressure, said sleeve means having a bore with an internally threaded reduced portion intermediate its ends, an elongated adjustable stem having

external threads at one end threadedly engaging said reduced portion of said sleeve means, the other end of said stem being positioned below the other end of said sleeve means, the external surface of said stem being spaced from the internal bore of said sleeve means, cap means threadedly mounted on said other end of said sleeve means, and a circular gasket



having a generally triangular cross-section carried by said cap means, said gasket having an inner diameter of a size to slidably receive the external surface of said adjustable stem, whereby said cap means is screwed onto said sleeve means so that said gasket forms a seal to prevent the passage of water under pressure but which permits rotation of said adjustable stem relative to said sleeve means.

4,007,878

ADJUSTABLE DRY PENDANT SPRINKLER HEAD ASSEMBLY

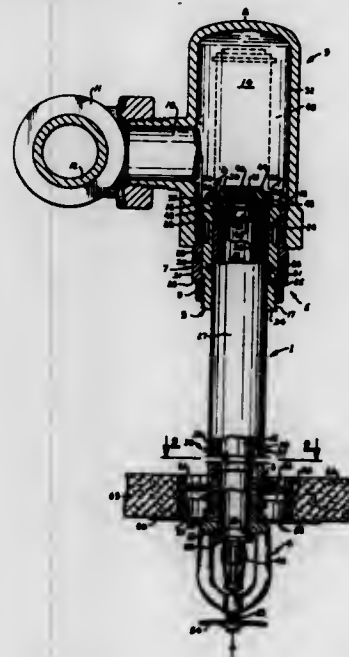
James R. Anderson, Berwyn, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed Aug. 19, 1976, Ser. No. 716,065

Int. Cl.² B05B 15/08; A62C 37/10; F16L 15/02

U.S. Cl. 239-209

20 Claims



1. A vertically adjustable drop nipple comprising:
a. a nipple,
b. a collet through which said nipple is inserted axially and which has an externally tapered section thereon,
c. a collet holder having an internally tapered section therein and into which said collet is inserted, said externally and internally tapered sections being in confronting abutment against each other, and
d. tightening means whereby said collet is thrust axially within said holder and is thereby compressed for gripping

said nipple and securing it from axial movement within said holder.

4,007,879

TEXTURE APPLICATOR

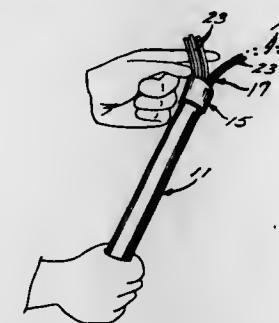
Elvin R. Jensen, 953 E. Howard, Pasadena, Calif. 91104

Filed Nov. 5, 1975, Ser. No. 628,986

Int. Cl.² B05B 3/00

U.S. Cl. 239-214

9 Claims



1. A texture applicator for applying a flowable texture material and comprising:
a tubular handle formed with an elongated chamber for receipt of said flowable texture material and defining first and second ends;
an end wall on said first end;
hollow, open-ended flex members projecting on their respective one ends through said end wall and projecting coextensively from said handle to define whip tubes; and
a removable closure mounted on said handle and normally closing said second end whereby said closure may be removed, said flowable texture material inserted in said tubular handle, said closure replaced and said applicator manipulated about to pivot said one end rapidly downwardly to an abrupt stop to force said material under its own momentum in small flow streams into the free extremities of said whip tubes so said whip tubes may be drawn to one side from their normal position and released to snap back past their normal position to whip said flex material from said flow streams in separated droplets to be applied in a random pattern to a surface to be textured.

4,007,880

ELECTROMAGNETIC FUEL INJECTION VALVE

Waldemar Hans, Bamberg, and Herbert Wagner, Mellichstadt, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

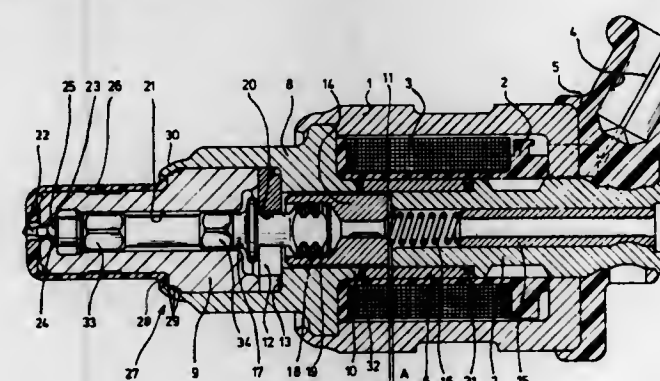
Filed Dec. 3, 1975, Ser. No. 637,147

Claims priority, application Germany, Dec. 12, 1974, 2458728

Int. Cl.² B05B 1/30

U.S. Cl. 239-585

4 Claims



1. In an electromagnetic fuel injection valve for timed low-pressure fuel injection systems, which valve includes a coaxial assembly of a connection tube, a bushing, a housing extension and a fuel nozzle body, said assembly forming a substantially

cylindrical passage for fuel to be delivered by said valve to an engine, the improvement comprising metallic seals between adjacent portions of said connection tube and said bushing, and between said bushing and said housing extension, said metallic seals having their surfaces in engagement with their corresponding adjacent elements under pressure, and a further metallic seal between said housing extension and said nozzle body, said further metallic seal being formed by parallel edges on said nozzle body which mate with an interior portion of said housing extension, and under external pressure embed themselves into the wall defining the interior portion of said housing extension.

4,007,881

COIL WINDING MACHINE

Horst Eugen Haslau, and William Emerson Riggsbee, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 278,351, Aug. 7, 1972, abandoned.

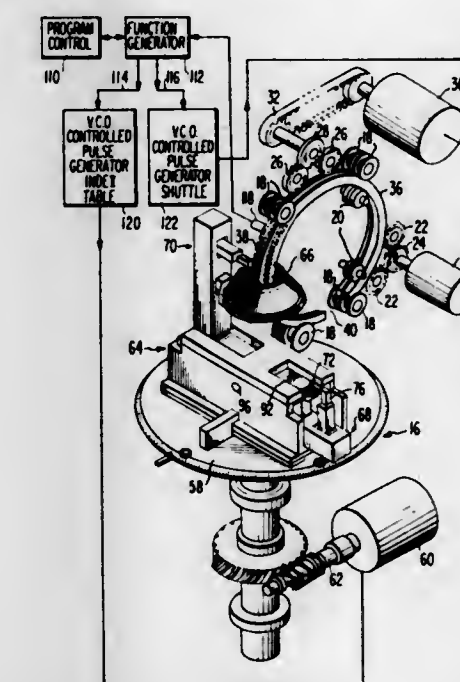
This application Sept. 6, 1974, Ser. No. 503,681

Claims priority, application United Kingdom, Feb. 22, 1972, 8214/72

Int. Cl.² H01F 41/08

U.S. Cl. 242-4 B

4 Claims



1. In a winding machine for winding a toroidal coil about a hollow core the combination comprising:
a rotatably mounted floating annular magazine for storing filament to be wound into said coil and arranged to be linked with said core,
a rotatably mounted annular shuttle arranged to be linked with said core for withdrawing the filament from said magazine and for guiding the filament on to said core, the withdrawing of said filament rotating said magazine, rotation restraining means coupled to said magazine for inhibiting the rotation of said magazine during said withdrawing, and
shuttle drive means including an electric motor and preprogrammed motor energizing means coupled to said motor for causing said motor to rotate the shuttle at an angular rate which varies in each rotation of the shuttle in accordance with the angular position of the shuttle to withdraw the filament from the magazine at a constant rate.

4,007,882

APPARATUS FOR THE AUTOMATIC DOFFING OF TEXTILE MACHINES SUCH AS WINDING MACHINES

Bernard Isoard, Ecully, France, assignor to Rhone-Poulenc-Textile, Paris, France

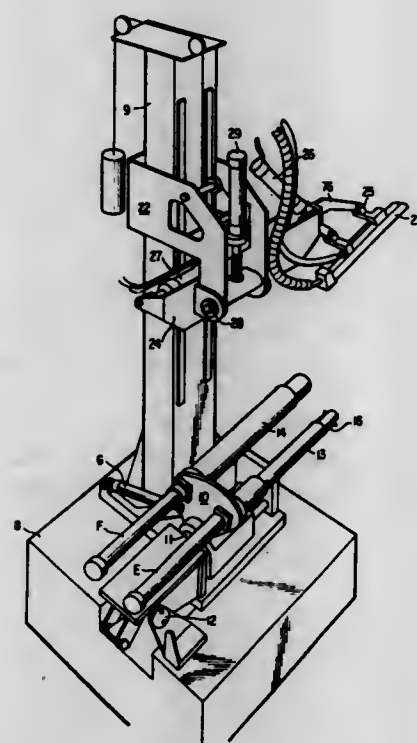
Filed Apr. 10, 1975, Ser. No. 566,811

Claims priority, application France, Apr. 11, 1974, 74.13119; Aug. 18, 1974, 74.28648

Int. Cl.² B65H 54/02

U.S. Cl. 242—18 R

21 Claims



1. In an apparatus for automatic bobbin changing on a high speed frontal bobbin winder having a frame with at least one winding-up station, at least one yarn support gripping spindle with a horizontal axis, a rotatable winding cylinder mounted for movement into and out of tangential engagement with a package forming on a yarn support on said spindle, a fixed yarn guide and a reciprocable yarn guide for distributing yarn along the yarn support, the improvement which comprises

a loading and unloading means mounted on a frame for movement in a direction parallel to the front of the bobbin winder, said loading and unloading means including at least two parallel spindles, one of said spindles being provided for removing a wound yarn package from the yarn support gripping spindle and another of said spindles being provided for placing an empty yarn support on said gripping spindle, said parallel spindles being movable in turn into an aligned position in axial alignment with a yarn support gripping spindle of said frame;

nozzle means for capturing and removing the yarn fed to the yarn support, said nozzle means having a rectilinear capture slit communicating with a channel through which a stream of fluid may be fed at high speed and means for cutting the yarn mounted at the bottom of said slit;

means on said frame for mounting the nozzle means parallel to the axis of said winding cylinder so that it is movable between a capture position in which the slit extends in a plane including the reciprocating yarn between the fixed guide and the reciprocable guide, to capture a yarn as it moves from the fixed guide to the reciprocable guide and a second position adjacent said aligned position, to engage the captured yarn on an empty yarn support carried by said gripping spindle.

4,007,883

SIMULTANEOUS BOBBIN WINDING STATION

Bernard Isoard, Ecully, France, assignor to Rhone-Poulenc-Textile, Paris, France

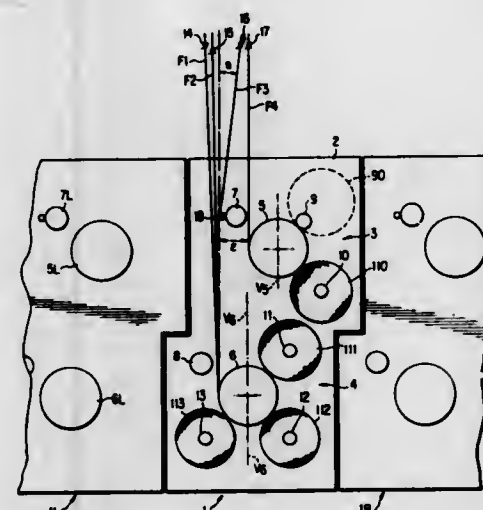
Filed Dec. 8, 1975, Ser. No. 638,445

Claims priority, application France, Dec. 9, 1974, 74.40872

Int. Cl.² B65H 54/20

U.S. Cl. 242—35.5 R

6 Claims



1. A winding station for simultaneously winding a plurality of bobbins including a pair of vertically staggered winding units each winding unit including

a pilot roller, bobbin mounting means and a reciprocating yarn distributor, the yarn distributor of each winding unit being positioned in an upper quadrant zone to guide yarn along a vertical plane tangential to the pilot roller, the bobbin mounting means of each winding unit including a pair of bobbin mounts adjacent their respective pilot roller and positioned in the upper and lower quadrant zones opposite from the side on which their respective yarn distributor is positioned, the bobbin mounting means of the lower of said winding units including a third bobbin mount in the quadrant zone underlying its respective yarn distributor, means for feeding a pair of yarns to each winding unit, and means for diverting one of the pair of yarns from the upper of said winding units to the lower winding unit.

4,007,884

WINDING APPARATUS

Heinz Schippers, and Erich Lenk, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

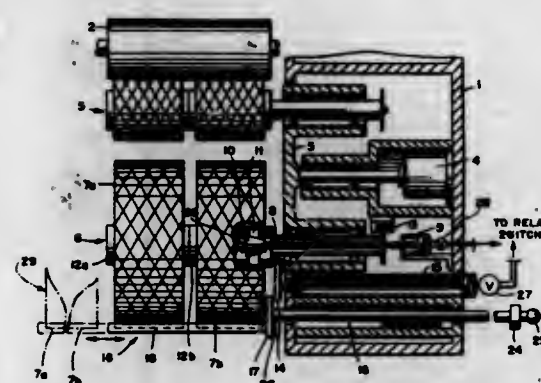
Filed June 25, 1975, Ser. No. 590,119

Claims priority, application Germany, July 1, 1974, 2431567

Int. Cl.² B65H 67/04

U.S. Cl. 242—41

3 Claims



1. In a winding machine having at least two rotatable bobbin-holding chucks mounted in a cantilevered projecting man-

ner on a rotatable or pivotal bobbin revolver adapted to shift each chuck and its associated bobbin tube or package in a rotating or pivoting movement from an upper operative chuck winding position to a lower inoperative chuck position, the improvement which comprises:

ejector means for dislodging the finished bobbin package from the chuck in its lower inoperative position; and take-up means for receiving said finished package after being dislodged from the chuck in its lower inoperative position, said take-up means being arranged below the chuck in its inoperative position in close proximity to the circumference of the finished package thereon and including supporting members arranged asymmetrically relative to the vertical axial plane of the chuck in its lower inoperative position to provide a receiving cradle inclined from the horizontal towards the rotating or pivoting movement of the bobbin revolver by which a chuck carrying the finished package is shifted into its lower inoperative position; and means to axially extend said take-up means outwardly of the chucks to hold the dislodged finished package in front of the outboard end of the chucks.

4,007,885

FLEXIBLE TRAVERSE GUIDE ASSEMBLY

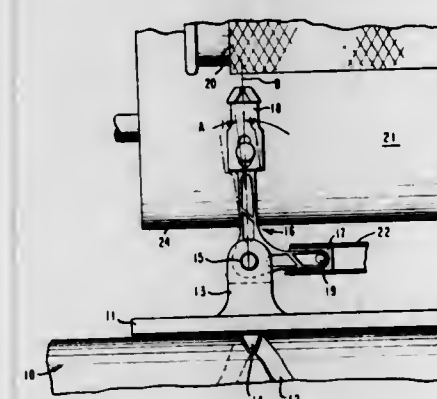
James Weaver Hare, Martinsville, Va., and Allan Bryce Hughes, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 17, 1975, Ser. No. 588,220

Int. Cl.² B65H 54/28, 57/00

U.S. Cl. 242—43 R

2 Claims



1. In a yarn winding apparatus including a rotatable driven barrel cam having a continuous helical groove in its surface, a cam follower riding in said groove and means limiting the follower to a reciprocating linear path of travel between cam reversal points, a yarn guide and a slide block mounted for reciprocating linear travel the improvement comprising: a resilient L-shaped arm having two legs joined at a junction, said yarn guide being connected to the end of one of said legs, said slide block being connected to the end of the other of said legs, said cam follower being connected to said arm at the junction of said legs, each of said legs being independently flexible, said leg connected to said yarn guide being capable of being flexed at an angle from about 2.5° to about 6.5° with respect to a plane perpendicular to said leg connected to said slide block during the cam reversal, as governed by the flexibility of said legs.

4,007,886

LINE WINDER

Bernard Kaminstein, 329 Franklin Place, Paramus, N.J. 07652

Filed Aug. 8, 1975, Ser. No. 603,008

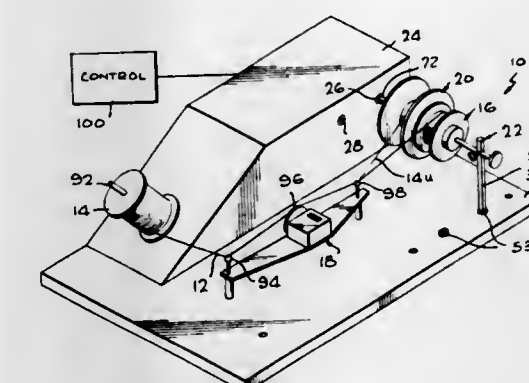
Int. Cl.² A01K 89/00

U.S. Cl. 242—84.2 R

11 Claims

1. A line winder for winding a line on a reel of the type which has an elongated strip-shaped reel base, a reel, and with a rotatable handle, comprising:

a winder base; a reel holder mounted on said winder base, for holding the base of a reel; and motor means mounted on said base for rotating a reel which is on said holder; said reel holder including a frame with a longitudinally-



extending portion, a bracket longitudinally positionable along said longitudinally-extending portion of said frame and having a pair of spaced legs for receiving the ends of a reel base between the legs and frame, and a cam assembly coupled to said frame and bracket for clamping said legs of said bracket and the ends of the reel base thereunder on said frame.

4,007,887

STRAP ROLLING DEVICE

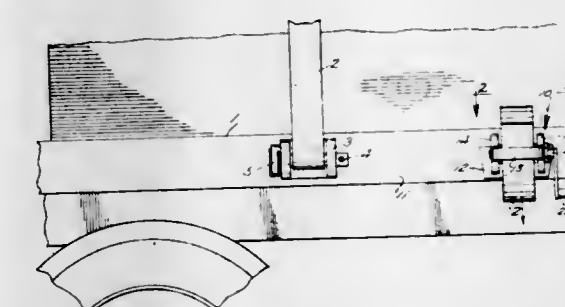
Lester J. Vice, Hillsboro, Oreg., assignor to Eugene H. Braukman, Cornelius and Gerald A. Kramer, Forest Grove, both of, Oreg.

Filed Sept. 26, 1975, Ser. No. 616,937

Int. Cl.² B65H 17/46

U.S. Cl. 242—86.5 R

4 Claims



1. A device for temporary attachment to a mobile base for rolling up elongate flexible material, said device comprising, a frame member including retention means, means detachably coupling said frame member to said mobile base, and a spindle assembly including a spindle defining a longitudinally orientated open ended opening to receive one end of the flexible material to be rolled in a manner permitting axial separation of the subsequently rolled material and said spindle, said spindle assembly further including retention means cooperating with the first mentioned retention means and a bearing housing within which one end portion of said spindle is journaled, said bearing housing being in detachable engagement with said frame member to permit axial extraction of the spindle assembly from material rolled thereon and the frame member.

4,007,888

YARN BOBBIN AND METHOD FOR MANUFACTURING THE SAME

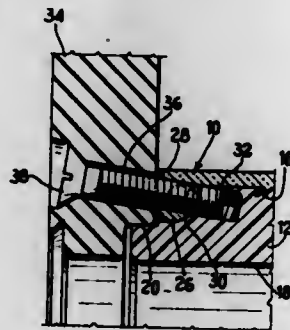
Enzo Scaglia, Brembilla (Bergamo), Italy, assignor to M. Scaglia S.p.A., Milan, Italy

Filed July 14, 1975, Ser. No. 595,422

Int. Cl.² B65H 75/14

U.S. Cl. 242—118.6

4 Claims

**3. A yarn bobbin comprising:**

a tubular metallic core member having opposite end portions;

a pair of centrally bored plastic inserts, one each force fitted into opposite ends of said core member, each said insert having at the outer end thereof a radially outwardly facing annular recess and a reduced outer diameter cylindrical stepped surface;

each said end portion of said core member being deformed inwardly and rearwardly in the form of a spirally-coiled curl-shaped bead seated in a respective said recess; radially inwardly inclined threaded holes extending through each said bead and at least partially through the respective said insert;

a pair of flanges, each having a central bore positioned against and centered around a respective said stepped surface, each said flange abutting the end of a respective said bead; and

thread means, extending through each said flange and the respective said holes, for securing said flanges to said core member and the respective said inserts.

4,007,889

FLOW CAMERA FILM TRANSPORT

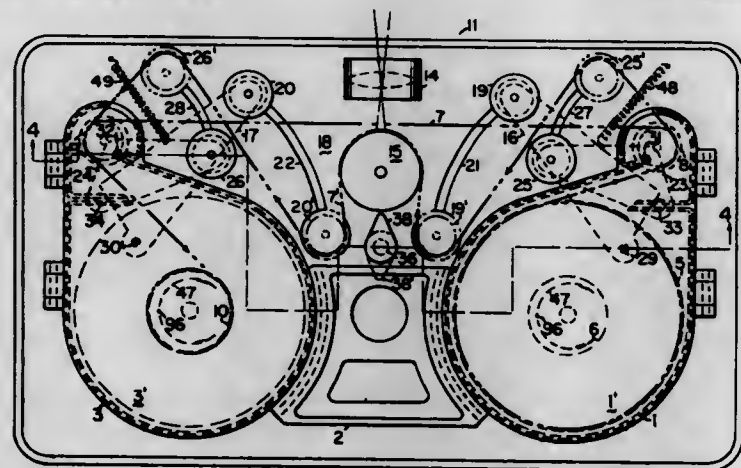
Forrest L. Langford, Northridge, Calif., assignor to Terminal Data Corporation, Woodland Hills, Calif.

Filed Oct. 9, 1975, Ser. No. 621,255

Int. Cl.² G03B 1/04; G11B 15/32, 23/04

U.S. Cl. 242—199

10 Claims

**1. An intermittently operable flow camera film transport system, comprising:**

a. a film cassette (1, 2, 3) for enclosing both extremities of a strip of film (7);

b. an intermittently operable capstan (15) to drive said film only when the exposure of a document thereon is to occur;

c. two pairs of members positioned on opposite sides of said

capstan, with a member of each pair on opposite sides of said strip of film, to guide the film from said cassette (1) to said capstan and from said capstan back to said cassette (3);

d. a mechanism (36-44) attached to and controlling said members to move the members of each pair oppositely away from the path of said film from said cassette to said capstan and from said capstan to said cassette (7') to allow said cassette with said film (7) to be removably installed into said camera; and

e. plural clutch means (52, 54) upon said transport system to control the egress and ingress of said film from said cassette.

4,007,890

AIRCRAFT TOWING BRAKING SYSTEM

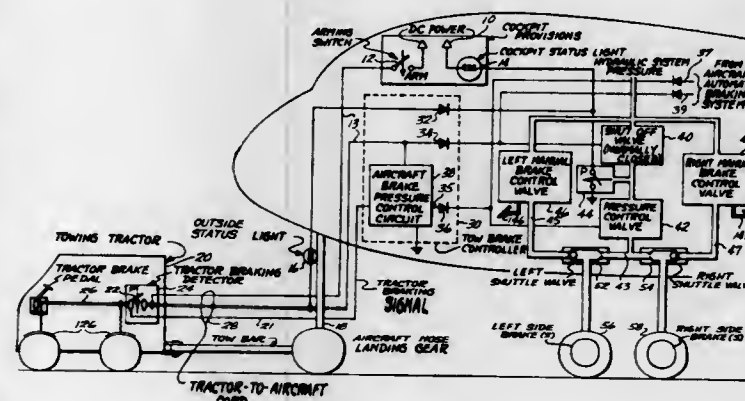
Allen Robert Bremer, Seattle, and Garrett Howard De Vlieg, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sept. 30, 1975, Ser. No. 618,297

Int. Cl.² B60T 13/68

U.S. Cl. 244—50

1 Claim

**1. In combination in an aircraft having brakes on one side and the other side of the aircraft:**

an aircraft automatic braking system comprising in combination;

means for generating an aircraft brake pressure control signal;

automatic braking pressure modulating valve means responsive to said brake pressure control signal for metering automatic braking pressure to first shuttle valve means for application to said brakes on one side of said aircraft and second shuttle valve means for application to said brakes on the other side of said aircraft;

first manually controlled pressure metering valve means coupled to said first shuttle valve means and second manually controlled pressure metering valve means coupled to said second shuttle valve means, each of said first and second shuttle valve means arranged for transmitting the greater of manually OR automatically controlled pressures for application to the brakes on the respective sides of the aircraft;

a tractor braking system for providing tractor braking pressure for application to the brakes of the tractor;

means for detecting tractor braking pressure;

said means coupled to said means for generating an aircraft brake pressure control signal; and,

wherein said means for generating an aircraft brake pressure control signal comprises aircraft brake pressure control circuit means for increasing brake pressure at a preset rate in response to detection of tractor braking pressure above a predetermined threshold level and decreasing brake pressure at a preset rate in response to detection of tractor braking pressure below a predetermined threshold level.

4,007,891

JET ENGINE AIR INTAKE SYSTEM

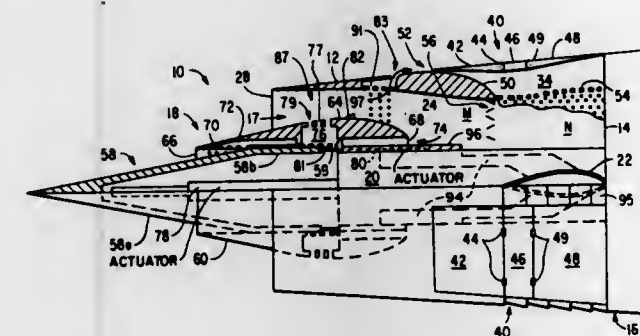
Norman E. Sorensen, Saratoga, and Eldon A. Latham, Sunnyvale, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 12, 1975, Ser. No. 612,899

Int. Cl.² B64D 33/02

U.S. Cl. 244—53 B

11 Claims



1. An axisymmetric air intake system for a jet aircraft engine comprising a fixed cowl extending outwardly from the face of said engine, a centerbody coaxially disposed within said cowl, said cowl and said centerbody defining a main airflow passageway therebetween with a throat, means for axially displacing said centerbody within said cowl so as to change the position of said throat for optimum performance at different aircraft speeds, means for increasing airflow to said jet engine face at least at aircraft speeds from takeoff to transonic, said last-named means including a cowl auxiliary airflow assembly and a forwardly located closeable air inlet in said centerbody, a centerbody airflow passageway connecting said centerbody inlet to said engine face, means for opening and closing said centerbody air inlet, and means for bleeding air from a region adjacent to said centerbody to a region external to said cowl when said aircraft is in the supersonic mode.

4,007,892

AIRCRAFT FLIGHT METHOD AND APPARATUS FOR BOOSTING AN AIRCRAFT TO A VERY HIGH ALTITUDE AND THEREAFTER BOOSTING THE AIRCRAFT TO A HIGH RATE OF FORWARD SPEED

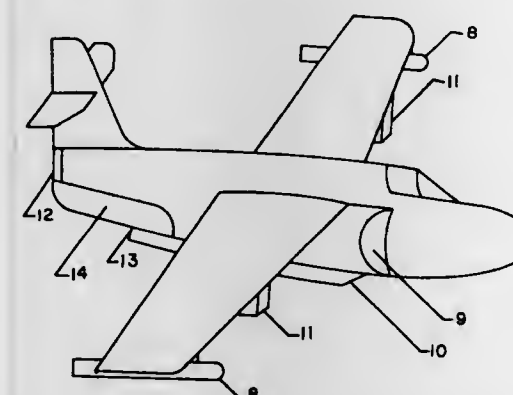
Alga M. Tabor, 907 Darlene Lane, Arlington, Tex. 76010

Continuation-in-part of Ser. No. 163,061, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 833,893, June 12, 1969. This application Jan. 24, 1975, Ser. No. 543,777

Int. Cl.² B64D 33/00

U.S. Cl. 244—62

26 Claims



1. In a flight method for improving the performance of an aircraft powered by an air breathing engine, the thrust of which is dependent during flight upon the function of rotating airfoils appurtenant thereto; the said aircraft and engine being adapted for and provided with suitable means for the utilization of oxygen booster system assistance; and the said aircraft and engine being adapted for and provided with suitable means for the effective intake and utilization of mass flow air; the steps comprising

elevating the aircraft to an above normal altitude; placing the aircraft in a flight attitude suitable for forward acceleration at the above normal altitude; accelerating the aircraft to full forward speed at the above normal altitude;

performing at least one step, included in said steps of elevating the aircraft to an above normal altitude and accelerating the aircraft to full forward speed, with assistance from an oxygen booster system;

whereby one functional advantage of the said method is that such an aircraft can thereby be enabled to attain unassisted and significantly prolonged flight, at an above normal altitude, at a higher forward speed and at a lower angle of attack than it could have attained by the use of standard and conventional flight methods.

10. In an aircraft powered by an air breathing engine, the thrust of which is dependent during flight upon the function of rotating rotor airfoils appurtenant thereto, means for improving the flight performance of said aircraft and said engine comprising, in operative combination

driving means of the said engine for providing rotary power to rotor airfoils of said engine;

interconnecting controllable variable speed drive transmission means for transmitting rotary power from said engine driving means to the said rotor airfoils;

and means for compensating for the momentary torque overload caused by the use of the said variable speed drive transmission means in stepping up the rotational speed of the said rotor airfoils relative to the rotational speed of the said engine driving means therefor;

whereby one function of the said combination is to enable the said aircraft to utilize more of its available engine power for producing thrust at very high forward flight speed; and whereby another function of said combination is to enable such an aircraft to utilize more of its potential engine power at above normal altitude to produce additional thrust.

4,007,893

HOMOCOPTER

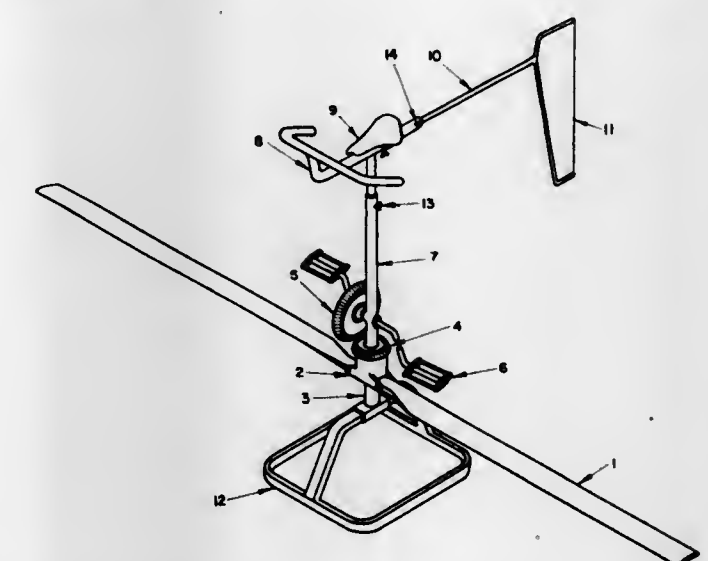
Hariton Khachikian, 5322 Russell Ave., Apt. No. 1, Los Angeles, Calif. 90027

Filed Oct. 28, 1975, Ser. No. 626,577

Int. Cl.² B64C 31/04

U.S. Cl. 244—64

2 Claims



1. A flying vehicle comprising a main column; a rotary wing assembly composed by two blades connected both to a central hub, which rotates on a main axle, said main axle being connected to the lower end of said main column; a landing sup-

port being fixed at the lower end of said main axle; an assembly composed by a pair of pedals and a main bevel gear fixed on the same axis of rotation as the pedals and this assembly rotates in a transversal bearing provided in the main column, above the hub; said bevel gear is connected to a secondary bevel gear fixed on the upper side of the hub and makes possible direct transmission of the human power from the pedals to the rotary wing.

4,007,894

METHOD AND APPARATUS FOR MINIMIZING AXIAL FRICTION FORCES IN A CYLINDER-PISTON SHOCK ABSORBER

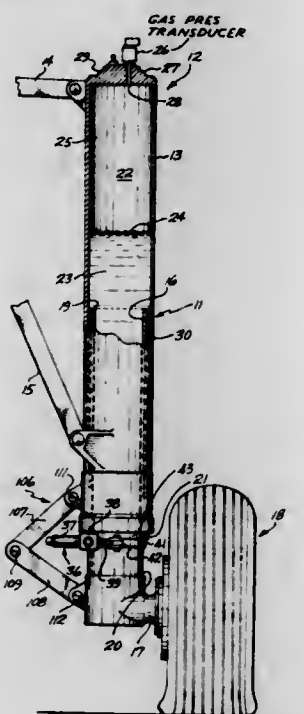
Erwin H. Hartel, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 4, 1975, Ser. No. 637,576

Int. Cl.² B64C 25/60

U.S. Cl. 244—104 FP

10 Claims



1. In a shock absorber assembly including a circular cylinder member and a piston member disposed for axial reciprocation in said cylinder member, the combination with said cylinder and piston members comprising:

bearing means of annular configuration disposed coaxially with and radially between said cylinder and piston members for supportively guiding the axial reciprocation of said piston member, said bearing means being formed and mounted for rotation about its axis relative to said members; and

actuator means connected between said bearing means and at least one of said members for rotating said bearing means relative thereto.

4,007,895

INERTIAL ESCAPE SYSTEM

Peter R. Payne, Box 282 Rte. 5, Annapolis, Md. 21401

Filed Mar. 31, 1975, Ser. No. 563,903

Int. Cl.² B64D 25/08

U.S. Cl. 244—138 R

9 Claims



1. A system for the ejection of a crew member from an aircraft comprising:

a mass disposed in said aircraft and disposed for ejection therefrom;
means for ejecting said mass;
A Kevlar pendant coupled between said mass and said crew member; and
means for releasing said pendant and said mass from said crew member when said crew member has cleared the aircraft, said means for releasing comprising a section of said pendant of reduced diameter sized to part when the peak loading is reached on the pendant.

4,007,896

UPWARDLY EXTENDIBLE WING FLAP SYSTEM

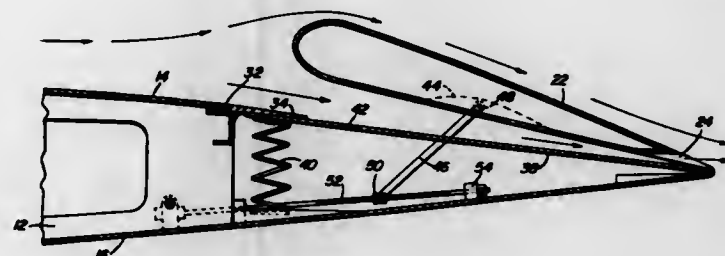
Collins J. Reynolds, III, 1615 Krameria St., Denver, Colo. 80220

Filed Aug. 8, 1975, Ser. No. 603,246

Int. Cl.² B64C 9/18

U.S. Cl. 244—42 D

6 Claims



1. In combination, a wing including leading and trailing marginal edge portions and upper and lower surfaces, the trailing marginal edge portion of said wing including a recess formed therein opening upwardly through said upper surface of and extending along said trailing marginal edge portion, a flap including leading and trailing edges, mounting means mounting said flap from said wing for guided shifting relative thereto along an upstanding path between a first lower retracted limit position at least substantially fully received in said recess, a second fully raised limit position upwardly displaced above said upper surface and with said flap disposed at a substantially greater angle of attack than said wing and a third partially raised somewhat lower intermediate extended position between said limit positions with said flap disposed only slightly above said upper surface and at an angle of attack greater than said wing but less than the first mentioned angle of attack, said flap including upper and lower surfaces, said flap upper surface constituting a substantial closure for the upper portion of said recess when said flap is in its lower limit position, a closure panel mounted in said recess below said flap for guided upward following movement behind said flap to an upper closed limit position at least substantially closing said recess at the upper portion thereof upon upward movement of said flap from said first position thereof to at least said third intermediate position thereof, said closure panel including a forward marginal edge portion, the portion of said wing defining the upper forward portion of said recess including a trailing flexible flap member which overlies the leading edge of said flap when the latter is in the closed position and past which the leading edge of said flap is movable, as a result of deflection of said flap member, upon movement of said flap back and forth between said first and third positions thereof, said flap member overlying the forward marginal edge portion of said closure panel when said closure panel is in the closed position thereof.

4,007,897

CONTROL SYSTEM FOR MONITORING VEHICLE PASSAGE AT PREDETERMINED LOCATIONS

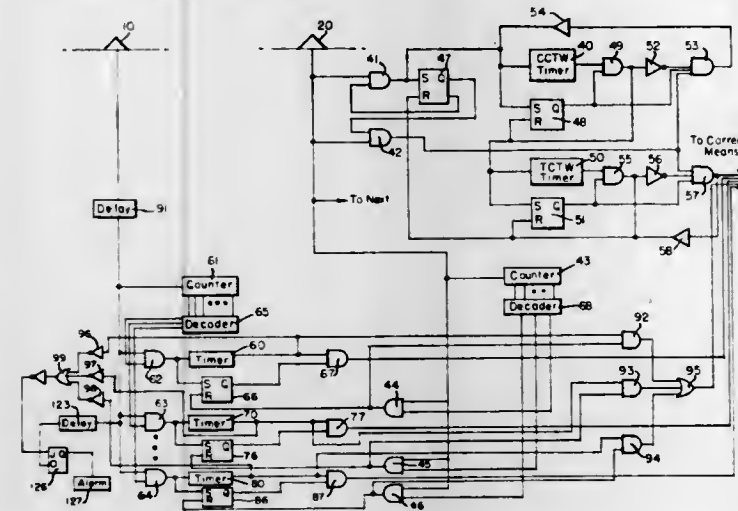
John H. Auer, Jr., Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Sept. 9, 1975, Ser. No. 611,742

Int. Cl.² B61L 23/00

U.S. Cl. 246—187 B

19 Claims



1. A control system for monitoring operation of a plurality of self-propelled vehicles moving along a guideway for assuring safety of operation, comprising:

a plurality of vehicle detectors at predetermined locations along said guideway for detecting passage of a vehicle, means responsive to actuation of one of said detectors by a leading and a trailing vehicle for determining time separation between said vehicles, and for allowing continued vehicle travel if actual time separation is greater than a first predetermined time period.

15. A method of ensuring safe operation of vehicles traveling along a guideway in which a plurality of vehicle detectors are spaced along said guideway for detection of vehicles passing said detectors comprising the steps of:

- detecting passage of a vehicle at a detector,
- detecting passage of a subsequent vehicle at said detector,
- comparing the time separation between said detections with a first predetermined time period, and
- allowing continued vehicle travel if said time separation is greater than said predetermined time period.

4,007,898

TORQUE COLLAR FOR HIGH TORQUE MOTORS

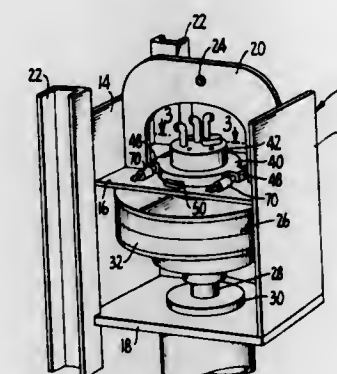
Michael G. Brenner, Pleasanton, and Gordon M. Brenner, Walnut Creek, both of Calif., assignors to M.G.B., Inc., Berkeley, Calif.

Filed May 12, 1975, Ser. No. 576,971

Int. Cl.² F04F 1/06; F02C 7/20

U.S. Cl. 248—26

4 Claims



1. Torque resisting apparatus for use in combination with a high torque motor having a stator, a rotor mounted for rotation relative to said stator about an axis of rotation, and a plurality of torque transmitting means mounted on the stator in angularly spaced relationship about said axis of rotation to

resist torque applied to the stator by the rotor, said apparatus comprising: a torque collar adapted to be disposed in an operative condition relative to the stator; stops carried by the collar, said stops each having a pair of opposed surfaces disposed for engagement with the torque transmitting means of a stator disposed in operative condition relative to the collar; a screw threaded member secured to each of the surfaces and extending through a mounting block therefor fixed to the collar; and means threadably received on the screw threaded members, said means being threadable on the threaded members to adjust the positions of the surfaces relative to the mounting blocks and lock the surfaces at select positions relative to the blocks to enable the adjustment of the opposed surfaces of the stops relative to torque transmitting means disposed for engagement therewith to provide for relative free play between the stops and torque transmitting means and simultaneous engagement of all of the stops and torque transmitting means at the end of said free play.

4,007,899

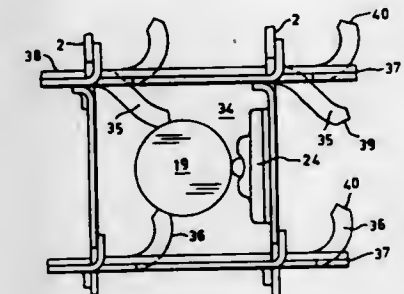
LATTICE CONSTRUCTION

Gijsbrecht Gerhardus Piepers, Heiloo, and Christiaan Gustaaf Adolf Scholtus, Alkmaar, both of Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands Division of Ser. No. 238,286, March 27, 1972, Pat. No. 3,886,438. This application Mar. 13, 1974, Ser. No. 450,863 Claims priority, application Netherlands, Mar. 26, 1971, 7104076

Int. Cl.² E04C 2/42

U.S. Cl. 248—49

4 Claims



1. A lattice constructed of a set of parallel elongated first strips residing in a given plane and a set of parallel elongated second strips also residing in said plane, said sets of first and second strips intersecting and engaging at a plurality of complementary spaced-apart incisions each of which extends from one edge of each strip toward the opposite edge of the respective strip, whereby said sets of strips form compartments, each edge portion of each strip having a lip stamped out of the material of the strip at the intersection points so as to extend parallel to the respective intersecting strip, said lip engaging the respective intersecting strip and being secured thereto, the strips of at least one of said sets each having at least two extension lips bent outwardly on either side at locations between incisions for the purpose of engaging objects in the compartments, those parts of the strips from which said extension lips are bent out being of thickened construction so that the thickness of said extension lips is greater than the thickness of the strips of the other set.

4,007,900

TUBE HANGER

George H. Holoubek, Muscatine, Iowa, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Oct. 20, 1975, Ser. No. 624,027

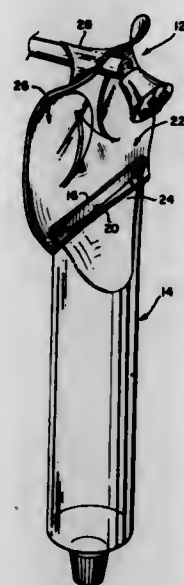
Int. Cl.² B67D 5/06

U.S. Cl. 248—311.1

4 Claims

1. A means for hanging a tube from a wall projection, said tube including a bottom sealing flange having a longitudinal dimension greater than the tube body width whereby the opposing lateral ends of said flange extend beyond the tube body proper comprising:

a thin flexible plastic part having a hanger portion for engagement with a wall projection and a tube attachment portion, said hanger portion comprising at least one slit and having a size sufficient to overlie a wall projection and said tube attachment portion comprising an elongated cut through said part having an overall length about



equal to the width of said tube body and less than the longitudinal length of said tube bottom sealing flange whereby the opposing lateral ends of said flange will resiliently grip said plastic part proximate the area at each end of said elongated cut beyond where said cut terminates.

4,007,901

CHRISTMAS TREE STAND

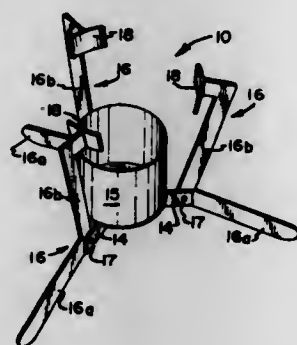
Angelo J. Mancini, and Ronald W. Galloway, both of Box 517, Afton, Wyo. 83110

Filed Nov. 20, 1975, Ser. No. 633,678

Int. Cl.² A01K 97/10

U.S. Cl. 248—526

1 Claim



1. A support stand for Christmas trees and the like comprising a generally Y-shaped base;
 - an open topped support vessel having its bottom mounted on said base such that portions of said Y-shaped support member project as extensions from beneath the vessel;
 - a support member pivotally connected to each extension, said support members each including an outwardly projecting leg portion and an upwardly and inwardly projecting arm portion and said support members being pivotally connected to said projections at the intersection of said leg and arm members, the exterior angles between said leg portions and said arm portions being between 102-106 degrees;
 - a partial collar fixed to and extending transversely with respect to the inwardly projecting portion of each arm and outwardly thereof, each said collar being of generally arcuate configuration, whereby the partial collar on the inwardly projecting arm portion pivots to a position well above and spaced from the top of the support vessel;
 - a spike extending upwardly within the vessel from the center base thereof; and

said outwardly projecting leg portion being about 1 1/2 times the length of the extensions of the Y-shaped support member, and the upwardly extending portion of the arm and the height of the vessel being respectively about 2 1/10 and 1 1/10 times the length of the extensions.

4,007,902

FISHING ROD HOLDER

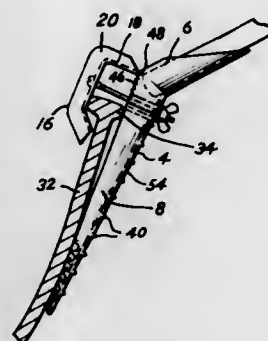
Gary K. Pettee, Rte. 3, Box 277, Roselle, Ill. 60172

Filed Oct. 9, 1975, Ser. No. 621,013

Int. Cl.² A01K 97/10

U.S. Cl. 248—534

3 Claims



1. A holder for a fishing rod capable of insertion into the ground and attachment to a boat comprising in combination:
 - a tapered substantially U-shaped bottom portion having a tip section insertable in the ground and an end section opposite said tip section, said end section defining a plurality of grooves along opposed edges of the U-shaped portion therealong and an opening therethrough;
 - a hollow top portion integral with said tapered substantially U-shaped bottom portion and extending from said end section at an acute angle, said hollow top portion defining a longitudinal opening therethrough for receipt of said fishing rod, said hollow top portion having a tapered end section to facilitate insertion of said fishing rod;
 - a bracket including a leading edge and a slot therethrough, said leading edge being adapted to engage a pair of said opposed grooves of said tapered, substantially U-shaped bottom portion in an assembled state; and
 - means for securing said bracket to said tapered, substantially U-shaped bottom portion in said assembled state, said securing means passing through said slot in said bracket and said opening in said end section of said tapered, substantially U-shaped bottom portion, said bracket pivoting substantially about the engagement of said leading edge and said tapered, substantially U-shaped bottom portion, said tapered, substantially U-shaped bottom portion, said bracket, and said securing means cooperatively defining means for adjustably clamping said holder to said boat.

4,007,903

APPARATUS FOR MAKING UNITARY CASING

Gordon Riblet, Wellesley, Mass., assignor to Microwave Development Laboratories, Inc., Needham, Mass.

Filed Sept. 18, 1975, Ser. No. 614,449

Int. Cl.² B22C 9/24

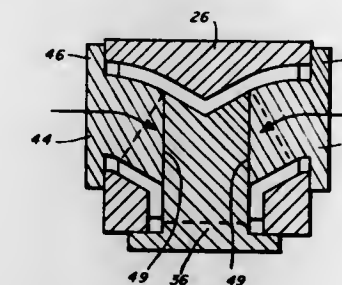
U.S. Cl. 249—145

13 Claims

1. Apparatus for constructing a microwave circulator having three ports comprising:
 - two pieces which interengage to define a mold and have means for introducing a molten material into the mold, said two pieces defining three passages meeting inside the mold at a common passage interconnecting area,
 - three core pieces which interengage or abut when inserted respectively in the three passages in the mold to define a mold core,
 - means for maintaining each core piece symmetrically in its

associated passage of the mold, a space being provided between the core and pieces for being filled about the core with the molten material to thereby define walls of the circulator,

one of said core pieces being longer than the other two core pieces including substantially straight parallel side surfaces and having a rectangular cross-section,



the other two of said core pieces having end surfaces that about the substantially straight parallel surfaces of the one core piece and side surfaces that include at least an outer arcuate surface segment extending longitudinally of the core pieces.

4,007,904

ANNULAR BLOWOUT PREVENTER

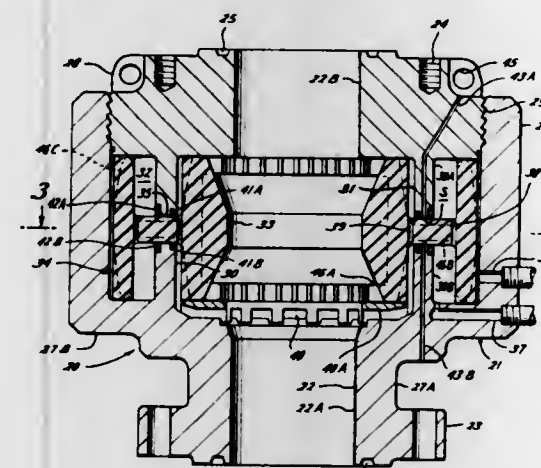
Marvin R. Jones, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Mar. 28, 1975, Ser. No. 563,194

Int. Cl.² E21B 33/06

U.S. Cl. 251—1 B

37 Claims



1. An annular blowout preventer, comprising a housing having a vertical bore therethrough, an annular recess in the bore, and an annular chamber about the recess and divided therefrom by a wall, a packer comprising a contractible annulus of resilient material disposed within the recess, a piston comprising a contractible annulus of resilient material sealably slidable within the chamber for movement toward the bore, means extending sealably through the wall for transmitting the inward movement of the piston to the packer to contract it into sealing engagement about an object in the bore or upon itself when the bore is empty, the upper end of the packer being sealably engageable with the top side of the recess as said packer is so contracted, and the outer surface of the packer being fluidly connected with the bore of the housing, and passageway means in the housing connecting with the chamber on the outer surface of the piston to permit operating fluid to be introduced thereto or exhausted therefrom.

4,007,905

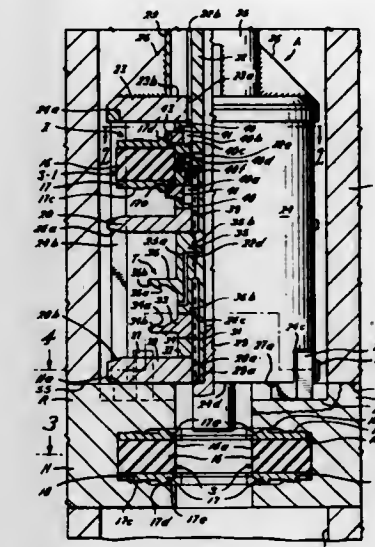
RETRIEVABLE BLOW-OUT PREVENTER RAM SEALS

James D. Mott, Houston, Tex., assignor to Hydril Company
Continuation of Ser. No. 327,627, Jan. 29, 1973, abandoned,
which is a division of Ser. No. 127,881, March 25, 1971, Pat.
No. 3,737,974. This application Feb. 24, 1975, Ser. No.
552,540

Int. Cl.² E21B 33/06

U.S. Cl. 251—1 R

53 Claims



1. An improved ram seal for a ram type blowout preventer having reciprocating ram means operably carrying the improved ram seal apparatus, said improved ram seal apparatus comprising a resilient ram seal body for blocking undesired flow through the flow passage of the blowout preventer, wherein the improvement comprises:

means with said ram seal body for releasably securing said ram seal body to the blowout preventer ram means from inside the flow passage of the blowout preventer.

4,007,906

MAIN STEAM ISOLATION VALVE

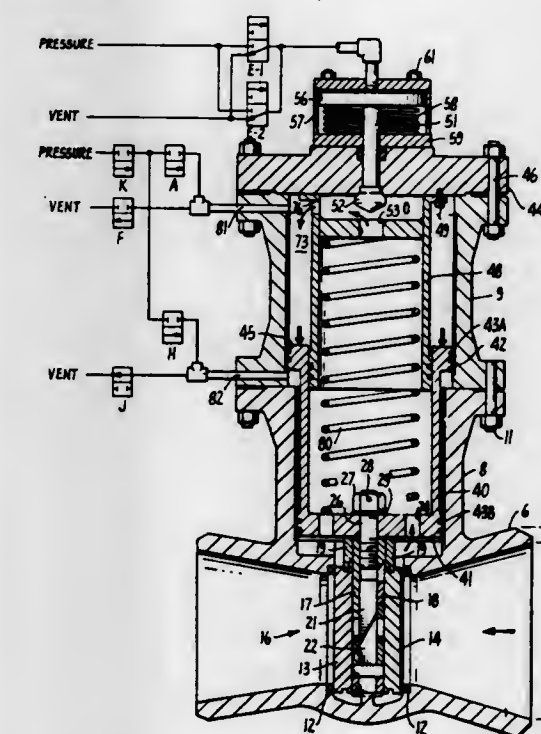
Anatole N. Karpenko, San Francisco, Calif., assignor to Anchor/Darling Valve Company, Hayward, Calif.

Continuation-in-part of Ser. No. 432,858, Jan. 14, 1974,
abandoned. This application June 16, 1975, Ser. No. 586,964

Int. Cl.² F16K 31/122

U.S. Cl. 251—26

11 Claims



7. A fail safe valve, comprising: a valve body having inlet passage means and outlet passage means and a valve seat between the inlet and outlet passage means, a cylinder on the

valve body, a piston reciprocable in the cylinder, a valve member movably mounted in the valve body between open and closed positions relative to the seat, means connecting the piston with the valve member to move the valve member to its open and closed positions, fluid passage means extending from the inlet passage means to the cylinder on opposite sides of the piston to introduce fluid pressure thereto from the inlet passage means, a fluid pressure operated pilot valve means in operative association with the fluid passage means to selectively control introduction of fluid pressure to one side of the piston to move the piston to close the valve member when the pilot valve means is open, pilot control means establishing fluid communication between the pilot valve means and the fluid pressure in the inlet passage means to selectively introduce and vent said fluid pressure to the pilot valve means to close and open the pilot valve means, biasing means connected with the pilot valve means to open the pilot valve means in the absence of said fluid pressure thereon, and biasing means connected with the piston to move the piston and thus move the valve member to its closed position in the absence of a predetermined fluid pressure in said inlet passage means and thus at said pilot valve means and in said cylinder.

4,007,907

FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

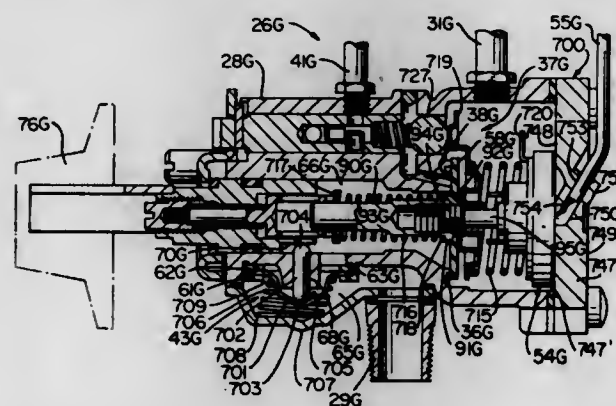
Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 530,605, Dec. 9, 1974, Published Application No. B530,605, and a continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,389, July 18, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,864

Int. Cl.² F16K 31/524

U.S. Cl. 251-85

17 Claims



1. In a fuel control system for a fuel burning apparatus or the like having a source of fuel adapted to be interconnected by passage defining means to a main burner means of said apparatus, a control device disposed in said passage defining means and having selector means and poppet valve means that is directly manually operated by said selector means for opening and closing said passage defining means so as to control the flow of fuel from said source to said main burner means, said selector means being rotatable and including a shaft means rotatable about a longitudinal axis and having a cam surface thereon, said poppet valve means of said control device having a valve stem engaging said cam surface to cause said poppet valve means to be moved transversely to said axis of rotation of said shaft means as said shaft means is rotated to open or close said poppet valve means of said control device, the improvement wherein said poppet valve means of said control device comprises a valve seat and a substantially rigid poppet valve member for opening and closing said valve seat, said stem being disposed between said poppet valve member and said cam surface and projecting through said valve seat, said control device having means for causing said poppet valve member to tilt relative to said valve seat as said poppet valve member opens said valve seat.

4,007,908

PROCESS AND DEVICE FOR ATTENUATING NOISE CAUSED BY A VALVE DURING THE EXPANSION OF A FLUID

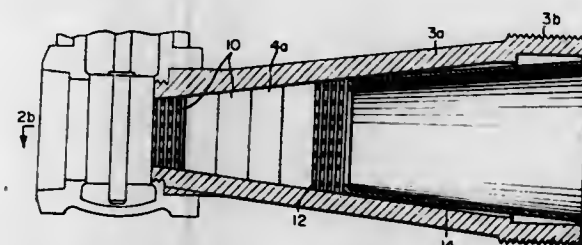
Paul V. Smagghe, Colombes, and Raymond B. Villier, Condesur-Noireau, both of France, assignors to Masonell International, Inc., Norwood, Mass.

Filed May 9, 1975, Ser. No. 576,033

Int. Cl.² F16K 47/08

U.S. Cl. 251-127

9 Claims



1. Throttling apparatus for reducing flowing fluid pressure with attenuation of fluid-expansion-generated noise and cavitation comprising, in combination, a pressure reducing valve having a downstream face; means for attenuating the noise or cavitation generated by the expansion of fluid flowing through said valve to a downstream pipe, said attenuating means comprising an at least partially cone-shaped tubular member provided between said valve and downstream pipe, wire grill, sinuous passage forming means transversely spanning across and fitting within said member beginning substantially at said downstream face of said valve, said wire grill means defining a series of juxtaposed pancakes filling a length of said tubular member, each said pancake composed of a series of perforated plates solidly joined to each other, each said plate formed of a lattice of criss crossed wires, each said lattice comprising a first transverse plane layer of parallel straight wires and a second transverse plane layer of parallel straight wires oriented substantially at right angles to and being welded to said first transverse plane wire layer, the perforated plates of each said pancake being transversely arranged such that their wire lattices are displaced relative to those of the preceding and following plates to form said sinuous passages and whereby the fluid flowing through said tubular member is made to encounter and follow continuously winding paths around each succeeding plate layer, and means for retaining said wire grill pancakes in their said juxtaposed, substantially downstream-valve-face-engaged assembly in said tubular member, the open, continuously winding passages through the mesh forming lattice layers of the successively offset plates of said pancakes causing said fluid to undergo maximum expansion full across the entire cross-section of said pancakes under slightly open as well as under full open settings of said valve.

4,007,909

FULL FLOW VALVED FITTING

Richard A. Buseth, Jackson, and Russell L. Rogers, Munith, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Oct. 16, 1975, Ser. No. 622,779

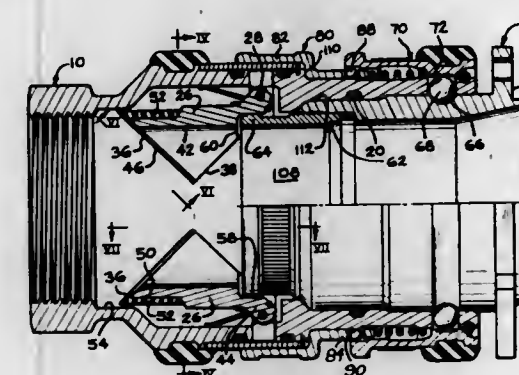
Int. Cl.² F16L 29/00, 37/28

U.S. Cl. 251-149.2

13 Claims

1. A valved coupling characterized by its ability to convey high fluid capacities with low flow resistance comprising, in combination, a first body half having a passage defined therein having an inlet end and a connecting end, a second body half having a passage defined therein having an outlet end and an inlet end, said second body half including an annular tubular

nose concentric with its associated passage inlet end receivable into said first body half passage connecting end and having a cylindrical passage, connecting means defined upon said body halves interengaging upon said body halves being coupled, a plurality of valve elements pivotally mounted in said first body half passage pivotal between open and closed positions, pivot means pivotally supporting said valve elements on said first body half, each of said valve elements comprising an arcuate cross-sectional segment having an inner



surface of a substantially cylindrical configuration of a radius substantially equal to the radius of said nose cylindrical passage, a nose abutment recess defined in each of said valve elements adjacent the associated pivot means and radially inwardly spaced therefrom, said second body half nose engaging and being received within said recesses upon said body halves being coupled maintaining said valve elements in said open position whereby said second body half cylindrical passage and valve element inner surfaces define a substantially cylindrical nonrestricted flow passage through the coupling.

4,007,910

BUTTERFLY VALVE APPARATUS

Masahiro Yasuoka, and Yoshitsugu Okada, both of Hirakata, Japan, assignors to Kubota, Ltd., Osaka, Japan

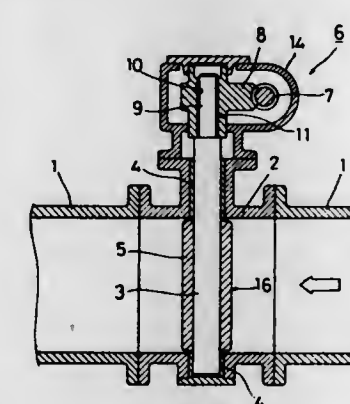
Division of Ser. No. 419,368, Nov. 27, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,300

Claims priority, application Japan, Nov. 30, 1972, 47-120382

Int. Cl.² F16K 31/44

U.S. Cl. 251-229

2 Claims



1. A butterfly valve comprising:

- a housing including a tubular portion for carrying fluid therethrough;
- a rotatable valve shaft arranged to penetrate said tubular portion perpendicularly to the axis thereof, said valve shaft being held in sleeve bearings located adjacent to opposite walls of said tubular portion and further including a drive stem with a rectangular cross section;
- a butterfly valve plate fixedly mounted on said rotatable valve shaft in said tubular portion;
- a lever system having an aperture arranged to receive the drive stem of said valve shaft and being capable of converting a rectilinear motion to a rotary motion; and

means for oscillating said lever system the improvement wherein:

said lever system has a rectangular means defining an opening including opposed longitudinal side dimensions which are perpendicular to the plane of said butterfly valve plate and transverse dimensions of said rectangular means defining the opening lies in planes parallel with said butterfly valve, said valve stem further including a stem portion of rectangular configuration complementary to said rectangular means defining the opening in said lever system and having a smaller longitudinal dimension than said lever system opening to thereby permit limited relative sliding movement of said complementally formed elements to thereby compensate for radial clearance in said bearings as well as to relieve pressure on the means motivating said lever system.

4,007,911

PACKINGLESS GATE VALVE AND ACTUATOR ASSEMBLIES

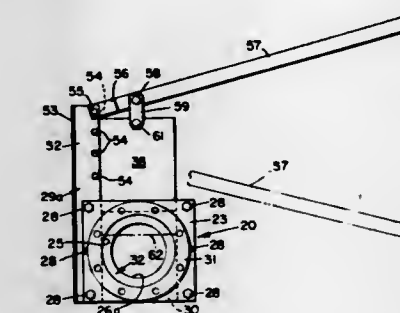
Curtis W. Clarkson, Palo Alto, Calif., assignor to The J. R. Clarkson Company, Palo Alto, Calif.

Division of Ser. No. 459,949, April 11, 1974, Pat. No. 3,945,604. This application Apr. 24, 1975, Ser. No. 571,274

Int. Cl.² F16K 3/312, 3/32

U.S. Cl. 251-233

12 Claims



1. In a gate valve and actuator assembly, a valve housing having a through fluid flow passage, means defining a transverse gate valve chamber in said housing, a gate valve member slidably mounted in said chamber between positions where it permits or blocks flow through said passage, an actuator operably connected to said gate valve member, and means providing a plurality of adjacent spaced sockets in a row on said housing each disposed at a different distance from said passage and adapted to detachably pivotally receive an end of said lever whereby said lever may be selectively pivotally mounted on said housing at any of a plurality of different distances from said passage for effecting staged displacement of said valve member in said passage.

4,007,912

PLUG TYPE CONTROL VALVE HAVING IMPROVED MEANS PROTECTING THE STEM THEREOF

Tommy L. Wells, Houston, Tex., assignor to Pullman Incorporated, Chicago, Ill.

Filed Nov. 13, 1975, Ser. No. 631,769

Int. Cl.² B01J 8/08; F16K 41/02

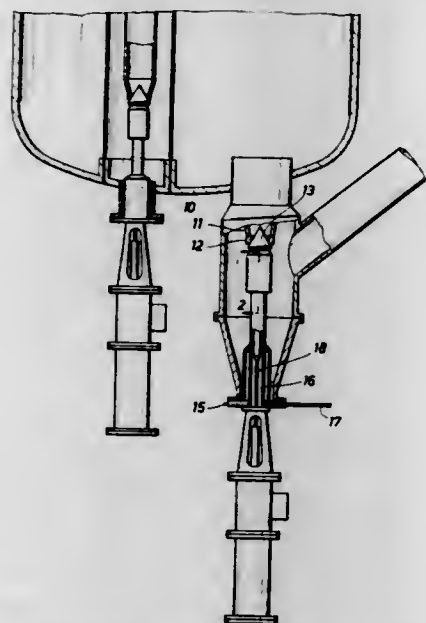
U.S. Cl. 251-355

8 Claims

1. A plug valve for controlling flow of an abrasive material through a mouth of a conduit, comprising:

- a housing;
- a valve stem movable within said housing;
- plug means mounted with said valve stem for movement between a first position in which said plug means blocks flow of abrasive material through the mouth of the conduit and a second position in which said plug means permits flow of abrasive material through the mouth of the conduit; and
- shroud means for protecting said valve stem from the abrasive material, said shroud means including:

a tail section mounted with said housing and encircling a first portion of said valve stem, said tail section having an inner diameter greater than the outer diameter of said valve stem to form a cleaning fluid passageway between said tail section and said stem; and



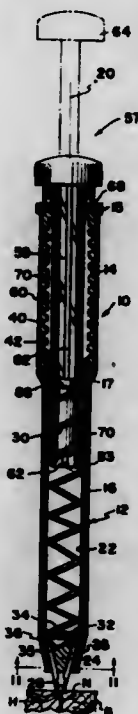
a head section mounted with said stem for movement therewith and encircling a second portion of said valve stem, said head section having a cleaning fluid cavity formed therein, said cleaning fluid cavity being in fluid communication with said cleaning fluid passageway to exhaust fluid from said cleaning fluid passageway.

4,007,913 NAIL PULLER

Ward Aldrich, 4322 North St., Akron, Mich. 48701
Filed Nov. 28, 1975, Ser. No. 636,051
Int. Cl.² B25C 11/00

U.S. Cl. 254-18

19 Claims



1. A nail puller comprising:
a tubular casing having an opening at at least one axial end thereof;
a hollow nail lifting member mounted in said casing for axial movement therein;
nail gripping jaws mounted on said lifting member for movement therewith and relative thereto between axially outward, radially contracted, nail gripping positions and radially spread, axially inwardly retracted positions;
means for axially withdrawing said lifting member and said

jaws carried thereby axially inwardly in a direction away from said one end comprising:
a rotatable member received in said casing and threadedly coupled to said lifting member;
means for rotating said rotatable member comprising a linearly reciprocable member movable in a to and fro path of travel; and
means reacting between said reciprocable member and said rotatable member for converting linear motion to rotary motion to drive said rotatable member when said reciprocable member is moved in one direction.

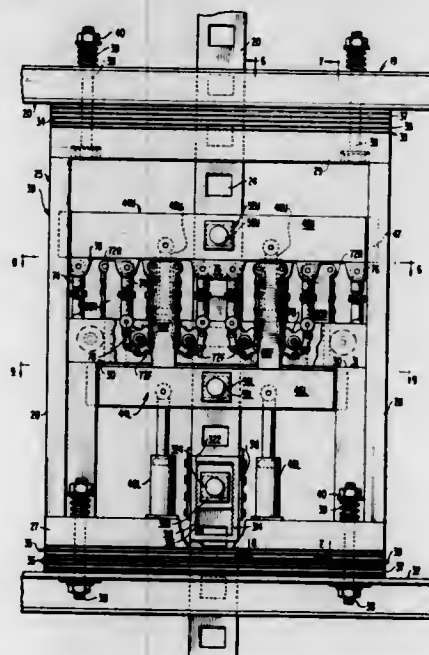
4,007,914

JACKING MECHANISM

John R. Sutton, P.O. Box 32, Beaumont, Tex. 77704
Filed June 17, 1975, Ser. No. 587,705
Int. Cl.² B66F 1/00; E02D 21/00

U.S. Cl. 254-108

23 Claims



1. Jacking apparatus for effecting relative vertical movement between an upright leg and a platform, said jacking apparatus comprising:
frame means, including generally horizontally spaced support means mounted on said platform and a generally horizontal cross member supported at horizontally spaced locations by said support means;
first fluid cylinder means carried by said platform and being mounted on said cross member in a generally upright position;
said first fluid cylinder means being selectively extendable and retractable;
first beam means operably connected to said first fluid cylinder means for vertical movement relative to said platform in response to extension and retraction of said first fluid cylinder means;
first holding means for selectively coupling said first beam means against vertical movement relative to said leg wherein actuation of said first fluid cylinder means produces relative movement between said platform and said leg;
second fluid cylinder means carried by said platform vertically remote from said cross member at a location which is vertically spaced from said cross member so that said second fluid cylinder means is disposed in vertically spaced relation relative to said first fluid cylinder means;
said second fluid cylinder means being selectively extendable and retractable in reverse phase relation to said first fluid cylinder means;
second beam means operably connected to said second fluid cylinder means for vertical movement relative to said platform in response to extension and retraction of said second fluid cylinder means;

second holding means for selectively coupling said second beam means against vertical movement relative to said leg wherein actuation of said second fluid cylinder means produces relative movement between said platform and said leg;
said first and second holding means being operable to couple first and second beam means to said leg in alternative sequence; and
power transfer means operably connecting said cross member to said first and second fluid cylinder means to transfer lifting forces directly to said cross member from the one of said first and second fluid cylinder means whose associated beam means is uncoupled from said leg, to augment forces being applied to said platform by the other of said first and second fluid cylinder means.

4,007,915

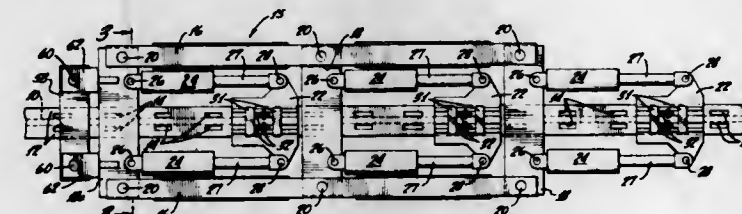
JACKING APPARATUS

Henry B. Chambers, Santa Inez, Calif., assignor to Hydranautics, Goleta, Calif.

Filed Dec. 15, 1975, Ser. No. 640,952
Int. Cl.² B66F 1/04

U.S. Cl. 254-108

7 Claims



1. Jacking apparatus having a plurality of hydraulic cylinders arranged to move a load along a rail; in which the improvement comprises:
a. a rail having a plurality of pairs of vertical slots uniformly spaced along the length of said rail, said slots in each pair being transversely aligned;
b. a sled comprising a pair of spaced apart side members pivotally connected to a plurality of spaced apart cross members slidably mounted on said rail;
c. a plurality of cross heads slidably mounted on said rail, each of said cross heads being spaced apart from an adjacent sled cross member;
d. hydraulic cylinders pivotally attached between the outer ends of each of said cross heads and the said adjacent sled cross members;
e. a pair of transversely aligned latches having longitudinally bevelled bottom surfaces mounted in each of said cross heads so as to be vertically slidable and engageable with said slots in said rail;
f. means for maintaining said pair of latches in each of said cross heads in transverse alignment with said pairs of slots in said rail;
g. means for causing simultaneous alternate retraction and extension of the piston rods of said hydraulic cylinders, thereby to cause repetitive, incremental movement of said sled along said rail by engagement of said latches with said slots in said rail when said cross heads are moved by said hydraulic cylinders in one direction with respect to said sled, and sliding of the bevelled bottom edges of said latches over edges of said slots in said rail when said cross heads are moved by said hydraulic cylinders in the other direction with respect to said sled; and
h. means on an end of said sled for engaging a load to be moved along said rail.

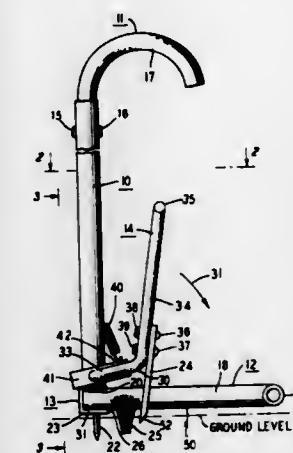
4,007,916

GARDENING TOOL

Billy G. Maples, 65 Dale Road, Middletown, N.J. 07748
Filed Mar. 22, 1976, Ser. No. 668,708
Int. Cl.² B66F 3/00

U.S. Cl. 254-132

9 Claims



1. A gardening tool adapted both for hand and foot operation to extract undesired growths from soil comprising, a downwardly positioned extendible caneshaped member having a curved portion suitable for a hand grip, a lateral support affixed substantially perpendicular to said member near to the bottom thereof and forming a contiguous unit with said member, engaging studs affixed below said lateral support adapted to penetrate said soil, and a foot operated pivotally mounted pedal in a lower portion of said member having a downwardly posed detachable cutter affixed thereon.

4,007,917

STRUCTURES FOR ABSORBING IMPACT ENERGY

Burton D. Brubaker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 449,146, March 7, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,482
Int. Cl.² A01K 3/00; E01F 15/00

U.S. Cl. 256-13.1

3 Claims

1. A highway guardrail structure which is capable of absorbing the impact energy of a moving vehicle, the structure including:
a layer of a foam material which covers the guardrail structure and which is fastened to the structure;
the foam layer being defined by a rigid, inorganic, multicellular foam selected from the group consisting of ceramic foams or glass foams which have a density of from about 6 to 20 pounds per cubic foot and which have a flexural strength of from about 50 to 250 pounds per square inch.

4,007,918

PREFABRICATED FENCE

Isamu Matsubara, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 17, 1975, Ser. No. 623,508
Claims priority, application Japan, Oct. 17, 1974, 49-125578

Int. Cl.² E04H 17/14

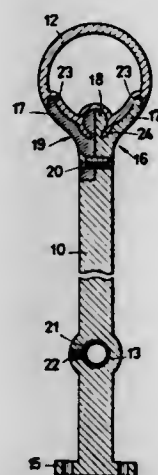
U.S. Cl. 256-59

9 Claims

1. A prefabricated fence for installation on a parapet or like stationary base structure, comprising in combination:
a. at least two posts having means by which they can be fixedly mounted in spaced-apart positions on the base structure, each of said posts having its upper end shaped as a top-rail holding portion and having a hole extending horizontally through each said post at a point adjacent to its lower end;
b. a top rail having a uniform cross-sectional shape through-

out its length, said top rail having its underside shaped in conformity with said top-rail holding portion of each said post, the underside of said top rail having a sliding fit with said top-rail holding portions of said posts in a longitudinal direction;

c. a bottom rail of uniform original cross-sectional shape throughout its length, said bottom rail extending through said holes of said posts; and



d. a plurality of balusters each having at its upper end a top-rail holding portion which is at least partially identical in cross-sectional shape and size with said top-rail holding portion of each said post, and having interfitting engagement with the underside of said top rail, each said baluster having at its lower end a bottom-rail holding portion fitting over said bottom rail.

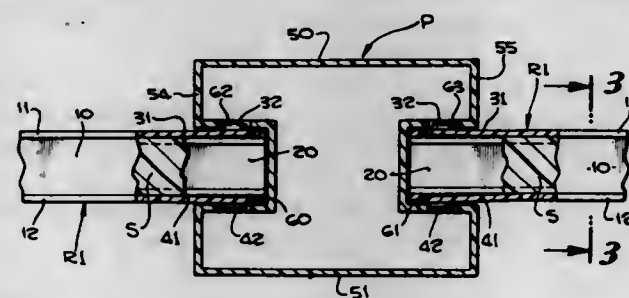
4,007,919 FENCE STRUCTURE

Clyde D. Totten, 31557 1/2 Castaic Road, Castaic, Calif. 91310

Filed July 24, 1975, Ser. No. 598,685
Int. Cl.² B01F 13/00

U.S. Cl. 256-59

3 Claims



1. A fence structure comprising:

a vertically disposed post having a vertically extending groove formed in one edge surface thereof and extending for substantially the length of said post, the configuration of said groove in the horizontal plane being substantially rectangular;

a plurality of horizontally disposed rails arranged in a vertical series, each of said rails being of substantially rectangular cross-sectional configuration both in the horizontal plane and in the vertical plane, one end of each of said rails extending into said post groove in abutting relationship therewith, said rails being hollow, the walls of said rails being made of plastic material, and a rigid plastic foam material filling the interiors of said rails and being bonded to the inner walls of said rails;

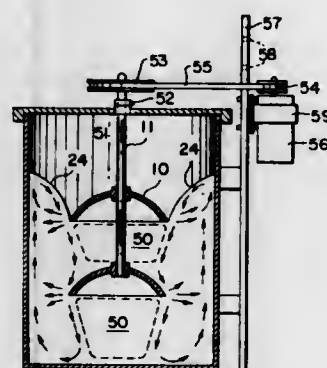
said post having a plurality of pairs of openings formed therein, on opposing sides of said groove, at least one pair of openings for each of said rails; and
each of said rail ends having in its lateral walls a pair of laterally movable panels, each of said panels having an outwardly projecting ear which is received by a corresponding opening of said post groove.

4,007,920 MIXING AND AERATING DEVICE

Mark Plungian, 6912 Columbia Drive, and Charles E. Cornwell, 7104 Marlan Drive, both of Alexandria, Va. 22307
Continuation-in-part of Ser. No. 392,643, Aug. 29, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 509,940
Int. Cl.² B01F 7/16

U.S. Cl. 259-108

7 Claims



1. A mixing and aerating device comprising a mixing container containing liquid material to be mixed or aerated, a vertically extending shaft supported for vertical movement and adjustably fixed relative to container, drive means adapted to be attached to said shaft for rotating said shaft at high relative speed, at least one mixing impeller attached symmetrically centrally to said shaft, said impeller comprising an imperforated relatively thin-walled symmetrical closed concave surface of a hollow sphere, said concave surface being disposed downwardly with the open end facing the bottom of said container, said symmetrical section being of such dimension with respect to said container to provide an opening adjacent the periphery of said impeller and said container for leading liquid and air from above the impeller through and opening to the lower side of said impeller toward the bottom of said container to thoroughly intermix said liquid and air; and said liquid being forcefully impelled outwardly from the periphery of said impeller.

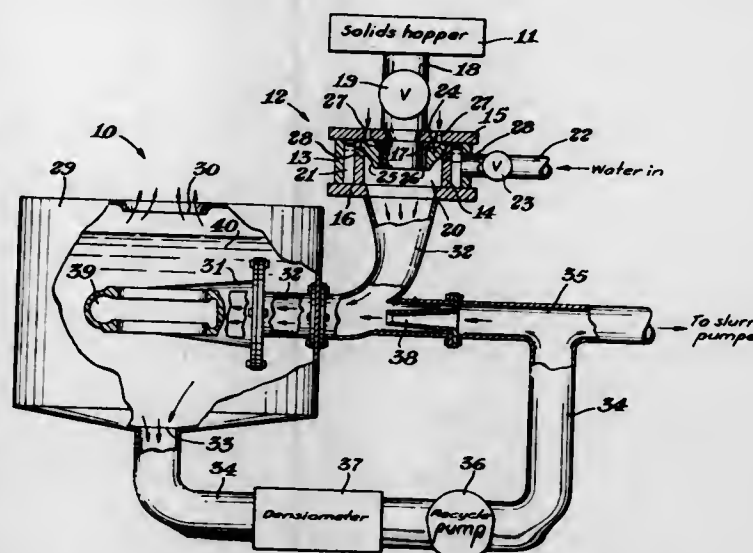
4,007,921 APPARATUS FOR MIXING DRY PARTICLES WITH A LIQUID

Warren M. Zingg, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 19, 1976, Ser. No. 650,091
Int. Cl.² B28C 5/06; B01F 13/10

U.S. Cl. 259-151

7 Claims



1. An apparatus for mixing dry particles with a liquid which comprises, in combination;
a hopper for storing a charge of dry particles, which hopper includes a discharge outlet;
a first conduit section which communicates with the discharge outlet;

a disperser means, the disperser being defined by a main chamber, the chamber including a first vertical nozzle and a first compartment positioned below the first nozzle, the nozzle communicating with the first conduit section and with the first compartment, the chamber further including a second compartment which surrounds the first compartment and which communicates with the first compartment, a source of liquid connected to the second compartment, air inlet ports in said chamber, the chamber further including a vane member which is positioned adjacent to the second compartment and which includes an outer surface in communication with the first compartment, the vane member being spaced from the first nozzle with the space defining an air intake passage which communicates with the air inlet ports in the chamber; the dry particles in the hopper being passed into the first compartment through the first nozzle, liquid received in the second compartment being passed into the first compartment to thereby mix with the particles and produce a slurry mixture;

a tank container which includes a vent opening therein; a volute casing which is positioned in the tank container; a second conduit section which connects the first compartment of the disperser with the volute casing; the slurry mixture being delivered into the volute casing through the second conduit section, and circulated within the volute casing and within the tank container; a third conduit section which connects the tank container with a fourth conduit section; a pump means which is installed in the third conduit section; the fourth conduit section being connected into the second conduit section and into a use point; a second nozzle which is positioned within the fourth conduit section; wherein
a portion of the slurry mixture is continuously circulated from the tank container through the pump means and second nozzle, and a portion of the slurry mixture is continuously delivered to the use point.

4,007,922 EXTRUDING DEVICE FOR HIGH MOLECULAR MATERIALS

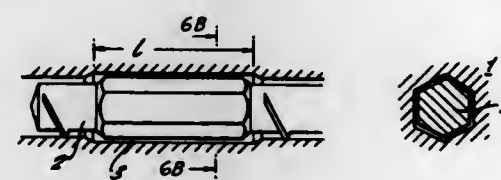
Yukio Tamura, Obu, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1975, Ser. No. 567,839

Claims priority, application Japan, Apr. 15, 1974, 49-40952
Int. Cl.² B29B 1/10

U.S. Cl. 259-191

8 Claims



1. An extruding device, comprising:

a barrel having internal wall means defining a longitudinally elongated chamber;

a longitudinally elongated screw received in said barrel chamber with its sense of longitudinal elongation generally parallel to the sense of elongation of said barrel chamber, for angular rotation of said screw about said sense of longitudinal elongation of said screw;

said barrel chamber and said screw each having a longitudinally intermediate portion which longitudinally coextend with one another over at least a major part of the length of each such portion to provide a kneading portion of the extruding device;

said barrel chamber and said screw, within said kneading portion, each having a polygonal transverse cross-sectional figure, which may be respectively inscribed and

circumscribed with respective imaginary circles of substantially the same diameter, so that each apex on the transverse cross-sectional figure of the screw within said kneading portion is alternately brought immediately radially adjacent and substantially radially spaced from said internal wall means of said barrel chamber as the screw is angularly rotated;

said barrel chamber and said screw each undergoing a substantial change in transverse cross-sectional shape at each end of each respective longitudinally intermediate portion which provides said kneading portion.

4,007,923 MOLTEN METAL FILTER

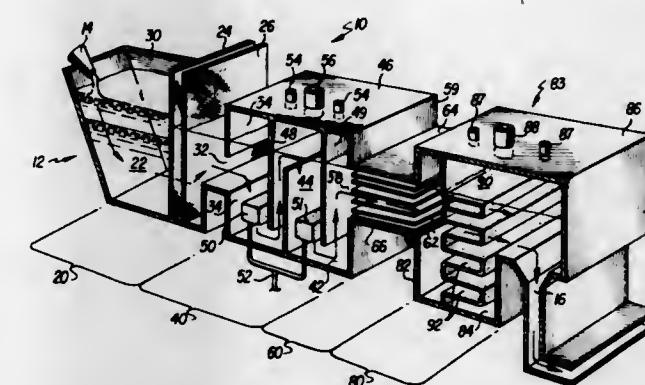
Enrique C. Chia, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed July 18, 1975, Ser. No. 597,312

Int. Cl.² C21C 7/00

U.S. Cl. 266-217

9 Claims



1. Apparatus for continuously treating molten aluminum and aluminum alloys to remove a substantial portion of solid particles and gases therefrom, comprising a chamber having an inlet for receiving a flow of molten aluminum to be purified and an outlet for discharging the purified molten aluminum, means dividing said chamber into a plurality of purifying stages including a deslagging stage having a filter medium adapted to be at least partly submerged in the molten metal, a fluxing stage including means for introducing a fluxing gas into the molten metal, an adsorption stage including means for adsorbing impurities from said molten metal, said adsorbing means comprising a plurality of spaced, planar refractory elements over which the molten metal flows and a filtration stage including a rigid filter medium for filtering solid impurities from the molten metal passing therethrough.

4,007,924 ELASTIC SUPPORT MOUNT

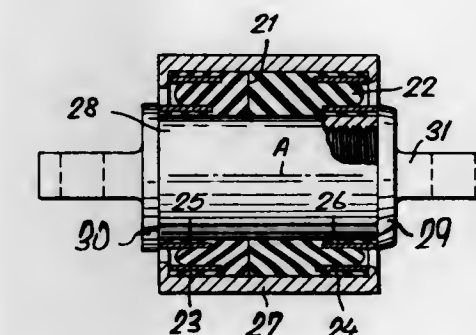
Raoul Jörn, Hengnau, and Georg Lang, Glessen, both of Germany, assignors to Raoul Jörn, Hengnau, Germany

Filed June 27, 1975, Ser. No. 590,857

Int. Cl.² F16F 1/38

U.S. Cl. 267-57.1 R

14 Claims



1. An elastic mount for use between an outer member having an inner surface formed generally as a surface of revolution and an inner member in said outer member and having

an outer surface formed generally as a surface of revolution, said mount comprising:

a solid circumferentially continuous elastomeric body of revolution having an outer surface directly engageable against said inner surface of said outer member and an inner surface directly engageable against said outer surface of said inner member, said surfaces normally being coaxial, said body having an axially open end and having in unstressed condition a predetermined overall axial length;

an inner metal sleeve and an outer metal sleeve both formed as bodies of revolution coaxial with said surfaces and imbedded in said elastomeric body at said open end and respectively generally on said inner and outer surfaces of said elastomeric body, said sleeves having axial lengths equal to a fraction of said predetermined length of said body whereby the major part of the axial length of said body is free from such sleeves, at least one of said sleeves projecting at said end beyond the remainder of said body; and

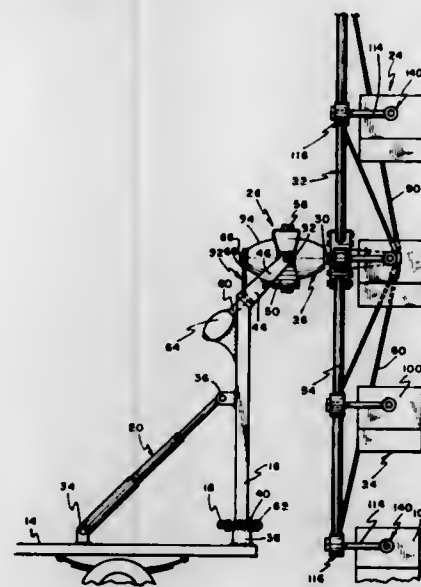
abutment means on at least one of said members acting upon opposite axial ends of said body and bearing against said one of said sleeves for holding said elastomeric body axially compressed to an axial length less than said predetermined length, whereby said axial compression forces said surfaces of said elastomeric body tightly against said surfaces of said members.

4,007,926
MOBILE AMUSEMENT RIDE
Herbert J. Ottaway, 3702 Elmwood Drive, Wichita, Kans. 67218

Filed Sept. 23, 1974, Ser. No. 508,160
Int. Cl.² A63G 1/40, 1/10

U.S. Cl. 272-37

6 Claims



5. In an amusement ride of the type wherein a wheel that carries a plurality of passenger carrying units spaced about its periphery is mounted for powered rotation about its central axis, the improvement comprising a stationary and upstanding ground support having fixed thereto a gimbal means rotatably mounting therein an axle to which the wheel is fixedly secured with the axis acting as the central axis of the wheel for enabling both vertical tilting movement of the axle of the wheel between approximately horizontal and vertical positions and simultaneous limited horizontal turning movement of the axle in the gimbal means, said gimbal means being fixed to the support at a vertical height above ground that is greater than is the spacing of the passenger units from the axis of the wheel in an arrangement such that the lowermost of the passenger units is spaced above ground when the axle is horizontal, and a single power driven means fixed to the support at a position adjacent the gimbal means and operatively connected to said axle for driving the axle synchronously both to tilt vertically and to turn horizontally through a predetermined cyclic sequence, each of the passenger carrying units comprising a seat adapted to support a passenger seated thereon, and a seat supporting arm pivotally connected for free pivotal movement at spaced positions to both the wheel and the passenger seat, with the pivotal connection of the arm to the wheel being about an arm axis substantially parallel to the axle, and with the pivotal connection of the arm to the seat being about an axis that is substantially perpendicular to the arm axis.

4,007,927
INERTIAL CYCLE EXERCISER
Richard I. Proctor, 3201 Orange Grove Ave., North Highlands, Calif. 95660

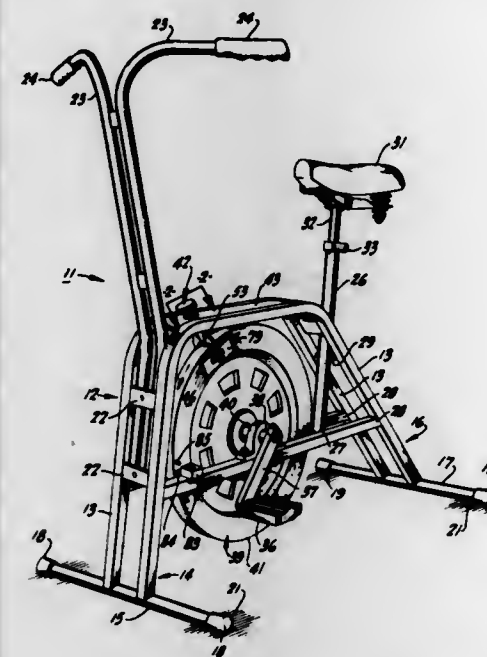
Filed Oct. 28, 1975, Ser. No. 626,485
Int. Cl.² A63B 21/00

U.S. Cl. 272-73

2 Claims

1. Inertial cycle exerciser comprising:
a. a stationary fore and aft frame on a supporting surface;
b. a handlebar mounted on the forward portion of said frame;
c. a seat mounted on the after portion of said frame;
d. a flywheel;
e. means for mounting said flywheel on the central portion of said frame for rotation of said flywheel above the supporting surface and in a median, vertical, fore and aft plane;
f. a pair of drive pedals connected to said flywheel;

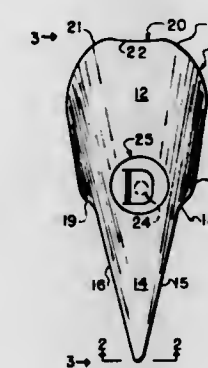
g. a pair of pins mounted on said frame, said pins being symmetrically disposed on opposite sides of said flywheel and extending in a fore and aft direction;
h. a pair of caliper arms each including a substantially vertical brake lever and a substantially horizontal lever arm, each of said caliper arms being pivotally mounted on a respective one of said pins for movement in a transverse plane;
i. a pair of brake shoes each mounted on a respective one of said brake levers, said lever arms extending toward each other in overlapping relation and being formed with transverse overlapping slots respectively;
j. a substantially vertical stem translatable mounted on said frame;



k. a clevis pin connected to the lower end of said stem and slidably engaging in said slots, said stem extending through an opening in said frame;
l. a knob threaded onto the upper end of said stem for selective movement toward and away from said frame; and
m. a compression spring disposed between said frame and said knob, said spring being effective to urge said stem and said clevis pin substantially upwardly and thereby pivot said caliper arms so as to urge said brake shoes into frictional engagement with said flywheel, the extent of frictional force exerted by said brake shoes being dependent upon the position of said knob relative to said frame.

4,007,928
GOLFER'S COMBINATION TOOL
John J. Doubt, 2515 Carlmont Drive, Belmont, Calif. 94002
Filed Oct. 23, 1975, Ser. No. 625,069
Int. Cl.² A63B 57/00; A47J 51/02
U.S. Cl. 273-32 B

2 Claims

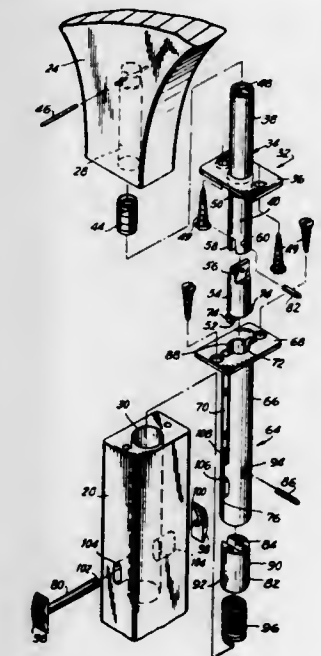


1. A golfer's combination tool comprising:
an elongated thin member having an arcuate cross-section along the entire length;

one end of said elongated member being sufficiently wide and of a curvature to fit within the inside of a normal shoe and thereby serve as a shoe horn;
the other end of said elongated member having edges extending in the elongated direction converging to at least one point whereby said tool can be used a shoe horn by grasping the other end and sliding the one end into a shoe adjacent the heel and the tool can also be used to repair divots in the putting surface by grasping the one end and pushing the other end into the ground next to a divot and pivoting the tool relative to the ground; and
one end of the tool including an edge extending normal to the elongated length of a slight concave configuration such that by pushing the other end of the tool vertically into the ground a golf club handle can be rested on the concave end thereof and be maintained off the ground.

4,007,929
COLLAPSIBLE GAME RACKET
Rubin Figa, 100 Lawn Terrace, Mamaroneck, N.Y. 10543
Filed Apr. 18, 1975, Ser. No. 569,489
Int. Cl.² A63B 49/02
U.S. Cl. 273-73 R

5 Claims



1. A collapsible racket for tennis or the like, comprising: a head portion having a frame terminating in a throat area; a handle portion having a gripping area at one end thereof; a male locking element positioned generally in said throat area and being generally axially disposed in one of said portions, said male locking element having an extending portion, said extending portion having a key transversely disposed across a distal end portion thereof, said key being a magnetic piece; a female locking element, which is mutually cooperatively associated with said male locking element, positioned generally in said throat area and being generally axially disposed in the other of said portions said female locking element having a first recess means interengageable with said extending portion, said female locking element having a female keyway element axially disposed in said first recess means and said female keyway element having means thereon operatively associated with pin means, which extend through said female keyway element, for limiting the axial movement of said female keyway element, said female keyway element having a keyway transverse of its top surface, said keyway facing toward said one of said portions, said keyway being engageable with said key for precluding rotational movement of said male locking element, said keyway being a magnetic piece; and biasing means being axially disposed in either said handle portion or said head portion, said biasing means constantly urging said head and handle portions together when said head and handle portions are interconnected together, and said biasing means constantly urging said female keyway element

toward said one of said portions; whereby said head and handle portions are locked together as an assembled unit and whereby rotational and axial movements between said male and female locking elements are precluded.

4,007,930

CLAMP FOR TENNIS RACQUET

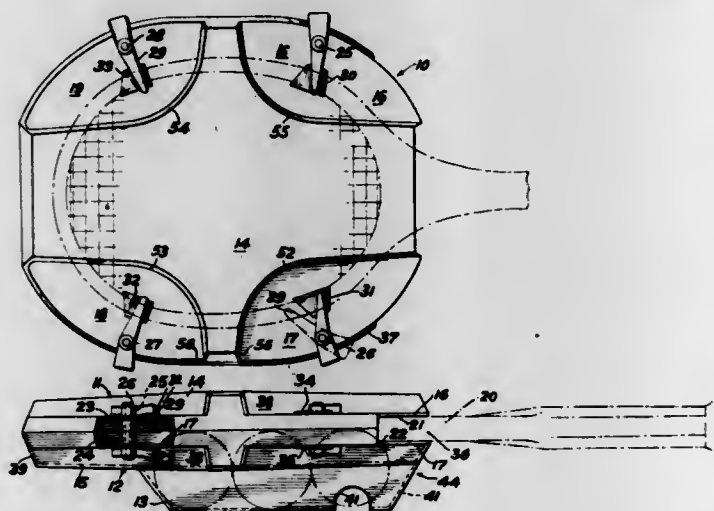
Albert E. Straus, 3740 Stirrup Drive, Erie, Pa. 16506

Filed Dec. 24, 1975, Ser. No. 644,072

Int. Cl.² A63B 49/16

U.S. Cl. 273-74

8 Claims



1. A racquet press comprising, two similar parts adapted to receive a tennis racquet therebetween comprising, clamping means for clamping the two parts together, each said part having at least four symmetrically arranged clamping members, each having a flat surface disposed in a plane with the other said flat surfaces on the particular part, each said part having a marginal flange disposed in an oval shape attached to the outer peripheral edges of said clamping members and extending toward the other said part providing torsional rigidity, said flange having ends terminating in spaced relation providing a space for receiving the frame of a tennis racquet, outwardly directed reinforcing flanges attached to the inner edges of said clamping members and an outer web member connected to the outer ends of said outwardly directed flanges, said clamping means extending through said clamping members adapted to urge said clamping members toward each other whereby said clamping members are held in rigid clamp relation to a tennis racquet clamped therebetween, thereby providing full protection for the strings of said racquet.

4,007,931

HAND WEAPON

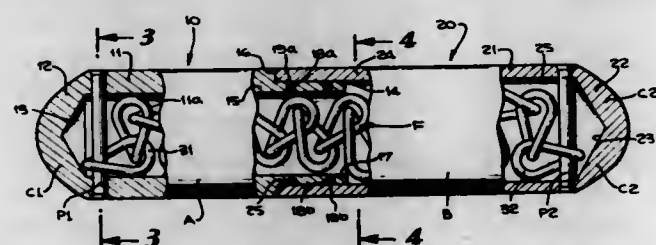
Horst W. Wich, 816 Brent, and James H. Ibrao, 1221 Monterey Road, both of South Pasadena, Calif. 91030

Filed Nov. 3, 1975, Ser. No. 628,573

Int. Cl.² F41B 15/10

U.S. Cl. 273-84

4 Claims



1. A hand weapon comprising: first and second generally cylindrical metallic members

whose inner ends are slidably interengaged and whose outer ends are dome-shaped and substantially fully enclosed, said members except for said dome-shaped ends being of uniform diameter throughout their length, said diameter being such as to be conveniently grasped by hand, and each of said members being elongated whereby said members together form an elongated rod;

one of said cylindrical members having a relatively thin circumferential wall, the other member having a relatively thick circumferential wall whose inner end has a projecting interior flange portion that is slidably received within the inner end of said one member;

a pair of fastening pins, one within the outer end of each of said cylindrical members, each said pin extending transversely within the associated member and having its outer ends secured in the outer circumferential wall of the member; and

an elongated flexible metal chain whose length is at least twice the length of said rod, the end links of said chain being captured upon corresponding ones of said fastening pins, and said chain occupying the interior space of both of said cylindrical members and being loosely folded up therein;

whereby said weapon may be used as a weight for striking purposes by grasping same with one hand near its longitudinal center and using the hand grip to hold said two members together; and

whereby, alternatively, the user may grasp one of said cylindrical members only, and swing said weapon about so that the other member slides longitudinally outward and said flexible chain then becomes extended to its full length.

4,007,932

MINIATURE HOCKEY GAME

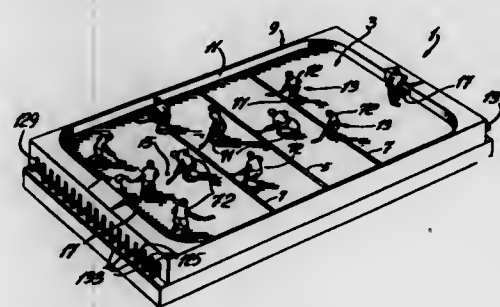
Robert LeBrun, 2231 Augier St., Montreal, Quebec, Canada

Filed Feb. 26, 1976, Ser. No. 661,707

Int. Cl.² A63F 9/14

U.S. Cl. 273-85 F

12 Claims



1. Miniature hockey game comprising: a substantially horizontal playing surface and means imparting to said surface an orbital movement in the plane of said surface; a plurality of miniature playing members unattachedly mounted over said playing surface to move thereover as said playing surface is subjected to said orbital movement, each member including: steering means having a steering wheel, said steering means ensuring movement of said playing member in substantially one direction, eccentric pivot means applicable against said surface to stop movement of said playing member in said one direction to permit spinning thereof, coupling means joining said eccentric pivot means and said steering wheel to change the direction of said steering wheel as said member spins upon application of said pivot means on said surface, resilient means acting on said steering wheel and on said pivot means to bias said steering wheel toward said playing surface and to bias said pivot means away from said playing surface, and control means beneath said playing surface, operable from

either end thereof, selectively to cause application of said eccentric pivot means against said surface to allow reorientation of said steering wheel.

4,007,933

TIMING GAME

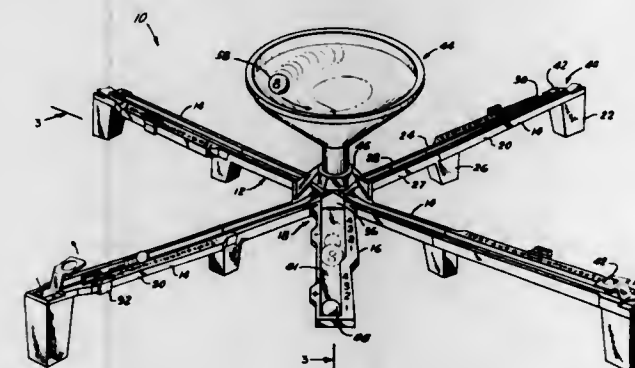
Julius Cooper, New Hyde Park, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,839

Int. Cl.² A63F 9/14

U.S. Cl. 273-86 C

23 Claims



1. A game comprising, a frame including a plurality of ramps directed towards a central common station and a discharge chute located below and in communication with said common station; a plurality of game balls respectively associated with said ramps for movement therealong to said common station and into said discharge chute; said ramps each having a first end portion located adjacent said common station and a second end portion remote from said first end portion and at a higher elevation than said first end portion whereby said balls will roll down the ramps to said common station and into said discharge chute, said chute having a first end adjacent said common station and a second end remote from and at a lower elevation than its first end whereby said balls will roll down the discharge chute towards its second end in the sequence in which they arrive at said common station; a marker ball, and means located above said common station and the first end portion of said ramps and chute for allowing deposit of said marker ball into the common station from a position above the common station and said first end portions of the ramps and chute independently of said ramps.

4,007,934

APPARATUS FOR SIMULATING RECOIL IN AN IMITATION GUN

Shikanosuke Ochi, Tokyo, Japan, assignor to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan

Filed Dec. 10, 1975, Ser. No. 639,610

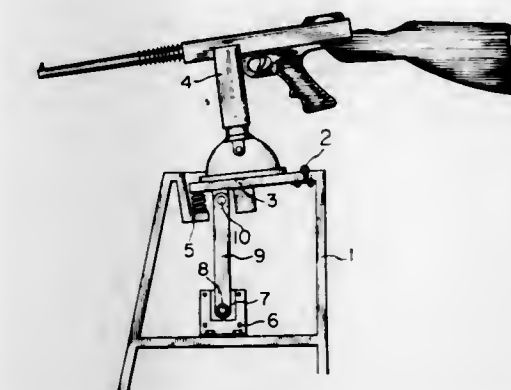
Claims priority, application Japan, Sept. 19, 1975, 50-127820

Int. Cl.² A63F 9/02

U.S. Cl. 273-101.2

1 Claim

1. An apparatus for simulating recoil in an imitation gun, comprising a frame, an imitation gun mounted on said frame in a freely movable manner including up and down movement, an electric motor having a rotary shaft, an eccentric fixed on said shaft, coupling means coupled between said shaft and imitation gun through said eccentric for reciprocating said imitation gun up and down for each rotation of the shaft of



ated and continuing rotation of said motor while said trigger is maintained in the actuated position.

4,007,935

SPINNING TOP BOWLING GAME

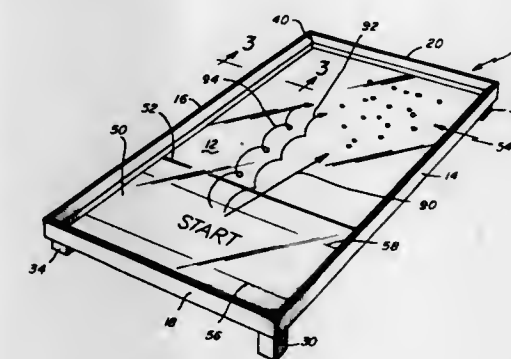
Erwin-Walter C. Siber, 175 Stonehenge Drive, Beaconsfield, Quebec, Canada

Filed Apr. 30, 1975, Ser. No. 573,314

Int. Cl.² A63B 67/16

U.S. Cl. 273-108

9 Claims



1. A bowling type of game played with pins and a spinning top comprising a smooth playing board surface for standing the pins and on which the top may be spun, superimposed arrays of nine and ten spots provided on the board surface denoting the nine pin and ten pin bowling arrangement for the pins, a coding marked on certain of the spots in each array for establishing an eleven pin arrangement for pins on the board surface utilizing selected spots of the nine and ten spot arrays, and a starting area marked on the board surface remote from the superimposed arrays denoting the region in which the spin of the top is to be initiated.

4,007,936

NOVELTY CLOSURE

James R. Hornsby, Jr., Orlando, Fla., assignor to Funstuf, Inc., Orlando, Fla.

Filed Apr. 9, 1975, Ser. No. 566,187

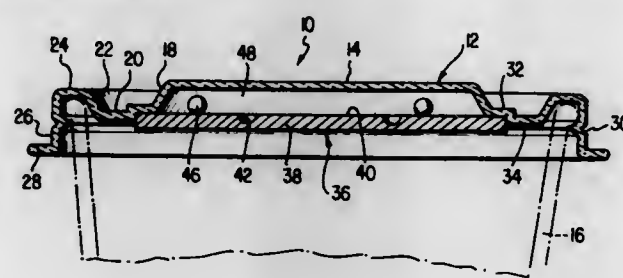
Int. Cl.² A63F 7/04

U.S. Cl. 273-115

6 Claims

1. A novelty closure comprising: a container cover having a central portion, and puzzle means coupled with said cover at said central portion, said puzzle means comprising a planar member having indicia thereon and having depression means therein, and ball means movably disposed upon said planar member, said puzzle means being operative by manual manipulation

of said container cover to position said ball means in said depression means,



said container cover being scored in surrounding relation to said central portion to enable said central portion and said puzzle means to be removed from the remainder of said cover by manual rupturing along said scoring.

4,007,937

TENNIS GAME BOARD

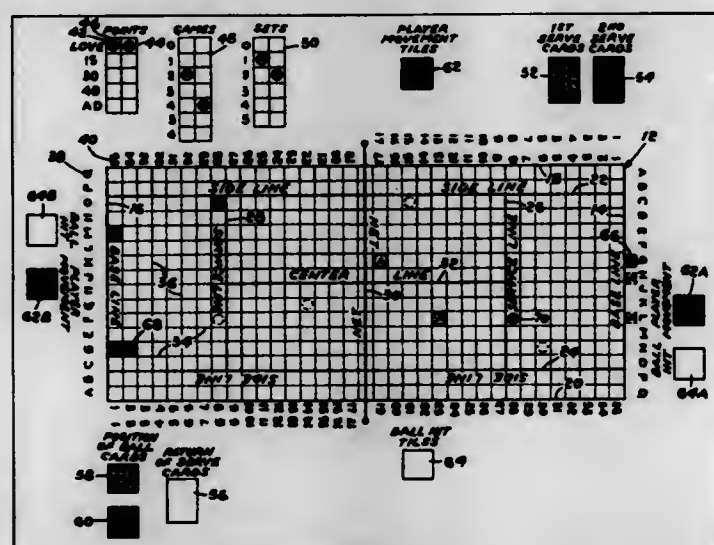
Robert M. Casciano, and Donna R. Casciano, both of 214 Long Pond Road, Hewitt, N.J. 07421

Filed May 27, 1975, Ser. No. 581,429

Int. Cl.² A63F 3/00

U.S. Cl. 273-134 CA

7 Claims



1. A tennis game board comprising:
 - a rectangular tennis court area,
 - a net line across the center of said court area dividing said court into opposite sides,
 - a plurality of longitudinal and lateral boundary lines dividing said court area into playing and serving areas,
 - a plurality of equally spaced longitudinal and lateral grid lines dividing said court area into a plurality of like incremental rectangular areas,
 - coordinate markings along said grid lines to indicate successive individual incremental areas of said court,
 - a plurality of player markers to indicate the position of individual players with respect to the court area,
 - a ball marker to indicate the position of the ball on the court area,
 - a plurality of stacks of cards having indicia thereon selectively designating types of service and return of service of the ball by the players,
 - a stack of ball position cards having indicia thereon selectively directing movements of the returned served ball to designated incremental rectangular area positions on the court,
 - a stack of player movement tiles having indicia thereon selectively directing player movements to designated area positions on the court with respect to the position of the ball,
 - a stack of ball hit tiles selectively directing further ball movements to succeeding designated area positions on

said court during continuing play following said movements of the returned served ball, a plurality of scoring markers, and means for indicating the scores of different players.

4,007,938

PUTTING DEVICE

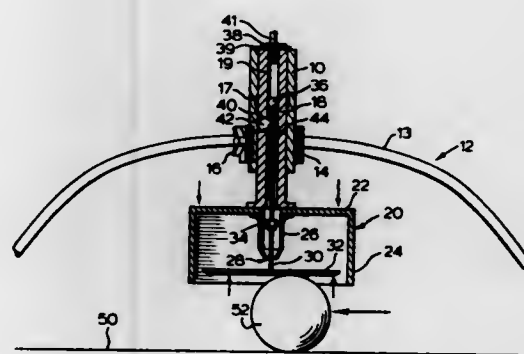
Arthur William Edward Guenther, 2400 St. Frances Drive, Burlington, Ontario, Canada

Filed Nov. 7, 1975, Ser. No. 629,807

Int. Cl.² A63B 69/36

U.S. Cl. 273-177 R

7 Claims



1. A putting device comprising:
 - a vertically oriented cylinder;
 - means to mount the cylinder a predetermined distance above a horizontal surface;
 - a barrel vertically slidable axially in the cylinder and projecting at least from the lower end of the cylinder;
 - an inverted cup fixed on the projecting bottom end portion of the barrel;
 - a rod axially movable vertically in the barrel, the lower end of the rod projecting from the bottom of the barrel;
 - disc means fixed on the lower end of the rod; and
 - means to releasably detain the barrel in a raised position with the cup above the disc means and to release the barrel and drop the cup on vertical movement of the disc and upward vertical axial movement of the rod.

4,007,939

MECHANISM FOR SUPPORTING PICKUP ARM IN DISC RECORD PLAYER OF LINEAR TRACKING ARM TYPE

Motol Iyeta, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed July 9, 1975, Ser. No. 594,557

Claims priority, application Japan, July 14, 1974, 49-87861; July 25, 1974, 49-85320

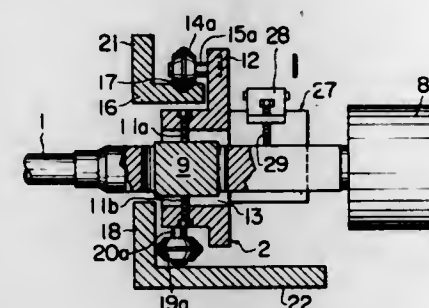
Int. Cl.² G11B 3/10

U.S. Cl. 274-23 A

5 Claims

1. A pickup arm supporting mechanism for a linear tracking arm type disc record player comprising:
 - a first horizontally disposed guide rail and a second vertically disposed guide rail spaced vertically below said first guide rail with both said guide rails extending parallel to each other,
 - a pickup arm supporting frame, a pickup arm, means mounting said pickup arm on said supporting frame for vertical as well as horizontal swinging movements,
 - said pickup arm supporting frame having an upper portion

and a lower portion with said means mounting said pickup arm disposed between said upper and lower portions, said upper portion having horizontally extending shaft means and first roller means mounted for free rotation about a horizontal axis on said horizontal shaft means, said first roller means engaging said first guide rail for movement therealong with said supporting frame suspended from said first guide rail on said roller means about a horizontal pivot axis said lower portion having vertically extending shaft means and second roller means mounted for free rotation about a vertical axis on said vertical shaft means, and engaging said second guide rail for movement therealong, the line of engagement of the



second guide rail and second roller means being offset from the vertical plane containing the line of engagement of said first roller means with said first guide rail said supporting frame and pickup arm mounted thereon having a weight disposition relative to said first roller means such that a moment is created about the point of engagement of said first roller means with said first guide rail tending to urge said lower portion of said supporting frame toward said second guide rail to maintain contact between said second guide rail and said second roller means, and said second roller means engaging said second guide rail so that a horizontal force applied to said arm in a direction away from said frame urges said second roller means against said second guide rail.

4,007,940

PROTECTED MECHANICAL SEAL

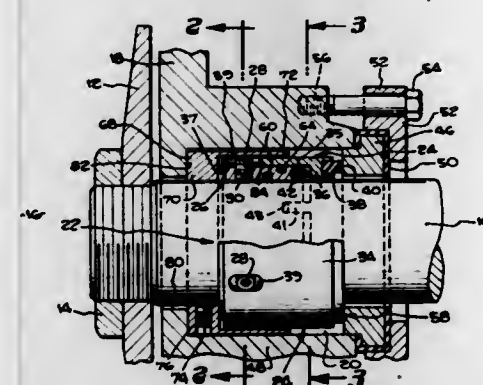
Roman Chapa, 4448 Fair St., Pico Rivera, Calif. 90660

Filed July 7, 1975, Ser. No. 593,629

Int. Cl.² F16K 41/00

U.S. Cl. 277-32

9 Claims



1. In a mechanical seal assembly for a slurry pump or like shaft rotating in a housing subject to incursions of grit contaminants, relatively rotating first and second seal elements in annular engagement defining the seal, the first of said seal elements comprising telescopically interfitted inner and outer cylindrical members having seal-wear-responsive extensible movement to maintain sealing engagement with said second seal element, said g.i.t. contaminants tending to work between said first element members and block their telescoping movement, the improvement of a third element comprising a rigid cylindrical shroud axially opposing and radially enclosing said

first element concentrically, said shroud being cup-shaped having a relatively thick cross-section base and a relatively thin cross-section cylindrical wall, and means securing said first element inner member to said shaft for rotation therewith, and separate means securing said shroud to said shaft in inner member axially abutting relation free of radial engagement with said first element, to block grit contaminants from between said first element inner and outer members while commonly rotating with the shaft and first element.

4,007,941

SEAL FOR DUCT TERMINATOR

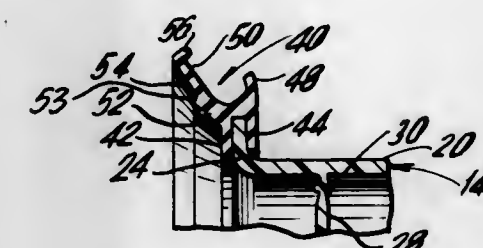
Nicholas F. Stancati, Basking Ridge, N.J., assignor to ACTA Limited, Manville, N.J.

Filed July 24, 1975, Ser. No. 598,855

Int. Cl.² F16J 15/10

U.S. Cl. 277-178

6 Claims



1. In combination with a duct terminator including a cylindrical conduit and having at one end a flared bell-mouth end portion, a flexible annular seal member of generally h-shaped cross-section and including first and second spaced apart leg portions which are respectively disposed on opposite axial sides of said flared bell-mouth end portion of the duct terminator, said first leg portion being disposed axially outwardly of said bell-mouth end portion, and a third leg portion extending radially outwardly and axially outwardly of said flared bell-mouth end portion of the duct terminator, said third leg portion extending from said first leg portion to an intermediate point thereof to define a first acute angle with respect to the center line of the cylindrical conduit, and then extending from said intermediate point to the distal end of said third leg to define a second acute angle with respect to the center line of the cylindrical conduit, with said second acute angle being greater than said first acute angle.

4,007,942

DEVICE FOR THE UPTAKE OF CUP-SHAPED PARTS OF GELATIN CAPSULES

Harro Hoffiger, Allmersbach, Taunus, Germany, assignor to Firma Allpack Industrielle Lohnverpackung GmbH & Co. KG, Waiblingen, Germany

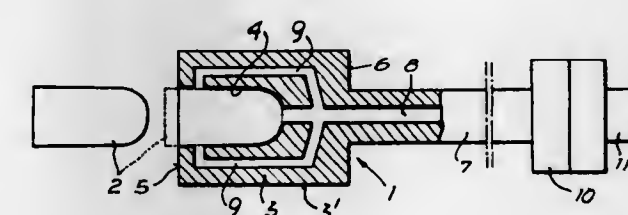
Filed Oct. 21, 1975, Ser. No. 624,564

Claims priority, application Germany, Nov. 7, 1974, 2452779

Int. Cl.² B23B 5/22; B25B 1/100; B23B 5/14

U.S. Cl. 279-3

1 Claim



1. A device for the uptake of cup-shaped elements, particularly capsule parts of gelatin capsules during manufacture thereof, said elements having a cylindrical body portion and a hemispherical end portion, comprising a holder adapted to rotate about its longitudinal axis, wherein said holder is a body

having an internal hollow chamber opening at one end to the exterior thereof, said holder including radially movable wall elements mounted within said chamber, said wall elements serving as a contact surface having a cylindrical portion and a hemispherical portion conforming to the shape of said elements, said holder further including resilient means for radially inwardly biasing said movable wall elements, said device further comprising channel means extending through said holder and communicating at least with said hemispherical portion of said contact surface, and means for connecting said channel means with either a source of underpressure or a source of overpressure.

4,007,943

POWER OPERABLE JAW CHUCK

Hans Scharfen, Meerbusch, and Josef Steinberger, Dusseldorf, both of Germany, assignors to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

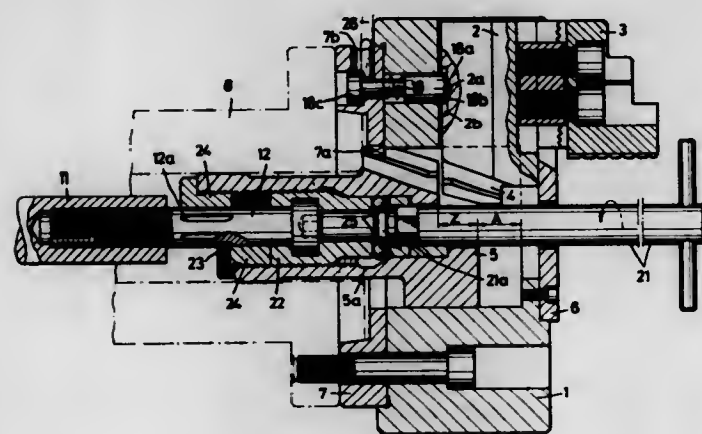
Filed July 8, 1975, Ser. No. 594,021

Claims priority, application Germany, July 29, 1974, 2436529

Int. Cl.² B23B 31/16

U.S. Cl. 279—121

8 Claims



1. A power operable chuck adapted for connection to a rotary spindle and comprising: a chuck body, chuck jaws guided for radial movement on said body, a jaw actuating piston receivable on the axis of said body, interengageable elements of cam means on said piston and jaws for positively moving the jaws radially on said body in response to reciprocation of said piston on the axis of said body, means for power actuating said piston in each direction of reciprocation thereof, means normally limiting the reciprocation of said piston to that range over which said elements of cam means are engaged, means selectively operable for moving said piston beyond said range to disengage said elements of cam means, means for holding said piston against rotation when said piston is beyond said range, and detent means holding said jaws in said body and operable to permit said jaws to be removed from said body when said elements of cam means are disengaged, said detent means comprising a spring loaded plunger in said body for each jaw having a nose at the jaw end and a recess in the respective jaw for engagement by said nose, a notch in the jaw, and a spring loaded safety plunger having an end part in said notch to limit range of the radial movement of the jaw on the body, an abutment element of the safety plunger, said abutment element engaging said piston and holding the piston against rotation when moved beyond said range having means responsive to movement of the piston beyond said range to retract the safety plunger from said notch.

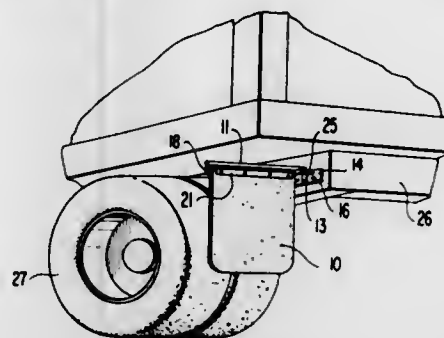
4,007,944
YIELDING SUPPORT FOR VEHICLE MUD FLAP
Jack L. Dingess, 1190 Manitoulin Pike, Brunswick, Ohio 44212

Filed Dec. 16, 1975, Ser. No. 641,263

Int. Cl.² B62D 25/16

U.S. Cl. 280—154.5 R

8 Claims



1. A mud flap support for vehicles comprising a bracket element adapted for attachment to a vehicle near a wheel thereof, a support arm adapted to carry a depending mud flap and extending from the bracket element substantially horizontally during use, cooperating means on the bracket element and support arm forming a substantially vertical axis positive pivotal connection between said arm and bracket element, whereby the arm can swing fore and aft without separating from the bracket element, and opposing variable tension spring means on opposite sides of said arm and yieldingly interconnecting said arm with said bracket element.

4,007,945

SWING-OUT SHOCK ABSORBING HITCH

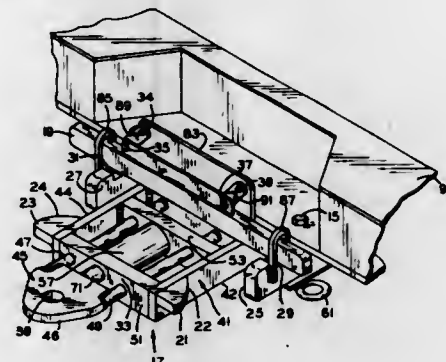
Edward F. Casad, and Richard E. Jones, both of St. Marys, Ohio, assignors to Ajax Machine and Welding Company, St. Marys, Ohio

Filed Oct. 6, 1975, Ser. No. 619,586

Int. Cl.² B60D 1/16

U.S. Cl. 280—478 B

14 Claims



1. A hitch for interconnecting a towing and a towed vehicle comprising: a frame rigidly attachable to one of the vehicles; a slide coupled to the frame for sliding movement therealong between first and second positions, the slide being pivotable relative to the frame through a limited range in a generally horizontal plane when in the first position and being adapted for coupling to the other of the vehicles; means associated with the frame for substantially limiting pivotal movement of the slide when the slide is in the second position; and a gravity actuated latch for maintaining the slide in the second position including a generally horizontally disposed cross member for engaging both the slide and the frame when the slide is in the second position and pivotable parallelogram linkage support means interconnecting the cross member and the frame for allowing movement of the cross member between positions parallel to and displaced vertically from one another.

4,007,946

SHORT SKI

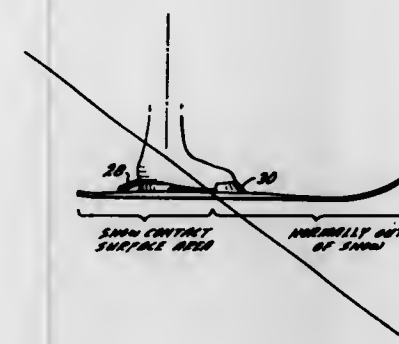
John Jeffery Sarver, 11 Carmel Bay Drive, Corona Del Mar, Calif. 92625

Filed Jan. 12, 1976, Ser. No. 648,140

Int. Cl.² A63C 5/00

U.S. Cl. 280—600

9 Claims



1. A pair of short skis for use by a skier employing a skiing technique wherein the skier's weight during turning and traversing of the skis by the skier is disposed principally on the heels of the skier's feet with turning and/or checking being accomplished by the skier unweighting his toes and repositioning the ski tips in the new line of direction of the desired travel, each of said skis comprising:

a relatively rigid after-section and a forwardly projecting flexible forward section turned upwardly at its front extremity to form an upturned shovel, said after and forward sections being formed with downwardly-facing flat surfaces for shifting from side-to-side on the snow to facilitate turning of said ski;

the top and bottom surfaces of said ski tapering gradually and continuously inwardly toward one another from a relatively thick aft-end to a relatively thin forward end to form a bottom surface having a continuous contour from the aft to the forward end thereof, the lateral sides of said ski further tapering inwardly and rearwardly from a relatively wide shovel to a relatively narrow aft-end;

a boot location area on each said ski, said boot location area being so disposed with reference to the total running length of the ski that the ball of the boot is disposed at the approximate median of the overall ski's total length, said flexible forward section of the ski extending from the turned-up tip section rearwardly to approximately the median of said total running length; and

the total length of each ski being at least 90 centimeters and the aft-end of the boot location area is disposed so as to position the boot heel substantially 6 inches forward of the tail end of the ski.

4,007,947

BABY CARRIAGE FOLDABLE IN WIDTH AND SHORTENABLE IN HEIGHT ALSO HAVING THE SEAT-BACK INCLINABLE IN VARIOUS POSITIONS
Giuseppe Perego, Arcore (Milan), Italy, assignor to Perego-Pines S.p.A., Italy

Filed Jan. 9, 1976, Ser. No. 647,815

Claims priority, application Italy, July 25, 1975, 25754/75

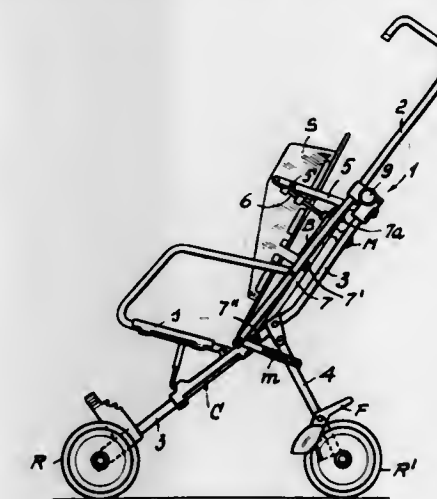
Int. Cl.² B62B 7/08

U.S. Cl. 280—642

4 Claims

1. A foldable baby carriage comprising, in combination, a pair of laterally spaced elongated handles; respective upper sleeve members slidable on said handles; a pair of elongated front legs having their upper ends secured to respective upper sleeve members; a pair of elongated rear legs each pivotally connected to an intermediate portion of a respective front leg; respective wheels on the lower ends of said front and rear legs; respective means interconnecting each rear leg to the lower end of the adjacent handle to move the rear legs toward the front legs when the carriage is folded and to maintain the rear

legs extended when the carriage is erected; respective lower sleeve members slidable on the lower portions of said front legs; and X-frame formed by a pair of elongated arms pivotally interconnected intermediate their ends; a pair of laterally spaced upright elongated frame members having their lower ends pivotally connected to respective front legs intermediate the ends of the latter; respective adjusting means secured to the upper ends of said frame members and each adjustably engaged with a respective upper sleeve member, whereby said frame members are angularly adjustable relative to said handles; a carriage seat including a seat back secured at its side edges to said frame members for adjustment therewith and foldable about a longitudinal center line parallel to its side edges; each arm of said X-frame having its upper end pivotally



connected to the upper end of a respective frame member adjacent one handle and its lower end pivotally connected to the lower sleeve slidable on that front leg connected to the upper sleeve slidable on the other handle; operating means interconnecting the upper ends of said arms for conjoint displacement of the associated upper sleeve members along the respective handles to contract and expand said X-frame, with said lower sleeve members being displaced along the respective front legs, to selectively erect or collapse said foldable baby carriage; and releasable retaining means operatively interconnecting said adjusting means with the respective upper sleeve members to adjust the inclination of the seat back; whereby said seat back may be adjustably inclined and releasably retained in adjusted position.

4,007,948

RELEASE FOR SAFETY BELT TENSION-RELIEVING APPARATUS

Robert Larry Stephenson, Sterling Heights; Yogendra Singh Loomba, Washington, and William Robert Fox, Warren, all of Mich., assignors to Allied Chemical Corporation, Morris Township, N.J.

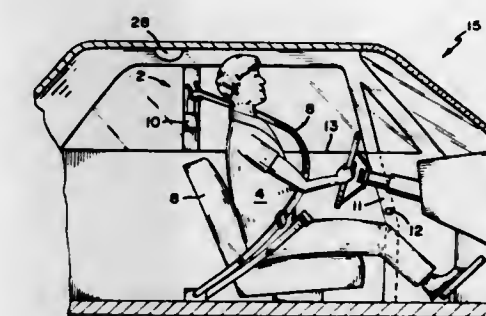
Continuation of Ser. No. 577,146, May 13, 1975, abandoned.

This application Apr. 26, 1976, Ser. No. 680,610

Int. Cl.² B60R 21/10

U.S. Cl. 280—744

17 Claims



11. In a vehicle safety belt system adapted to restrain an occupant in a vehicle seat, the safety belt system including a

safety belt, a retractor having a rewind mechanism biased to rewind the safety belt on a reel of the retractor, a tension-relieving apparatus for relieving tension on the safety belt, the tension applied by the rewind mechanism of the retractor, the improvement of a release means for said tension-relieving apparatus, the release means comprising:

- a sensing means disposed in said vehicle for operating said release means;
- a tension-relieving locking means disposed on the retractor, the tension-relieving locking means having a ready position wherein said locking means may be operated by said tension-relieving apparatus and an unlocking position wherein the rewind mechanism is allowed to wind the safety belt into the retractor, said sensing means causing said tension-relieving locking means to move to its unlocking position thereby deactivating the tension-relieving apparatus and allowing the rewind mechanism to wind the safety belt into the retractor;
- an actuating means mounted on the retractor adjacent to said locking means, mechanically coupled to a portion of said tension-relieving locking means and electrically coupled to said sensing means, said actuating means moving said tension-relieving locking means to its unlocking position thereby allowing the rewind mechanism of the retractor to operate under; and
- a biasing means biasing said tension-relieving locking means in its ready position, wherein said locking means may be operated by said tension relieving apparatus to block the rewind mechanism and relieving tension on the safety belt.

4,007,949

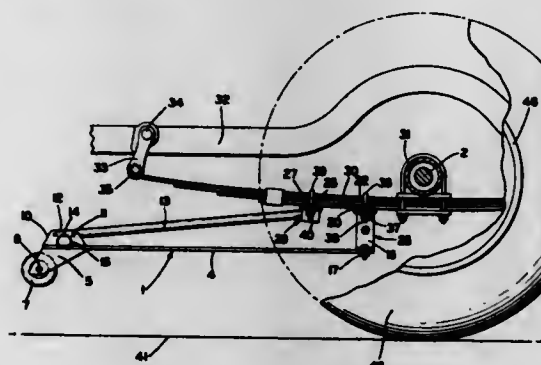
VEHICLE WHEEL LOADING BAR AND MOUNTING ARRANGEMENT

John A. Norcia, 2906 Susset St. NW., Canton, Ohio 44718, and Raymond E. Bickar, 2838 Saxon St. NE., Canton, Ohio 44721

Filed Nov. 25, 1975, Ser. No. 635,260
Int. Cl.² B60G 11/02

U.S. Cl. 280—767

16 Claims



1. Vehicle wheel loading bar construction in combination with a leaf spring of a vehicle wheel assembly including:
 - a. a vehicle having a rear axle and at least a single wheel rotatably mounted on said axle;
 - b. leaf spring means operatively mounted on the axle and extending rearwardly to a fixed support on the vehicle;
 - c. wheel loading bar means mounted on the leaf spring means generally adjacent to and rearwardly of the axle;
 - d. the wheel loading bar means including strut means mounted on the leaf spring means in a spaced relationship and extending rearwardly therefrom and terminating in an extended end;
 - e. the strut means including first and second strut members with one end of the first strut member being mounted on the leaf spring means adjacent to and rearwardly of the rear axle, and with said first strut member extending generally parallel to the ground when the loading bar construction is in a static position;
 - f. one end of the second strut member being adjustably

mounted on the leaf spring means and spaced rearwardly of said one end of the first strut member, with said second strut member extending in a downwardly rearwardly direction with respect to the leaf spring means;

- g. the second strut member mounting means including a pair of angles pivotally mounted on said one end of the second strut member, a reinforcing clamping plate and U-bolt means, with the leaf spring means being clamped between said U-bolt means and reinforcing clamping plate; and
- h. loading bar wheel means mounted on the other ends of the strut means, said wheel means being adapted to move downwardly and contact the ground upon acceleration of the vehicle and resulting deflection of the leaf spring means adjacent the spaced mounting of the strut means to increase the starting traction of the vehicle wheel.

4,007,950

BINDER UNIT FOR STAPLED BOOKLETS

Joe D. Giulie, Palo Alto, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

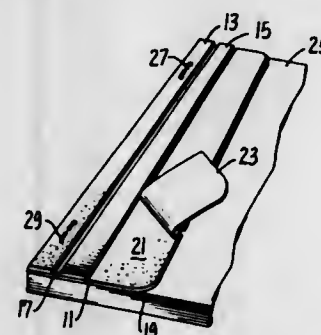
Filed July 24, 1974, Ser. No. 491,618

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B42D 1/00

U.S. Cl. 281—25 R

1 Claim



1. A binding unit for a stack of paper having opposite first and second major surfaces and a spine edge surface around which said binding unit is attached, said binding unit comprising in combination:

- a thin elongated generally rectangular flexible backing having an elongate edge, said backing having a first elongate portion adjacent said elongate edge contacting the first major surface of said stack of paper with the elongate edge of said backing positioned along the spine edge surface of the stack of paper;
- a plurality of U-shaped staples through the stack of paper and the first portion of said backing, said staples having central portions along the second major surface of the stack of paper and having terminal ends clinched over the first portion of said backing;
- an elongate strip of foam plastic corresponding in shape with the first portion of said backing and being adhered to the first portion of said backing on its surface opposite the stack of paper, said staples extending through said strip of foam plastic and said clinched over ends being embedded in said foam plastic, said strip of foam plastic having a thickness adapted to totally receive the clinched ends of the staples so that said ends do not extend above the foam plastic;
- a second strip congruent to said first strip and lying over said strip of foam plastic and over the terminal ends of said staples on the side of said strip of foam plastic opposite said stack of paper;
- said backing member extending from said strip of foam plastic around said second strip and being adhered to the surface of the second strip opposite said strip of foam plastic, and extending from said second strip around the spine edge surface of said stack of paper and over at least a portion of the second major surface of said stack of paper and being adhered thereto to cover the central portion of said staples.

4,007,951

MULTI-WAY CONNECTOR FOR HYDRAULIC CONDUITS

Andre Legris, St-Maur, France, assignor to Ste Legris France S.A., France

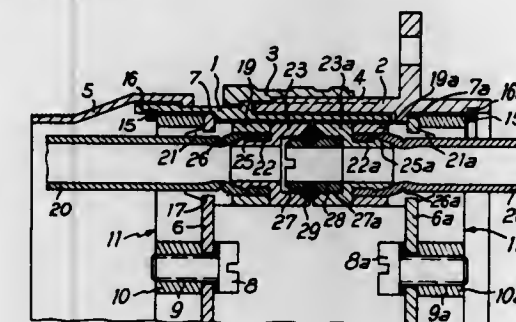
Filed Aug. 15, 1974, Ser. No. 497,674

Claims priority, application France, Aug. 21, 1973, 73.30326

Int. Cl.² F16L 39/00

U.S. Cl. 285—137 R

12 Claims



1. A multiple fluid line connector which comprises a pair of sockets disposed for releasable interconnection, a pair of frames each connected to a corresponding one of said sockets for support thereby, a pair of matching grid plates each releasably connected to a corresponding frame for support thereby, said grid plates having apertures receiving respective fluid line matching connector parts to support same with corresponding pairs of matching connector parts, one on each grid plate, positioned in alignment for interconnection, each of said connector parts being disposed for connection to a corresponding fluid line, each pair of matching connector parts, when interconnected, establishing a fluid flow connection between their associated fluid lines.

4,007,952

COMPACT MULTIPLE TUBE CONNECTOR APPARATUS

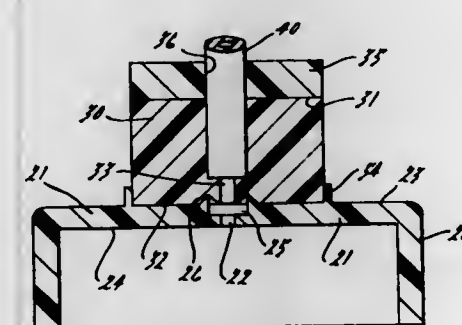
Theodore E. Fiddler, 1268 Suffield Drive, Birmingham, Mich. 48009

Filed Jan. 9, 1975, Ser. No. 539,575

Int. Cl.² F16L 39/00

U.S. Cl. 285—137 R

3 Claims



1. Apparatus for connecting a plurality of tubes to a member such as a control device, supply elements, supplied elements, other tubes, and the like, comprising,
 - a base plate of relatively non-elastic material having opposite top and bottom planar surfaces and ports leading between and opening through said planar surfaces;
 - a block of relatively elastic material having a top planar face, a bottom planar face, and counter-bored channels leading between and opening through said planar faces; said counter-bored channels having a relatively larger I.D. to receive a tube and a relatively smaller I.D. to communicate with said ports in said base plate;
 - said block bottom planar face being superposed on said top planar surface of said base plate with the smaller I.D. openings of said channels of said block aligned with said ports of said base plate;
 - a clamp bar overlying said top planar face of said block

having tube receiving holes aligned with the openings of said channels at said top planar face of said block; tubes inserted in said larger I.D. of said channels of said block through said holes in said clamp bar; interconnecting clamping means on said clamp bar and said base plate forceably urging them toward one another to compress said block between said clamp bar and said base plate with said bottom planar face of said block at said smaller I.D. of said channels forced into sealing relationship with said top planar surface on said base plate to sealably connect said ports in said base plate with said channels and said tubes in said block, and a raised bead on said top planar surface of said base plate surrounding each said port in said base plate; said beads surrounding the smaller I.D. opening of said channels through said bottom of said block; said raised bead at each said port engaging said bottom planar face of said block in sealing relationship surrounding each said channel smaller I.D. opening in said block with increased sealing force due to the raised position of said beads and small area of contact between each said bead and said bottom planar face of said block; said smaller I.D. opening of said block leaving said block with a strong mass of material to sealably engage said raised bead on said base plate.

4,007,953

REMOVABLE CAPTIVE COUPLING NUT ASSEMBLY

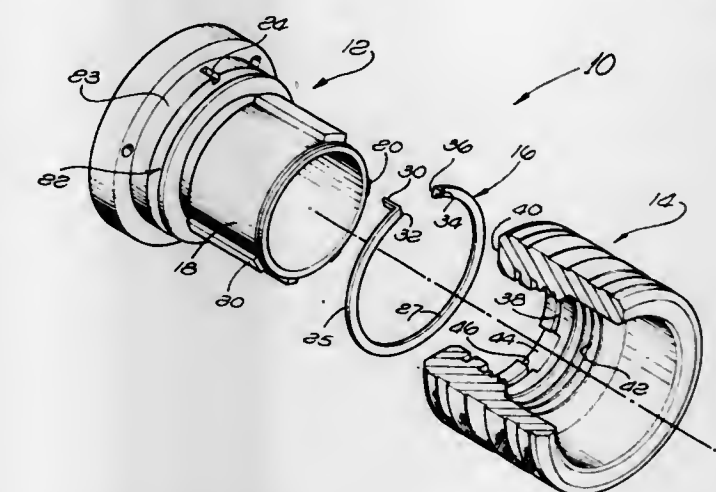
Lloyd James Powell, Newmarket, Canada, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 10, 1975, Ser. No. 611,995

Int. Cl.² F16L 55/00, 37/08

U.S. Cl. 285—321

4 Claims



1. A removable captive coupling nut assembly comprising: a coupling nut rotatably mounted on a barrel, said nut having a forward end; means for captivating said nut axially on said barrel; said captivating means including an annular groove in the outer surface of said barrel, an annular groove in the inner surface of said nut axially aligned with said barrel groove and a snap ring positioned in both said grooves; said captivating means further including:
 - a recess in the inner surface of said nut intersecting said nut groove and opening at said forward end of said nut;
 - a slot in the outer surface of said barrel extending rearwardly from said barrel groove;
 - said snap ring being circular and having spaced free ends within the outer circumference of said circular snap ring;
 - a rearwardly extending tab on one of said free ends engageable with said slot and a forwardly extending tab on the other free end engageable with said recess whereby the nut is rotated to contract the snap ring for assembly and disassembly of the coupling nut and the

barrel, both of said tabs being positioned within said recess in the assembled position; and said captivating means being releasable to allow removal of said nut from said barrel.

4,007,954

HOSPITAL LATCH

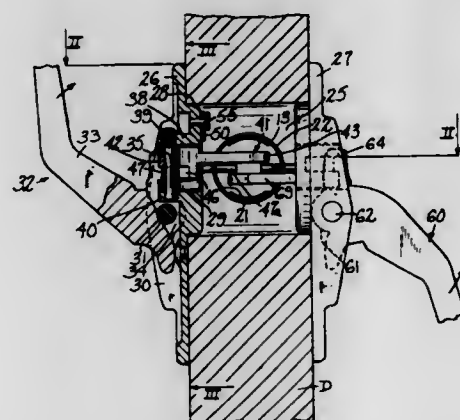
Lars Erickson, Clinton, Conn., assignor to Walter Kidde & Company, Inc., Belleville, N.J.

Filed Nov. 10, 1975, Ser. No. 630,368

Int. Cl.² E05F 15/20

U.S. Cl. 292-165

6 Claims



1. In a latch bolt mechanism of the push-pull type for fire doors, said mechanism having a latch bolt slidable in a housing and handle actuated cams engageable with the bolt for retraction thereof upon actuation of either handle, a lever pivotally supported at one end and having its other end adapted to engage the push handle cam to prevent bolt retracting movement thereof and fusible means for holding said cam engaging means in inactive position.

4,007,955

LOCKING APPARATUS

Fumio Kobayashi, Yokohama, Japan, assignor to Ohi Manufacturing Co., Ltd., Yokohama, Japan

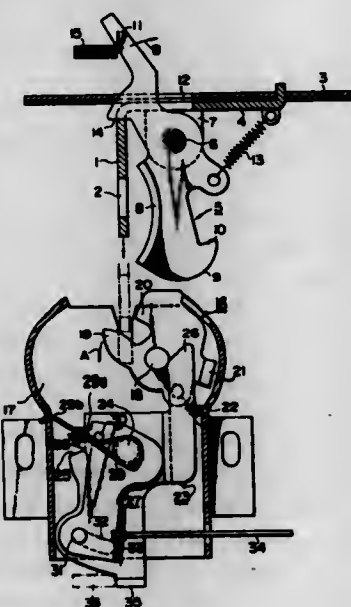
Filed July 15, 1975, Ser. No. 596,142

Claims priority, application Japan, July 20, 1974, 49-86614; July 29, 1974, 49-89449

Int. Cl.² E05C 3/26

U.S. Cl. 292-216

7 Claims



1. A locking apparatus for a trunk lid of a motor vehicle or the like comprising:
a striker rigidly mounted on the underside of a trunk lid for movement therewith, said striker including a lower aperture portion;

a locking plate pivotally mounted on said striker, said locking plate including a hook opposite said striker;
a body fixed in the path of movement of said striker;
a latch pivotally mounted on said body, said latch having an engagement member at one side for engagement by said striker for pivoting said latch, said latch having a notch portion, spaced from said engagement member for sequential receipt in the lower aperture portion of said striker after the striker has engaged said engagement member of said latch, said latch having a flange opposite said notch portion engageable with said hook; and unlatching means for disengaging the latch from said striker and locking plate.

4,007,956

DOORKNOB GUARD

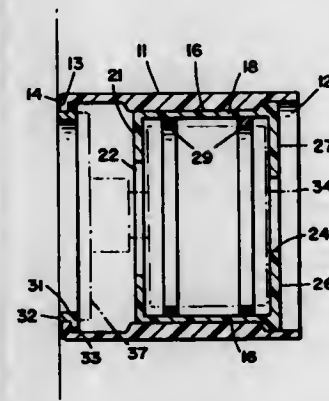
Steven K. Harris, 2142 Via Barrett, San Lorenzo, Calif. 94980, and Stanley P. Schiffman, 22 Glen Alpine Road, Piedmont, Calif. 94611

Filed May 23, 1975, Ser. No. 580,294

Int. Cl.² E05C 19/18

U.S. Cl. 292-347

7 Claims



1. A door knob protective device, comprising a first member secured about a door knob, said first member being formed of rigid, non-compressible material, and friction means disposed within said first member and about said door knob for transmitting a limited and unincreasable amount of torque therebetween, said friction means including a second member, within said first member, secured about said knob, and wherein said first and second members include at least one pair of cooperating torque and groove portions to transmit torque therebetween.

4,007,957

HOOK ASSEMBLY

Mack L. Roden, 5210 N. Villa Ave., Clovis, Calif. 93612

Filed July 21, 1975, Ser. No. 597,945

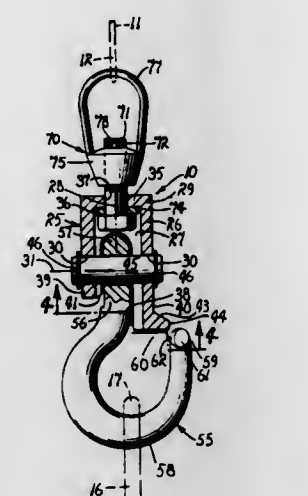
Int. Cl.² B66C 1/36

U.S. Cl. 294-82 R

3 Claims

1. A hook assembly for dependably secure interconnection of a means of support and a work load, the assembly comprising a housing having a substantially cylindrical side wall with an integral end wall and an opposite open end; means extending through the end wall for mounting the housing on the means of support for rotation about an axis substantially coaxial with the cylindrical side wall; a hook having a load-supporting portion disposed in a reference plane and an integral eye portion defining a pivotal axis in said plane; a shaft mounted on the side wall extending through the eye portion of the hook and the housing in substantially right-angular relation to the axis of the mounting means to mount said load-supporting portion of the hook for pivotal movement on the shaft laterally from a normal position in which said plane of the load-supporting portion coincides with the axis of the mounting means; a radial flange borne by the housing having a semi-circular surface substantially concentric to the axis of the mounting means; and a guide mounted on the load-supporting portion of

the hook substantially normal to the plane thereof and having a semi-circular surface juxtaposed the semi-circular surface of



the flange when the hook is in the normal position to capture a work load supported on said load-supporting portion.

4,007,958

PIVOTED WINDOW FOR CAB OF MOTOR VEHICLE

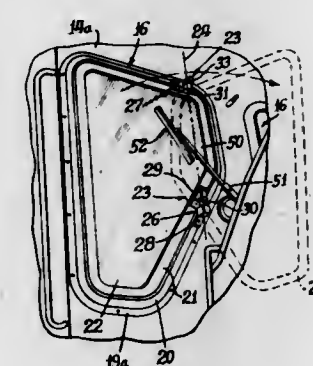
Gary S. Peifer, Waynesville, and David D. Shulke, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1975, Ser. No. 566,561

Int. Cl.² B62D 25/00

U.S. Cl. 296-28 C

5 Claims



1. A window structure for an enclosed cab of a motor vehicle which has a wall provided with a window opening that has transverse top and bottom margins and upright side margins, said window structure comprising, in combination:

a window including a frame that has a top cross bar, a bottom cross bar, and upright side bars, said frame fitting loosely in the window opening, and glass in said frame; top and bottom hinges outside said cab which mount said window in the opening for outward swinging movement about an upright pivot axis, each of said hinges having a first bracket secured in abutting relationship to an upright outer surface of the cab wall immediately adjacent to the window opening, one of said first brackets having an integral split collar with opposed arcuate surfaces on said one of said first brackets and on the free end of the split collar, said opposed arcuate surfaces defining a socket, each of said hinges also having a second bracket secured to the outer surface of one of said frame bars, and a hinge pin integral with one of said second brackets and rotatable in said socket;

a shaft which is journaled in a hole in the cab wall, said shaft having a threaded outer end portion which is screwed into a threaded hole in the free end portion of the split collar so that rotation of said shaft flexes said split collar to selectively clamp or release the hinge pin, there being a handle on the inner end of said shaft for rotation thereof from inside the cab; and sealing means for sealing said window in the opening when it is closed.

4,007,959

WHEELCHAIR

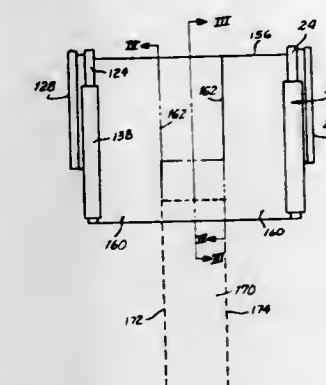
Eugene H. Juergens W75 N758 Tower Ave. Cedarburg, Wis. 53012

Filed July 7, 1975, Ser. No. 593,846

Int. Cl.² A47C 4/00

U.S. Cl. 297-42

7 Claims



1. An improved laterally collapsible wheelchair having left and right side structures including vertical and horizontal support members, each of said side structures provided with rotatably mounted rear wheels and forwardly mounted caster wheel assemblies, said wheelchair including an upper, foldable elongated horizontal support structures interconnecting said left and right side structures, and interpivot elongated members, each said elongate member being pivotally connected at one end to a lower portion of one of said side structures and pivotally connected at the opposite end to the foldable support structure adjacent the other of said side structures, said interpivot elongate members lying in a vertical plane forwardly of the vertical plane in which said caster wheel assemblies are disposed, seat structure coupled to said side structures and extending therebetween, said seat structure including a plurality of cushion sections, at least one of said cushion sections being pliable and coupled to the remainder of said sections for slidable withdrawal forwardly relative to said chair from the seat structure by a user of said chair.

4,007,960

RECLINING ELEVATOR CHAIR

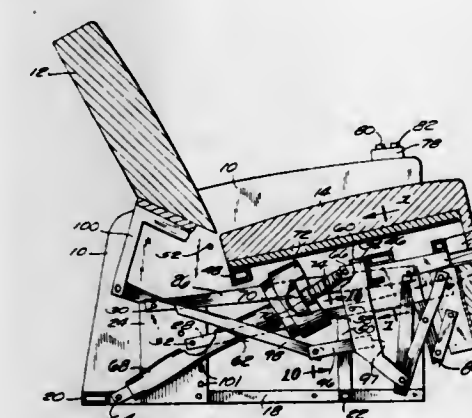
Edward J. Gaffney, N. 26 W. 27293 Highway SS, Pewaukee, Wis. 53072

Filed Apr. 30, 1975, Ser. No. 573,209

Int. Cl.² A47C 1/02

U.S. Cl. 297-71

23 Claims



1. In a reclining chair having a frame, a back portion, a seat portion, a leg rest portion, recliner actuator means including means for swinging said back portion between an upright and a reclined position and means for moving said leg rest portion between an extended and a retracted position, the improvement comprising elevator means for raising said seat and simultaneously tilting said seat forwardly to assist exit from said chair, and power-actuated drive means common to both the recliner actuator means and the elevator means for sequentially actuating both the recliner actuator means and the

elevator means and being operable sequentially in a first mode of operation to drive the recliner actuator means to swing said back portion between its upright and reclined positions and to simultaneously move said leg rest between its retracted and extended positions while said seat is in its lowered position, and operable in a second mode of operation to drive the elevator means to raise and tilt said seat forwardly, said power actuator drive means comprising a crank connected to said recliner actuator means, and abutment means connected to the elevator means and disposed in the path of crank movement to transfer the force of said drive means from the recliner actuator means to the elevator means at a transfer point between said first and second modes of operation, said power-actuated drive means comprising an extendible and retractable ram pivotally connected at one end to said frame and pivotally connected at the other end to said crank.

4,007,961

CONVERTIBLE SOFA-CHAIR

Tarsis Octavio Costa, Dr. Oliveira 1093, Theresopolis, R. J., Brazil

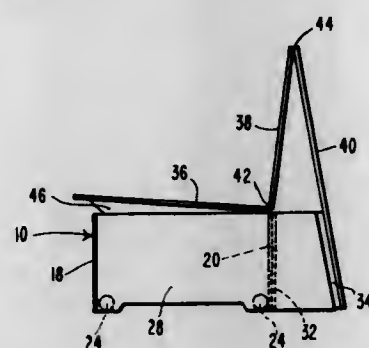
Filed Oct. 23, 1975, Ser. No. 625,066

Claims priority, application Brazil, Oct. 25, 1974, 8965

Int. Cl.² A47C 13/00

U.S. Cl. 297-111

7 Claims



1. In a convertible sofa, chair or the like, the combination comprising a pair of generally hollow bases disposed in spaced relation to each other, platform means overlying both of said bases to define a sleeping bed, one of said bases being smaller than the other of said bases permitting a telescoping arrangement therebetween whereby the sleeping bed may be converted into a sitting chair, hinge means pivoting parts of said platform means into a back rest for the sitting chair when the bases are telescoped together, and spaced slanted elements carried by one part of said platform means and straddling the smaller one of said bases when the bases are extended from each other, said spaced slanted elements engaging the other of said bases when the bases are telescoped together so that the one part of said platform means defines a slanted seating surface.

4,007,962

CHAIR WITH ADJUSTABLE BACK

Wolfgang Müller-Deisig, Schieder-Schwalenberg, Germany, assignor to Fehlbaum, Basel, Switzerland

Filed Jan. 5, 1976, Ser. No. 646,737

Claims priority, application Switzerland, Jan. 10, 1975, 247/75

Int. Cl.² A47C 3/00

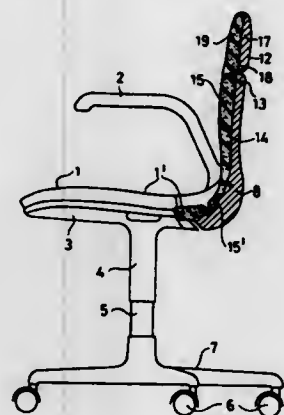
U.S. Cl. 297-306

4 Claims

1. A chair having an adjustable back with means for the ergonomically correct support of the chair occupant's spine, comprising:

a vertically adjustable seat having a rounded buttocks support and formed with a cut-out section which is located in

the centre of the rounded buttocks support and is of width about $\frac{1}{4}$ - $\frac{1}{2}$ that of the chair seat; a back support which is pivotally mounted with respect to the chair seat so that it can tilt forwards and backwards and so that a lower portion of the back support is fitted in said cut-out section so that it practically fills the cut-out section, the back support having vertical contours defining a surface which corresponds to the natural position of the human spine; and



a shoulder support which is pivotally mounted with respect to the back support and which is formed with a cut-out section opening downwards, the back support having an upper portion which is fitted in the cut-out section of the shoulder support, the width of the cut-out section of the shoulder support being at least equal to the width of the upper portion of the back support.

4,007,963

OIL COLLECTION AND RECOVERY SYSTEM FOR IN SITU OIL SHALE RETORT

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

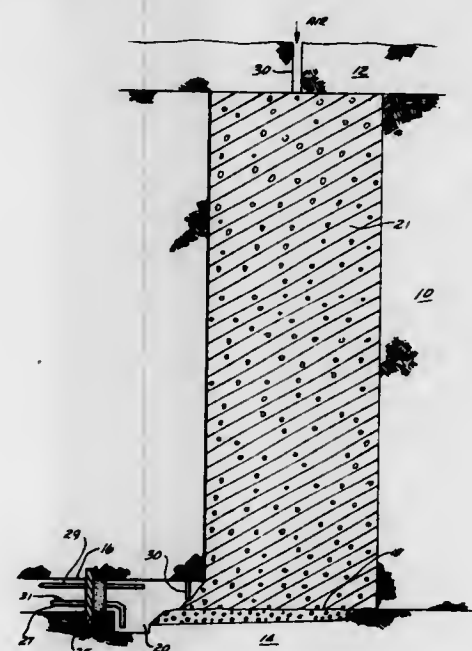
Continuation of Ser. No. 578,258, May 16, 1975, abandoned.

This application Mar. 30, 1976, Ser. No. 671,957

Int. Cl.² E21B 43/24, 43/26; E21C 41/10

U.S. Cl. 299-2

16 Claims



1. An in situ oil shale retort in a subterranean oil shale formation containing a volume of fragmented oil shale and having an access tunnel at the bottom of the in situ retort, which comprises:

a gas-tight bulkhead means in the access tunnel for providing a sealed space connected to the bottom of the in situ retort;

a sump in said sealed space for collecting liquids from the in situ retort;

at least one trench extending from at least one low point in the bottom of the in situ retort to said sump for directing liquid from the bottom of the in situ retort into said sump; a conduit extending through said bulkhead means and into said sump for withdrawing liquids from said sump; and a conduit extending through said bulkhead means and into the sealed space with an opening above the sump for removing gas from the in situ retort.

8. A method of forming an in situ oil shale retort containing a volume of fragmented oil shale in a subterranean oil shale formation comprising the steps of:

excavating subterranean formation to form an access tunnel to a lower portion of the in situ oil shale retort being formed;

excavating subterranean formation to form an excavated region in communication with the access tunnel at the lower portion of the in situ oil shale retort being formed;

excavating subterranean formation to form a pump in the floor of the access tunnel outside of the excavated region;

forming at least one trench in the floor of the excavated region extending from a low area in the floor to the sump, such a trench sloping downwardly toward the sump; and

blasting subterranean oil shale formation from above the excavated region toward the excavated region to form a volume of fragmented oil shale in the in situ oil shale retort being formed.

4,007,964

PREFERENTIAL SOLUTION MINING PROCESS

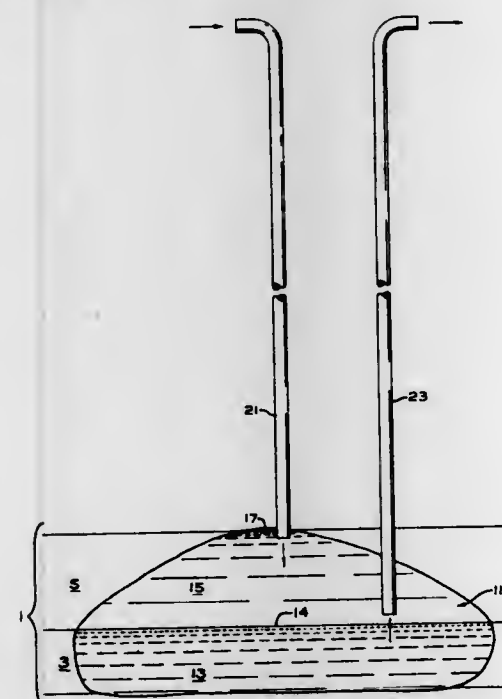
Elmar L. Goldsmith, Regina, Canada, assignor to PPG Industries Canada Ltd., Regina, Canada

Filed Sept. 23, 1975, Ser. No. 616,101

Int. Cl.² E21B 43/28

U.S. Cl. 299-4

22 Claims



1. In a method of solution mining chloride salt from a stratified subterranean deposit of at least two chloride salts wherein the ratio of the chloride salts to each other varies between strata within the deposit which method comprises establishing a solution mining cavity in said deposit, feeding aqueous solvent into the solution mining cavity thereby dissolving chloride salts from the deposit to form a first aqueous working solution within the cavity, mining upwardly through said deposit, and withdrawing first working solution as an aqueous effluent from the cavity, the improvement comprising:

feeding aqueous solvent into said cavity and withdrawing first aqueous working solution effluent from said cavity until a preferentially minable higher zone having a different ratio of chloride salts than the layer subjacent thereto is reached;

injecting aqueous solvent having a density less than the

density of said first aqueous working solution into the cavity above the surface of said aqueous working solution and above the bottom of the zone being preferentially mined;

dissolving chloride salts from the higher zone into said less dense aqueous solvent whereby to establish a layer of a second aqueous working solution; and

withdrawing effluent from the second aqueous working solution within said cavity near the bottom of the zone being preferentially mined, while maintaining said second aqueous working solution less dense than said first aqueous working solution and substantially undiluted by said first aqueous working solution, said effluent having a higher salt content than said less dense aqueous solvent.

4,007,965

METHOD OF RECOVERING USEFUL MINERALS FROM SUBTERRANEAN DEPOSITS THEREOF

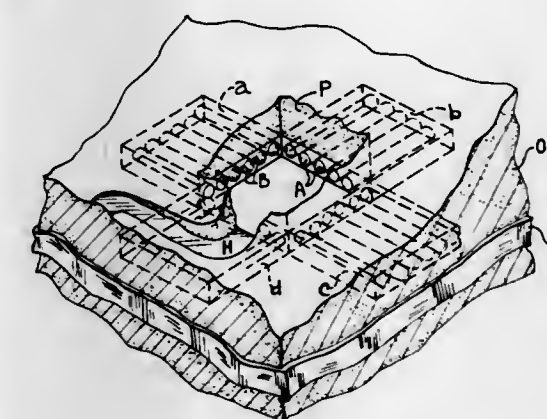
Anthony J. Shuttle, Jr., 839 Rydal Road, Jenkintown, Pa. 19046

Filed July 18, 1975, Ser. No. 597,004

Int. Cl.² E21C 27/20, 41/00

U.S. Cl. 299-11

1 Claim



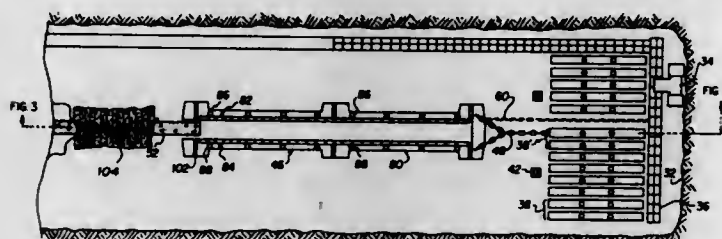
1. The method of recovering minerals from a subterranean substantially horizontal seam thereof underlying an overburden layer, the steps of excavating in the overburden layer a pit exposing at its bottom a substantially square area of the mineral seam, recovering the mineral from the seam in said area, then projecting from each side of said area an extraction operation removing mineral of the seam into said pit from a substantially square area extending from each of said sides under the overburden layer, then excavating in the overburden layer another pit substantially congruent with said first pit exposing at its bottom another substantially square area of the mineral seam having one side extending in prolongation of a side of said first area, said second area extending oppositely from said first area in respect to the line common to said sides of said areas, said areas being spaced apart along said common line a distance approximately equal to each of the several sides of said areas, then projecting from each side of said second area an extraction operation removing mineral of the seam into said second pit from a substantially square area extending from each of the sides of said second area, the area of such removal extending from one of the sides of the second pit into substantial encounter with two of the extraction areas projected from adjacent sides of said first pit, then excavating similar square pits and areas under the overburden extending from the sides of each of said pits into the seam in like manner until extraction of the mineral of the seam has been substantially completed and after extraction of the mineral of the seam to said pits removing the mineral from said pits and finally returning to the pits overburden excavated therefrom to restore the surface substantially to the condition existing before the initiation of the mining operation.

4,007,966

SINGLE-ENTRY MINING DEVELOPMENT SYSTEM
William Zorn Wenneborg, Thousand Oaks, Calif., assignor to
Atlantic Richfield Company, Los Angeles, Calif.
Filed Dec. 29, 1975, Ser. No. 644,585
Int. Cl.² E21C 41/00

U.S. Cl. 299-11

9 Claims



1. A method of developing a single-entry for use in longwall mining comprising the steps of:
 - a. advancing the working face of the entry;
 - b. dividing said entry lengthwise by means of a continuous upstanding wall formed in progressive increments in following spaced relation to said face as it is advanced, said wall being adapted to provide load bearing support and air isolation between the two sides thereof; and
 - c. directing air flow from the leading edge of said wall to said face during the mining of said entry.

4,007,967

LOCKRING, TRIM RING AND MOLDED PLASTIC WHEEL COVER ASSEMBLY
Herbert Buerger, Walton, N.Y., assignor to Del-Met Corporation, Walton, N.Y.

Filed July 7, 1975, Ser. No. 593,779
Int. Cl.² B60B 7/04

U.S. Cl. 301-37 P

6 Claims



1. A lockring made from a flat straight strip of metal, and comprising a band of metal formed with transverse notches opening to one edge of the band and providing spring fingers between the notches, and also provided with transverse equiangularly spaced crimps increasing in depth toward the opposite edge of the band to cause said straight strip to curve into a circular band shape, the portions of the band between the crimps being in a common flat plane of said flat strip, the ends of said strip being overlapped and attached together to hold said crimped strip in circular band shape, a trim ring having a flange in a flat plane contacting said flat portions of said lockring, a plastic wheel cover having a flange in a flat plane contacting the flange of said trim ring, and means to attach

said flanges of said trim ring and wheel cover to said flat portions of said lockring, said spring fingers being bent to one side of the plane of said flat portions, and said crimps extending to an opposite side of said plane of said flat portions, alternates of said spring fingers being bent to different angles relative to said flat portions.

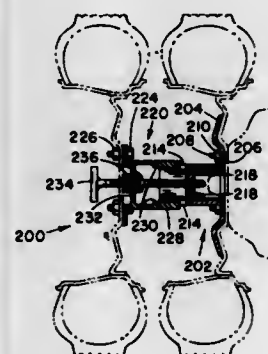
4,007,968

VEHICLE WHEEL ACCESSORY MOUNTING FIXTURE AND REMOVABLE ACCESSORIES THEREFOR
Cruz Luevano Solis, 1204 Buena Vista, San Antonio, Tex. 78207

Continuation-in-part of Ser. No. 329,442, Feb. 5, 1973, Pat. No. 3,860,297. This application Dec. 3, 1974, Ser. No. 529,032
Int. Cl.² B60B 15/26

U.S. Cl. 301-38 R

2 Claims



1. A wheel accessory and mounting fixture therefor, said fixture comprising a first component including means for removable semi-permanent securement to a mounting vehicle wheel in the central portion of the latter, and a second component affixed to the wheel accessory, said first and second components including first and second co-acting portions releasably engaged with each other by supporting said accessory from said wheel and for the transfer of torque from the wheel through the fixture to the accessory; said first and second co-acting portions comprise telescopically engaged cylindrical hub portions, one of said hub portions including circumferentially spaced endwise outwardly opening longitudinal slots and the other of said hub portions including generally radially extending ribs keyed and slidably received in said slots for the transfer of rotational torque from one hub portion to the other hub portion, said second component being threadably connected by bolt means from said second component to said first component said bolt means extending parallel to the slots and ribs.

4,007,969

DEVICE FOR FLUIDIZING AND DISTRIBUTING POWDER

Gerard Aubin, Evreux; Michel Arsène Braguier, Paris; Christian Naturel, Pacy-sur-Eure; Etienne M. Poulin, Evreux, and Joseph A. Wattre, Bobigny, all of France, assignors to Letat Francais represente par le Ministre des Postes et Telecommunications, Moulineaux and Desmarquest et C.E.C. S.A., Montrouge, both of, France

Filed July 14, 1975, Ser. No. 595,356
Claims priority, application France, July 16, 1974, 74.24702

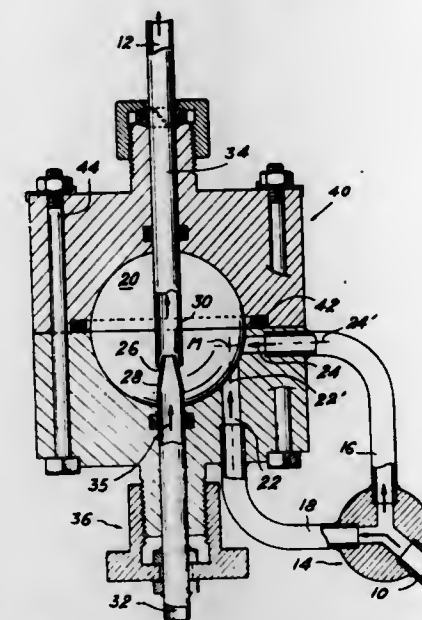
Int. Cl.² B65G 53/28

U.S. Cl. 302-25

3 Claims

1. A device for fluidizing and distributing a powder in suspension in a carrier gas comprising:
 - an enclosed cornerless chamber having an inner wall and a center;
 - inlet conduit means for feeding a powder to be fluidized into said chamber;
 - separating means dividing said inlet conduit into two pipes communicating with said chamber, said pipes having axes which converge to a point in the vicinity of said wall; and

outlet conduit means for distributing said powder once fluidized, said outlet conduit means having an opening



communicating with said chamber, and said opening being located in the vicinity of said center of said chamber.

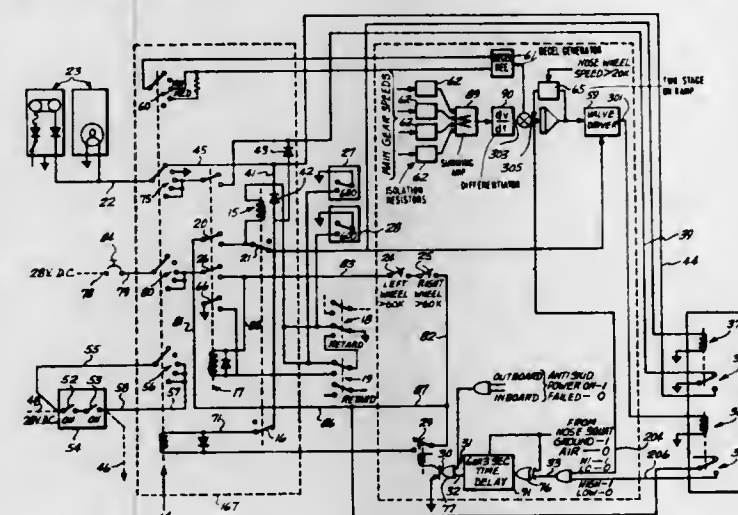
4,007,970

AIRCRAFT AUTOMATIC BRAKING SYSTEM
Ervin Gordon Romero, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 30, 1975, Ser. No. 618,190
Int. Cl.² B60T 8/02

U.S. Cl. 303-93

4 Claims



1. The method of braking a first wheel on a main landing gear on a first side of a plane passing through the fuselage of an aircraft having a nose gear and a second wheel on a main landing gear on the remaining side of said plane comprising the following steps:
 - measuring the wheel speeds of said first and second wheels;
 - applying braking pressure to said first and second wheels at an increasing rate of less than a predetermined value after said wheel speeds of said first and second wheels exceed a predetermined wheel speed value;
 - measuring the wheel speed of a wheel on said nose gear of the aircraft;
 - applying braking pressure to said first and second wheels at an increasing rate of less than a further predetermined value after said wheelspeed of said wheel on the nose gear of the aircraft exceeds a predetermined value until the rate of deceleration of said aircraft equals a predetermined rate of deceleration, said further predetermined value being greater than said increasing rate of less than a predetermined value; and then,
 - adjusting braking pressure to said first and second wheels to maintain constant said predetermined rate of deceleration of said aircraft.

2. In combination of an aircraft, an automatic braking system having system arming and disarming switching means for automatically controlling the application of braking pressure to a plurality of wheels of the aircraft upon touchdown of the aircraft:

nose gear squat switch means for providing a signal representative of aircraft status with respect to the ground;

first circuit means for providing a first time delay having a first predetermined value when said signal representative of aircraft status is indicative of an air mode, and a second time delay having a second predetermined value less than said first predetermined value when said signal representative of aircraft status is indicative of a ground mode; and,

second circuit means coupled between said first circuit means and said system arming and disarming switching means for disarming said automatic braking system upon the occurrence of said first time delay and permitting disarming of said automatic braking system upon the occurrence of said second time delay.

4,007,971

ANTI-SKID CONTROL SYSTEM FOR VEHICLES

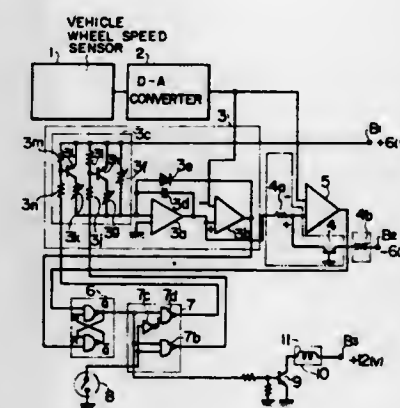
Akio Sugiura, Nagoya; Atutoshi Okamoto, Toyohashi; Takahiro Nogami, Susono, and Jun Ohta, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 392,775, Aug. 29, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,298

Claims priority, application Japan, Aug. 31, 1972, 47-87279
Int. Cl.² B60T 8/10

U.S. Cl. 303-109

8 Claims



1. An anti-skid control system for vehicles comprising:
 - a wheel sensor for detecting a wheel speed,
 - a reference wheel speed generating circuit for producing a reference wheel speed signal which decreases in accordance with a predetermined control pattern to approximate a vehicle body speed during a braking action and which is derived from a wheel speed signal generated by said wheel sensor,
 - comparison means for generating a relaxation signal when a difference between said wheel speed signal and reference signal reaches a set-up speed width,
 - braking pressure modification means for reducing braking pressure by receiving the relaxation signal from said comparison means;
 - road surface detecting means for generating a detection signal when the friction coefficient between a road surface and a wheel becomes less than a predetermined level, and a pattern modification circuit, connected to said road surface detecting means, said comparison means and said reference wheel speed generating circuit, for first setting up a predetermined downward gradient as the gradient of said reference wheel speed signal at the beginning thereof when said reference wheel speed signal corresponds to the wheel speed, said predetermined gradient being independent of deceleration, and second, setting up either a

steeper or a slower gradient, after said braking pressure reducing signal has been generated, in accordance with whether said detection signal is generated, and variation means for successively varying said set-up speed width in response to the magnitude of the vehicle body deceleration.

4,007,972

SEALED TRACK JOINT

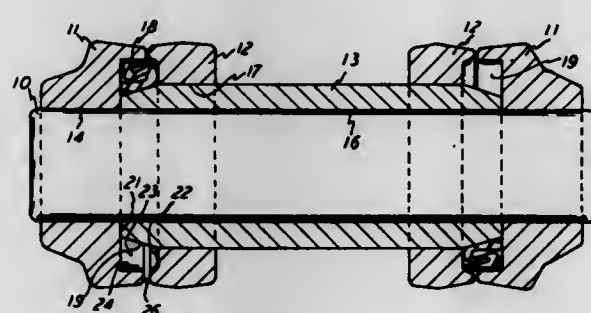
John M. Baylor, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 1, 1975, Ser. No. 618,438

Int. Cl.² B62D 55/20

U.S. Cl. 305—11

7 Claims



1. In a sealed track joint, a track pin, a cylindrical bushing extending over said pin and presenting a cylindrical contact area therebetween, a pair of track links on each respective end of said pin and said bushing for presenting an assembly of said links and said pin and said bushing, said links having surfaces facing each other along the axis of said assembly and being spaced apart relative to the axis of said assembly, and said assembly having circumferential and radially spaced-apart surfaces, with all said surfaces presenting a seal cavity, an elastomeric seal compressed in said cavity, the improvement comprising said seal being an endless ring and of an S-shape in cross section, with two end leg portions respectively disposed radially inwardly and outwardly relative to the longitudinal axis of said ring, the two extending ends of said leg portions being in abutment with the respective said link surfaces, and the radially inwardly and outwardly disposed two said leg portions being in abutment with the respective said radially spaced-apart surfaces, and said two extending ends when in the free body unassembled position away from said assembly being spaced apart a distance greater than the spacing between said link surfaces, to be compressed therebetween in the assembly, and the radially inwardly and outwardly disposed two said leg portions when in the free body unassembled position away from said assembly being disposed to present an overall height of said S-shape greater than the radial dimension between said radially spaced-apart surfaces, to be compressed therebetween in the assembly.

4,007,973

FLUID BEARINGS

Roger Bernard Collins, 187 Cutlers Place, and Jonathan Anthony Henry Key, Craigie Lea, Croft Close, Corfemullen, both of Wimbourne, Dorset, England

Filed Mar. 11, 1974, Ser. No. 449,907

Claims priority, application United Kingdom, Mar. 20, 1973, 13183/73

Int. Cl.² F16C 17/16

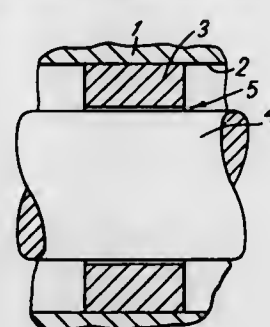
U.S. Cl. 308—9

8 Claims

1. A bearing member, of a fluid rotary bearing for use at speeds in excess of the "half speed whirl" speed of a solidly mounted bearing, comprising a substantially annular body formed at least partially, considered in the radial direction, of

a material of which:

A. the tensile modulus lies in the range 75,000 and



1,500,000 pounds per square inch inclusive, and
B. the specific gravity is less than 3.

4,007,974

SELF-PRESSURE PRODUCING SLIDING THRUST BEARING

Wolfgang Huber, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

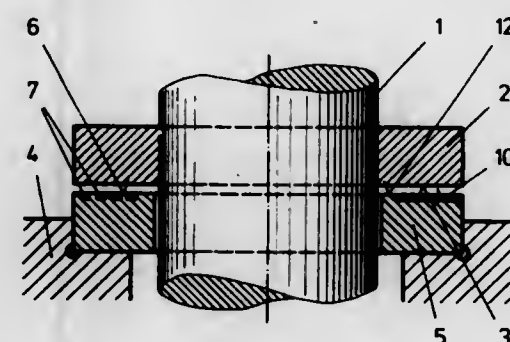
Filed Feb. 2, 1976, Ser. No. 654,329

Claims priority, application Germany, Feb. 1, 1976, 2504204

Int. Cl.² F16C 17/16

U.S. Cl. 308—9

10 Claims



1. In a sliding thrust bearing having a first sliding bearing surface with grooves open to a lubricant supply, the grooves being inclined to the circumferential direction of the bearing, and a second bearing surface in sliding engagement with said first bearing surface, whereby hydrodynamic or aerodynamic pressure builds up in said grooves upon relative rotation of said first and second bearing surfaces in both circumferential rotational directions, the improvement wherein said first bearing surface has a plurality of regions each of which has a slot extending radially from a circumferential edge of said first bearing surface, and wherein each region further has first and second groups of grooves extending from opposite sides of the respective slots, the grooves of said first and second groups being oppositely inclined with respect to the circumferential direction of the bearing surface, whereby pressure builds up in said grooves of said first group upon relative rotation of said first and second surfaces in one direction, and pressure builds up in said grooves of said second group upon relative rotation of said first and second surfaces in the opposite direction.

4,007,975

ARTICULATED BEARING

Karl-Heinz Schutz, and Heinz Peter, both of Schweinfurt, Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed Feb. 2, 1976, Ser. No. 654,696

Claims priority, application Germany, Feb. 1, 1975, 7502998

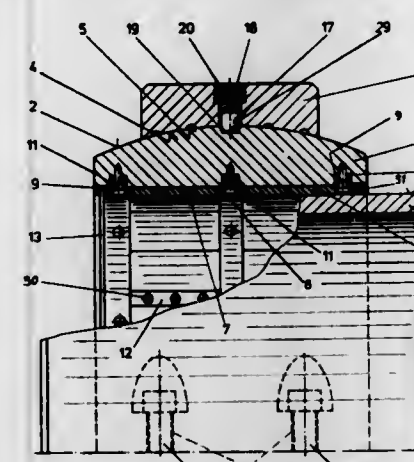
Int. Cl.² F16C 27/00

U.S. Cl. 308—238

14 Claims

1. In an articulated bearing having an inner ring with a spherical outer surface, an outer ring with a hollow spherical inner surface corresponding to and engagement with the outer

surface of the inner ring, and a sliding bearing surface in the inner cylindrical bore of the inner ring; the improvement wherein said sliding bearing surface comprises a plurality of plastic inserts arranged about the circumference of said bore, ring means adjacent to the inner ring at the axial ends of said inserts, said ring means having inclined surfaces engaged in the axial ends of said inserts for holding said inserts in said



bore, and strip means affixed to said inner ring in said bore between at least one pair of circumferentially adjacent inserts for inhibiting circumferential movement of said inserts in said bore, said inserts extending radially inwardly with respect to said ring means and strip means, in the unloaded condition of the bearing, a distance corresponding to the elastic deformation of said inserts under load.

4,007,976

ELECTRICAL CONNECTORS

George W. Knecht, Brooklyn, N.Y., assignor to Midland-Ross Corporation, Cleveland, Ohio

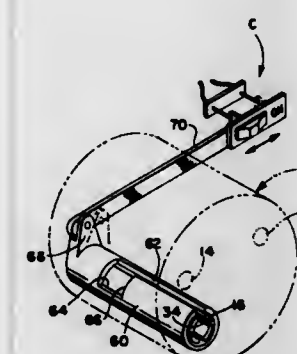
Division of Ser. No. 530,061, Dec. 6, 1974, Pat. No. 3,971,609.

This application Jan. 15, 1976, Ser. No. 649,395

Int. Cl.² H01R 3/06

U.S. Cl. 339—14 RP

3 Claims



1. An electrical connector socket comprising; a body member having a plurality of spaced-apart socket electrical contacts and a socket ground contact spaced from said electrical contacts, said ground contact including a sleeve member having a longitudinal slot therein, a keying groove in said body member aligned with said slot, locking means adjacent said ground contact for locking a ground pin therein, and said locking means including a sleeve member rotatably surrounding said ground contact and having a generally L-shaped slot therein including a main slot leg alignable with said ground contact slot and a rear lateral slot leg extending transversely of said main slot leg.

4,007,977

ELECTRICAL CONNECTOR

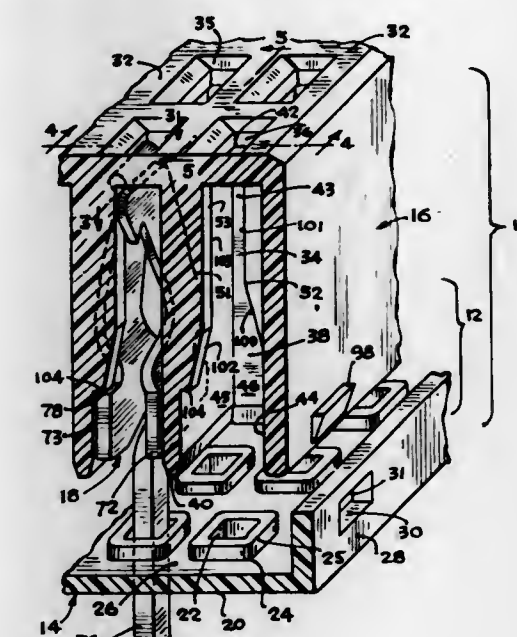
Gerhard Bauerle, Willsbach, Germany, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed May 9, 1974, Ser. No. 468,394

Int. Cl.² H01R 13/40

U.S. Cl. 339—217 S

2 Claims



1. An electrical connector comprising: a dielectric housing including a base having an opening encircled by a raised collar and a body member having a front surface and at least one cavity open on said surface and rearwardly extending longitudinally therefrom in communication with the opening in said base defined by a box-like wall section with longitudinal sides in encircling engagement with said collar and a pair of limiting shoulders disposed apart from said sides and laterally separated parallel to said sides, and at least one metallic contact, said contact being mounted in said housing and frontwardly including a pair of opposite, inwardly-facing spring arms for receiving a mating contact and rearwardly including spaced facing flanges abutting said collar and engaging said sides and a tail portion passing through the opening in said base for receiving a conductive element, said spring arms frontwardly including a pair of engagement portion means at least partially disposed in said box-like section and movable in a common plane with one of said portions facing said side and inwardly facing said other portion, said engagement portion means including a pair of laterally offset tabs in inwardly limiting engagement with said shoulders, said shoulders located adjacent the longitudinal mid-plane between said engagement portions, each of said engagement portion means having one of said tabs extending laterally beyond the other portion to one of said shoulders and being outwardly movable away therefrom.

4,007,978

INTEGRATED OPTICAL CIRCUITS

William C. Holton, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 434,469, Jan. 18, 1974, abandoned.

This application May 9, 1975, Ser. No. 575,862

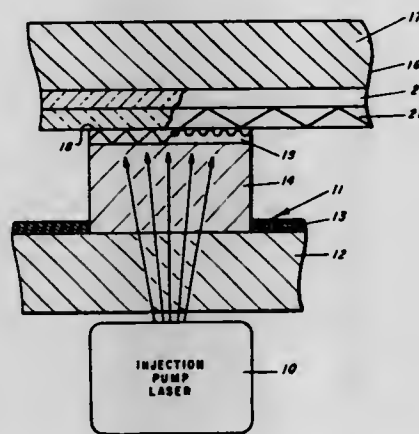
Int. Cl.² G02B 5/14

U.S. Cl. 350—96 WG

8 Claims

1. In an integrated optics structure, a source of laser radiation, a surface laser operably associated with said source of laser radiation for receiving laser radiation therefrom, said surface laser comprising: a substrate of semiconductor material taken from the group consisting of III-V semiconductor compounds and mixed ternary III-V semiconductor compositions, a mesa of semiconductor material taken from the group consisting of III-V semiconductor compounds and mixed

ternary III-V semiconductor compositions mounted on said substrate, and means defining an active surface laser region extending along the top of said mesa and in which laser radiation is generated in response to activation of said source of laser radiation causing the emission of laser radiation through said substrate and said mesa in a direction extending thereto;



optical waveguide means disposed in juxtaposition to said active surface laser region; and means coupling said active surface laser region to said optical waveguide means by forming an evanescent field-coupling therebetween matching the phase velocity of the laser radiation generated in said active surface laser region to that of said optical waveguide means for transmitting laser radiation to said optical waveguide means.

4,007,979

REFLECTION ELIMINATION SYSTEM

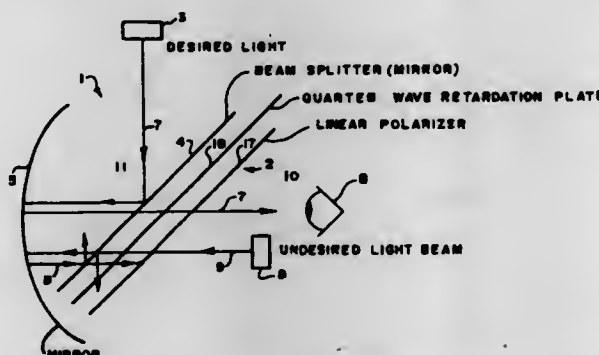
David B. Coblitz, Hazelwood, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 18, 1975, Ser. No. 569,480

Int. Cl.² G02B 27/10

U.S. Cl. 350-156

15 Claims



1. In a device including a material which partially polarizes radiation passing through it, said material having a P axis and an S axis, the improvement which comprises a retarder and a linear polarizer for imparting an elliptical polarization to radiation passing through the retarder and the linear polarizer, said retarder having a fast axis and a slow axis, said fast axis being aligned parallel to one of said P and S axes of said material, the retardance of the combination of said retarder and said material being approximately a quarter wave, said linear polarizer having a pass axis, said pass axis being placed at an angle ϕ with respect to the P axis of said material, where ϕ is determined from the formula $\tan^2 \phi = t_p^2 / t_s^2$, in which t_p is the amplitude transmittance of the material for light polarized in the P direction, and t_s is the amplitude transmittance of the material for light polarized in the S direction.

4,007,980

DEVICE FOR THE MEASUREMENT OF THE SIZE OF AN EYE PUPIL

Daniel Bracher, Beethovenstrasse 10, 3073 Gumligen, and Walter Lotmar, Chaumontweg 102, 3028 Spiegel, near Berne, both of Switzerland

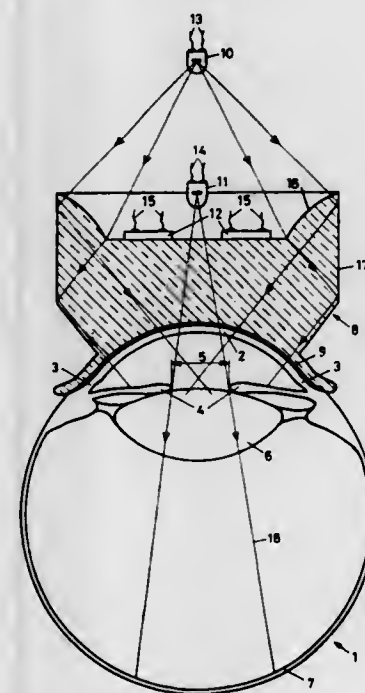
Filed Aug. 19, 1975, Ser. No. 605,871

Claims priority, application Switzerland, Aug. 23, 1974, 11556/74

Int. Cl.² A61B 3/10

U.S. Cl. 351-6

15 Claims



1. A device for measuring the size of an eye pupil, comprising:

contact body means made of a transparent material, for adhering to and moving with the eye; illuminating light source means, fixedly connected to said contact body means, for directing illuminating light divergently towards the eye; light detection means, fixedly connected to said contact body means, for detecting light reflected by the eye; and optical system means, integral with said transparent contact body means, for collecting the diverging light from said illuminating light source means and directing the collected light obliquely onto the iris, the light converging towards the optical axis of the eye through an annular area of the cornea,

whereby light impinging on the iris is reflected toward said light detection means and light passing through the pupil does so obliquely and thus strikes only lateral parts of the fundus of the eye, from which reflected light will not reach said light detection means.

4,007,981

DUAL MODE ELECTROSTATOGRAPHIC PRINTING MACHINE

Robert N. Goren, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 10, 1975, Ser. No. 566,873

Int. Cl.² G03G 15/30

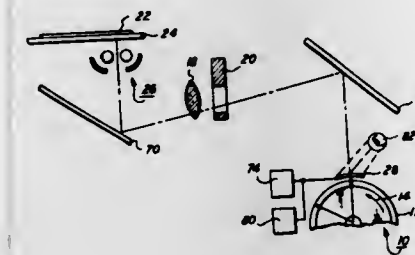
U.S. Cl. 355-4

11 Claims

5. An electrophotographic printing machine of the type having an arcuate photoconductive member, including:

a screen member mounted movably in the printing machine closely spaced to the photoconductive member, said screen member comprises an arcuate member having a curvature equal to the curvature of said arcuate photoconductive member with the centers of curvature being in coincidence with one another and the radius of curvature of said screen member being greater than the radius of curvature of said photoconductive member;

means for adjusting the spacing between the photoconductive member and said screen member; and



means for translating said screen member relative to said photoconductive member while maintaining the spacing between said screen member and photoconductive member substantially constant.

4,007,982

METHOD AND APPARATUS FOR ULTRASONICALLY CLEANING A PHOTOCONDUCTIVE SURFACE

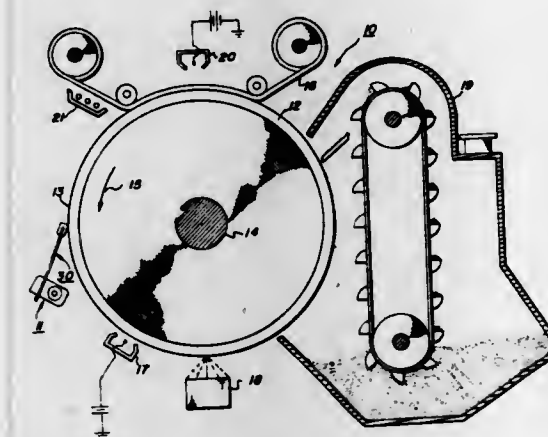
Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 6, 1975, Ser. No. 547,523

Int. Cl.² G03G 21/00

U.S. Cl. 355-15

22 Claims



1. A cleaning apparatus for removing particulate material from an imaging surface of an electrostatographic imaging member which is arranged for movement in a desired direction, said apparatus comprising:

means for removing said particles from said surface, said removing means comprising at least one blade member having an edge engaging said surface, said blade member extending across said surface; and means for vibrating said blade member in a direction substantially parallel to said surface and transverse to the direction in which said imaging surface is movable and at an ultrasonic frequency which is sufficiently high to substantially reduce the frictional resistance between said blade edge and said imaging surface and with a vibrational amplitude at said blade edge sufficiently small to insure sufficient conformity between said blade edge and said imaging surface for providing adequate cleaning of said particulate material therefrom.

4,007,983

LIQUID DEVELOPER CLEANING MEANS

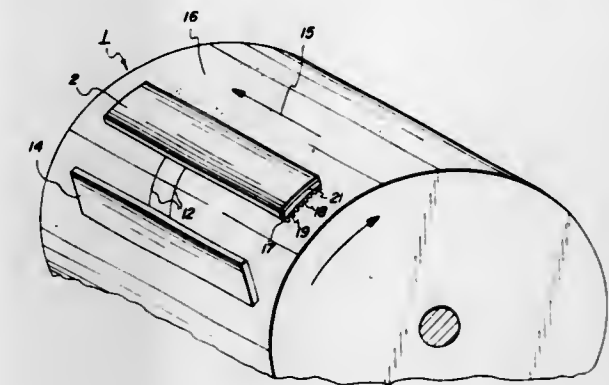
James J. Knieser, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1975, Ser. No. 626,955

Int. Cl.² G03G 21/00, 13/00; A46B 15/00

U.S. Cl. 355-15

16 Claims



7. An apparatus for the improved conditioning of reusable surfaces to be cleaned after the liquid development thereon of a charge pattern and the transfer therefrom of the developed pattern comprising:

a. a cleaning means which is brought into moving contact with the surface to be cleaned; and downstream therefrom in the direction of motion of the surface to be cleaned;

b. a stationary, compressible pad having a pattern of raised and depressed portions on the substantially non-absorbing working surface for redistributing transferable deposits of liquid developer remaining on the surface to be cleaned to other areas of said surface.

4,007,984

METHOD AND APPARATUS FOR HANDLING A BELT OF PHOTOCONDUCTIVE MATERIAL

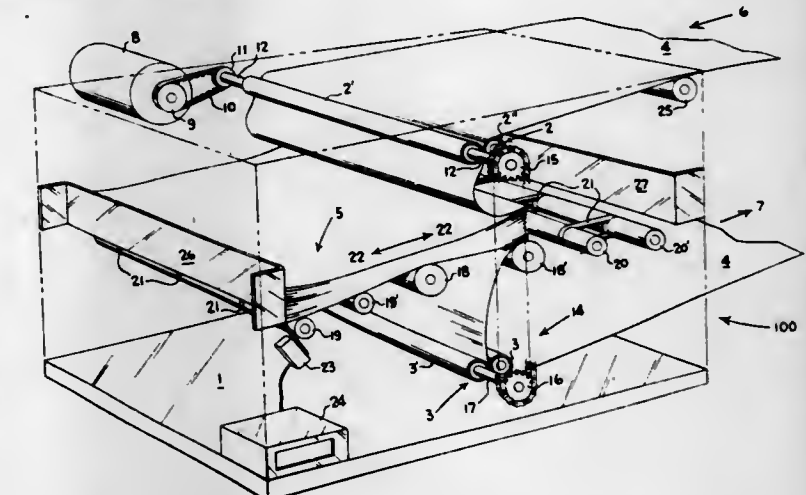
Christian A. Beck, Ridgefield, and David W. Hubbard, Stamford, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Continuation of Ser. No. 384,938, Aug. 2, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,295

Int. Cl.² G03G 15/00

U.S. Cl. 355-16

11 Claims



4. A device for handling a quantity of fan-folded photoconductive web material comprising:

means for supporting fan-folded photoconductive web material, said material comprising an endless web at least a portion of which is compactly arranged with respect to said supporting means to constitute a stored mass of said fan-folded material;

edge abutment means disposed on either side of said supporting means and being spaced apart a distance substantially greater than a length of said material thereby defining a limited path of travel of said stored mass of material relative to said supporting means; and

feed means operatively associated with said endless web of material for simultaneously feeding said endless web of material to said stored mass of fan-folded material and dispensing said endless web of material from said stored mass of fan-folded material whereby the amount of material in said stored mass remains substantially constant while the fan-folded material in said stored mass is continuously changing.

4,007,985

MULTIPLE FUNCTION RECORDING AND READOUT SYSTEM

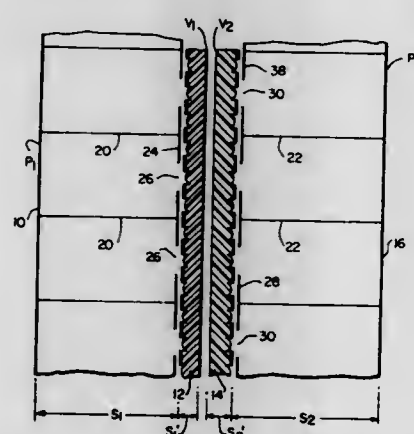
George Johannus Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Filed Oct. 16, 1974, Ser. No. 515,344

Int. Cl.² B60Q 3/04; G03B 21/14, 23/08, 33/14

U.S. Cl. 355-46

5 Claims



1. A plural-function optical apparatus, including,
 - a. a first optical screen,
 - b. a first lensfiche whose lensettes face said first screen, said first lensfiche being parallel to said first optical screen,
 - c. a second lensfiche, parallel to said first lensfiche, whose emulsion side faces the emulsion side of said first lensfiche,
 - d. a second optical screen, parallel to said second lensfiche, on the same side of said second lensfiche as the latter's lensettes.
 - e. two sets of septa each defined by opaque, intersecting walls, said intersecting walls defining opened cells, said septa walls being orthogonal to said optical screens, one septa set extending between said first optical screen and said first lensfiche, the other septa set extending between said second lensfiche and said second optical screen,
 - f. two apertured, planar selector masks, each mask positioned contiguous to the lensettes of, respectively, said lensettes, and each mask lying between its contiguous lensettes and one end of the cells of a septa set,
 - g. each aperture of said selector masks opening onto a single associated lensette of a corresponding lensfiche, each aperture lying at one end of a septa cell, there being one mask aperture for each septa cell, the remaining lensettes being covered by said selector masks.

4,007,986

COPYING APPARATUS

Shigehiro Komori, Yokohama; Hajime Katayama, Tokyo, and Masashi Suda, Iruma, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1974, Ser. No. 534,160

Claims priority, application Japan, Dec. 28, 1973, 48-924

Int. Cl.² G03B 27/34

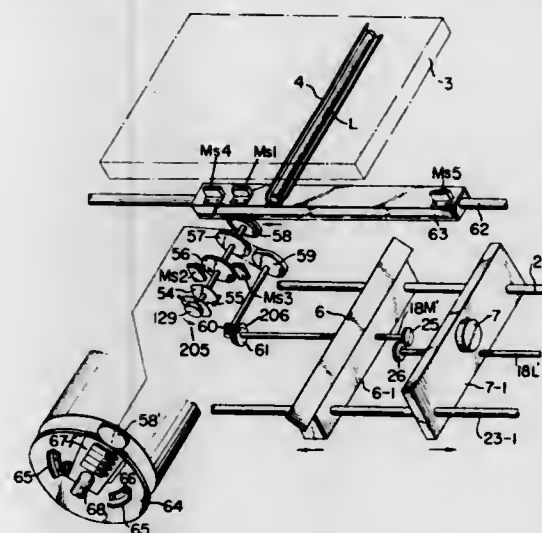
U.S. Cl. 355-57

7 Claims

1. A copying apparatus for varying the magnification of images projected from an original onto a recording member comprising:

a reciprocable original carriage;

means for producing an image of the original; optical means for projecting the image from a scanning position, said optical means including a mirror and lens combination movable to vary the magnification of the projected image and wherein said scanning position varies with movement of said mirror and lens combination;



means for moving the recording member past the projected image to thereby form an image on the recording member; and control means for actuating said moving means in accordance with the position of said mirror and lens combination.

4,007,987

VACUUM CONTACT PRINTING SYSTEM AND PROCESS FOR ELECTRONIC CIRCUIT PHOTOMASK REPLICATION

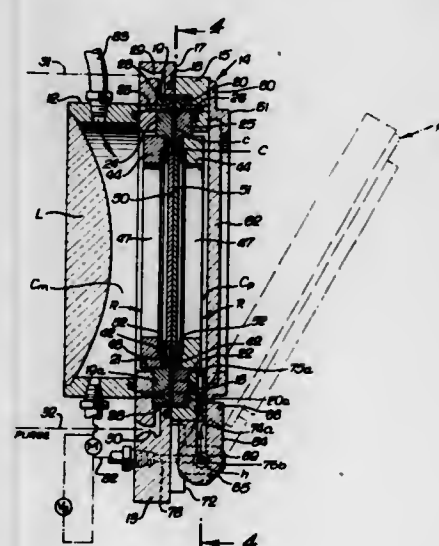
Ronald E. Sheets, Westminster, Calif., assignor to Tamarack Scientific Co. Inc., Orange, Calif.

Filed Jan. 12, 1976, Ser. No. 648,209

Int. Cl.² G03B 27/20

U.S. Cl. 355-91

16 Claims



15. The process of contact printing a photomask copy plate from a photomask master plate within a sealed housing of a contact printer, and containing a window for entrance of printing radiation, that includes:

supporting said plates in mutual contact, in the field of said radiation, between elastically deformable elastomeric seals contacting the oppositely facing outside faces of said plates continuously around the margins thereof, said elastomeric seals being elastically deformable to permit separation of said plates and thereby enlargement of a central vacuum chamber space around and between said plates in response to application to the oppositely facing surfaces of said plates of incrementally higher vacuums

than a vacuum existing in said central vacuum chamber space, applying an increasing vacuum to said central vacuum chamber, and incrementally higher increasing vacuums to the oppositely facing surfaces of said plates, to the extent that said surfaces limitedly separate, limiting the vacuums developed in said central vacuum chamber space and applied to the oppositely facing surfaces of said plates to a common predetermined maximum level, whereby said elastomeric seals return from their relatively deformed to their normal relatively undeformed states, and said plates return toward their initial contacting positions, thereafter holding a vacuum in said central vacuum chamber in a relatively steady state while reducing the vacuums applied to the opposite surfaces of said plates to a predetermined lower level, whereby a resultant pressure differential acts to force said plates against one another for a dwell period, and exposing said photomask master and copy plates to radiation for a following exposure period.

4,007,988

MANUFACTURE OF MULTI-LAYER STRUCTURES

Ian Derek Bromfield, Leicester, and Peter Seddon, Wigan, both of England, assignors to Nippon Kogaku K.K., Tokyo, Japan

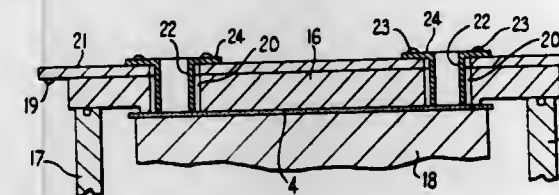
Filed May 3, 1974, Ser. No. 466,914

Claims priority, application United Kingdom, May 3, 1973, 21073/73

Int. Cl.² G03B 27/00

U.S. Cl. 355-133

4 Claims



2. Apparatus for use in positioning a succession of masks relative to a photo-sensitive substrate for the manufacture of a multi-layer structure by a series of photographic exposures, the substrate and each mask bearing respective fiducial marks which are utilized in such positioning, said apparatus comprising:

- a. means for adjusting the position of each mask relative to said substrate;
- b. first exposure means for exposing said substrate surface through each mask when said adjustment is completed; and
- c. second exposure means for exposing only the fiducial marks of the substrate and immediately surrounding regions thereof, without interposing the fiducial marks on said masks in the path of said exposure by said second means, upon but not simultaneously with each exposure of the substrate surface through each mask by said first means, so that no photographic images corresponding to the mask fiducial marks are formed on the substrate due to each said exposure by said first means.

4,007,989

HADAMARD FILTER DESIGN

Edward S. Wajda, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 29, 1975, Ser. No. 618,308

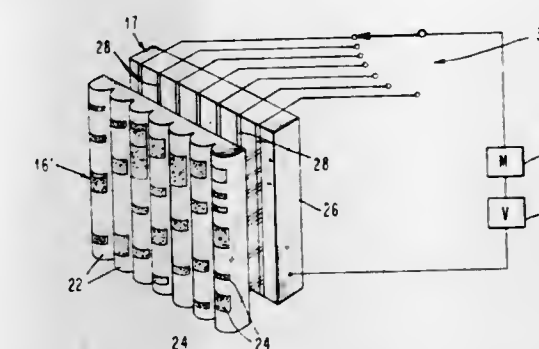
Int. Cl.² G01J 3/42

U.S. Cl. 356-96

5 Claims

1. In a Hadamard transform spectrometer having a dispersive element arranged to disperse an elongated beam of spectral energy to be analyzed, the combination comprising: a lens array disposed in the path of the dispersed beam and having a plurality of lens rows corresponding in number

to at least the number of spectral elements to be analyzed, each row receiving spectral energy dispersed over a bandwidth containing such spectral elements, said array further comprising opaque means on said array providing a Hadamard mask in each lens' row,



and a photodiode array comprising a plurality of linear photodiode means corresponding to the number of lens' rows, said diode array being juxtaposed to said lens array whereby each lens' row directs the spectral energy incident thereon onto a different one of said photodiode means.

4,007,990

APPARATUS AND METHOD FOR MEASURING REFRACTIVE PROPERTIES OF A SPHERO-CYLINDRICAL OPTICAL SYSTEM

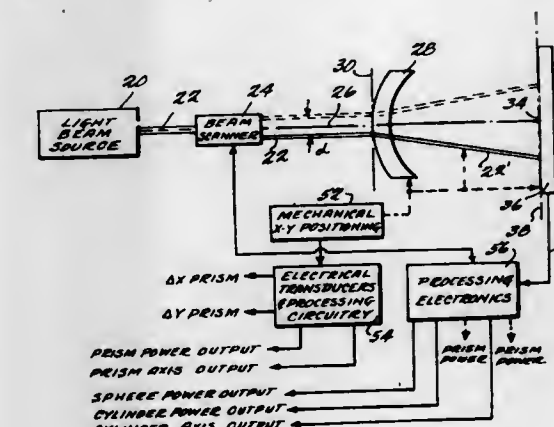
Howard I. McDevitt, Jr., Reston; Ronald F. Bax, Burke, and Richard H. Body, Centerville, all of Va., assignors to Acuity Systems, Incorporated, McLean, Va.

Filed May 23, 1975, Ser. No. 580,213

Int. Cl.² G01B 9/00

U.S. Cl. 356-124

80 Claims



1. Apparatus for measuring refractive properties of a spherocylindrical optical system under test including the measurement of at least one of the spherical power, cylindrical power and cylindrical axis refractive properties which are potentially present in a spherocylindrical optical system, said apparatus including: light source means for providing a beam of incident light rays emanating along the general direction of a predetermined line axis,

means for positioning said optical system under test in the path of said beam of incident light rays, relative movement means for effecting relative rotational motion at a predetermined relative frequency f_r between said beam of incident light rays and said optical system under test so as to cause the beam to effectively move about a predefined first locus in the plane of said optical system under test and thereby produce a refracted light beam which moves correspondingly about a second locus in a subsequent plane parallel to the plane of the optical system, said second locus having relative maximum and minimum dimensions representative of the spherical power, cylindrical power, and cylinder axis refractive parameters,

photo detector means having a photoelectric position sensitive surface disposed in the path of said refracted light beam for producing an analog electrical output having an instantaneous magnitude representative of the relative instantaneous position on said position sensitive surface at which the refracted light beam strikes the photosensitive surface.

said analog electrical output comprising a composite analog signal having a plurality of predetermined analog signal characteristics, each respectively representative of one of said refractive properties, and electrical processing circuit means connected to receive said electrical output and including means selectively responsive to different ones of said predetermined analog signal characteristics so as to provide an output indication representing said at least one refractive property of the optical system under test.

4,007,991

SYSTEM FOR TRANSMITTING POSITION INFORMATION

Hans R. Robertsson, Molndal, Sweden, assignor to Saab-Scania Aktiebolag, Linköping, Sweden

Continuation of Ser. No. 484,958, July 1, 1974, abandoned.

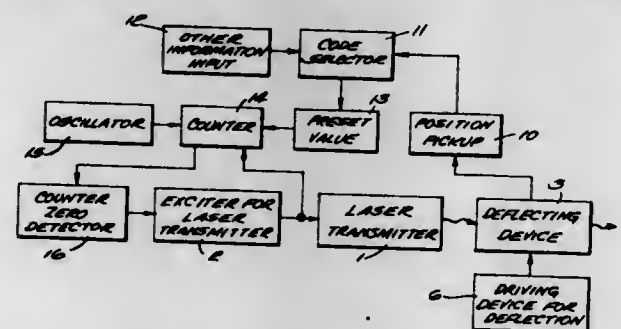
This application Dec. 3, 1975, Ser. No. 637,107

Claims priority, application Sweden, July 2, 1973, 7309268

Int. Cl.² G01B 11/26; B22D 7/10

U.S. Cl. 356—141

3 Claims



1. A method by which numerous different predetermined items of information can be transmitted one by one towards a moving body from a relatively fixed radiation emitter that emits pulses of radiant energy in a fan-shaped beam and sweeps angularly in a direction flatwise of the beam, each such item of information being transmitted in a different and predetermined portion of the sweep and the beam being narrow in the direction of sweep so that the body can receive only such of the transmitted items of information as are appropriate to its position at the time the beam intercepts it, but the width of the beam and the rate of sweep being so related to the expected speed of the body that at least two radiant energy pulses are detectable at the body during each sweep, said method enabling each such transmitted item of information to comprise a plurality of kinds of data, as for example sweep angle data and beam identification data, said method being characterized by:

A. assigning to each item of information to be transmitted a whole number which is unique to that item of information;

B. at the radiation emitter generating encoding clock pulses at a regular rate;

C. by counting encoding clock pulses beginning at the end of an invariant non-characterizing time period following each emission of a radiant energy pulse, so controlling the time interval between said emission and the next succeeding emission of a radiant energy pulse that said time interval is equal to

1. said non-characterizing time period

2. plus a characterizing time period which is measurable in a whole number of consecutive time units of a constantly uniform short duration, each of said time units being defined by the generation of a whole number of

encoding clock pulses and the number of said time units in said characterizing time period being equal to the whole number assigned to an item of information to be transmitted during said time interval;

D. at the body, generating decoding clock pulses at a regular rate which is so related to said rate at which said encoding clock pulses are generated that an integral number of decoding clock pulses are issued during each of said time units; and

E. beginning after said non-characterizing time period following reception at the body of an emitted radiant energy pulse, counting decoding clock pulses generated until the next radiant energy pulse is received, to enable decoding of the item of information signified by the time elapsed between two successively received radiant energy pulses.

4,007,992

LIGHT BEAM SHAPE CONTROL IN OPTICAL MEASURING APPARATUS

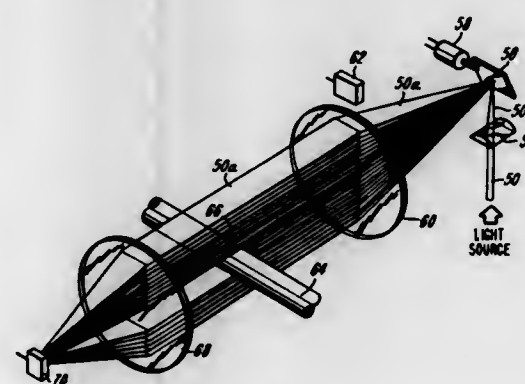
Harry G. Petrohilos, Yellow Springs, and Francis M. Taylor, Xenia, both of Ohio, assignors to Techmet Company and Systems Research Laboratories, Inc., both of Dayton, Ohio

Filed June 2, 1975, Ser. No. 582,690

Int. Cl.² G01B 11/04, 11/10

U.S. Cl. 356—160

5 Claims



1. In optical measuring apparatus for measuring an object of the type having a light source to produce a collimated substantially round light beam of small diameter, means for rotating the light beam about a predetermined axis to scan the light beam, means for converting the rotating scanning light beam into a parallel scanning light beam, and photodetector means for sensing the parallel scanning light beam, the improvement for providing average contour sensing in an environment in which irregular surfaces are present on the object measured comprising a cylindrical lens positioned between the light source and the means for rotating the light beam, the light beam passing through the cylindrical lens, changing the shape of the light beam from a substantially round light beam into a light beam having an elongate shape, the light beam having a major dimension normal to the direction of scan movement of the light beam.

4,007,993

PIPE COUPLER

Edward J. Schwartz, 758 Perrien Place, Grosse Pointe Woods, Mich. 48236

Filed Apr. 4, 1975, Ser. No. 565,084

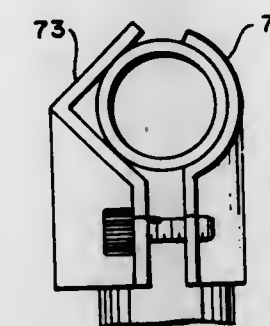
Int. Cl.² F16B 7/00

U.S. Cl. 403—3

1 Claim

1. A pipe coupler comprising a pair of gripping members, each of said gripping members having a plurality of angularly displaced channels and a plurality of planar webs disposed between said channels, said channels of one of said gripping members having an arcuate cross-section and said channels of the other of said gripping members having a V-shaped cross-section, said gripping members being adapted to be mated together in spaced apart relationship to connect a plurality of

pipes between corresponding ones of said channels, and means cooperable with corresponding ones of said webs for



drawing said gripping members into closer spaced apart relationship, whereby the pipes are rigidly secured between said gripping members.

4,007,994

EXPANSION JOINT WITH ELASTOMER SEAL

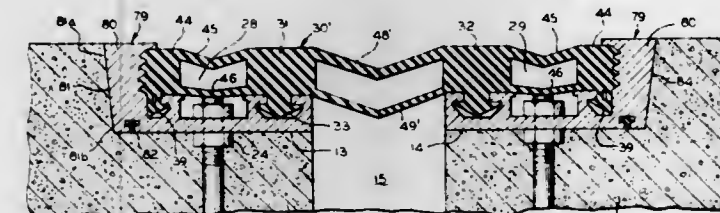
Delmont D. Brown, North Baltimore, Ohio, assignor to The D. S. Brown Company, North Baltimore, Ohio

Filed Dec. 18, 1975, Ser. No. 641,891

Int. Cl.² E01C 11/02

U.S. Cl. 404—69

7 Claims



1. An expansion joint frame structure with an elastomer seal and tread comprising a pair of opposed, elongated, side frames adapted to be mounted on respective steps in the upper corners of a pavement or a bridge deck expansion joint, an elongated elastomer seal removably mounted on said side frames and extending therebetween, said side frames each having a bottom wall adapted to rest on a step in the pavement or bridge deck in the respective upper corners of the joint and further having a joint-remote, upstanding end wall, said bottom wall having a downwardly opening slot extending longitudinally of its respective side frame adjacent the intersection of said end wall and said bottom wall, and an elongated elastomer gasket strip mounted in said slot to provide a longitudinal seal adapted to provide a longitudinal water tight seal between the lower joint remote corner of said frame and said step, said bottom wall having therein a plurality of longitudinally spaced holes through which protrude upwardly respectively threaded ends of downwardly extending anchor bolts, and nuts threaded on respective threaded ends of said anchor bolts and seated against the upper surface of said bottom wall, whereby said nuts are accessible from the upper side of said side frame for removal of said nuts from said anchor bolts in order to remove said side frame from said step for repair or replacement.

4,007,995

METHOD OF PROVIDING A SURFACE DRESSING FOR A ROADWAY

Serge Rofidal, Paris, France, assignor to Huiles Goudrons et Derives, Paris, France

Filed July 9, 1975, Ser. No. 594,435

Claims priority, application France, July 16, 1974, 74.24732; Apr. 10, 1975, 75.11273

Int. Cl.² E01C 7/06

U.S. Cl. 404—77

6 Claims

1. The method of providing a surface coating on roadways

constituted by a binder and aggregate comprising, the steps of, placing a layer of aggregates in physical contact with a solid layer of binder formed of 70% to 85% by weight of bitumen and 15% to 30% by weight of pitch tar and thereafter heating the layer thus obtained until the temperature of the binder, measured at a depth of 1 mm below the surface of the binder, reaches a temperature of between 100° C. and 200° C.

4,007,996

TURBINE ENGINE AND PUMP

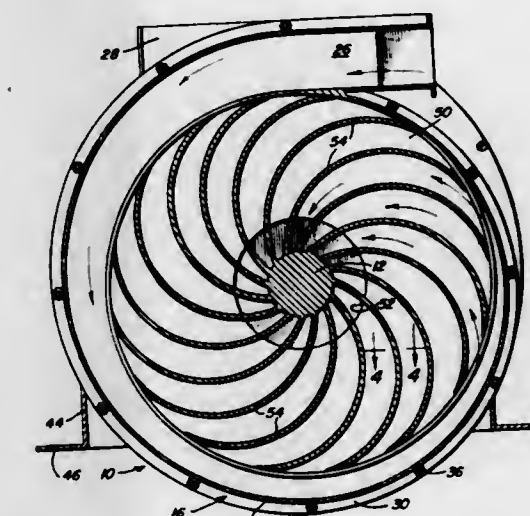
Henry S. Boone, 2342 Midfield Drive, Montgomery, Ala. 36111

Filed Jan. 22, 1976, Ser. No. 651,296

Int. Cl.² F04D 17/02

U.S. Cl. 415—120

4 Claims



1. A fluid pressure device in the form of a turbine or pump comprising a housing defined by spaced parallel end plates interconnected by a peripheral wall having a constant diametric dimension from end to end thereof, a rotor disposed within the housing, a shaft centrally located with respect to the rotor and being journaled in said end plates, said housing including a tangential inlet and outlet with the peripheral wall spiralling inwardly from the inlet and outlet to provide a tapering converging inlet channel and diverging outlet channel extending around a major of the periphery of the housing with the inlet and outlet being oppositely disposed, said rotor including a central, circular partition plate, a plurality of equal length and width radial blades on each side of said partition plate, the outer ends of the blades coinciding with the periphery of the partition plate, said partition plate including a centrally disposed opening enabling passage of fluid therethrough whereby fluid enters the inlet, travels radially inwardly along one surface of the partition plate, make a U-turn through the opening in the partition plate and then radially outwardly along the other side of the partition plate for discharge through the outlet, said peripheral wall of the housing having an inwardly extending peripheral partition member conforming with and closely spaced in aligned relation to the partition plate on the rotor to divide the rotor and housing into inlet and outlet portions, the inner ends of said blades extending inwardly of the periphery of the opening in the partition plate and being rigid with said shaft.

4,007,997

ROTOR DIAMETER INDICATOR

Jay Martin Yarm, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 5, 1975, Ser. No. 628,873

Int. Cl.² B64C 11/28

U.S. Cl. 416—61

6 Claims

1. In a helicopter rotor, a plurality of blades, each having inner and outer telescoping blade portions and a jackscrew shaft for extending and retracting said outer blade portion to vary the length of the blade, a rotor drive shaft having a hub

flected toward the rotor at low speeds to provide a minimal rotor-cheek plate clearance and will be less deflected at higher speeds to provide increased rotor-cheek plate clearance.

4,008,003

VALVELESS POSITIVE DISPLACEMENT PUMP

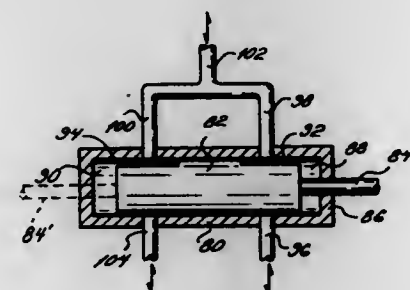
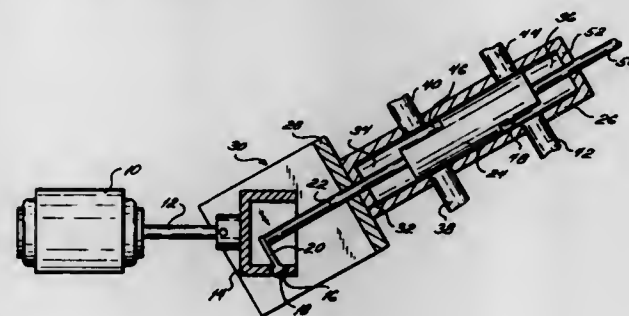
Harry E. Pinkerton, Bridle Path Lane, Mill Neck, N.Y. 11765

Filed June 27, 1975, Ser. No. 590,896

Int. Cl.² G05D 11/035

U.S. Cl. 417-250

11 Claims



1. Apparatus for proportionally mixing two fluids comprising a cylinder, a piston reciprocal and rotatable in said cylinder and dividing said cylinder into two working chambers, an inlet port for a first fluid to one of said chambers, an outlet port from said one chamber, and an inlet port to the other of said chambers, a conduit between said outlet port of said one chamber and the inlet port of the other of said chambers, an outlet port from said other chamber for mixed fluids, said piston having duct means sequentially registering with said ports, and conduit means connecting with said ports to form a fluid circuit, a drive piston rod secured to said piston and projecting from one end thereof to the exterior of the cylinder and connected to drive means for producing reciprocating and rotating movement of said piston, said piston rod being effective to reduce the volume of said one chamber through which it extends to be lesser than that of the other chamber, and second conduit means connected to said circuit and connectable to a supply of a second fluid whereby said second fluid is drawn into the circuit to make up for the difference in volumes in said chambers.

4,008,004

CONTROL SYSTEM FOR VARIABLE DISPLACEMENT PUMPS

Edwin L. Shaw, Delaware, Ohio, assignor to Abex Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,867

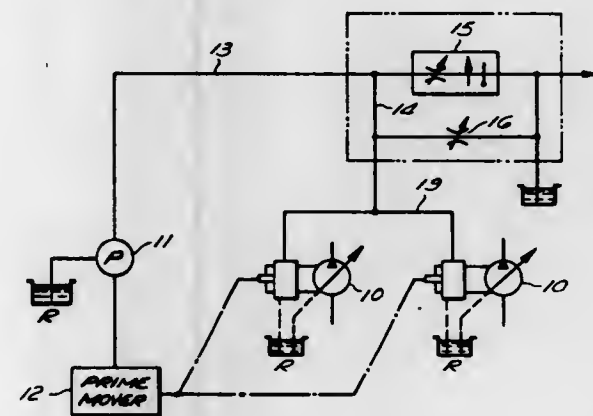
Int. Cl.² F15D 31/02; F04B 49/00, 1/26

U.S. Cl. 417-216

5 Claims

1. In a control for a hydraulic system which includes a prime mover, a plurality of variable displacement pumps driven thereby, each pump having a movable thrust plate, a fluid motor connected to the thrust plate which is operable to pivot the thrust plate between a position of maximum fluid displacement in one direction and a position of maximum fluid displacement in another direction with a position of minimum fluid displacement therebetween and an independent control for selectively operating the fluid motor to move the thrust

plate to thereby control the displacement of the pump, the improvement comprising a load sensing means, means connecting the load sensing means to the prime mover, the load sensing means having an output signal proportional to the load on the prime mover, each independent control including a rotary servo control valve which controls the fluid motor, the rotary servo control valve having an input assembly which includes a rotary input shaft which sets the position of the fluid motor to thereby set the displacement of the pump and the independent control further includes a variable ratio rotary input means connected to the rotary input shaft, second means connecting the variable ratio rotary input means to the



output signal and the variable ratio rotary input device includes rotary means for manually setting the position of the rotary input shaft, means responsive to said output signal for automatically changing the displacement of the pump in response to the output signal irrespective of the position of the manual setting means, said responsive means including an axially movable and rotatable control member, third means connecting the control member to the rotary means and the rotary input shaft and each of said variable ratio rotary input means changes the displacement of its respective pump relative to the setting of the rotary input shaft by the same percentage.

4,008,005

REFRIGERANT COMPRESSOR

Masaharu Hiraga, Iseaki, Japan, assignor to Sankyo Electric Company, Limited, Iseaki, Japan

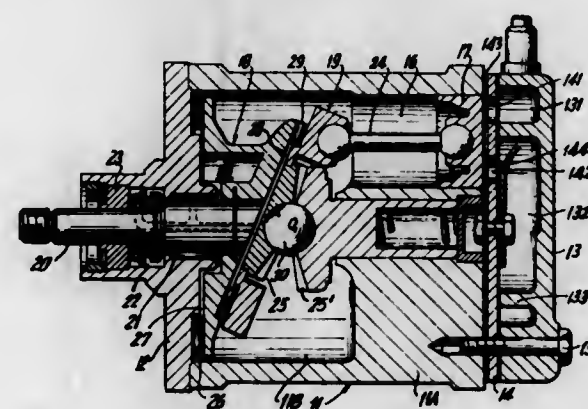
Filed July 29, 1975, Ser. No. 599,973

Claims priority, application Japan, July 31, 1974, 49-88858; July 31, 1974, 49-88859; July 31, 1974, 49-88860

Int. Cl.² F04B 1/12

U.S. Cl. 417-269

7 Claims



1. In a fluid suction and discharge apparatus comprising a generally cylindrical housing, a cylinder block mounted in and at one end portion of said housing, said block having a plurality of axially directed cylinders formed therein in equally spaced annular relation, a plurality of pistons slidably fitted in said cylinders respectively, a plurality of piston rods connected to said pistons respectively, an end plate mounted on the other end of said housing and closing said other end

thereof, a drive shaft rotatably borne in said end plate and extending from exterior to interior of said housing through said end plate, said drive shaft extending on an axis which extends on a mid point of a plurality of cylinders formed in spaced annular relation, a wedge-shaped rotor member mounted and fixed on an inner end portion of said drive shaft to be rotated together with said drive shaft within said housing, said wedge-shaped rotor being formed with an end surface inclined to said drive shaft by a predetermined angle at an end thereof opposite to the other end facing to said end plate, wobble means closely mounted, and relatively rotatably borne, on said inclined end surface of said rotor, means for supporting said wobble means at its position and permitting a wobbling motion of said wobble means about a point on said axis, and means for connecting said plurality of piston rods to said wobble means at angularly spaced positions thereon corresponding to said piston rods respectively, whereby said pistons are reciprocated within respective cylinders in different phase of reciprocating motion from one another by the rotation of said drive shaft to perform fluid suction and discharge, the improvement which comprises: said wobble means being formed such that a centroid thereof is on said point about which said wobble means wobbles, said rotor being so formed such that a centroid thereof is on said axis and centroids of two half sections of said rotor split by an imaginary plane and including said axis and perpendicular to a plane defined by said axis and a point on said inclined surface nearest to said cylinder block are axially spaced by a predetermined distance, said distance being so determined such that a torque due to centrifugal forces developed to said rotor during the rotation of said rotor cancels a torque due to the inertia of said pistons, said piston rods, and said wobble means during the reciprocation thereof.

4,008,007

AXIAL FLOW FAN ASSEMBLY

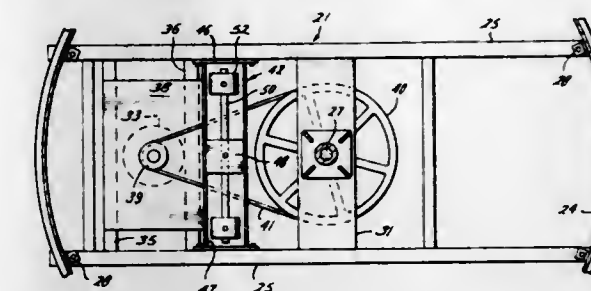
Kelly V. Shipes, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed May 23, 1975, Ser. No. 580,338

Int. Cl.² F04B 17/00

U.S. Cl. 417-363

16 Claims



1. An axial flow fan assembly, comprising a fan ring, supporting means extending across and connected at its opposite ends to the ring, an axial flow fan having its shaft carried by the supporting means to mount its blades for rotation within said ring, said fan shaft having means thereon to which a motor may be connected, and a spring mass assembly carried by said supporting means intermediate its opposite ends so as to absorb at least a portion of the vibration of said supporting means which results from rotation of said fan therepast.

4,008,008

PUMPS

Marc Yves Vergnet, 1, Chemin du Val Doux, "La Paveigne", 83200 Toulon, France

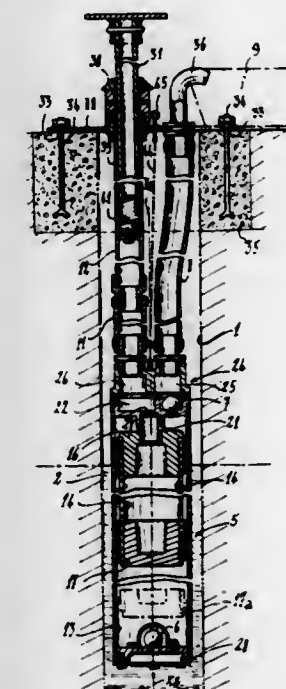
Filed Jan. 3, 1975, Ser. No. 538,379

Claims priority, application France, June 21, 1974, 74.21593

Int. Cl.² F04B 9/08

U.S. Cl. 417-385

6 Claims



1. A pump comprising a hollow housing having rigid walls to be immersed in a liquid to be sucked therein, said walls of said housing bearing an intake valve and a delivery valve connected to a delivery tube, said housing containing a resiliently deformable chamber connected through a said wall of said housing to an end of a control tube full of liquid in the operative position and having its other end connected to a control cylinder in which an actuating piston is slidably movable, between a position of maximum volume of a part of the cylinder connected to the resilient chamber and a position of minimum volume of said part of the cylinder, wherein the delivery tube and the control tube are connected to each other in the vicinity of the housing by a priming conduit including a check

4,008,006

WIND POWERED FLUID COMPRESSOR

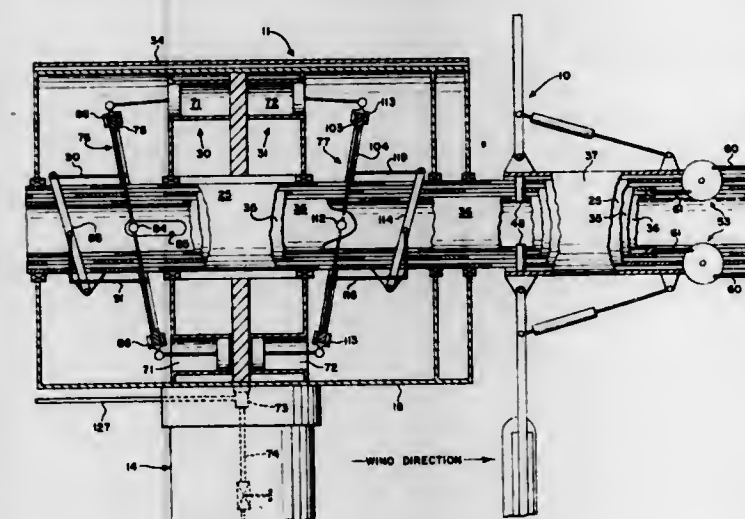
Karl J. Bea, 128 Dewitt St., Syracuse, N.Y. 13203

Filed Apr. 24, 1975, Ser. No. 571,395

Int. Cl.² F04B 1/10

U.S. Cl. 417-271

11 Claims

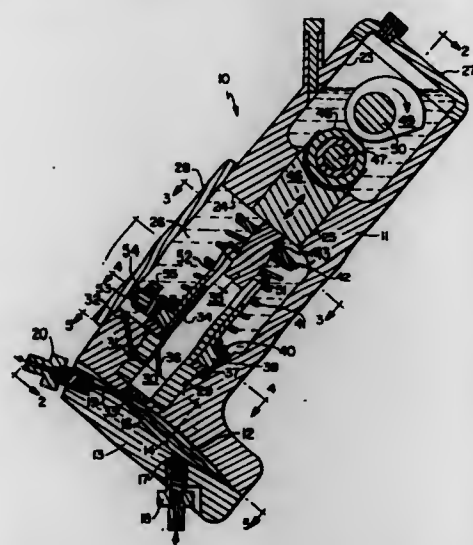


1. In a wind powered machine, a fixed pitch wind blade assembly rotatively mounted in said machine for rotation in response to the force of the wind against said blade assembly, a variable displacement fluid compressor mounted in said machine, rotatable drive means connected between said blade assembly and said compressor for rotatably operating said compressor responsive to the rotation of said blade assembly by the wind, and compressor displacement control means operatively connected between said blade assembly and said compressor for varying the fluid displacement of said compressor directly with the drag force of the wind on said blade assembly.

valve for allowing the liquid to flow only from the delivery tube downstream of said delivery valve to the control tube, whereby the head of liquid in the delivery tube passes to the control tube to replace air in the deformable chamber and the control tube and the control cylinder.

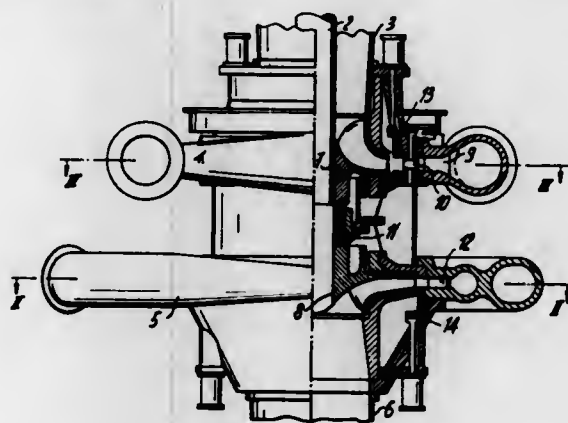
4,008,009 FUEL INJECTION PUMP

Endre Kovacs; Peter Kovacs; Michael Kovacs, all of 1708 Cedar Drive; Marta Kovacs, 1707 Cedar Drive, and Geza Kovacs, 1610 Cedar Drive, all of Plant City, Fla. 33566
Filed Sept. 30, 1975, Ser. No. 618,178
Int. Cl.² F04B 9/10, 7/06; F02M 59/26
U.S. Cl. 417-387 2 Claims



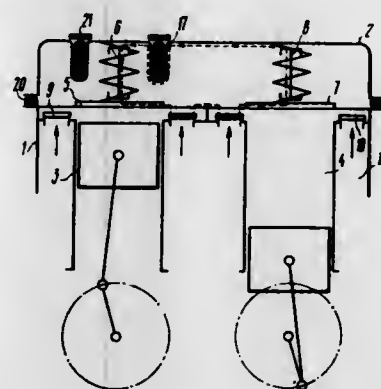
1. A fuel injection pump for pumping fuel under high pressure to an internal combustion engine comprising a body having cap means at one end, said body and said cap means having cooperating recesses defining a diaphragm cavity, a diaphragm located between said body and said cap means and separating said cavity into upper and lower portions, said cap means having inlet and outlet valve means communicating with the lower portion of said diaphragm cavity, said body having a reservoir for receiving a non-compressible liquid, a barrel having an axial bore mounted in said body and extending into said reservoir, passageway means providing communication between said reservoir and the lower portion of the bore of said barrel, said barrel having a groove extending along said bore between said passageway means adjacent said lower portion of the bore of said barrel and said reservoir adjacent the upper end of said barrel, a piston slidably mounted within said bore, means for moving said piston along the bore of said barrel, said piston having an angularly disposed peripheral groove extending upwardly from the lower end thereof, means for rotating said piston to alter the point of communication between the groove of said piston and the groove of said barrel so that said groove of said piston may selectively communicate with the groove of said barrel to permit said non-compressible liquid and gas bubbles to continuously pass through said angularly disposed peripheral groove of said piston and said groove of said barrel as said piston is moved along the bore of said barrel until said peripheral groove is moved from open communication with said groove of said barrel, and said body having at least one opening providing communication between the bore of said barrel and the upper portion of said diaphragm cavity, whereby the quantity of liquid forced from the bore of the barrel into the upper portion of the diaphragm cavity is regulated by the relative positions of the grooves in said piston and the bore of said barrel.

4,008,010
HYDRAULIC MACHINE
Michel Fauconnet, Geneva, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland
Filed June 24, 1975, Ser. No. 589,800
Claims priority, application Switzerland, July 9, 1974, 9398/74
Int. Cl.² F04B 17/00
U.S. Cl. 417-405 13 Claims



1. A hydraulic machine comprising a pump, a turbine, pump and turbine runners keyed on a common shaft, means defining separate first and second spaces for rotatably receiving the pump and turbine runner respectively, at least two first partial volutes communicating with said first space for connection to an upstream head, at least two second partial volutes communicating with said second space for connection to an upstream head, and means for separating each of said first and second spaces from the head to drain the respective space, said first and second partial volutes having inverted winding directions, and said pump and turbine runners being designed for the same direction of rotation.

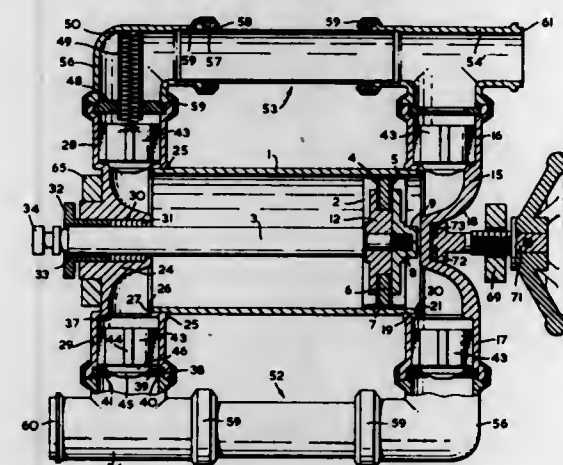
4,008,011
PISTON COMPRESSOR
Vsevolod Sergeevich Scherbakov, Konkovo-Derevlevo, korpus 7"v", kv. 120; Igor Andreevich Gruzintsev, Malaya Shukinskaya ulitsa, 5, korpus 2, kv. 14, and Viktor Mikhailovich Zolotukhin, Raduzhnaya ulitsa, 10, kv. 17, all of Moscow, U.S.S.R.
Filed Feb. 20, 1975, Ser. No. 551,413
Int. Cl.² F04B 7/00
U.S. Cl. 417-446 1 Claim



1. A piston compressor comprising: a compressor cylinder block including at least two cylinders; a cover on said cylinder block; suction valves mounted inside each of said cylinders; pressure valves located inside each of said cylinders; a regulator for controlling the capacity of said piston compressor; an electromagnet coil on said regulator for actuating said suction valves and being installed on the outer side of said cover; a gasket of nonmagnetic material laid between said cylinder block cover and said cylinder block body; a magnetic circuit connecting said electromagnet coil to each of said suction

valves; said magnetic circuit being formed by said cylinder block cover, said cylinder block body and said pressure valves of each said cylinders.

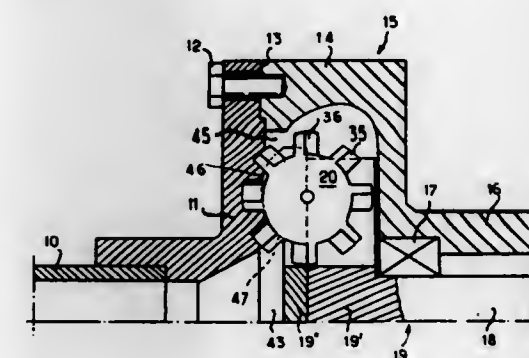
4,008,012
DOUBLE-ACTING PUMP
Victor John Page, 47 Westmiston Avenue, Saltdean, Sussex, England
Filed July 7, 1975, Ser. No. 593,504
Claims priority, application United Kingdom, July 9, 1974, 30365/74
Int. Cl.² F04B 21/02, 39/00
U.S. Cl. 417-454 4 Claims



1. A double-acting pump comprising:
a metering cylinder,
a piston in the metering cylinder,
a pushrod attached to the piston,
a first end cap removably fitted at one end of the metering cylinder, said first end cap containing an annular seal which supports the pushrod for reciprocal movement therein,
a second end cap removably fitted at the other end of the cylinder,
a pair of valve housings fitted to each one of said end caps, each valve housing in said pair defining either an inlet or an outlet port to said cylinder,
a non-return valve located in each valve housing, each valve being supported in its housing between an annular seating and an annular stop, said seating and said stop communicating directly with the respective port and manifold whereby material, moved by said piston, is caused to flow past said valve, the external surface of the valve between portions engaging said seating and said stop being fluted so as to enable passage of material past said fluted surface while slidably engaging the internal wall of the valve housing,
an outlet manifold removably fitted to the valve housings which define the outlet ports,
an inlet manifold removably fitted to the valve housings which define the inlet ports,
each of said manifolds comprising a sleeve, a tubular bend and a tubular tee, said tubular bend and said tubular tee of said manifolds being removably connected to the respective housings,
a first backing plate clamped adjacent said first end cap,
a draw plate adjacent said second end cap,
at least two tie rods connected between said first backing plate and said draw plate,
a second backing plate adjacent said first backing plate, said second backing plate being provided for connection to fixed supporting means for said pump,
means connected to said draw plate for exerting a force on said second end cap whereby said end caps are drawn together, and
a locking collar adjacent said second backing plate and

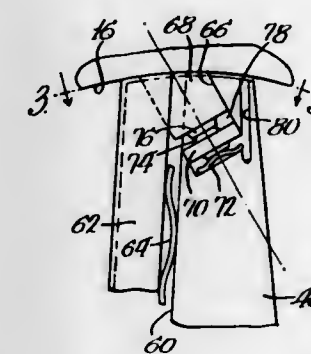
threadably engaging said first backing plate, said collar being movable on said treaded engagement either to exert a clamping force on said first and second backing plates to hold said pump fast, or to release said clamping force whereby said pump can be bodily rotated about the axis of the metering cylinder without releasing the force securing the end caps and the metering cylinder in sealing relationship, the valve housing in each pair of said valve housings being located diametrically opposite the other valve housing across the diameter of said cylinder, whereby the attitude of the inlet and outlet valves in the valve housings can be changed by turning the pump bodily through 180° about said axis of the metering cylinder for draining said pump.

4,008,013
FLUID ROTATIVE MACHINE WITH VARIABLE DISPLACEMENT
Eugeniusz M. Rylewski, 43 bis, Avenue du Gal Leclerc, 78470 St. Remy les Chevreuse, France
Filed Jan. 5, 1976, Ser. No. 646,677
Claims priority, application France, Jan. 3, 1975, 75.00153
Int. Cl.² F04C 29/10, 27/00, 17/00
U.S. Cl. 418-16 8 Claims



2. In a rotative machine for fluids, including a plate with spiral-like passages for the circulation of fluid therethrough, in which also circulate the vanes of vane wheels carried by a disc coaxial with and facing said plate, the improvement therein which comprises:
spiral-like wall means placed inside said passages and movable in relation thereto so as to vary the cross-sections of the passages and, consequently, the fluid circulating therein.

4,008,014
PISTON SEALS FOR ROTARY MECHANISMS
Paul J. Staebler, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 23, 1975, Ser. No. 625,225
Int. Cl.² F01C 1/02, 19/00; F04C 17/02, 27/00
U.S. Cl. 418-51 3 Claims



1. A rotary mechanism for use with a fluid comprising:
a housing defining a chamber;
a shaft journaled in said housing and extending through said chamber;

a rotor having plural apices journaled on said shaft and within said chamber, said rotor including apex seal receiving grooves at its apices and piston seal receiving bores intersecting said grooves;
apex seals disposed in said apex seal receiving grooves;
piston seals received in said bores;
balance pistons within said bores and abutting the associated piston seals adjacent the point of intersection of said bores and said grooves; and
fluid passages in said rotor establishing fluid communication with said bores and portions of the surface of said rotor remote from the corresponding apex, the fluid from said passages urging the corresponding balance piston into engagement with the associated piston seal.

4,008,015

ROTOR-STATOR GEAR SET

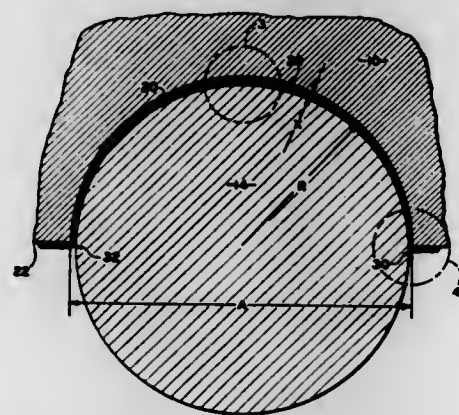
Hugh L. McDermott, Minneapolis, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 3, 1975, Ser. No. 628,273

Int. Cl.² F01C 1/02; F03C 3/00; F04C 1/02; F16H 55/10

U.S. Cl. 418-61 B

15 Claims



1. A pair of relatively movable members for use with a fluid comprising:

- A. an externally toothed member; and
- B. an internally toothed member cooperating in gear relationship with the externally toothed member and having at least one more tooth than the externally toothed member, the internally toothed member including
 1. an annular inwardly facing peripheral wall,
 2. a plurality of circumferentially spaced pockets opening radially inwardly into the inwardly facing peripheral wall, the wall of each pocket being defined in part by a pair of spaced arcuate surfaces on the internally toothed member,
 3. a cylindrical roller in each of the pockets forming the teeth of the internally toothed member, each of the rollers being in contact with the respective pair of arcuate surfaces, to form a seal which will substantially restrict the flow of fluid between the roller and the arcuate surfaces when a force is exerted on the roller in a radially outwardly direction, the arcuate surfaces being made of a material that is resilient relative to the material of the respective rollers to allow for radially outwardly movement of the rollers in their respective pockets,
 4. an enclosed space for trapping fluid in each of the pockets intermediate the arcuate surfaces, the space being defined in part by the wall of the pocket and the roller and having a relatively small volume which would be substantially decreased in the absence of trapped fluid with slight movement of the roller in the radially outwardly direction to cause an increase in the pressure of the trapped fluid within the enclosed space upon such radially outwardly roller movement, and
 5. a tangent circle that interferes with the average diameter of the externally toothed member whereby rotation of the externally toothed member relative to the inter-

nally toothed member will create a radially outwardly directed force on each of the rollers tending to move each of the rollers radially outwardly in the respective pocket.

4,008,016

OIL COOLED SEAL FOR ROTARY ENGINE

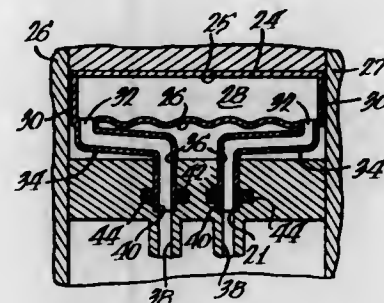
Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 2, 1975, Ser. No. 583,238

Int. Cl.² F01C 21/06; F16J 15/16

U.S. Cl. 418-92

2 Claims



1. A rotary engine comprising:
 - a housing having an interior wall;
 - a rotor within said housing;
 - a plurality of seals carried by said rotor and engaging said interior wall for establishing a seal between said rotor and said interior wall; each said seal being thin walled and hollow and further having a fluid inlet and a fluid outlet; and
 - means, including conduits in said rotor for directing a coolant through each of said seals via the inlets and outlets of each said seal and said conduits, each said seal including a corrugated surface for flexibility to allow the same to conform to the shape of said interior wall.

4,008,017

SEAL ARRANGEMENT FOR ROTARY ENGINES

Karl-Friedrich Hennig, Schloss Ricklingen; Wolfgang Kalthenthaler, Wennigsen; Werner Heger, Hoyer; Fritz Isernhagen, Letter; Manfred Kramer, Barsinghausen, and Wilhelm Pape, Wunstorf, all of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

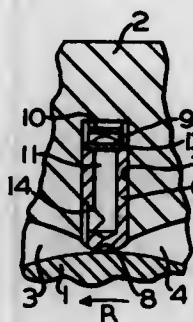
Filed Oct. 20, 1975, Ser. No. 623,766

Claims priority, application Germany, Oct. 31, 1974, 2451669

Int. Cl.² F04C 27/00

U.S. Cl. 418-129

4 Claims



1. In a rotary type engine including a housing, a rotary piston operably disposed in a piston chamber in the housing and cooperative therewith for forming a plurality of operating pressure chambers each alternately pressurized and depressurized in sequential order by operation of the piston, and respective seals for sealingly isolating the several chambers, particularly the chamber being pressurized, from each other and the others, respectively, during operation, each of said seals comprising:

- a. a seal strip slidably disposed in a slot cooperatively located relative to the housing and the piston, said slot having a closed end radially inwardly thereof and an outer open end opening to the piston chamber, one edge of said strip projecting from said open end of said slot to form a sealing relationship between the housing and the piston, and the opposite edge of said strip cooperating with said closed end of said slot to form a spring chamber adjacent thereto,
- b. said seal strip having formed therein a plurality of bores each having one end thereof opening to said spring chamber and the opposite ends thereof opening to the piston chamber, one half to one side of said one edge of the seal strip and the other half to the other side of said one edge of the seal strip;
- c. one-way check valves provided at the ends of each of said bores opening to said spring chamber; and
- d. spring means disposed in said spring chamber for exerting a spring force on and urging said seal strip radially outwardly from the slot to provide said sealing relationship.

4,008,018

ROTARY FLUID DISPLACEMENT DEVICE HAVING IMPROVED PORTING

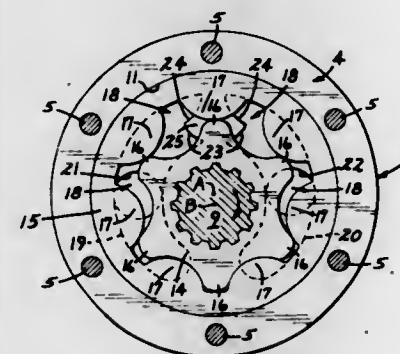
Hugh L. McDermott, 6101 Ashcroft Ave., Edina, Minn. 55424

Filed Nov. 28, 1975, Ser. No. 635,787

Int. Cl.² F04C 1/06, 15/00

U.S. Cl. 418-171

4 Claims



1. In a rotary fluid displacement device comprising, a housing defining a cylindrical chamber having a cylindrical wall and axially opposite end wall means, a drive shaft journaled in the housing on an axis in spaced parallel relation to the axis of the cylindrical wall, an externally toothed star member fixed on the drive shaft, an internally toothed ring member encompassing the star member and journaled in the chamber concentric therewith, said ring member having internal teeth greater in number than the teeth of said star member and moving into and out of engagement therewith during rotation of said members on their respective axes to provide successively expanding and contracting compartments respectively, said star member and ring member each having axially opposite ends in rotary sliding engagement with said chamber end wall means; characterized by inlet and outlet ports defined by said housing in said end wall means in register with said expanding and contracting chambers respectively, and passage means leading from said ports to the exterior of the housing, said inlet port having one end defining a pair of curved portions angularly displaced from each other, the curvature of each of said portions corresponding to the curvature of a tooth portion of a different respective one of said members and coincident respectively with corresponding tooth portions of both of said members in given relative positions of rotation between said members.

4,008,019

ROTARY PUMP WITH PIVOTED FLAP ENGAGING A BLADED ROTOR

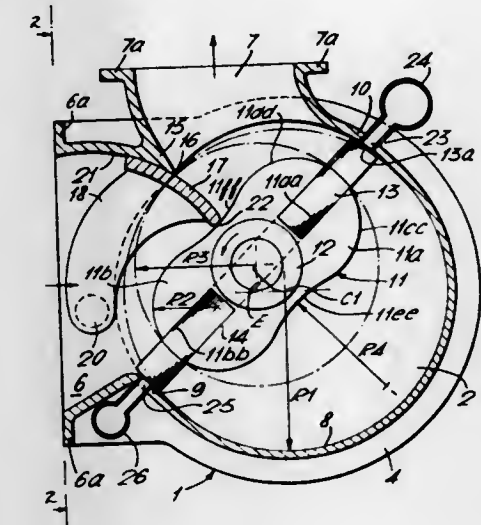
Helge Carling, Oslo, Norway, assignor to Myrens Verksted A/S, Oslo, Norway

Filed June 9, 1975, Ser. No. 584,929

Claims priority, application Norway, June 14, 1974, 742174
Int. Cl.² F01C 1/00; F04C 1/00

U.S. Cl. 418-221

7 Claims



1. A rotary pump comprising
 - a. a casing defining a working chamber with substantially circular cross section of a given radius (R1), and which is provided with an inlet and an outlet arranged substantially rightangled to each other and together extending across at least one quarter of the surface of the case and communicating with said working chamber,
 - b. a rotor eccentrically arranged in said working chamber, said rotor having two blades which are arranged in opposite recesses in a rotor boss, and which during operation are pressed against the inner surface of the working chamber, said two-bladed rotor being profiled and having a cross section along its complete length which is defined by a fixed curve which in the areas of the blade recesses have convex portions (11cc, 11dd) coinciding with approximately circularly arched portions having a first radius of curvature (R2) which is less than the smallest circumscribed circle of the cross section, and which in the areas between the blade recesses have concave portions (11ee, 11ff) coinciding with approximately circularly arched portions having a second radius of curvature (R4) which is less than said given radius (R1), said concave portions (11ee, 11ff) being located inside the smallest circumscribed circle of the cross section and evenly merging with said convex portions (11c, 11dd), and
 - c. a pivotable flap extending substantially along the complete width of said profiled rotor, and being arranged between the outlet and the inlet of the casing, said flap having an edge which during the rotation of the rotor slidingly abuts against said the outer surface of the rotor.

4,008,020

VANE SUPPORT ASSEMBLY FOR ROTARY TYPE POSITIVE DISPLACEMENT APPARATUS

Albert Raymond Thomas, 7313 S. Gessner, Houston, Tex. 77036

Filed May 28, 1975, Ser. No. 581,956

Int. Cl.² F01C 1/00; F03C 3/00; F04C 1/00

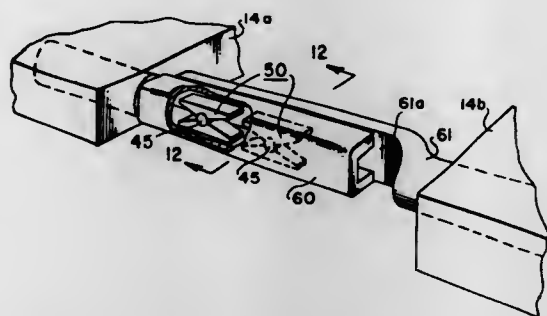
U.S. Cl. 418-258

3 Claims

1. In a rotary type apparatus of the type including a stator housing defined by a peripheral wall and end walls defining a central chamber therein, a rotor eccentrically mounted to rotate within said central chamber, vanes adapted to reciprocate within diametrically opposed, longitudinally and radially extending slots within the wall of said rotor, and a support

assembly for structurally supporting and mounting diametrically opposed vanes with said rotor, the improvement wherein said support assembly comprises:

- a. support rod means operatively coupling said diametrically opposed vanes, said supporting rod means being rigidly coupled at opposed ends to said opposed vanes and having free end portions translatablely coupled at a



- situs between said opposed ends, one of said free end portions having a cross-section defining a channel, the other free end portion having at least one projection extending into said channel, and
- b. bearing assembly means slidably disposed within said channel and pivotably coupled with said at least one projection.

4,008,021

APPARATUS FOR FORMING A SINTERABLE COMPACT OF A POWDER

Renzo Fedrigo, Banchette d'Ivrea (Turin); Bartolomeo Borini, Ivrea (Turin); Vittorio Garattini, Lovere (Bergamo), and Giovanni Pino, Banchette d'Ivrea (Turin), all of Italy, assignors to Schwelmer Eisenwerk Muller & Co. GmbH, Schwelm, Germany

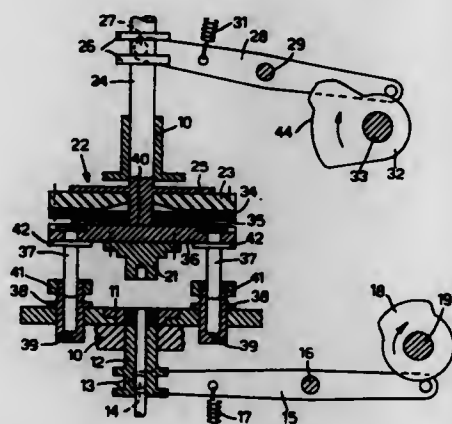
Division of Ser. No. 272,584, July 17, 1972, abandoned, and a continuation of Ser. No. 390,137, Aug. 20, 1973, abandoned.

This application May 9, 1975, Ser. No. 576,117

Claims priority, application Italy, Aug. 10, 1971, 69685/71 Int. Cl.² B30B 11/02

U.S. Cl. 425-3

2 Claims



1. An apparatus for forming a sinterable compact of a powder comprising:

- a support;
- a die on said support for receiving a mass of powder to be compacted;
- respective rams juxtaposed with said mass on opposite sides thereof and displaceable relative to said die to compact said mass between them;
- respective plates on opposite sides of said die each carrying a respective one of said rams;
- respective pairs of pneumatic cylinders interposed between said support and each of said plates, said cylinders being pressurizable to displace said plates away from said support;
- respective shafts displaceable on said support toward and

away from said die, each of said shafts being engageable with a respective one of said plates to entrain the same toward said mass upon displacement of the respective shafts;

respective flat coils carried by said shafts and lying in planes parallel to but spaced from the respective plates, said coils being impulsively electrically energizable to electro-dynamically repel the respective plates and drive said rams at a high speed against said mass; and

respective cam means for displacing said shafts toward said die to precompact the mass by entrainment of the plates and the rams with said shafts for compaction of said mass to a low density whereby said pneumatic cylinders thereupon move said plates away from said die and into proximity of said coils for electrodynamic displacement thereby.

4,008,022

THERMOPLASTIC TUBE SEAL AND COOLING MEANS

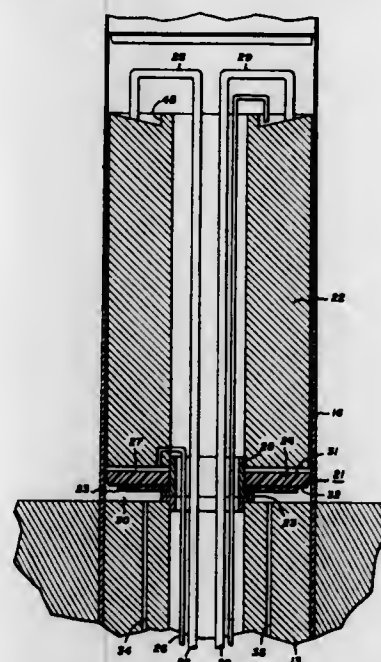
Philip Hugh Carrico, Greenfield Center, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Filed Feb. 28, 1975, Ser. No. 553,934

Int. Cl.² B29D 23/04; B29F 3/08

U.S. Cl. 425-72 R

10 Claims



1. In an apparatus for producing thermoplastic film comprising an extruder for extruding thermoplastic material in tubular stalk form and a coaxial cooling mandrel over which said tube passes and is cooled thereby, the improvement comprising

- a. plate like seal means between said extruder and said mandrel and closely adjacent said mandrel and engaging the internal periphery of said tube,
- b. said seal means defining a fluid space between said seal means and said mandrel, and between said seal means and said die,
- c. fluid cooling means operatively associated with said mandrel and said seal means to continually introduce a fluid coolant in the space between said mandrel and said seal means, the seal means and mandrel diameters being proportioned so that the action of said tube in passing over said seal means draws a continuous and coextensive very thin film of fluid along said mandrel and coextensively between said mandrel and said tube, and,
- d. an atmosphere control means operatively associated with said seal means and said die to continually introduce a vapor of said coolant into the space between said seal means and said die to leak past said seal and condense in said coolant,
- e. and fluid collection means operatively associated with said mandrel to remove said fluid from contact with said tube before inflation thereof.

4,008,023

MOLD PACK FOR MAKING METAL POWDER ARTICLES

Joseph M. Wentzell, Remsen, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

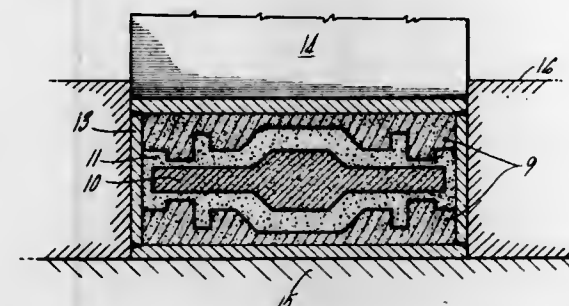
Continuation-in-part of Ser. No. 238,411, March 27, 1972,

abandoned. This application June 24, 1976, Ser. No. 699,285

Int. Cl.² B29C 3/00; B30B 11/00

U.S. Cl. 425-78

8 Claims



1. A mold pack for making an article of complex inner and outer contour and substantial uniform density directly from metal powder comprising: first and second porous, compactible mold sections in opposed working relationship to define a cavity therebetween having the general outer contour of the article to be made, a porous, compactible core suspended in said cavity to define the general inner contour of said article, the cavity and core being oversized in the direction of compaction, the mold sections and core being expendable and having an initial porosity substantially equal to that of the metal powder to be compacted so that the mold sections, core and metal powder are uniformly densified when the mold pack is compacted to size, the densified metal powder forming the desired article.

4,008,024

APPARATUS FOR PRODUCTION OF GAS-PERMEABLE SEAMLESS PIPES

Sadaaki Yokota, Iwakuni; Shinzi Hayata, Waki, and Toshio Kaya, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

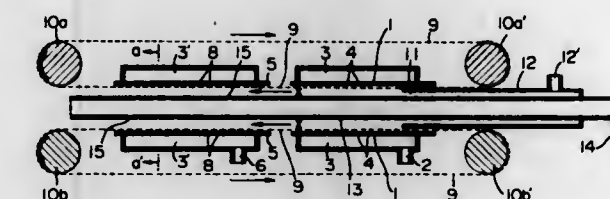
Filed Dec. 2, 1975, Ser. No. 637,086

Claims priority, application Japan, Dec. 9, 1974, 49-140445; Dec. 14, 1974, 49-143053; Sept. 22, 1975, 50-113673

Int. Cl.² B29C 11/00; B29D 23/00; B29J 5/00

U.S. Cl. 425-85

2 Claims



1. An apparatus for producing a gas-permeable seamless pipe structure comprising a tubular shaping screen movable in its axial direction; a suction chamber, provided upstream in the moving direction of the screen surrounding the outer wall surface of the shaping screen, for sucking the solid component of a slurry consisting of (A) 20 to 95% by weight of thermoplastic fibers, (B) 5 to 80% by weight of a component consisting of (a) 20 to 100% by weight of other fibers being infusible at the fusing temperature of the thermoplastic fibers (A) or having a higher melting point than said thermoplastic fibers (A) and (b) 0 to 80% by weight of a void-containing particulate material having an apparent density of not more than 1 and an average particle size of 20 to 20,000 microns and being infusible at the fusing temperature of the thermoplastic fibers (A), and (C) a liquid medium to the inner wall surface of the shaping screen and depositing it thereon in the form of a pipe structure; a slurry feed means for feeding the slurry onto the

inner wall surface of the screen at the site of the suction chamber upstream in the moving direction of the screen; a core member in a tubular passageway formed by the shaping screen, said core member being disposed along the axial direction of the tubular passageway and at a position spaced from the inner wall surface of the shaping screen; and a heating means for withdrawing the deposited pipe structure from the terminal portion of the tubular passageway and heat-fusing the thermoplastic fibers of the pipe structure.

4,008,025

BREAD DOUGH ROUNDER BAR

Sterrett P. Campbell, Atlanta, Ga., assignor to Pak-It Mfg Co., Inc., Atlanta, Ga.

Filed Nov. 15, 1974, Ser. No. 524,085

Int. Cl.² A21C 11/00

U.S. Cl. 425-96

2 Claims



1. Bread dough rounder bar defining a cavity along its length, said cavity varying in cross-section from an entrance end to an exit end and having a first concave work surface which decreases in height from the entrance end to a point intermediate the ends of the cavity, a flat-roofed work surface beginning at said point and proceeding toward said exit end to join a second concave work surface which increases in height from said flat-roofed surface to the exit end.

4,008,026

CONCRETE FORMING APPARATUS FOR MAKING FENCE POSTS AND THE LIKE

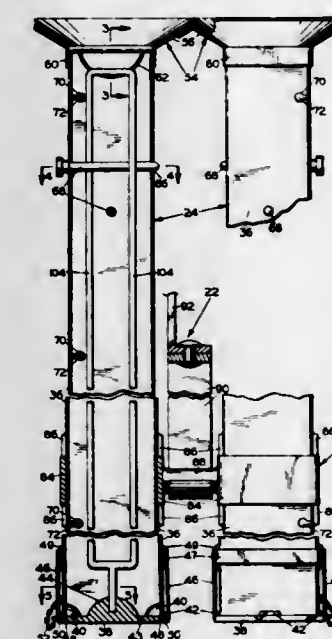
William J. Engstrom, 5608 E. 96th, Puyallup, Wash. 98381

Filed Apr. 25, 1975, Ser. No. 571,856

Int. Cl.² B28B 1/08, 5/04, 23/18

U.S. Cl. 425-117

3 Claims



1. A mold for vertical forming of concrete fence posts comprising:

- a. an elongate tube which is rectangular cross-sectioned, open at each end and slightly downwardly flared,
- b. a bottom cap, in releasable engagement with the lower extremity of the tube having a raised center portion defining centered reinforcing rod locating means and fluid drainage means,

- c. means releasably securing the bottom cap to the tube,
d. funnel-shaped top cap in releasable engagement with the upper extremity of the tube having paired, depending, centered, U-shaped reinforcing rod locating clips,
e. the tube having plural, paired, centered, circular openings for insertion of support hole pins and plural, paired, off-centered key shaped openings for insertion of wire slot pins.

4,008,027

APPARATUS FOR FORMING A PIPING BEAD

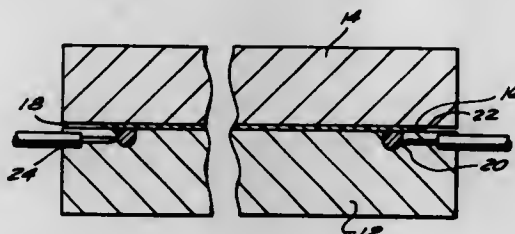
James K. Polk, R.D. 2, Box 307A1, Englishtown, N.J. 07726

Filed June 21, 1974, Ser. No. 481,840

Int. Cl.² B29C 1/00; B29F 1/022

U.S. Cl. 425-127

5 Claims



1. A device for applying a piping bead to a sheet of plastic material comprising a two piece sealing die having a mold section and a platen, said mold section having a flat sheet support surface throughout substantially its entire extent for supporting a plastic sheet thereon in a flat configuration, said flat surface cavity of generally semi-cylindrical cross-section formed therein and located in a predetermined position such that said plastic sheet is supported on said support surface over said cavity said mold section being made of RTV silicone, and means for supplying a liquefied plastic to said cavity to contact said supported sheet, said means for supplying liquefied plastic to said mold section includes an input port communicating through said mold section with said cavity a separate output port for said liquefied plastic also communicating through said mold section with said cavity, and means for providing communication between said separate outlet and inlet ports to provide for flow back of excess liquefied plastic from said separate outlet port to said inlet port; and said platen being adapted to engage the side of said sheet opposite said cavity, said platen including high frequency means for heating said plastic and said sheet in said die and cooling means in said platen.

4,008,028

APPARATUS FOR BELLING PLASTIC PIPE

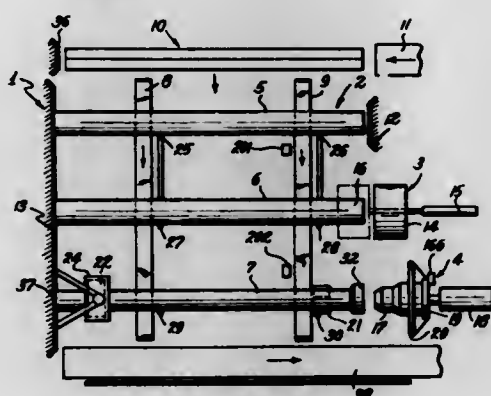
Clifford P. Ronden, and Imre Rabel, both of Edmonton, Canada, assignors to Grandview Industries, Limited, Canada Division of Ser. No. 41,267, May 28, 1970, Pat. No. 3,910,744.

This application Oct. 21, 1974, Ser. No. 516,828

Int. Cl.² B29C 17/07

U.S. Cl. 425-145

20 Claims



1. Apparatus for forming a bell end on a thermoplastic pipe comprising, in combination:

endless conveyor means for conveying a pipe in a direction transversely of its length;
means defining first and second work stations along said conveyor means;
heating means adjacent one side of said conveyor means at said first work station for heating, and therefore softening, an end of a pipe conveyed thereto;
a bell forming device adjacent said one side of said conveyor means, spaced from said heating means in the direction of travel of a pipe on said conveyor means and located at said second work station for belling the heated end of a pipe conveyed thereto;
said means defining said first work station including first means, adjacent said conveyor means, for positioning a pipe in alignment with said heating device at said first work station;
said means defining said second work station including second means, adjacent said conveyor means, for positioning a pipe in precise axial alignment with said bell forming device at said second work station;
means, adjacent said bell forming device and at said second work station, for providing relative axial movement, and therefore engagement, between said bell forming device and the heat softened end of the pipe to form a bell end thereon;
first control means, coupled to said first means for positioning and responsive to movement of the pipe, for actuating said first means for positioning to align the pipe with said heating means where the pipe end is heated, and for deactuating said first means to allow the pipe to leave said first work station; and
second control means, coupled to said second means and to said means for providing relative axial movement and responsive to movement of the pipe towards said second work station, for actuating said second means to align the pipe with said bell forming device, and for actuating said means for providing relative axial movement to move said bell forming device and the pipe into engagement.

4,008,029

MOLDING APPARATUS

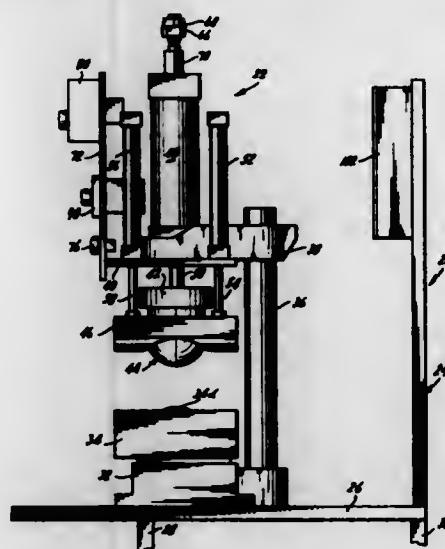
Richard J. Shokite, Stratford, Conn., assignor to Warnaco, Inc., Bridgeport, Conn.

Filed Jan. 27, 1975, Ser. No. 544,404

Int. Cl.² B29C 3/06

U.S. Cl. 425-157

8 Claims



1. A machine for molding brassiere cups and like shapes from a moldable material comprising a support, a first mold member on said support, a second mold member, means mounting said second mold member on said support for movement into and out of a molding position to said first mold member, a holddown member, means mounting said holddown member on said support for movement into and out of a material-holding position relative to said first mold member,

4,008,031

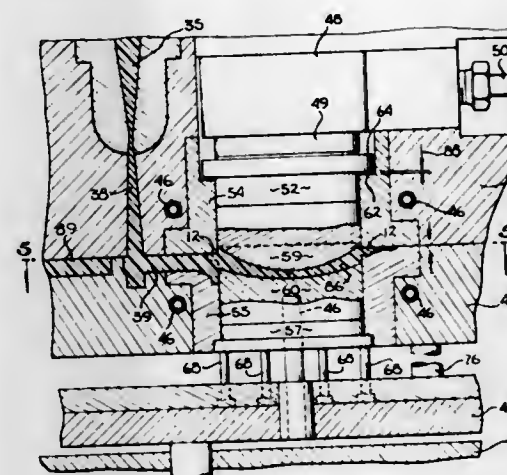
APPARATUS FOR INJECTION MOLDING LENSES
Hermann P. Weber, 5506 Beckford Ave., Tarzana, Calif. 91356

Filed Aug. 22, 1975, Ser. No. 606,774

Int. Cl.² B29D 11/00

U.S. Cl. 425-242 R

9 Claims



first pneumatic means for moving said holddown member into said material-holding position, second pneumatic means for moving said second mold member into said molding position relative to said first mold member and a control for said first and second pneumatic means including a source of air under pressure, means including a first solenoid controlled valve and an adjustable pressure regulator for establishing a first relatively low pressure line between said source and said first pneumatic means, means including a second solenoid controlled valve establishing a second relatively high pressure line between said source and said first pneumatic means, means including a third solenoid controlled valve for establishing a third relatively high pressure line between said source and said second pneumatic means, an adjustable timer, means responsive to the initiation of a timing cycle by said timer for actuating said first and third solenoid controlled valves to move said holddown member into said material-holding position under the low pressure established by said adjustable pressure regulator in timed relation to the movement of said second mold member into said molding position in mating relation with said first mold member, means operable after the elapse of a present and adjustable interval of said timing cycle to actuate said second solenoid controlled valve to apply high pressure to said first pneumatic means for the remainder of said timing cycle and means responsive to the termination of said timing cycle for moving said holddown member and said second mold member in timed relation relative to each other out of said material-clamping and molding positions relative to said first mold member.

1. An apparatus for injecting molding a lens comprising: a housing;
a pair of dies disposed within said housing and a cavity for receiving molten plastic therein;
said housing including means permitting the relative movement of said dies such that the volume of said cavity may be varied;
injection molding means communicating with said cavity for injecting plastic into said cavity;
at least one transfer pocket for receiving plastic from said cavity, said transfer pocket communicating with said cavity; and
compression means coupled to at least one of said dies, for sequentially reducing the volume of said cavity and for applying pressure to said plastic in said cavity after said plastic is injected into said cavity to transfer plastic from said cavity into said transfer pocket;
whereby molten plastic may be injected into said cavity, and then the volume of said cavity may be decreased forcing molten plastic from said cavity into said transfer pocket.

4,008,030

DEVICE FOR MANUFACTURING BLOCKS OF POROUS THERMOPLASTIC IN A CONTINUOUS PROCESS

Lelf Carl Gustaf Ampler, Vastra Frolunda, Sweden, assignor to Gullfiber AB, Billesholm, Sweden

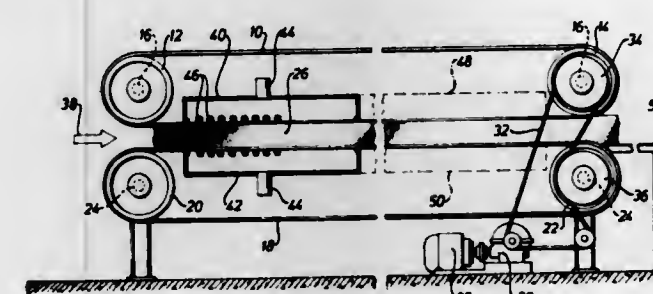
Filed Sept. 22, 1975, Ser. No. 615,283

Claims priority, application Sweden, Sept. 30, 1974, 7412287

Int. Cl.² B29D 27/04

U.S. Cl. 425-224

2 Claims



1. A device for manufacturing a block of porous thermoplastic, comprising
means defining an elongated channel open at both ends and through which granules containing an expanding agent are adapted to be fed continuously,
said means including at least two, endless, perforated belts mounted to have confronting portions thereof travelling in the same direction and forming two sides of said channel,
means adjacent one end of said channel defining a heating zone through which the granules introduced into the channel pass and are expanded, and
means adjacent the opposite end of said channel defining a cooling zone through which the expanded particles pass and are sintered,
said belts being made of steel and having therethrough a plurality of holes each having a diameter of less than 1 mm, and
the number of holes per m² of each belt amounting to a minimum of 15,000.

4,008,032

DEVICE FOR THE CYCLIC MANUFACTURE OF MOLDED PARTS

Karl-Heinz Pahl, Leuchtenberger Kirchweg 101, 4 Dusseldorf, Germany

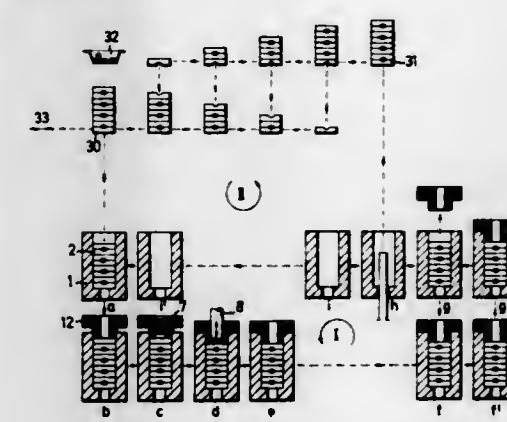
Filed Mar. 14, 1975, Ser. No. 558,388

Claims priority, application Germany, Mar. 20, 1974, 2413317

Int. Cl.² B29C 1/16; B29F 1/00; B29G 3/00

U.S. Cl. 425-246

7 Claims



1. A device for the cyclic manufacture of molded parts comprising:

- a. a plurality of forming tools composed of a form carrier and a plurality of article-related mold inserts having cavities for the molding and being shaped for disposition of a plurality thereof in a stack in each mold carrier, the forming tool having conduit means for feeding of material to be molded to the mold insert cavities,
- b. a filling station outfitted with a feeding device for feeding material to the forming tools,
- c. a molding station outfitted with means for pressing the material fed to the forming tools into the cavities of the mold inserts, and means for releasably connecting the forming tools to the pressing means,
- d. an unloading station outfitted with means for removing the mold inserts from the form carriers,
- e. a loading station outfitted with means for filling the form carriers with mold inserts whereby the mold inserts are exchangeable for each working cycle and whereby empty preselected mold inserts can be placed in the mold carriers,
- f. and routing means for routing the molding tools successively through said stations,
- g. the form carriers having a bore for receiving the stack of mold inserts and a pressure actuatable membrane in the bore for receiving a radially acting pressure force and transferring the pressure force to mold inserts formed of radially split segments.

4,008,033

EXTRUSION MASK

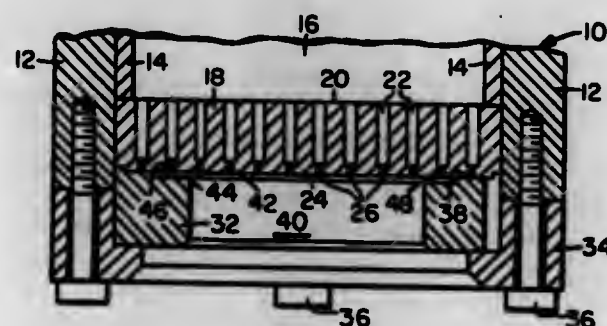
Robert G. Folmar, and Robert V. VanDewoestine, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,360

Int. Cl.² B29F 3/04

U.S. Cl. 425-467

4 Claims



1. An extrusion mask for use in combination with die means for forming honeycomb structures which comprises, a mask having a blocking surface for blocking off selected portions of the outlet face of an extrusion die for forming honeycomb structures, said mask having an orifice extending longitudinally through said mask and communicating at an inlet end with said blocking surface for receiving an extruded honeycomb article therethrough, offset means formed in said blocking surface radially outwardly of said orifice and communicating with the outlet face of said extrusion die, said offset means including a substantially planar surface lying within a plane substantially perpendicular to a longitudinal axis through said orifice, said orifice having wall portions extending substantially parallel to said axis, said orifice wall portions joining said planar surface through a continuous curve portion, and said planar surface being offset from said blocking surface with a predetermined gap distance.

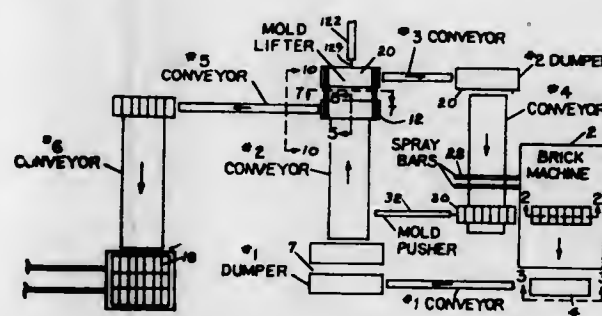
4,008,034
BRICK MAKING MACHINE HAVING STRIPPING MEANS
Joseph F. Kane, c/o Kane-Gonic Brick Corp., Gonic, N.H.
03867

Filed Oct. 1, 1975, Ser. No. 618,319

Int. Cl.² B28B 13/05

U.S. Cl. 425-441

7 Claims



1. Apparatus for facilitating the removal of a mold from wet bricks therein, said apparatus comprising

a pallet,

a mold having a plurality of compartments open at top and bottom and resting on said pallet,

said compartments adapted to be filled with wet clay forming wet bricks,

a slide board resting on the top of said mold and covering all said compartments,

a slide lifter overlying said slide board,

means securing said slide board and slide lifter together, said slide lifter having a depending end plate at each end thereof, said plates spaced from the ends of said mold and at least partially overlapping the said mold ends,

first cams on the ends of said mold,

second cams on the depending end plates of said slide lifter shaped and positioned to cooperate with the said first cams on the ends of the said mold so that relative transverse movement of said slide board and slide lifter with respect to said mold will cause said first and second cams to function to achieve separation of said slide board from the top of said mold and from the upper surface of the wet bricks therein.

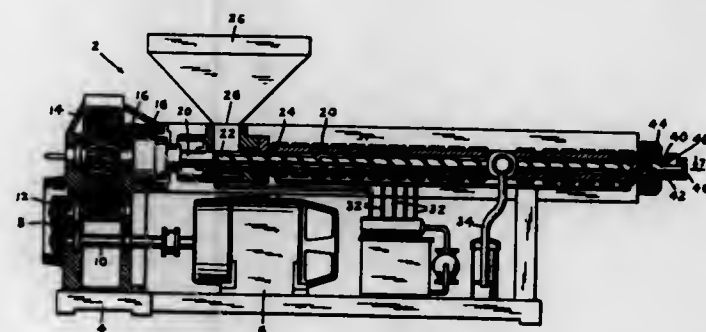
4,008,035
EXTRUSION DIE

Edward Korostoff, and Gary K. Zin, both of Philadelphia, Pa., assignors to Matcon, Inc., Philadelphia, Pa.
Division of Ser. No. 402,297, Oct. 1, 1973, Pat. No. 3,893,796, which is a continuation of Ser. No. 118,595, Feb. 25, 1971, abandoned, which is a division of Ser. No. 18,499, March 11, 1970, Pat. No. 3,588,987. This application July 7, 1975, Ser. No. 593,484

Int. Cl.² B29F 3/04

U.S. Cl. 425-461

6 Claims



1. An extrusion die for extruding material into a desired profile comprising

a liner having a wall, the wall having an input orifice, an output orifice, an internal contour connecting the input orifice to the output orifice, a transition region of said internal contour having at a first end, a shape substan-

tially identical to the shape of the input orifice and at a second shape, a shape substantially identical to the shape of the output orifice, said region having a gradual transition in cross-sectional orifice having a pattern, the pattern having only a 1-fold rotational axis normal to its plane, and a land portion of said internal contour having third and fourth ends, said third end corresponding to the second end of the transition portion and the fourth end corresponding to the output orifice of the liner,

- a shell having an inner peripheral greater than the outer periphery of said liner wall, said shell being disposed around substantially the entire outer peripheral of said liner, and
- a filling medium situated intermediate said liner and the inner periphery of said shell to substantially fill the space between said liner and said shell, whereby the filling medium may supply support to said liner.

4,008,036

DIE ASSEMBLY

Victor Clement Verlinden, Edegem, and Victor Franciscus De Beul, Mortsel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

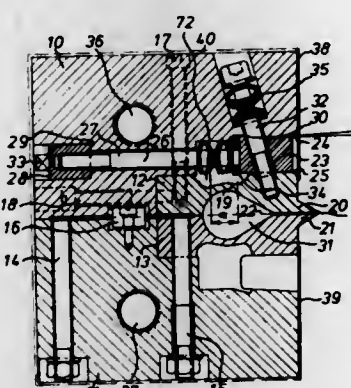
Filed May 29, 1975, Ser. No. 581,917

Claims priority, application United Kingdom, June 17, 1974, 26806/74

Int. Cl.² B29F 3/04

U.S. Cl. 425-466

12 Claims



1. A die assembly comprising a die body section, a pair of elongated lip members mounted in said body section which have opposed lips defining an elongated slot-like orifice through which material can be extruded as a layer, said lips being constituted by spaced apart generally parallel surfaces having an extended depth dimension in the extrusion direction, at least one such lip member having a base portion affixed in said die body section, an end portion carrying said lip-forming surface, and an interconnecting neck portion of reduced cross-section which is sufficiently flexible to allow displacement of such end portion thereby to vary the spacing between said lip surfaces, said lip member end portion having an outer guide face extending along a side thereof opposite said lip-forming surface with a depth not substantially less than the depth of said lip-forming surface, said die body section having a fixed face extending thereon in spaced generally opposed relation to said guide face, said guide and fixed faces being inclined relative to one another in their depth dimension, a plurality of wedge-like adjusting members arranged in the clearance space between said relatively inclined guide and fixed faces at points spaced lengthwise thereof, each such member having opposite surfaces in mating contact with said faces, means for individually adjusting the position of said wedge-like members relative to the depth of said clearance space, and biasing means for biasing said guide face and fixed face relatively toward one another and into contact with the mating faces of said adjusting members.

4,008,037
COMPOSITIONS AND METHODS FOR HIGH
TEMPERATURE STABLE CATALYSTS

Saul G. Hindin, Mendham, and Joseph C. Dettling, Jackson, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Division of Ser. No. 423,095, Dec. 10, 1973, Pat. No. 3,945,946. This application Oct. 21, 1975, Ser. No. 624,463
Int. Cl.² F23J 7/00

U.S. Cl. 431-2

4 Claims

1. A method for the combustion of carbonaceous fuel comprising: forming an intimate admixture of said fuel and air; contacting said fuel air admixture with an oxidation catalyst at a temperature sufficient to combust said admixture, said catalyst having a surface area of at least 20 m²/g after calcination for two hours at a temperature of 1200° C., said catalyst comprising: (a) a catalytically-active calcined composite of alumina and a mixture of two metal oxide components wherein the first component is selected from the group consisting of an oxide of Cr, W, and mixtures thereof and the second component is selected from the group consisting of an oxide of a Group IVB metal and mixtures thereof and (b) a catalytically-effective amount of platinum group metal deposited thereon after calcination of said composite at a temperature of at least 850° C.

4,008,038

FUEL CONDITIONING APPARATUS AND METHOD

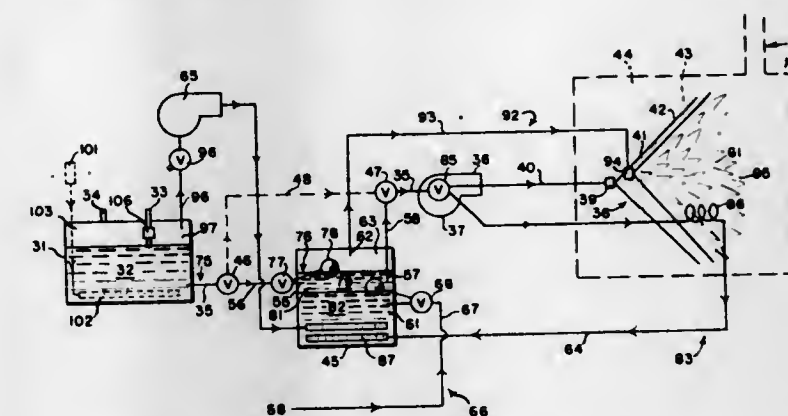
Camille J. Berthiaume, Dover, N.H., assignor to Columbia Technical Corporation, Braintree, Mass.

Filed Sept. 10, 1975, Ser. No. 612,109

Int. Cl.² F23D 11/44

U.S. Cl. 431-11

12 Claims



1. In a heating system of the type having a liquid fuel tank; a heating unit with a combustion chamber; a fuel burner with a liquid fuel pump and an atomized fuel burner tip within the combustion chamber; said pump feeding fuel from said tank to said tip, the combination of:

a pressure tank in said system, said tank having a liquid fuel inlet, a liquid fuel outlet, a water inlet and a vapor outlet in the upper portion thereof;

water supply means, connecting said water inlet to a water source to fill the lower portion of said tank with water;

automatic water control means for maintaining said water at a predetermined level within said pressure tank;

liquid fuel supply means connecting said liquid fuel inlet to said fuel tank and connecting said liquid fuel outlet to said pump and tip to fill the intermediate portion of said pressure tank with liquid fuel floating on said water;

automatic liquid fuel control means for maintaining said liquid fuel at a predetermined level;

vaporized, fuel formation means comprising a liquid fuel line leading from said liquid fuel supply means, in rear of said pump and in advance of said tip; said line including a coil in said combustion chamber, in the path of the flame therein, and a perforated tube, bubbler beneath the level of said water in said tank for creating liquid fuel bubbles rising through said water and said oil to form enriched vapor in the upper portion of said tank; and

enriched vapor supply means including a vapor tip in said combustion chamber, a vapor conduit connecting said tip with the vapor outlet of said pressure tank, and air pressure supply means for maintaining predetermined pressure in said pressure tank.

4,008,039

LOW EMISSION BURNERS AND CONTROL SYSTEMS THEREFOR

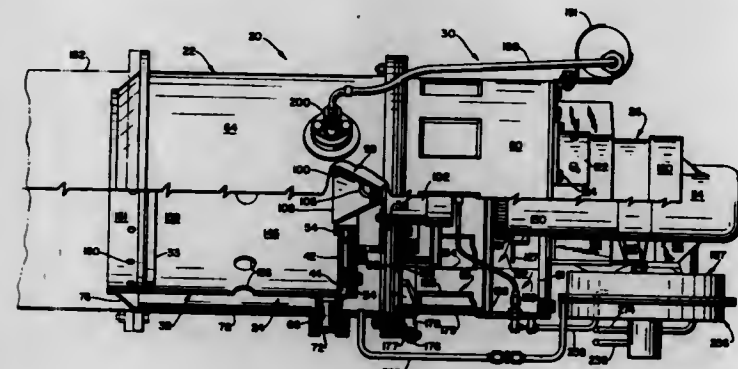
William A. Compton; Thomas E. Duffy; Richard T. LeCren, and Jack R. Shekleton, all of San Diego, Calif., assignors to International Harvester Company, San Diego, Calif.

Filed May 16, 1975, Ser. No. 578,098

Int. Cl.² F23R 1/10

U.S. Cl. 431-90

11 Claims



1. A low emission burner comprising: a combustor, means for injecting a liquid fuel in spray form into one end of the combustor; air inlet means having a plurality of apertures therethrough located adjacent said end of said combustor; means for supplying air to said combustor and for effecting a flow of combustion air through said apertures and into said combustor; a valve member rotatably mounted adjacent said air inlet means and having therethrough apertures corresponding to the apertures through said air inlet means; means for rotating the valve member relative to said air inlet means to vary the area through which air can flow to the combustor as the demand upon the burner changes; an air bypass means for diverting air supplied as aforesaid from said combustor; means for adjusting the flow area through said bypass means; and means so mechanically connecting said flow area adjusting means to said valve member that, as said valve member is rotated to decrease the area through which air can flow to the combustor, air is automatically diverted through said bypass means at an extent which will tend to keep the pressure drop across the valve member and the air inlet means essentially unchanged.

4,008,040

PHOTOFLASH LAMP AND METHOD OF MAKING SAME

Donald E. Murray, Montoursville, and Daniel W. Bricker, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Montoursville, Pa.

Filed Nov. 24, 1975, Ser. No. 634,991

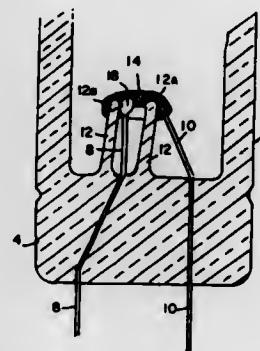
Int. Cl.² F21K 5/02

U.S. Cl. 431-94

9 Claims

7. A method of making a photoflash lamp comprising: inserting an insulating sleeve over the top portion of a first lead-in wire with the end of the wire protruding above the top end of the sleeve; applying a flame to the protruding end of said first lead-in wire to cause said protruding end of wire to melt and provide a smooth, rounded surface of wire at the top end of the sleeve; forming a second lead-in wire to terminate and make contact with the exterior surface of said sleeve at or near the top end thereof; sealing said lead-in wires and the bottom end of said sleeve into one end of a length of glass tubing;

bridging the top ends of said lead-in wires within said glass tubing with primer material; filling said glass tubing with a quantity of filamentary combustible material and a combustion-supporting gas;



tipping off the tubing to provide an hermetically sealed envelope and applying a protective coating on the exterior of said envelope.

4,008,041

APPARATUS FOR THE GAS PHASE COMBUSTION OF LIQUID FUELS

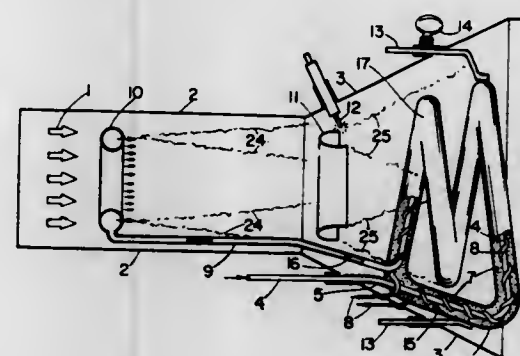
Gerald Alton Roffe, 3 Markwood Lane, East Northport, N.Y. 11731, and Horacio Andres Trucco, 13 Sadler Court, Huntington Station, N.Y. 11746

Filed Oct. 2, 1975, Ser. No. 618,966

Int. Cl.² F23D 11/44

U.S. Cl. 431-247

8 Claims



1. An apparatus for the controlled temperature gasification of a liquid fuel, injection and mixing of the gasified fuel with air or gaseous oxidizer and combustion of that mixture comprising, in combination, a closed loop of heat transfer tubing disposed with lateral asymmetry with respect to the centerline of the apparatus, said tubing containing a heat transfer material which is a liquid at the fuel vaporization temperature, a temperature sensor within said heat transfer material, a fuel gasification tube passing through said heat transfer material, an orifice at the exit of said fuel gasification tube, a thermally insulated tube connecting the exit of said fuel gasification tube with a hollow gaseous fuel distribution ring equipped with a plurality of symmetrically disposed holes, flameholder and ignition means positioned downstream of said fuel distribution ring such that the resulting flame impinges upon the heat transfer tubing, an adjustable bracket supporting said heat transfer tubing such that the position of the tubing with re-

spect to said flame may be varied so as to produce any desired temperature of the heat transfer material contained within said heat transfer tubing. absorbed by said coal when fed to such equipment and to maintain said equipment at a temperature within said temper-

4,008,042

COAL HEATING TEMPERATURE CONTROL

Harvey S. Auvil, Ashland, and Rufus F. Davis, Jr., Kenwood, both of Ky., assignors to Coaltek Associates, Morristown, N.J.

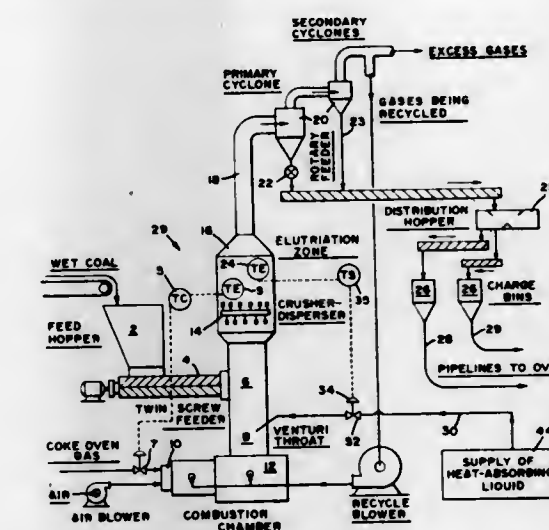
Continuation-in-part of Ser. No. 498,152, Aug. 16, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,479

Int. Cl.² F27B 3/24

U.S. Cl. 432-26

15 Claims

1. A method for maintaining equipment used for heating coal at a temperature within a temperature range normally used for heating said coal in said equipment, which comprises introducing into said equipment a heat-absorbing liquid at a rate sufficient to absorb substantially all of the heat normally

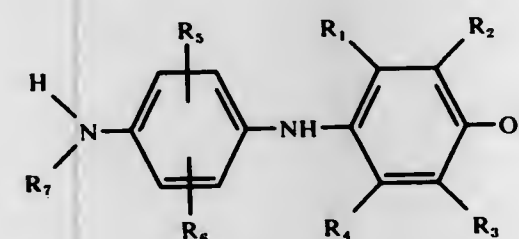


ature range maintained for heating said coal in said equipment.

CHEMICAL

4,008,043
DIPHENYLAMINES FOR DYEING KERATINIC FIBERS
 Gregoire Kalopissis, Neuilly-sur-Seine; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France
 Filed Feb. 21, 1975, Ser. No. 551,627
 Claims priority, application Luxembourg, Feb. 22, 1974, 69457
 Int. Cl.² A61K 7/13
 U.S. Cl. 8—10.2

21 Claims
 1. A composition for coloring keratinic fibers comprising an aqueous or hydroalcoholic solution of at least one diphenylamine of the formula



wherein R₁ and R₄ each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1-6 carbon atoms, lower alkoxy having 1-6 carbon atoms, amino, N-lower alkyl amino wherein the alkyl moiety has 1-6 carbon atoms, N-lower hydroxy alkyl amino wherein the alkyl moiety has 1-6 carbon atoms, N-lower carbamylalkylamino wherein the alkyl moiety has 1-6 carbon atoms, acetamino, ureido and carbalkoxyamino wherein the alkoxy moiety has 1-6 carbon atoms;

R₂ and R₃ each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1-6 carbon atoms, lower alkoxy having 1-6 carbon atoms, acetylamino and ureido;

R₅ and R₆ each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1-6 carbon atoms and lower alkoxy having 1-6 carbon atoms with the proviso that when both R₅ and R₆ are other than hydrogen at least one of R₅ and R₆ occupies a position meta to -NHR₇; and

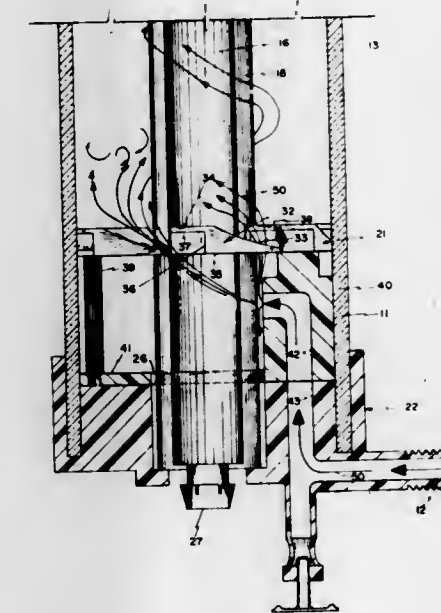
R₇ represents a member selected from the group consisting of alkyl having 1-6 carbon atoms, hydroxyalkyl having 1-6 carbon atoms, amino alkyl having 1-6 carbon atoms, acetamino alkyl wherein the alkyl moiety has 1-6 carbon atoms and mesylamino alkyl having 1-6 carbon atoms, said diphenylamine being present in an amount effective to color said keratinic fibers.

4,008,044
TREATMENT OF POLYESTER TEXTILES TO IMPROVE SOIL RELEASE AND WETTABILITY PROPERTIES
 Bruce M. Latta, Bloomingdale, and Ildo E. Pensa, Palisades Park, both of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.
 Filed June 3, 1975, Ser. No. 583,499
 Int. Cl.² D06M 1/10
 U.S. Cl. 8—115.5

2 Claims
 1. A continuous process for imparting soil release properties to fabric consisting essentially of polyester, said process comprising

- Applying to said fabric about 70 to 90% by weight based on the weight of said fabric of an aqueous solution containing 0.5 to 2.5% by weight of NaOH,
- Contacting said fabric having said aqueous solution thereon with saturated steam for a period of 10 to 90 minutes while maintaining the moisture content of the fabric within the range of 35 to 120% by weight based on the weight of the fabric to remove about 0.4 to 2.5% by weight of the polyester in the fabric and
- Washing said fabric with water to remove any unreacted NaOH.

4,008,045
ULTRA-VIOLET STERILIZER HAVING A FLUID FLOW DIFFUSER PLATE
 David Free, Vancouver, Canada, assignor to Naturvard Research (Canada) Ltd., Vancouver, Canada
 Filed Oct. 11, 1974, Ser. No. 514,269
 Claims priority, application Canada, Oct. 3, 1974, 210733
 Int. Cl.² A61L 3/00, 3/02
 U.S. Cl. 21—102 R
1 Claim



1. In a fluid sterilization apparatus having a chamber defined by the space between an outer cylindrical housing and an ultraviolet radiation source coaxially mounted therein, the radiation source irradiating fluid flowing in the chamber from a source of fluid, and a fluid inlet channel at one end and a fluid outlet channel at the other end of the chamber, the improvement comprising: fluid flow deflector means having a chamber inlet orifice connecting said chamber to the inlet channel and disposed perpendicular to the longitudinal axis of and in close proximity to a portion of the radiation source, said portion of the radiation source being in the flow path of fluid emerging from said inlet orifice such that fluid flowing from the source of fluid through the inlet channel and emerging from the inlet orifice strikes a portion of the radiation source and is deflected into non-coincident flow paths in said chamber, and an annulus shaped device extending substantially transversely to and being coaxial with the longitudinal axis of the ultraviolet source and positioned in the chamber between the radiation source and the cylindrical housing, the annulus device having a plurality of rigid non-overlapping vanes and being positioned downstream of but in close proximity to the inlet orifice, each of said vanes being essentially in the form of a step extending in the direction of the longitudinal axis of the radiation source, said step being formed by first and second horizontal treads interconnected by a vertical riser, said first tread being spaced axially upstream of said second tread, and wherein said step is further formed by a concave surface extending between the leading edges of the first and second treads, said leading edges being those edges of the downstream portion of each tread which first contact the inflowing fluid, whereby said concave surface is integral with said vertical riser and said first tread, such that the fluid deflected into non-coincident flow paths in said chamber after striking the radiation source, passes over the concave surfaces of the vanes and is directed thereby into turbulent rotational paths flowing downstream through the chamber toward the fluid outlet channel.

4,008,046

DUAL TEMPERATURE EXCHANGE APPARATUS

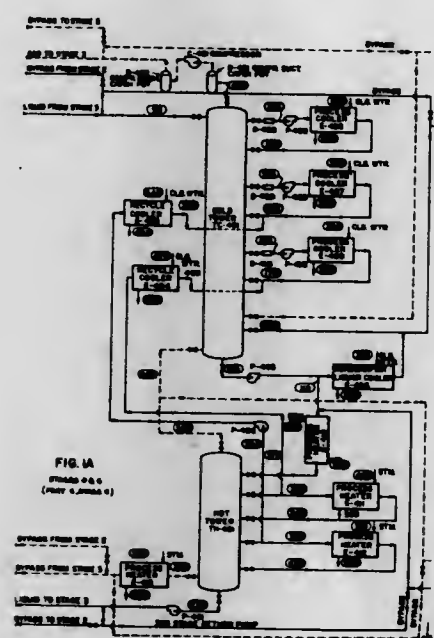
Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 126,623, March 22, 1971, Pat. No. 3,872,223. This application Aug. 14, 1974, Ser. No. 497,451

Int. Cl.² B01D 11/04; C01B 4/00

U.S. Cl. 23—270.5 W

10 Claims

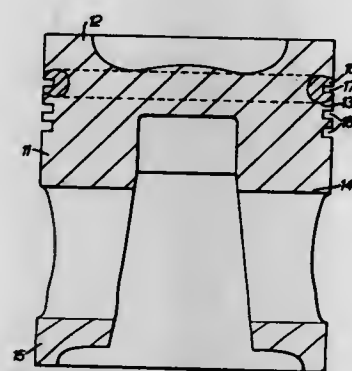


the insert comprising a sintered body of an austenitic ferrous alloy containing chromium and nickel, the ferrous alloy having been infiltrated with copper or copper-base alloy during or after sintering of the body, and

the body having been cast around the insert, the insert having been thereby bonded to the body over substantially the whole of its surface which is in contact with the body.

13. A metal article in the form of a piston for an internal combustion engine,

the piston comprising a body of aluminum or aluminum alloy and a piston ring carrier around which the body has been cast,



the carrier comprising a sintered body of an austenitic ferrous alloy containing chromium and nickel, the ferrous alloy having been infiltrated with copper or copper-base alloy during or after sintering of the body.

14. A method of manufacture of an aluminum or aluminum alloy article incorporating a ferrous alloy insert comprising the steps of

compacting and sintering a powder to form a sintered body of an austenitic ferrous alloy containing chromium and nickel,

infiltrating the ferrous alloy either simultaneously or in a subsequent step with copper or copper base alloy, and casting the aluminum or aluminum alloy around the insert.

4,008,052

METHOD FOR IMPROVING METALLURGICAL BOND IN BIMETALLIC CASTINGS

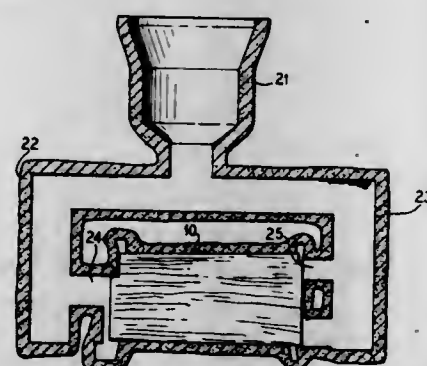
Constantine Vishnevsky, Solon, and Lawrence D. Graham, North Canton, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 30, 1975, Ser. No. 572,964

Int. Cl.² B23P 3/00

U.S. Cl. 29—194

14 Claims



1. In the method of making a bicast article in which a solid metal preform is positioned in a mold and a molten metal is cast about the portions of said preform exposed in said mold, the improvement which comprises coating said exposed portions prior to the casting step with a boron containing alloy having a melting range below the melting range of either said preform or said cast metal, fusing said alloy into said preform

without significant interalloying with the metal preform, said alloy having a major ingredient the same as the major ingredient of at least one of the metals to be joined, and heat treating the resulting bicast article after solidification of the molten metal at a temperature below the melting range of either said preform or the solidified metal to cause diffusion of boron into the preform and into the solidified metal.

14. A composite metallic article comprising a first nickel base superalloy bonded to a second nickel base superalloy through an intermediate bonding zone of a nickel base alloy containing boron, both said first and second nickel base superalloys having boron diffused therein from said bonding zone, and the interface between said first and second superalloys with said bonding zone being characterized by small columnar grains extending perpendicular to said interface.

4,008,053

PROCESS FOR TREATING ORGANIC WASTES

Richard S. Breneman, Natick, and John J. Clancy, Westwood, both of Mass., assignors to Combustion Equipment Associates, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 456,338, March 29, 1974, Pat. No. 3,961,913. This application Mar. 11, 1975, Ser. No. 557,433

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.² C10L 9/02, 5/00

U.S. Cl. 44—1 D

50 Claims

1. A process for embrittling the solid organic waste fraction of a solid waste material characterized by the treating of said organic waste fraction with a total of up to 11% of at least two mineral acids based on the weight of said solid organic waste fraction and at elevated temperature, the quantity of said acid and the time and temperature of said treating being such as to form an embrittled material, readily reducible to a finely divided form, without any substantial carbonization, any substantial pyrolysis, any substantial decomposition or any substantial loss in dry weight of said solid waste fraction.

27. A process for forming a combustible fuel from solid municipal waste containing an organic waste fraction and an inorganic waste fraction, comprising the steps of

a. treating the solid organic waste fraction of solid municipal waste with a total of up to 11% of at least two mineral acids based on the weight of said solid organic waste fraction and elevated temperature under conditions to form an embrittled material without effecting any substantial carbonization, any substantial pyrolysis, any substantial decomposition or any substantial loss in dry weight of said waste component; and

b. reducing the resulting embrittled material to a finely divided form.

4,008,054

PROCESS FOR MAKING LOW-SULFUR AND LOW-ASH FUELS

James T. Clancey; Everett Gorin; Eric H. Reichl, and Charles H. Rice, all of Pittsburgh, Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Jan. 10, 1975, Ser. No. 540,310

Int. Cl.² C10L 5/00; C10G 1/00

U.S. Cl. 44—10 R

7 Claims

1. In a coal conversion process which includes extraction of coal by a solvent to yield a mixture of coal extract, solvent and undissolved ash- and sulfur-containing hydrocarbonaceous residue, the IMPROVEMENT which comprises:

a. subjecting said coal to solvent extraction and hydrotreatment in a coal liquefaction zone under hydrosulfurizing conditions whereby said coal extract has a lower organic sulfur content than said coal;

b. separating the effluent mixture from said coal liquefaction zone into at least two parts, the first part being a low solids-containing product containing coal extract and the

second part being a high solids-containing product containing undissolved ash- and sulfur-containing hydrocarbonaceous residue;

c. forming low-ash and low-sulfur pellets from a mixture consisting essentially of coal extract contained in said first part and carbonaceous solids;

d. subjecting said second part to distillation to yield a hydrocarbonaceous ash-containing solid and a hydrocarbonaceous distillate including solvent;

e. reacting said hydrocarbonaceous ash-containing solid with steam in a gasification zone to yield a gaseous product and ash; and

f. treating said gaseous product from said gasification zone to yield a methane-rich gas and hydrogen for use in said liquefaction zone.

4,008,055

ABRASIVE WHEEL CONTAINING NICKEL COATED NEEDLE-SHAPED CUBIC BORON NITRIDE PARTICLES

Cornelius Phaal, Robant Lane, Edenburg, Rivonia, Sandton, Transvaal, South Africa

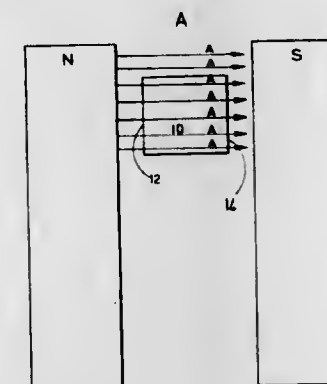
Filed Feb. 28, 1975, Ser. No. 554,121

Claims priority, application South Africa, Mar. 7, 1974, 74/1474

Int. Cl.² B24D 3/28

U.S. Cl. 51—298 R

1 Claim



1. A grinding wheel comprising a hub portion and a peripheral grinding portion, the peripheral grinding portion comprising a resin matrix selected from phenolformaldehyde and polyimide resins containing nickel coated needle-shaped cubic boron nitride particles, each particle having a long axis and a transverse short axis, the nickel coating comprising from 30 to 80 weight percent of the coated particle and a substantial portion of the particles being so aligned that their long axes are substantially normal to the working face of the grinding portion.

4,008,056

SCRUBBER SYSTEM FOR REMOVING GASEOUS POLLUTANTS FROM A MOVING GAS STREAM BY CONDENSATION

George Potter, 680 "F" St., Eastside, Oreg. 97420

Filed Sept. 29, 1975, Ser. No. 617,598

Int. Cl.² B01D 47/12

U.S. Cl. 55—92

8 Claims

6. A method of removing gaseous non-aqueous pollutants from a moving stream of gas comprising the steps of:

a. receiving through the base of a first upright chamber a moving gas stream containing said non-aqueous pollutants in vapor form;

b. imparting an upwardly directed cyclonic motion to said gas stream within said first chamber;

c. condensing a portion of said pollutant vapors to liquid form within said chamber by exposing said moving gas stream to a water spray having a temperature less than the condensation temperature of said pollutants and thereby cooling said pollutants to their condensation temperature

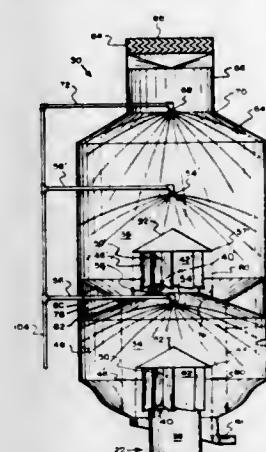
by the transfer of heat from said pollutants to said water spray;

d. capturing the resultant liquified pollutants within said first chamber by contacting said liquified pollutants with the water from said water spray;

e. conducting said moving gas stream from the top of said first chamber into the base of a second upright chamber;

f. further imparting an upwardly directed cyclonic motion to said gas stream in said second chamber;

g. condensing the remaining portion of said pollutant vapors to liquid form within said second chamber by exposing



said moving gas stream to a second water spray having a temperature less than the condensation temperature of said remaining portion of pollutants and thereby cooling said remaining pollutants to their condensation temperature by the transfer of heat to said second water spray;

h. capturing the resulting liquified pollutants within said second chamber by contacting said liquified pollutants with the water from said second water spray; and

i. collecting said water with said liquified pollutants contained therein from said respective chambers and exhausting said gas stream from said second chamber.

4,008,057

ELECTROSTATIC PRECIPITATOR ELECTRODE CLEANING SYSTEM

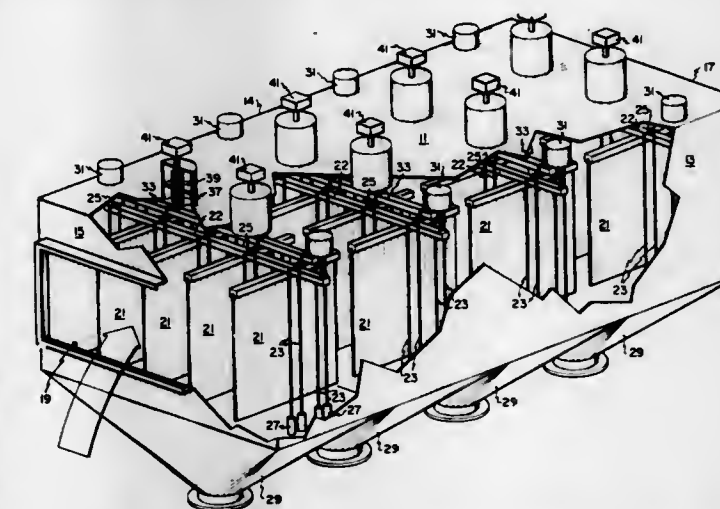
Peter C. Gelfand; Richard A. Carpenter, both of Lebanon, and Jerry F. Shoup, Palmyra, all of Pa., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Nov. 25, 1974, Ser. No. 526,990

Int. Cl.² B03C 3/66

U.S. Cl. 55—105

12 Claims



1. In an electrostatic precipitator having electrically-activated rappers arranged in a plurality of modules that operably extend transverse to the gas flow direction through the electro-static precipitator, each of said modules comprising a plurality of rappers connected in parallel across associated busses, and each of said rappers having an electrically-operated normally-open switch connected thereto to control

the flow of electricity to the rapper from the associated buss; and each of said rappers being connected to shake an electrode of the precipitator to dislodge particulates therefrom; a system for operating the rappers the improvement comprising:

- a. a main distributor circuit including a plurality of output lines, said main distributor circuit operating to place an electrical signal on each one of said output lines in sequence and to the exclusion of the other said output lines at a first predetermined rate;
- b. a plurality of control circuits, each said control circuit associated with a particular one of said modules and each said control circuit including:
 - i. a timer means for generating a continuous train of signals at an adjustable second rate that is substantially slower than said first predetermined rate;
 - ii. synchronizing means connected to a particular one of said output lines of said main distributor circuit to receive signals therefrom and, also, connected to receive said train of signals from said timer means, said synchronizing means being operative to generate an output signal only if it receives a signal from said timer means followed by a signal from said main distributor circuit; and
 - iii. a secondary distributor circuit that is connected to receive said output signals from said synchronizing means and which includes a plurality of output lines, each of said secondary distributor output lines being connected to a said switch of a particular one of said rappers in the associated module, said secondary distributor circuit being operative to place an electrical output signal on each of its said output lines in an ordered sequence and to the exclusion of the other of its said output lines, each sequential placement being made upon the receipt of an output signal from said synchronizing means, and said electrical output signals from said secondary distributor circuit being operative to close the switch of the rapper which receives the signal to activate that rapper with power from said associated buss.

4,008,058

APPARATUS FOR REGENERATING A DRYING AGENT IN DRIERS FOR GASES OR AIR UNDER POSITIVE PRESSURE

Karl Wischer, Alaryds mellangard, 560 10 Skillingaryd, and Kjell Eric Ericsson, Bruksgratan 30, 560 12 Vaggeryd, both of Sweden

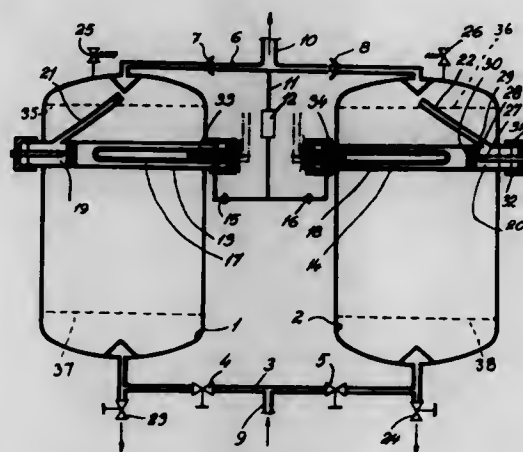
Filed Mar. 17, 1976, Ser. No. 667,805

Claims priority, application Sweden, Mar. 18, 1975, 7503034

Int. Cl.² B01D 53/04

U.S. Cl. 55—179

7 Claims



1. Apparatus for regenerating a drying agent in driers for gas under positive pressure, said apparatus comprising
 - a. two drying towers, each tower having upper and lower ends, respectively,
 - b. a drying agent disposed in each of said drying towers,

- c. means for interconnecting said drying towers by their respective upper ends and lower ends,
- d. valve means in said interconnecting means,
- e. means for supplying to one of said interconnecting means compressed gas to be dried,
- f. means for expelling from the other of said interconnecting means dried compressed gas,
- g. hollow cartridge means extending diametrically through each of said drying towers, said cartridge having choke means at the output thereof,
- h. heating means disposed in each of said cartridge means,
- i. feedback means from the interconnecting means for expelling dried compressed gas from each of said drying towers to the respective cartridge means, and
- j. valve means in said feedback means, whereby moist, compressed gas introduced at one end of a first one of said drying towers is expelled at the other end of said drying tower and a lesser portion of this dried gas is fed back as regenerating gas to the cartridge means of the second drying tower and heated therein and is discharged from said cartridge means through said choke means for flowing through the entire drying agent of the second drying tower for drying said drying agent of the second drying tower.

4,008,059

CENTRIFUGAL SEPARATOR

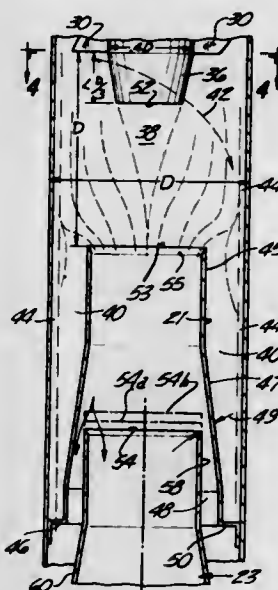
Donald R. Monson, West St. Paul, Minn., and Thomas E. Rosendahl, McMurry, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 6, 1975, Ser. No. 574,975

Int. Cl.² B01D 45/14

U.S. Cl. 55—396

2 Claims



1. A miniature centrifugal separator comprising a cylindrical imperforate main flow tube having an upstream end for receiving a stream of dust-laden gas, and a downstream end for discharging concentrated dust;
 - swirl means within the upstream end of the main flow tube for imparting centrifugal force to the dust particles in the dust-laden gas; said swirl means comprising a hub coaxially located in the main flow tube, and helical vanes extending outwardly from said hub at acute angles to the tube axis; the hub diameter being approximately 40% of the main flow tube diameter, and the swirl vanes being angled to the flow tube axis at approximately 65°; said hub having a frusto-conical tail extending downstream beyond the trailing edges of the vanes for a distance that is slightly less than one third the diameter of the main flow tube;
 - a first separator tube coaxially located within the main flow tube downstream from the swirl means; said first separator tube comprising a leading cylindrical section and a trailing frusto-conical section flaring outwardly from its point of connection with the cylindrical section; the cylindrical section of the second separator tube having approximately the same diameter as the cylindrical section of the first separator tube;
 - the cylindrical section of the second flow separator tube defining an annular flow separator edge (54) that cooperates with the inner surface of the frusto-conical section of the first separator tube to define a second dust scavenger port; the second separator tube being telescoped into the first separator tube so that the first scavenger port and second scavenger port having a size ratio of approximately 0.2;
 - and means for producing a scavenger flow force on the first and second ports, whereby dust particles are drawn through the ports while relatively clean gas flows through the second separator tube.

4,008,061

METHOD OF MAKING OPTICAL FIBER OPTICAL POWER DIVIDER

Melvin M. Ramsay, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

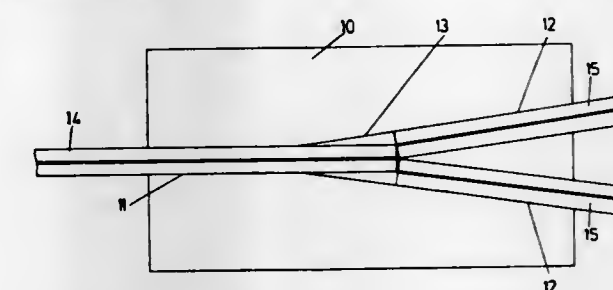
Filed Jan. 6, 1976, Ser. No. 646,818

Claims priority, application United Kingdom, Jan. 23, 1975, 3000/75

Int. Cl.² C03C 23/20; G02B 5/14

U.S. Cl. 65—4 A

4 Claims



1. A method of making an optical fiber optical power divider comprising the steps of:
 - inserting a glass optical fiber having a core and cladding into a bore formed in one end of a glass block having an index of refraction in the range of less than and equal to the optical fiber cladding;
 - inserting a glass optical fiber having a core and cladding into each of at least two converging bores formed in an opposite end of the glass block so that the ends of the fibers inserted in said opposite end of said glass block contact an end of the fiber inserted in said one end of said glass block having an index of refraction in the range of less than and equal to the optical fiber cladding;
 - heating the block to a softening temperature to collapse the bores of the glass block; and
 - drawing said glass block to reduce the cross-section of said block proximate said fiber ends.

4,008,062

APPARATUS FOR DETECTING THE POSITION OF FLOAT GLASS

Tuneharu Nishikori, Tetsu Mori, Yasuo Kobayashi, and Kenjiro Hiyama, all of Aichi, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 519,292, Oct. 30, 1974, abandoned.

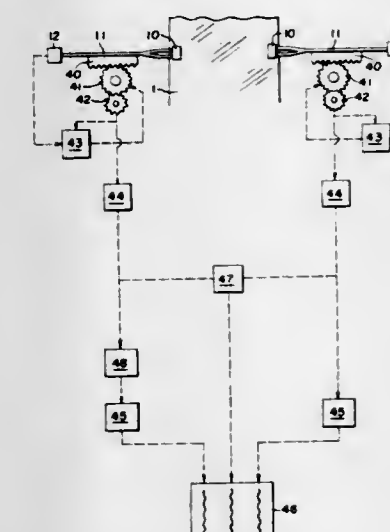
This application Feb. 13, 1976, Ser. No. 658,017

Claims priority, application Japan, Oct. 30, 1973, 48-121202

Int. Cl.² C03B 18/02

U.S. Cl. 65—158

2 Claims



1. An apparatus for detecting the position of an edge of a glass ribbon being forwardly moved on a bath of molten metal in an elongate tank in a process for manufacturing a float glass, comprising:

tor tube comprising a leading cylindrical section and a trailing frusto-conical section flaring outwardly from its point of connection with the cylindrical section; the cylindrical section of the first separator tube having a diameter that is approximately 1.4 times the hub diameter; the cylindrical section of the first separator tube defining an annular flow separator edge (53) that is spaced downstream from the swirl vanes by a distance that is approximately the same as the diameter of the main flow tube; wall means (50) joining the first separator tube to the main flow tube; said wall means having at least one opening therethrough defining a first dust scavenger port; a second separator tube coaxial with the main flow tube and downstream from the first separator tube; said second separator tube comprising a leading cylindrical section and a trailing frusto-conical section flaring outwardly from its point of connection with the cylindrical section; the cylindrical section of the second separator tube having approximately the same diameter as the cylindrical section of the first separator tube;

the cylindrical section of the second flow separator tube defining an annular flow separator edge (54) that cooperates with the inner surface of the frusto-conical section of the first separator tube to define a second dust scavenger port; the second separator tube being telescoped into the first separator tube so that the first scavenger port and second scavenger port having a size ratio of approximately 0.2;

and means for producing a scavenger flow force on the first and second ports, whereby dust particles are drawn through the ports while relatively clean gas flows through the second separator tube.

4,008,060

GAS FILTER

Erhard Charles Andreae, 36, Chemin de Pierrefleur, 1018 Lausanne, Switzerland

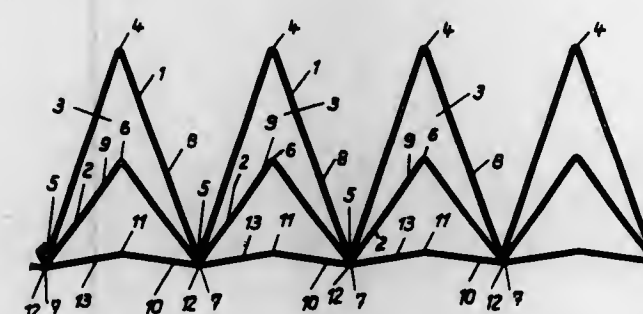
Filed Feb. 9, 1976, Ser. No. 656,141

Claims priority, application Switzerland, Dec. 4, 1975, 15783/75

Int. Cl.² B01D 45/00

U.S. Cl. 55—446

3 Claims



1. A gas filter of the type comprising two walls having parallel folds, connected along certain of said folds to define therebetween chambers while allowing extension of the filter in the manner of an accordion, and perforations in each said wall staggered in relation to those of the other wall for the passage of gas through said chambers along a sinuous path, which further comprises a perforated third wall having folds parallel to those of the first two walls and being connected to the assembly of the first two walls in the regions where the first two walls are connected, with its perforations staggered in relation to those of at least one of the first two walls, said third wall having a developed length substantially less than the maximum length to which the assembly of the first two walls alone could be extended and limiting the extension of the filter to said developed length.

a reciprocally movable radiation receiving edge of a radiation pyrometer being disposed for movement transversely above said floating glass ribbon,
 a control motor for reciprocally moving said radiation receiving edge of said pyrometer, having a gear interlocked with a rack mounted on said supporting rod;
 an electronic temperature controller, having means for receiving temperature information from said radiation receiving edge and a setting index set at a predetermined temperature in the temperature range where apparent temperatures indicated by said radiation pyrometer increases rapidly, for controlling the rotation of said control motor so as to move the radiation receiving edge backwardly when the temperature indicated by said radiation pyrometer is higher than said predetermined temperature and to move said radiation edge forwardly when the indicated temperature is lower than said predetermined temperature; and
 potentiometer means for indicating the position of said radiation receiving edge in said transverse movement as a measure of the position of the edge of the floating glass ribbon, said potentiometer having a gear interlock with the gear of said control motor.

4,008,063

APPARATUS FOR PRODUCING BLOWN HOLLOW GLASS OBJECTS

Heinz Krämer, Oldenburg; Norbert Peretti, Mulheim, Ruhr, and Helmut Waschneck, Düsseldorf, all of Germany, assignors to Owens-Illinois, Inc., Toledo, Ohio

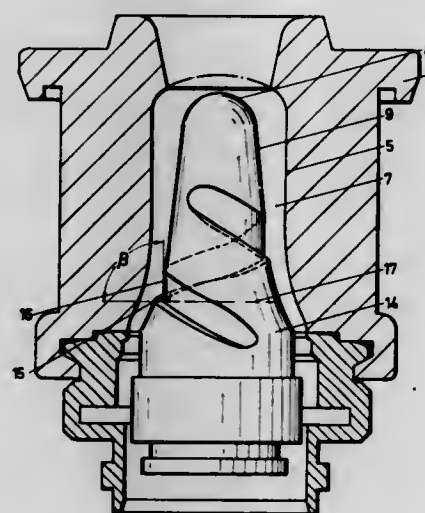
Filed June 10, 1975, Ser. No. 585,655

Claims priority, application Germany, June 26, 1974, 2430656

Int. Cl.² C03B 11/00

U.S. Cl. 65—305

4 Claims



1. Apparatus for the production of blown hollow glass bodies having an optical inner wall structure comprising means defining a hollow mold cavity adapted to have a heated glass blank introduced thereinto, a plunger having a central longitudinal axis and an exterior surface generally formed in a configuration tapering toward a narrower leading end of said plunger, said plunger being adapted to be inserted into said mold cavity with said leading end first and to be pressed against said glass blank to form said hollow glass body, and a helically shaped molding pattern formed on the exterior of said plunger adapted to form said inner wall structure of said glass body by pressing of said plunger against said glass blank, said helical molding pattern comprising a main pattern surface configured to extend throughout said helical molding pattern at an angle of not less than 90° relative to the diameter of said plunger, said angle being taken as an exterior angle relative to the body of said plunger when the diameter from which said angle is taken is located rearwardly of said main pattern surface relative to said leading end of said plunger, said angle

being taken as an interior angle relative to the body of said plunger when the diameter from which said angle is taken is located forwardly of said main pattern surface relative to said leading end of said plunger.

4,008,064

METHOD OF PAN GRANULATION

Öyvind Skauhl, Porsgrunn, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

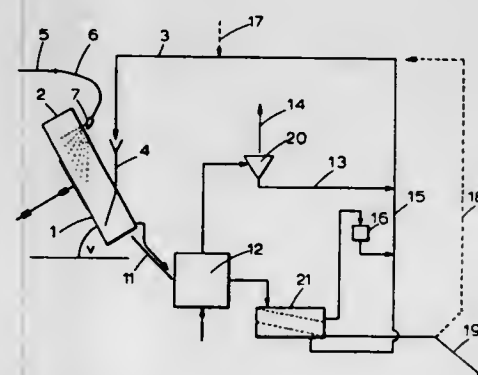
Filed Feb. 12, 1975, Ser. No. 549,428

Claims priority, application Norway, July 26, 1974, 742729

Int. Cl.² C05C 13/00

U.S. Cl. 71—28

6 Claims



1. In a pan granulation process for the production of low-water or substantially anhydrous nitrogenous compounds, comprising charging hot nitrogenous melt and cooled solids to an inclined rotating pan whereby, during the rotation of the pan there is formed a substantially crescent shaped bed of rolling particles having a thickness or depth which gradually increases in the direction towards the periphery of the pan and its overflowing sector, i.e. from position 2 o'clock to position 6 o'clock where the pan surface is regarded as a clock face and when the rotation of the pan is counter clockwise, or from position 6 o'clock to position 10 o'clock when the rotation of the pan is clockwise, the improvement comprising:
 charging the solid material to the pan bottom surface such that downward sliding particles cover the thus charged cooler solid material;
 maintaining the temperature of discharged material from the pan within a range of 4°–25° C below the melting point of the material; and
 spraying the main part of the melt onto the surface of the bed in a zone within a quadrant from position 12 to position 3 o'clock when the rotation of the pan is counter clockwise or from position 9 o'clock to position 12 o'clock when the rotation of the pan is clockwise and where the coarser particles appear, whereby the highest temperature arising in the rolling material bed is concentrated within said zone.

4,008,065

GRANULATED FERTILIZER COMPOSITION AND METHOD FOR ITS PREPARATION

Ulrich Hauschild, Hannover, Germany, assignor to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Feb. 14, 1975, Ser. No. 550,158

Claims priority, application Germany, Feb. 16, 1974, 2407491

Int. Cl.² C05B 7/00

U.S. Cl. 71—34

13 Claims

1. A granulated fertilizer composition comprising mineral phosphates calcined with alkali and between about 0.5 and 15% by weight of tetrapotassium pyrophosphate K₄P₂O₇.

4,008,066

PHENYLAMINOACETAMIDES FOR REGULATING PLANT GROWTH

Hans Moser, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

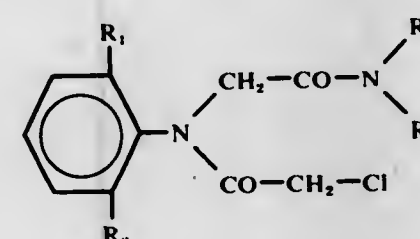
Continuation-in-part of Ser. No. 458,970, April 8, 1974, abandoned. This application Oct. 15, 1975, Ser. No. 622,595

Int. Cl.² A01N 9/20; C07C 103/22, 103/78

U.S. Cl. 71—76

20 Claims

1. A compound of the formula



(I)

wherein R₁ and R₂ each represents methyl or ethyl, or wherein R₁ represents chlorine or methoxy and R₂ represents methyl, and R₃ and R₄ each represents hydrogen, methyl or ethyl.

17. A method for retarding the growth of grasses and crop plants which comprises applying thereto an effective nonlethal amount of a compound according to claim 1.

4,008,067

OXACYCLOHEXANE DERIVATIVES

Yoshihiko Hirono, Hiratsuka; Hisao Ishikawa, Odawara; Isao Iwataki, Odawara; Mikio Sawaki, Odawara; Takashi Okabe, Odawara; Daigaku Takiguchi, Tokyo, and Kuniyasu Maeda, Yokohama, all of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

Filed May 28, 1975, Ser. No. 581,705

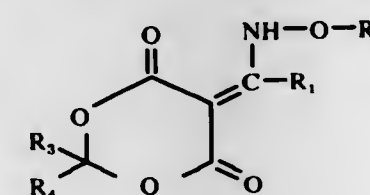
Claims priority, application Japan, June 4, 1974, 49-63209

Int. Cl.² C07D 319/04; A01N 9/20

U.S. Cl. 71—88

12 Claims

1. A compound of the general formula



wherein

R₁ is alkyl of 1 to 3 carbon atom,
 R₂ is selected from the group consisting of ethyl, allyl and propargyl,
 R₃ is methyl when R₄ is methyl or ethyl,
 or R₃ is hydrogen when R₄ is phenyl,
 R₄ is selected from the group consisting of alkyl of 1 to 2 carbon atoms and phenyl, and
 R₅ forms cyclo-alkylene of 4 to 5 carbon atoms by combining with R₄;
 or sodium salt of the compound defined herein above.

4,008,068

1-THIADIAZOLYL-5-MORPHOLINOIMIDAZOLIDINONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

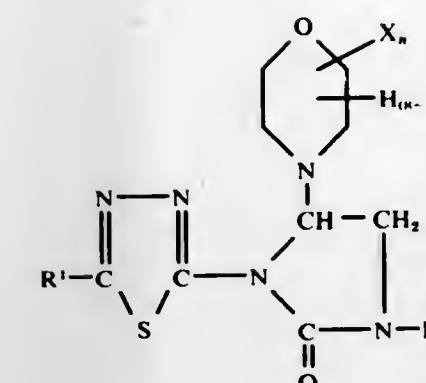
Filed Mar. 8, 1976, Ser. No. 665,131

Int. Cl.² C07D 417/14; A01N 9/12

U.S. Cl. 71—90

10 Claims

1. A compound of the formula



wherein R₁ is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R₂ is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; X is selected from the group consisting of lower alkyl and halogen; and n is an integer from 0 to 2.

10. A method of controlling weeds which comprises contacting said weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim 1.

4,008,069

SYNERGISTIC WEED CONTROL COMPOSITION

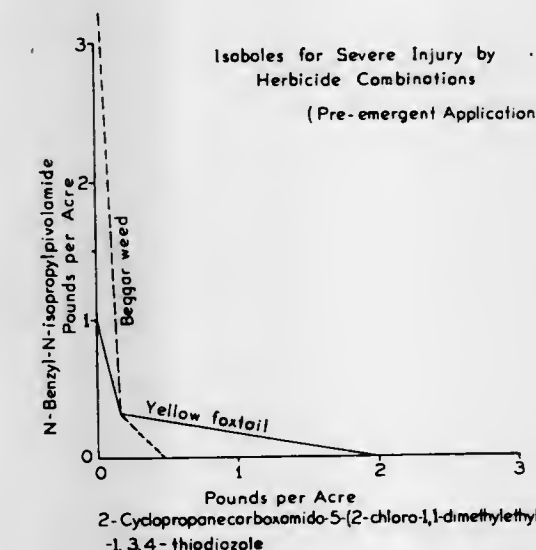
James L. Ahle, Shawnee, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 13, 1972, Ser. No. 288,646

Int. Cl.² A01N 9/22

U.S. Cl. 71—90

3 Claims



1. The synergistic pre-emergent weed control composition consisting essentially of a herbicidally effective amount of a mixture of one part by weight 2-cyclopropanecarboxamido-5-(2-chloro-1,1-dimethylethyl)-1,3,4-thiadiazole and two parts by weight N-benzyl-N-isopropylpivalamide.

0.005 to 0.025 weight percent metallic aluminum, the balance being iron with the usual low impurities, said steel having a Cr content less than 0.35% by weight

4,008,079

SUPERCONDUCTING ALLOYS

John Edwin Bowers, Wantage, England, assignor to International Lead Zinc Research Organization, Inc., New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,623

Claims priority, application United Kingdom, Mar. 20, 1974, 12492/74

Int. Cl.² C22C 11/08

U.S. Cl. 75—134 T

12 Claims

1. An alloy comprising a matrix of a Type II superconductor, which is a homogeneous mixture of lead with 30 to 50 atom % indium, lead with 15 to 40 atom % bismuth, at least 50 atom % lead with at least 5 atom % bismuth and 10 atom % indium, including, dispersed in the matrix, a material to provide pinning centres comprising from 0.01 to 20% by volume of a stable discontinuous phase comprising discrete crystalline particles of copper, manganese, tellurium, selenium, nickel, calcium, chromium, cerium, germanium or lanthanum, either in the form of the element or of a compound with at least one of components of the matrix, wherein the discrete particles have an average diameter of not more than 2 microns.

8. An alloy comprising a matrix of a Type II superconductor which is an homogeneous mixture of from 60 to 85 atom percent lead and from 15 to 40 atom percent bismuth, including dispersed in the said matrix a material to provide pinning centres comprising from 0.01 to 20% by volume of a stable discontinuous crystalline phase of discrete particles selected from the group consisting of copper, selenium, nickel and tellurium either in the form of the element or of a compound with at least one of the components of the said matrix, wherein the discrete particles have an average diameter of not more than 0.5 microns.

4,008,080

COPPER FREE DENTAL GOLD ALLOYS

Ewald Wagner, Pforzheim, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Nov. 4, 1975, Ser. No. 628,766

Claims priority, application Germany, Nov. 13, 1974, 2453799

Int. Cl.² C22C 5/02

U.S. Cl. 75—134 N

9 Claims

1. A copper free dental gold alloy consisting essentially of 25 to 40% silver, 40 to 60% gold, 5 to 20% palladium, 0.05 to 0.5% iridium, 0 to 6% indium 0 to 6% tin and 0 to 2% zinc, with the proviso that the named non-noble metals are present in a total amount of at least 2%.

4,008,081

METHOD OF MAKING VACUUM INTERRUPTER CONTACT MATERIALS

Richard L. Hundstad, Forest Hills Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1975, Ser. No. 589,979

Int. Cl.² C22C 1/02

U.S. Cl. 75—135

8 Claims

1. In a method of making contact materials suitable for use in a vacuum interrupter, the steps comprising melting a predetermined mass of a first metal having a high electrical conductivity, adding from about 30% to about 70% of a second metal in solid form to said molten mass, said second metal having:

- a melting point in excess of the melting point of the first metal, and
- a solid solubility in the first metal of less than 1 percent by weight at the temperature to which the first metal is heated, the temperature to which the first metal is heated

being within the range between the melting point of the first metal and below the melting point of the second metal, intermixing the liquid and solid components to a uniform consistency, casting the component into the desired configuration, and cooling said configuration to room temperature.

4,008,082

METHOD FOR PRODUCING AN ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Hans-Hermann Beschoner, Bad Westernkotten; Hartmut Dulken, Belecke; Gottfried Guder, Belecke, and Karl-Heinz Kassel, Belecke, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Continuation of Ser. No. 442,319, Feb. 14, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,386

Claims priority, application Germany, Feb. 19, 1973, 2308070

Int. Cl.² G03G 5/04; C23C 13/02

U.S. Cl. 96—1.5

4 Claims

1. In a method for producing an electrophotographic recording material composed of a layer of a photoconductive substance comprising an arsenic-selenium alloy whose composition approximately corresponds to As₂Se₃ applied to a conductive substrate, the improvement comprising: initially vapor-depositing a first layer of the photoconductive substance to a thickness of about 0.1 to 2.0μ and substantially less than that of the completed layer onto the substrate while maintaining the substrate at a temperature which lies above the glass transformation temperature of the photoconductive substance; and subsequently vapor-depositing a second layer of the substance to a thickness equal to the remainder of the intended complete layer thickness, at least the major part of the second layer being vapor-deposited while maintaining the substrate at a temperature substantially lower than such transformation temperature and at least more than 80° C less than such transformation temperature.

4,008,083

STABILIZATION OF COLOR IMAGES FORMED BY PHOTOMODULATION OF THE CHRISTIANSEN EFFECT

Donald George Pye, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1976, Ser. No. 650,800

Int. Cl.² G03G 5/04

U.S. Cl. 96—27 R

15 Claims

1. In a method of forming a colored image by projection of light through an imaged Christiansen cell so that the light is separated into scattered and unscattered components either of which is focused on a viewing surface, said Christiansen cell having two constituents of different optical dispersion but having identical refractive indices at a matching wave-length in or near the visible spectrum the constituents being a discrete phase dispersed in an optically homogeneous polymerizable medium whose refractive index is locally changed by polymerization, the improvement comprising: forming an optically homogeneous, photopolymerizable medium containing a polymerizable monomer and a cross-linking monomer in an amount sufficient to produce upon exposure to actinic light cross-linked polymer which stabilizes the colored image formed and is optically homogeneous with any remaining medium; and exposing the Christiansen cell to varying intensities of actinic light in accordance with a predetermined image.

7. A Christiansen cell having as its operating element a dispersion of a transparent, isotropic solid in a photopolymerizable medium which is an optically homogeneous mixture of: (1) at least one ethylenically unsaturated monomer; (2) at least one cross-linking monomer for said unsaturated monomer in an amount sufficient to produce cross-linked polymer which is optically homogeneous with the medium; and (3) an initiating amount of an actinic light-activatable photoinitiator which does not form gaseous or insoluble products.

4,008,084

METALLIC IMAGE FORMING MATERIAL

Tomoaki Ikeda; Sadaharu Ikeda; Yuzo Mizobuchi, and Takeshi Tomotsu, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 25, 1975, Ser. No. 571,817

Claims priority, application Japan, Apr. 25, 1974, 49-46949

Int. Cl.² G03C 5/00

U.S. Cl. 96—35

12 Claims

1. A metallic image forming article comprising a support, an intermediate layer comprising aluminum and a metal having a ionization tendency lower than that of aluminum, and an photosensitive resin layer on the intermediate layer.

12. A method of forming a metallic image comprising image-wise exposing the metallic image forming article of claim 1 to active light thereby to form a latent image in accordance with the image-wise exposure, developing said exposed metallic image forming article to remove the easily soluble parts or to strip off the easily peelable parts, thereby dissolving and removing the image part of the underlying aluminum layer or the metal and removing the photosensitive resin layer.

4,008,085

PHOTOSENSITIVE MATERIAL CONTAINING AN ORGANIC POLYHALOGEN COMPOUND AND A DYE PRECURSOR AND THE USE THEREOF

Raymond Gerard Lemahieu, Mortsel, and Urbain Leopold Laridon, Wilrijk, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Dec. 18, 1974, Ser. No. 533,890

Claims priority, application United Kingdom, Dec. 19, 1973, 58782/73

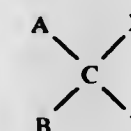
Int. Cl.² G03C 5/24, 1/52

U.S. Cl. 96—48 R

19 Claims

1. A photographic process wherein a visible image is formed in a recording material, which contains in intimate admixture an image-forming system consisting essentially of:

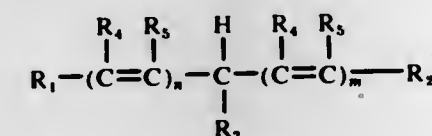
1. at least one ultra-violet radiation-sensitive organic polyhalogen compound corresponding to the following general formula:



wherein:

each of A, B, X and Y are halogen atoms of the group of chlorine, bromine, or iodine, or wherein one of said groups A, B, X or Y represents an alkyl group, an aryl group or an aroyl group and the other groups chlorine, bromine, or iodine, and

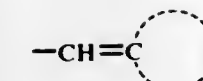
2. a dye precursor compound corresponding to the following general formula:



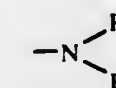
wherein:

R₁ represents (1) a substituted aryl group, at least one substituent of the substituted aryl group being an ether group R₆-O— in which R₆ represents a hydrocarbon group, or (2) a heterocyclic group containing a 5-membered nitrogen-containing heterocyclic nucleus.

R₂ represents (1) a substituted aryl group, at least one substituent of the substituted aryl group, being an ether group R₆-O—, in which R₆ represents a hydrocarbon group, (2) a heterocyclic group containing a 5-membered nitrogen-containing heterocyclic nucleus, or (3) a



group in which Z represents the necessary atoms to close a 5-membered nitrogen containing heterocyclic nucleus, R₂ represents (1) a —XH or —X—R₇ group, in which X is oxygen and R₇ is an alkyl group, or (2) a



group wherein each of R_n and R_m (same or different) represents hydrogen or an alkyl group, a cycloalkyl group, an aralkyl group, or an aryl group or R_n and R_m together represent the necessary atoms to close a 5- or 6-membered nitrogen-containing heterocyclic nucleus, each of R₄ and R₅ (same or different) represents hydrogen, a C₁—C₅ alkyl group, a cycloalkyl group, an aralkyl group or an aryl group.

n is 0 or 1, and m is 0,

said visible image being formed (A) by the step of: information-wise exposing the recording material to activating electromagnetic radiation of a dose sufficient to bring about a directly visible image, or (B) by the steps of: information-wise exposing the recording material to activating electromagnetic radiation of a dose sufficient to bring about a latent or barely visible image, the image portions of which have a spectral sensitivity in a wavelength range outside the inherent sensitivity range of the ultraviolet radiation-sensitive polyhalogen compound, and overall exposing the image-wise exposed recording material to light within the wavelength range for which the initially exposed portions are made more sensitive than the initially non-exposed portions, thereby bringing about the formation of a visible image corresponding with the initially information-wise exposed portions, or (C) by the steps of:

overall exposing the recording material to electromagnetic radiation of a dose sufficient to bring about in the recording material an increase in spectral sensitivity in a wavelength range outside the inherent sensitivity range of the ultraviolet radiation-sensitive polyhalogen compound, and information-wise exposing the thus overall exposed recording material within the wavelength range for which the overall exposed portions of the recording material are made more sensitive.

4,008,086

SILVER HALIDE EMULSION CONTAINING PHOTOGRAPHIC YELLOW COUPLER

Wataru Fujimatsu; Shui Sato, both of Hachioji; Tamotsu Kojima, Kokubunji; Takaya Endo, Hino, and Kazumi Minahara, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 351,031, April 13, 1973, Pat. No. 3,900,483. This application May 16, 1975, Ser. No. 578,017

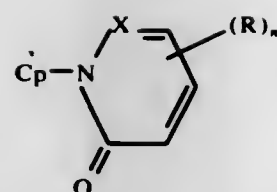
Claims priority, application Japan, Apr. 15, 1972, 47-37367; May 27, 1972, 47-52179

Int. Cl.² G03C 7/00, 1/40

U.S. Cl. 96—56.5

11 Claims

1. A light-sensitive gelatinous silver halide photographic emulsion containing a substituted type photographic yellow coupler having the formula,



wherein X is a —N= or —Ch= group; Cp is a residue formed by removing one hydrogen atom of the active methylene group of a yellow coupler of the acetanilide type; n is an integer of 1 to 4; and R is a hydrogen or halogen atom, or an alkyl, alkoxy, alkylcarbonyl, aryl, arylcarbonyl, amino, acylamino, carboxyl, nitrile, aralkyl or aralkyloxy group, provided that in case n is 2 or more the R groups may be the same or different and two adjacent R groups in combination may form a benzene ring.

4,008,087

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masazumi Aono, Shuichi Shindo, and Takushi Miyazaki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

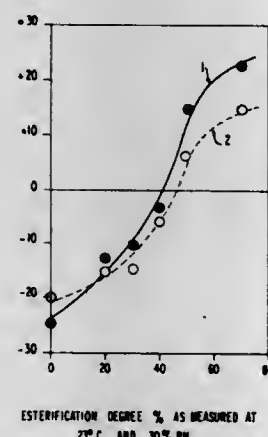
Filed Aug. 4, 1975, Ser. No. 601,953

Claims priority, application Japan, Aug. 5, 1974, 49-89606 and

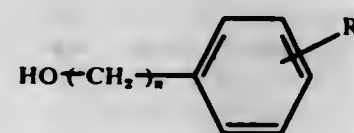
Int. Cl.² G03C 1/16, 1/18, 1/18, 1/18

U.S. Cl. 96—69

7 Claims



1. A photographic light-sensitive material comprising a support having thereon at least one silver halide photographic layer and at least one layer containing a styrene-maleic acid copolymer having a molecular weight ranging from about 2000 to 500,000, containing 20 to 60 mol % styrene and 40 to 80 mol % maleic acid, and in which about 10 to 70 mol % of the carboxylic acid groups of the styrene-maleic acid copolymer is esterified with a compound represented by the following formula (I)



wherein R represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or a phenyl group, and n is 1 or 2.

4,008,088

MOTION PICTURE FILM MATERIALS CONTAINING MAGNETIC RECORDING STRIPES

August Jean Van Paesschen, Antwerp, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed May 20, 1975, Ser. No. 579,220

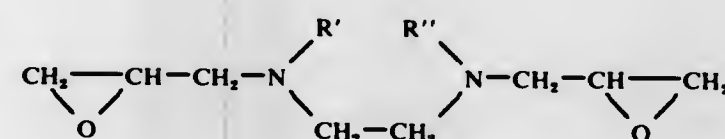
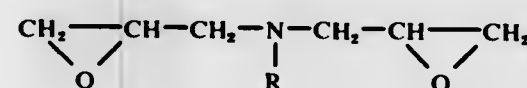
Claims priority, application United Kingdom, May 24, 1974, 23410/74

Int. Cl.² G03C 1/84

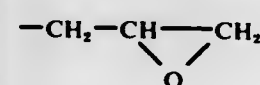
U.S. Cl. 96—84 R

11 Claims

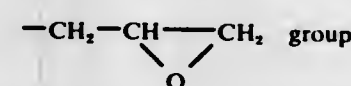
1. A multilayer motion picture film material comprising a support, at least one light-sensitive emulsion layer on one side of such support and, at the opposite side of said support, an antihalation layer capable of being removed from said support in the presence of an alkaline solution, and also comprising, on said antihalation layer, at least one stripe formed by the application thereto of a coating composition containing magnetizable material dispersed in an alkali-insoluble binder, said composition containing a cross-linking agent for the alkali-soluble binder of said antihalation layer, characterized in that as a said cross-linking agent, at least one bis- or polyepoxide is used in combination with at least one sulphoxide and/or formamide, said bis- or polyepoxide corresponding to one of the formulae:



wherein R represents an alkyl group of 1 to 6 carbon atoms, a benzyl group, or a group of the formula



and each of R' and R'' represents a methyl group, or a



or R' and R'' together represent a —CH₂—CH₂— group.

4,008,089

DIRECT-POSITIVE SILVER HALIDE EMULSION REDUCTION AND GOLD FOGGED IN CONTACT WITH A PALLADIUM COMPOUND

Herman Alberik Pattyn, Kapellen; Willy Joseph Vanassche, Kontich, and Luc Achiel De brabantere, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Mar. 24, 1975, Ser. No. 561,656

Claims priority, application United Kingdom, Apr. 3, 1974, 14800/74

Int. Cl.² G03C 1/28

(1) U.S. Cl. 96—108

9 Claims

1. A direct-positive silver halide emulsion comprising reduction and gold fogged silver halide grains wherein the grains have an average grain size of less than 100 nm and wherein a palladium compound was added to the silver halide emulsion at the time of fogging said silver halide grains being gold fogged with from about 0.001 to about 0.1 millimole of a gold compound per mole of silver halide.

4,008,090

PROCESS FOR THE PRODUCTION OF TUNGSTEN CARBIDE OR MIXED METAL CARBIDES

Masaya Miyake; Akio Hara, and Noriyuki Ayano, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 287,024, Sept. 7, 1972, abandoned. This application Sept. 2, 1975, Ser. No. 609,729

Claims priority, application Japan, Sept. 7, 1972, 47-69937

Int. Cl.² C04B 35/52; C01B 31/34

U.S. Cl. 106—43

4 Claims

4. A process for the production of tungsten carbide containing mixed metal carbides selected from the group consisting of titanium carbide, tantalum carbide, columbium carbide and mixtures thereof, which consists essentially of mixing tungsten oxide powder-containing high melting point metal oxide powders selected from the group consisting of titanium oxides, tantalum oxides, columbium oxides and mixtures thereof, with carbon power in an amount sufficient to give the theoretical quantity of combined carbon, subjecting the resulting mixture to pelletization, heating the pelletized mixture under movement in a rotary furnace at a temperature of from 1000° to 1600° C in nitrogen to reduce the oxygen content of the oxide to less than 5% and then heating the intermediate product under movement in a rotary furnace at a temperature of from 1600° to 2000° C in a hydrogen atmosphere, the temperature of the second heating being about 200° C higher than that of the first heating.

4,008,092

METHOD OF PRODUCING MgO AND Cr₂O₃ BASED REFRACTORIES AND THE PRODUCTS THEREOF

Gunther Lorenz Mortl, Carinthia, Austria, assignor to Österreichisch-Amerikanische Magnesit Aktiengesellschaft, Austria

Continuation-in-part of Ser. No. 290,767, Sept. 20, 1972, abandoned. This application May 19, 1976, Ser. No. 687,886

Int. Cl.² C04B 35/42

U.S. Cl. 106—59

5 Claims

1. A sintered refractory brick consisting essentially of about 96 to 99.95 weight percent of a magnesia rich synthetic magnesia chromite sinter containing about 0.05 to 4.0 weight percent of a member selected from the group consisting of calcium oxide and strontium oxide, said magnesia rich magnesia chromite consisting essentially of about 11 to 61 weight percent free magnesia and about 89 to 39 weight percent magnesium chromite, said magnesia rich magnesium chromite sinter having a total porosity of about 9.5 to 11.9 percent and a particle specific gravity of about 3.6 to 3.8 grams per cubic centimeter.

4,008,093

CONTROL METHOD AND EQUIPMENT FOR CHARGING READY-MIXED CONCRETE ADDITIVES BATCHWISE

Toshiyuki Kitsuda, Morioka; Kenichi Hattori, Musashino; Hiromi Nakagawa, Wakayama; Mitsuru Wakao, Sagami, and Tsunehisa Matsuda, Urawa, all of Japan, assignors to Japanese National Railways; Kao Soap Co., Ltd. and Kayabakogyo-Kabushiki-Kaisha, all of Tokyo, Japan

Filed July 8, 1974, Ser. No. 486,348

Claims priority, application Japan, July 12, 1973, 48-77938

Int. Cl.² C04B 7/02

U.S. Cl. 106—89

4 Claims

1. A control method for the batchwise charging of ready-mixed concrete, comprising the steps of mixing the concrete until a slump change occurs in the concrete; detecting the occurrence of the slump change as a function of a change in the mixing torque required for effecting said mixing; initiating a signal when said change in the mixing torque reaches a predetermined level; and utilizing said signal to initiate dispensing of slump-adjusting additives into said concrete for a timed period.

4,008,094

HIGH DURABILITY, REINFORCING FIBERS FOR CEMENTITIOUS MATERIALS

George H. Beall, Big Flats, and Hermann L. Rittler, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 16, 1975, Ser. No. 596,432

Int. Cl.² C04B 31/06; C03C 13/00, 3/04

U.S. Cl. 106—99

6 Claims

1. Fibers demonstrating exceptional resistance to attack by alkaline solutions composed of a glass consisting essentially, by weight, of 85-99% tholeiitic basalt containing less than about 5% alkali metal oxides and 1-15% ZrO₂.

4,008,095

PAVING COMPOSITIONS AND METHOD FOR PRODUCING THE SAME

Fumiki Fukushima, Tokyo; Hiroshi Nozaki, Chiba; Keisuke Tanaka, and Takashi Kanagawa, both of Tokyo, all of Japan, assignors to Nichireki Kagaku Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 374,543, June 28, 1973, abandoned, which is a continuation of Ser. No. 278,854, Aug. 8, 1972, abandoned, which is a continuation of Ser. No. 18,498, March 11, 1970, abandoned. This application Dec. 9, 1974, Ser. No. 531,181

Claims priority, application Japan, Mar. 12, 1969, 44-18306

Int. Cl.² C08L 7/00, 91/00, 93/00, 95/00

U.S. Cl. 106—235

16 Claims

1. A paving composition, consisting essentially of: from 3 to 50% by weight of microgranular undigested coal particles having a particle size in the range of 1 to 30 μ ; the balance is a bituminous material which is liquid at a temperature below about 200° C. and consisting principally of asphalt, said asphalt being at least about 50% by weight of the total weight of the composition; said composition being free of mineral aggregate particles, said coal particles being uniformly mixed with and dispersed in the bituminous material, said composition having been prepared by simultaneous trituration of said coal particles and said bituminous material at a temperature below about 200° C. by flowing a mixture of said bituminous material and coal particles between the opposing surfaces of a pair of closely spaced triturating discs, one of which is rotating relative to the other, to subject the mixture to simultaneous compression, shear, friction and centrifugal forces.

14. A method for producing a paving composition, which comprises the steps of

1. feeding into the narrow gap between a pair of opposed, closely spaced triturating discs, one of which is rotating relative to the other at a high speed, a starting mixture free of particles of mineral aggregate and consisting essentially of

a. from 3 to 50% by weight of undigested coal particles, and
b. the balance is a liquid bituminous material consisting principally of asphalt, said asphalt being at least about 50% by weight of the total weight of said starting mixture.

2. triturating said starting mixture by subjecting same to simultaneous compression, shear, friction and centrifugal forces between said discs at a temperature below about 200° C. to subdivide the coal particles to a size in the range of 1 to 30 μ and simultaneously uniformly mixing and dispersing the coal particles in the liquid bituminous material.

4,008,096

ASPHALT PLUG EMPLACEMENT PROCESS

Randolph H. Knapp, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 497,011, Aug. 13, 1974, Pat. No. 3,901,316. This application Apr. 16, 1975, Ser. No. 568,756

Int. Cl.² C08L 95/00

U.S. Cl. 106—277

3 Claims

1. An oil-in-water emulsion for penetrating into and plugging the pores within the first few inches of a portion of a subterranean earth formation that is encountered by a fluid injected into a well, which emulsion consists essentially of:

an emulsified mixture of an asphalt-containing oil-phase liquid, an aqueous liquid, and a cationic emulsifier, having compositions and concentrations such that (a) the particles dispersed within the aqueous liquid are capable of flowing through the pores of said earth formation, (b) the emulsion has a relatively neutral pH of from about 4

to 8, and (c) the emulsion breaks when its pH is increased by a significant amount; and

dissolved in said aqueous liquid, a pH-increasing reactant having a composition and concentration such that the pH of the emulsion is increased to one at which the emulsion breaks when it is subjected to a time-temperature exposure of from about 5–60 minutes at from about 80°–140° E equivalent to that to which a fluid is exposed when it is injected into said earth formation, said pH-increasing reactant being a member of the group consisting of: mixtures of water-soluble epoxides and water-soluble chlorides, mixtures of water-soluble nitrite salts and water-soluble amides of carbonic acid, and water-soluble cyanate salts.

4,008,097

CO-CONDENSATE MIXTURES OF IMINOISOINDOLINONES

Peter Bitterli, Reinach, and Fritz Kehrer, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Dec. 3, 1975, Ser. No. 637,361

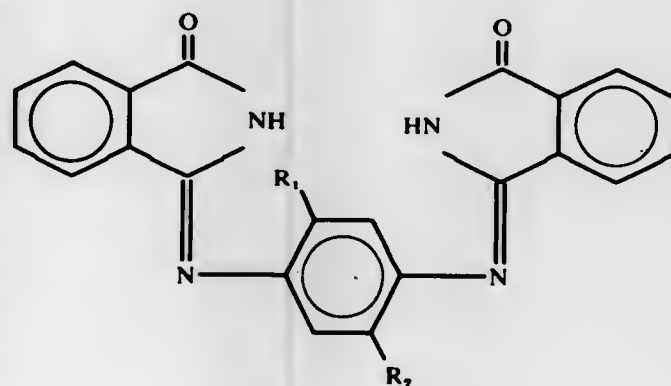
Claims priority, application Switzerland, Dec. 6, 1974, 16232/74

Int. Cl.² C07D 209/50

U.S. Cl. 106—288 Q

9 Claims

1. A pigment, being a co-condensate mixture of two compounds of formula I,



wherein

R₁ is chloro, bromo, fluoro, methyl, methoxy or ethoxy, and R₂ is hydrogen or has one of the significances of R₁, wherein one of the compounds in said mixture is present in an amount of from 20 to 70 mol % and the other compound in an amount of from 80 to 30 mol %.

4,008,098

PROCESS AND APPARATUS FOR CONTINUOUSLY PRODUCING A HIGH CONCENTRATION SUGAR SOLUTION

Walter Dietzel; Siegfried Matusch; Helmut Schaper, and Erwin Zeichner, all of Braunschweig, Germany, assignors to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed Dec. 10, 1975, Ser. No. 639,223

Claims priority, application Germany, Nov. 11, 1974, 2550496

Int. Cl.² B04B 15/00; C13F 1/00

U.S. Cl. 127—19

12 Claims

1. A process for continuously centrifuging massecuite to produce sugar crystals and again dissolving said sugar crystals to produce a sugar solution, comprising continuously introducing massecuite into a centrifuge having a centrifuging basket with an upper rim, to produce sugar crystals, pressurizing a liquid solvent, continuously contacting said sugar crystals with said pressurized liquid solvent by directing jets of said pressurized liquid solvent onto the sugar crystals where these sugar crystals pass over said upper rim of the centrifuging basket to thereby generate a turbulent flow of a liquid solvent

4,008,100

SHEATH FOR TUBULAR STORAGE BATTERY ELECTRODES AND METHOD FOR THEIR PRODUCTION

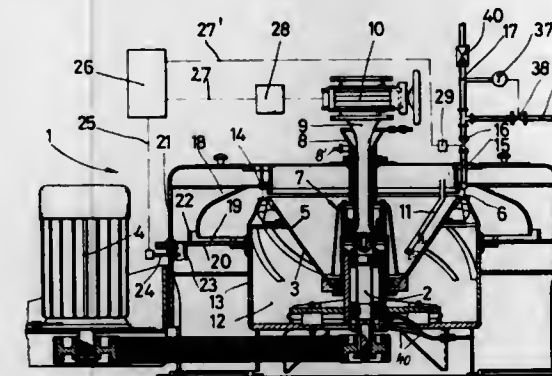
Erik G. Sundberg, Nol, and Erik Westberg, Lidingo, both of Sweden, assignors to Aktiebolaget Tudor, Sundbyberg, Sweden

Division of Ser. No. 533,499, Dec. 17, 1974, Pat. No. 3,972,728. This application Mar. 8, 1976, Ser. No. 664,997
Claims priority, application Sweden, Dec. 17, 1973, 7316973; Aug. 26, 1974, 74107699

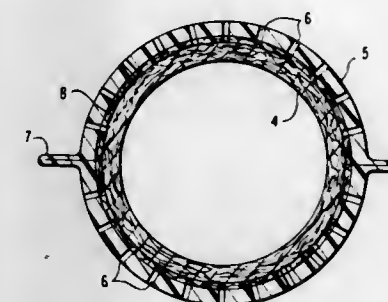
Int. Cl.² H01M 4/80

U.S. Cl. 29—623.4

7 Claims



guiding said enveloped sugar crystals along said guide means into a back-up zone of sugar solution, and driving the sugar solution together with air and liquid mist through a gap and over a damming wall out of the centrifuge.



1. A method for producing a sheath for a tubular storage battery electrode which comprises heating a layer of an electro-chemically inert fibrous material, adding thereto a porous foraminous layer of thermoplastic material, whereby the heated fibrous material causes at least local softening of the thermoplastic layer to enable at least surface fibers to become embedded in the softened thermoplastic surface without materially reducing the porosity of the foraminous layer, and forming a tubular sheath from the combined double layer.

4,008,101

METHYLENE CHLORIDE PHOSPHATIZING

Edward A. Rowe, Jr., and William H. Cawley, both of Lake County, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Mar. 20, 1975, Ser. No. 560,378

Int. Cl.² C23F 7/10

U.S. Cl. 148—6.15 R

46 Claims

1. A methylene chloride and water-containing liquid composition having a continuous and homogeneous liquid phase suitable for phosphatizing metal with a coating of at least substantial water insolubility, with said liquid phase containing water in minor amount, which composition comprises methylene chloride, solubilizing solvent capable of solubilizing phosphoric acid in methylene chloride, a phosphatizing proportion of phosphoric acid, and water in an amount exceeding said proportion of phosphoric acid, while being sufficient for said composition to provide a phosphatized coating of substantial water insolubility, and while retaining liquid phase homogeneity.

4,008,102

METHOD OF THE MANUFACTURE OF A SUPERCONDUCTOR WITH A LAYER OF THE A-15 PHASE OF THE SYSTEM Nb-Al-Si

Alfred Muller, and Arno Fink, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Oct. 31, 1974, Ser. No. 519,679

Claims priority, application Germany, Nov. 2, 1973, 2355005

Int. Cl.² C23C 1/00; C21D 1/00; C22F 1/18

U.S. Cl. 148—6.11

7 Claims

1. In a chemoelectric battery comprising a plurality of bipolar electrodes; each electrode including an electrically conductive separating wall which is impermeable to electrolyte, negative electrode material disposed on one side of said separating wall, and positive electrode material disposed on the other side of said separating wall, said electrodes being separated by an electrolyte-containing chamber, the improvement wherein each electrolyte chamber includes a gas lock, with the gas locks being fluidly interconnected by means of fluid conduits, said conduits communicating with said gas locks at a level disposed below the top of the electrolyte chamber.

- preparing a melt having the composition $AL_{0.5}Si_{0.5}Nb_{0.5}$;
- heating said melt to a temperature between 850° and 1300° C;
- passing said niobium carrier through said melt and thereafter;
- annealing said carrier with a deposited layer of said melt at a temperature between 1800° and 1950° C for at least 0.5 seconds.

4,008,103

PROCESS FOR THE MANUFACTURE OF STRONG TOUGH STEEL PLATES

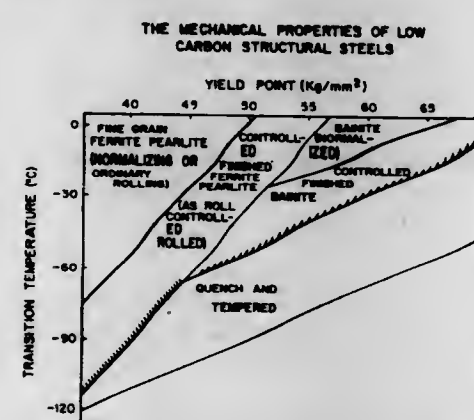
Eiji Miyoshi, Nishinomiya; Minoru Fukuda, Itami; Yasuhiko Hagiwara, Wakayama, and Yasuhiro Asai, Ibaragi, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Japan Continuation of Ser. No. 408,950, Oct. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 144,534, May 18, 1971, abandoned. This application Sept. 17, 1975, Ser. No. 613,996

Claims priority, application Japan, May 20, 1970, 45-43563; May 25, 1970, 45-45021; June 11, 1970, 45-50898; July 1, 1970, 45-58009; Sept. 19, 1970, 45-82373; Sept. 19, 1970, 45-82374

Int. Cl.² C21D 7/14

U.S. Cl. 148—12 F

14 Claims



1. A method for the manufacture of a high strength and tough steel plate from a steel comprising 0.03 – 0.30% of carbon, not more than 1.5% of silicon, 0.5 – 4.0% of manganese and the balance essentially of iron, the method comprising the steps of: applying a primary rolling step by heating the steel to a temperature higher than 1000° C; rough rolling the heated steel to obtain a steel plate of a suitable intermediate thickness; cooling down the rough rolled steel plate to a temperature lower than 650° C; reheating the cooled steel plate to a temperature of 800° to 1000° C; and applying a secondary rolling step by finish rolling the reheated steel plate within the range of temperature of from 680° to 850° C and with the total reduction in thickness of not less than 30% on the basis of the steel plate thickness when said finishing rolling is started.

4,008,104

METHOD FOR DEPHOSPHORIZATION AND DENITRIFICATION OF AN ALLOY CONTAINING EASILY OXIDIZABLE COMPONENTS

Yasushi Nakamura; Michihisa Iton, both of Tokyo; Takamasa Ohno, Hikari, and Hidetake Ishikawa, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan Filed May 5, 1975, Ser. No. 574,696

Claims priority, application Japan, May 9, 1974, 49-50706 Int. Cl.² C21D 1/68; B23K 35/34

U.S. Cl. 148—13.1

6 Claims

1. A method for removing phosphorus and nitrogen from an alloy containing easily oxidizable components which comprises bringing the alloy in the solid phase thereof into contact with a flux composition comprising

- at least one member selected from the group consisting of metallic Ca, Mg, Ba and Sr, and

- at least one member selected from the group consisting of calcium halide, magnesium halide, barium halide and strontium halide
- at a temperature not less than the melting point of said flux composition but not more than the melting point of said alloy.

4,008,105

MAGNETIC MATERIALS

Sumio Yuda; Tohru Sawada, and Kohji Moriya, all of Warabi, Japan, assignors to Warabi Special Steel Co., Ltd., Warabi, Japan

Filed Apr. 22, 1975, Ser. No. 570,475

Int. Cl.² H01F 1/02

U.S. Cl. 148—101

5 Claims

1. A ductile permanent magnetic composition exhibiting a residual flux density greater than 10,100 gauss and a coercive force greater than 540 that can be cold drawn from a specimen diameter of 10 mm through a die having a diameter of less than 9.8 mm without breaking and is characterized by small grain structure in the α phase when cooled in water in the order of 20° C. which composition consists essentially of 0.03 to 3.5% by weight of zirconium, 10 to 35% by weight cobalt, 25 to 40% by weight chromium and the balance being iron and incidental impurities.

4,008,106

METHOD OF FABRICATING III-V PHOTOCATHODES

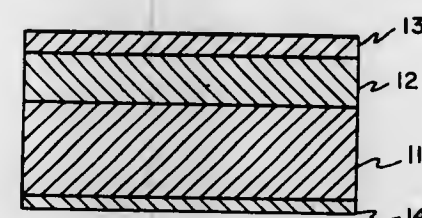
William A. Gutierrez; Herbert L. Wilson, both of Woodbridge, and Edward M. Yee, Alexandria, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 13, 1975, Ser. No. 631,589

Int. Cl.² H01L 21/208, 21/205

U.S. Cl. 148—172

1 Claim



1. A method of fabricating a III-V compound transmission mode photocathode comprising the steps of: preparing a single crystal III-V compound substrate window for epitaxial growth by chemically polishing the growth surface; growing by liquid phase epitaxy an intermediate III-III-V compound layer onto the prepared surface of the seed crystal; optically polishing the exposed surface of the resultant intermediate layer; protecting the polished surface of the intermediate layer by the vapor phase epitaxial growth of a nucleating layer of III-V material thereon; removing the nucleating layer by an etchback technique immediately prior to growing by liquid phase epitaxy a III-V photoemitting layer upon the nucleated surface of the intermediate layer; growing a liquid phase epitaxy III-III-V compound protective layer upon the photoemitting layer during the same growth cycle but at the termination of the growth of the emitting layer; preferentially chemically removing the III-III-V compound protective layer from the emitting layer; and activating the surface of the electron emitting layer to a state of negative electron affinity, thereby effecting a functional photocathode.

4,008,107

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES WITH LOCAL OXIDATION OF SILICON SURFACE

Akio Hayasaka, Kodaira; Hideo Noda, Oume; Michio Suzuki, Hino, and Hiroyuki Kondo, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

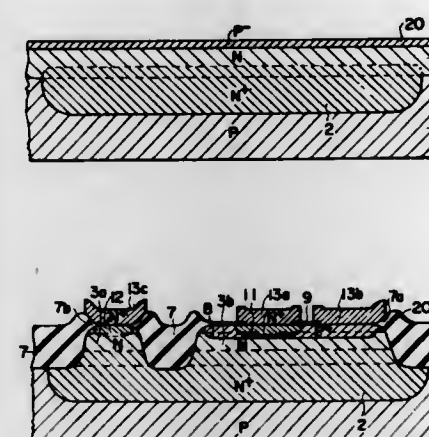
Filed Dec. 19, 1973, Ser. No. 426,352

Claims priority, application United Kingdom, Sept. 27, 1973, 45236/73

Int. Cl.² H01L 21/76, 27/04

U.S. Cl. 148—175

3 Claims



1. A method for manufacturing a semiconductor device comprising the succeeding steps of:

- providing a semiconductor substrate of a first conductivity type, said semiconductor substrate having a semiconductor region of a second conductivity type opposite said first conductivity type formed at the surface thereof;
- forming a first semiconductor layer of said second conductivity type on said semiconductor substrate so as to bury said semiconductor region thereunder;
- forming a second semiconductor layer of said first conductivity type and having a relatively low impurity concentration over the entire surface of said first semiconductor layer whereby a first PN junction between said first and second layers is formed;
- selectively forming a mask material which is impermeable to oxygen on at least one predetermined portion of said second semiconductor layer;
- selectively oxidizing said first and second semiconductor layers except for said at least one predetermined portion so that an oxide region having an oxide beak extending between the edge of said mask material and the portion of said second semiconductor layer thereunder is formed, whereby said first PN junction terminates at the side surface of said oxide region;
- removing said mask material thereby exposing the surface of said at least one predetermined portion of said second semiconductor layer;
- diffusing an impurity of said first conductivity type through said at least one predetermined portion into said first and second semiconductor layers while using said oxide region as a mask for the impurity diffusion so as to form a first diffused region of said first conductivity type having a relatively high impurity concentration and defining a second PN junction with said first semiconductor layer, said second PN junction terminating at said first PN junction at a location spaced from the side surface of said oxide region; and
- providing an electrode in contact with said first diffused region extending over said oxide beak.

4,008,108

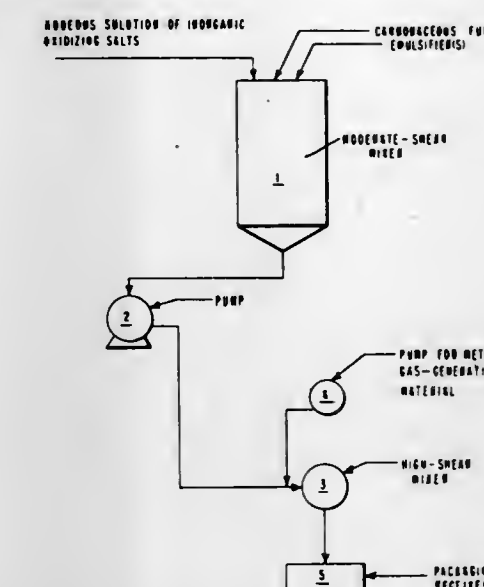
FORMATION OF FOAMED EMULSION-TYPE BLASTING AGENTS

Joseph Dean Chrisp, Hagerstown, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del. Filed Apr. 22, 1975, Ser. No. 570,952

Int. Cl.² C06B 45/00, 33/02, 31/30, 43/00

U.S. Cl. 149—2

25 Claims



1. In a method of chemically foaming an emulsion comprised of oxidizing salt, carbonaceous fuel, water and emulsifier to form a blasting agent wherein a gas-generating material is injected into the emulsion and the injected emulsion is subjected to work, said gas-generating material reacting with gas evolution so as to foam said emulsion and thereby decrease the density thereof, the improvement comprising injecting the gas-generating material into a stream of the emulsion, subjecting the injected stream to work only before more than about 50 percent of the total density decrease that is attainable by the full foaming of said emulsion has occurred, and delivering the injected stream into packaging receivers where the remainder of the density decrease takes place, whereby a substantially uniform lowered density is achieved from one receiver to another.

4,008,109

SHAPED HEAT INSULATING ARTICLES

Gerard Norton, Vancouver, Canada, assignor to Chemincon Incorporated, Southfield, Mich.

Filed July 1, 1975, Ser. No. 592,331

Int. Cl.² C06B 33/00; B28B 7/28; C04B 43/00

U.S. Cl. 149—37

12 Claims

1. In a shaped heat insulating article for forming a molten-metal contacting lining for metallurgical moulds or the like which comprises a refractory composite having a high infrared radiation opacity and consisting essentially of an inorganic fibrous refractory material and a granular refractory filler material, an exothermic mixture of a fuel and an oxidizing agent, and a binder; the improvement wherein said fibrous refractory material is a material selected from the group consisting essentially of aluminosilicate, zircon and alumina fibres and said shaped article has a density of about 0.25 to 0.55 grams per cubic centimeter.

4,008,110

WATER GEL EXPLOSIVES

Oldrich Machacek, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed July 7, 1975, Ser. No. 593,307

Int. Cl.² C06B 31/28, 33/08, 31/12, 25/36

U.S. Cl. 149—46

39 Claims

1. A method for producing a surfactant free water gel explosive composition having lasting stability comprising the steps

of combining a liquid nitroparaffin having 1-3 carbon atoms in an amount of 3-30% by weight of the total composition for use as an internal dispersed phase and free of crosslinking agents, an aqueous oxidizer salt solution for use as a continuous external phase, a gelling agent soluble in water for the aqueous oxidizer solution phase, a crosslinking agent for the aqueous oxidizer solution phase, and 0.2-2.0% by weight of the nitroparaffin present of a gelling agent insoluble in water for the liquid nitroparaffin phase, incorporating voids in the above combined components, mixing the combined components to disperse the nitroparaffin phase as fine particles within the continuous aqueous oxidizer salt solution phase, and simultaneously gelling in situ the dispersed nitroparaffin phase and the aqueous salt solution phase by continuing the mixing until a predetermined viscosity of the gel is achieved.

4,008,111

AIN MASKING FOR SELECTIVE ETCHING OF SAPPHIRE

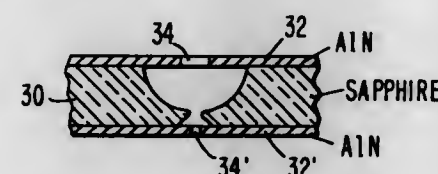
Richard Frederick Rutz, Cold Spring, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,740

Int. Cl.² B29C 17/08; C23F 1/02; H01L 7/50

U.S. Cl. 156-656

26 Claims



1. A method of etching Al_2O_3 including the steps of:
 - a. depositing an AlN film with a predetermined pattern on said Al_2O_3 ; and
 - b. heating said Al_2O_3 in the presence of an Al_2O_3 etchant whereby said Al_2O_3 is etched in said predetermined pattern.

4,008,112

METHOD OF MAKING AN OPTICAL WAVEGUIDE COUPLER

Michael Robert Matthews, London, England, assignor to The Post Office, London, England

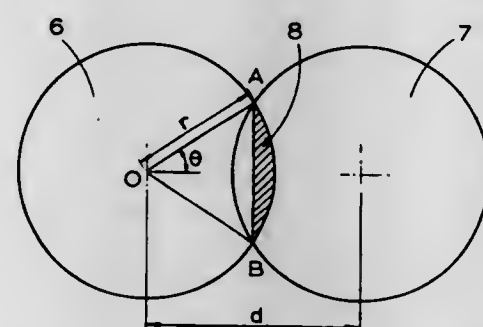
Division of Ser. No. 497,095, Aug. 13, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,607

Claims priority, application United Kingdom, Aug. 24, 1973, 40221/73

Int. Cl.² C03C 15/00, 25/06

U.S. Cl. 156-644

5 Claims



1. A method of making a dielectric optical waveguide coupler in the form of a hollow tube, with a bore which tapers inwardly from at least one end toward a central capillary sized bore, the steps comprising:
 - (1). Providing a dielectric tube having a capillary bore extending out of at least one end of said tube, with a liquid filling said bore;
 - (2). Immersing at least one end of said tube in an etchant for said tube, said etchant being miscible in said liquid.

4,008,113

HIGH VOLTAGE CABLE

Fritz Glander, Isernhagen, and Hermann Uwe Voigt, Langenhagen, Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

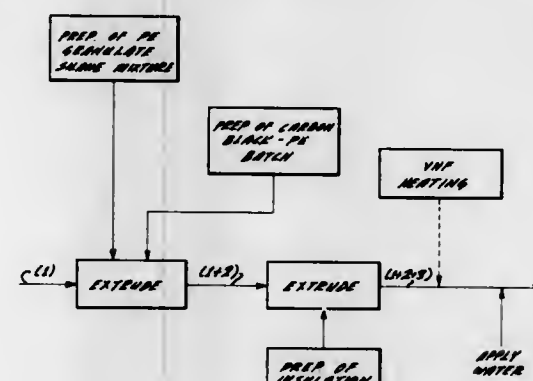
Filed May 20, 1975, Ser. No. 579,193

Claims priority, application Germany, May 11, 1974, 2422914

Int. Cl.² H01B 3/10

U.S. Cl. 156-52

5 Claims



1. Method of making a cable, comprising the steps of:
 - providing a cross-linking, not yet cross-linked, electrically conductive, first layer around a conductor or conductor assembly as overall surface finishing and conductive coating, the first layer requiring thermal energy for cross-linking;
 - providing a cross-linking, not yet cross-linked graft-polymeric second layer onto said first layer;
 - causing said first layer to cross-link through thermal energy conducted from the second to the first layer but without conduction of thermal energy into the second layer from the outside of said first and second layer; and
 - causing the second layer to cross-link in the presence of moisture.

4,008,114

MACHINE FOR WRAPPING TAPE ON A PIPE INCLUDING IMPROVED MEANS OF CONTROLLING THE TENSION ON THE TAPE

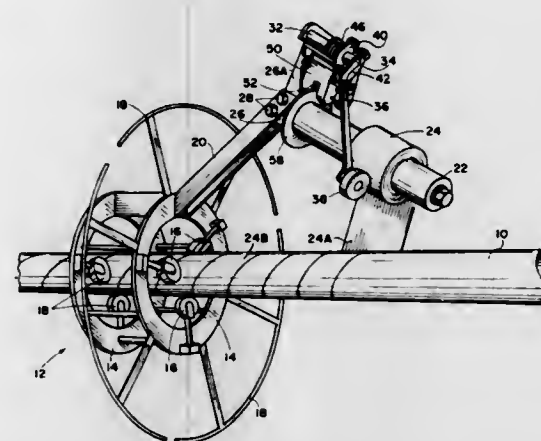
Clifford P. Lindsey, Sapulpa, Okla., assignor to Midwestern Manufacturing Company, Tulsa, Okla.

Filed Sept. 15, 1975, Ser. No. 613,337

Int. Cl.² B65H 81/00

U.S. Cl. 156-392

3 Claims



1. A machine for wrapping tape on a pipe including improved means of controlling the tension on the tape, comprising:
 - a bracket supported for simultaneous rotation around and axial advancement along a pipe;
 - a spindle rotatably supported to the bracket and adapted for receiving a roll of tape thereon;
 - a brake disc coaxially mounted and rotated with said spindle;

a brake housing having a slot therein receiving the outer peripheral area of said disc;
 a movable brake pad;
 an opening in said brake housing having a said brake pad longitudinally positionable therein, one surface of the brake pad contacting said disc;
 a rotatable cam plate having a cam surface thereon, the cam plate being supported in proximity to said brake pad;
 a longitudinally positionable cam follower having one end in engagement with said brake pad and the other in engagement with said cam plate, the pressure exerted by said cam follower pushing said brake pad into increased frictional contact with said disc being determined by the rotational position of said cam plate;
 a follower arm having the inner end pivotally supported to said bracket and having the outer end in engagement with the external periphery of a roll of tape mounted on said spindle;
 a first linkage arm extending from said cam plate normal to the rotational axis thereof; and
 a second linkage connected to said follower arm adjacent the inner pivoted end, the outer ends of the first and second linkage arms being pivotally secured to each other, whereby increased frictional contact of said brake pad with said brake disc is achieved in proportion to the diameter of the roll of tape on said spindle.

4,008,115

METHOD FOR MAKING DURABLE OVERCOATED LABELS

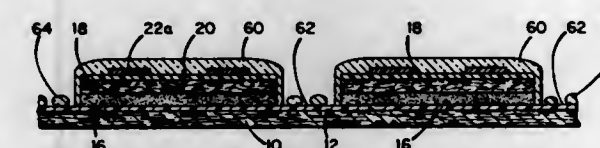
Daniel F. Fairbanks, Needham; Frank A. Magnotta, Framingham, and Warren R. Pitts, Winchester, all of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Feb. 25, 1976, Ser. No. 661,401

Int. Cl.² B31B 31/00; B29C 19/02

U.S. Cl. 156-267

16 Claims



14. A method of making a series of laid-on labels each of which has a solvent and abrasion resistant overcoating, the labels being spaced apart on a temporary carrier web from which each label is individually removable, said method comprising as steps

- a. applying adhesion-promoting tie coat means to the surface of a laminate comprising a carrier web having a release surface, an adhesive in contact with said release surface, and a label base layer, said tie coat being applied to said base layer and being adapted to improve the adhesion to said base layer of inks and coatings subsequently applied thereto;
- b. printing indicia over said tie coat to form a plurality of printed labels;
- c. die-cutting through all of said layers except said carrier web in the peripheral outline of said labels, thereby forming a skeleton of surplus material between labels;
- d. stripping away said skeleton;
- e. moving said carrier web and plurality of labels along a path at a linear speed of at least about 75 feet per minute;
- f. forming a continuous film over the surface of said labels and a discontinuous film over the carrier web release surface exposed between labels by applying, in at least two applications, to the carrier web and labels moving along said path a thin layer of liquid curable by exposure to ultra-violet radiation, said liquid containing a photoinitiator sensitive to ultra-violet radiation and wetting agent means for improving the wetting of the surface of

said labels by said liquid, said liquid having a viscosity less than about 100 seconds as measured by a No. 2 Zahn cup, said liquid wetting the surface of said labels but not wetting the exposed release surface of said carrier web, the liquid forming over said exposed release surfaces by surface tension beads of liquid substantially unconnected to the continuous films over said labels, and thereafter passing said labels and carrier web in air under a source of ultra-violet radiation sufficient to cure said liquid films over the labels to a solvent and abrasion resistant overcoating layer.

4,008,116

ADHESIVES BASED UPON POLYVINYL ALCOHOL AND STARCH

Hans-Georg Sebel, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Dec. 18, 1974, Ser. No. 533,981

Claims priority, application Germany, Dec. 24, 1973, 2364438

Int. Cl.² C09T 3/02

U.S. Cl. 156-328

12 Claims

1. An aqueous adhesive solution consisting essentially of:
 - a. 12% to 25% by weight of a polyvinyl alcohol which is water-soluble in the range, 10° C.-30° C.,
 - b. an unmodified unboiled unoxidized alkali hydrolyzed neutralized starch, the weight ratio of said polyvinyl alcohol to said starch being 65% - 85% : 15% - 35%,
 - c. 0.1% to 1.0% by weight of an inorganic thickening agent, and
 - d. water.
9. In a process for adhesively bonding together two substrates wherein an aqueous adhesive solution is applied to at least one of said substrates, said substrates are placed together with said solution therebetween as an intermediate adhesive layer, and said intermediate layer is dried: the improvement wherein the solution of claim 1 is said adhesive layer.

4,008,117

APPARATUS FOR BONDING AND PLATING WITH EXPLODING FOIL

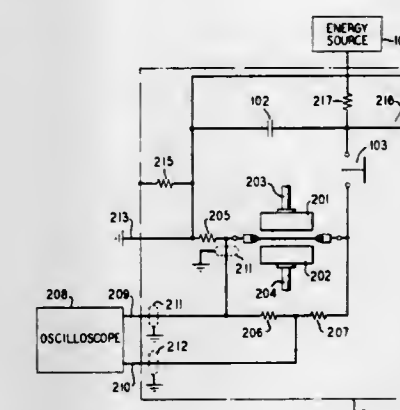
Gay Leon Dybwad, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 362,191, May 21, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,774

Int. Cl.² B23K 11/26; C03C 27/08; C23C 13/08

U.S. Cl. 156-380

13 Claims



1. A system for bonding a pair of workpieces comprising, in combination,
 - a metal foil,
 - means for positioning said foil between said workpieces in an area to be bonded,
 - energy storage means,
 - means for supplying electrical energy to said energy storage means, and
 - means for discharging said electrical energy stored in said energy storage means into said foil, whereby said foil is

caused to explode by the current flowing therethrough, thereby bonding said workpieces, wherein said foil is characterized by at least one slit cut along a surface thereof and in a direction parallel to said current flow.

4,008,118

BUTT FUSION MACHINE

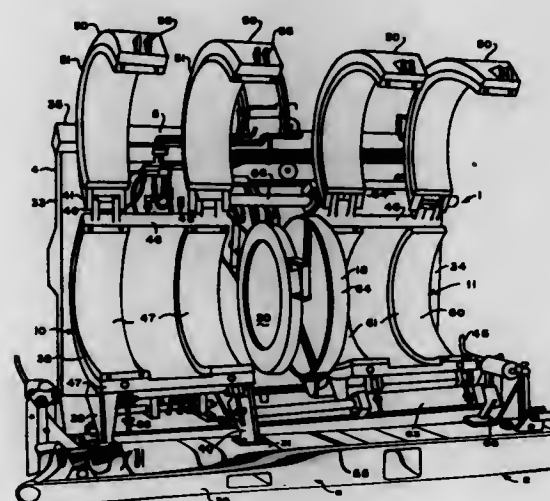
Paul E. Wesebaum, Elyria, Ohio, and Wayne E. Cooper, Bartlesville, Okla., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 30, 1975, Ser. No. 645,436

Int. Cl.² B32B 31/18, 31/20, 35/00

U.S. Cl. 156-499

7 Claims



1. In a butt fusion machine for fusing two sections of large diameter plastic pipe wherein one of said sections is clamped between upper and lower semi-cylindrical shells hinged for swinging relative to one another to form a clamp which is fixed against linear movement and one of said sections is clamped between upper and lower semi-cylindrical shells hinged for swinging relative to one another to form a clamp which is linearly movable relative to said other clamp, said clamps being axially aligned and spaced from one another, said machine being adapted to accommodate a facer and heater successively between said clamps and between butt ends of the sections of pipe held therein, the improvement comprising an L-shaped frame having a base section defining a base reference plane, and an upright section; two, axially aligned, spaced clamps mounted on said frame, each of said clamps comprising a lower semi-cylindrical shell having a mouth with one part more remote from said reference plane than another part, whereby the said mouth lies in a plane at an acute angle to said reference plane, hinge means at said part of said mouth more remote from said reference plane, and at least one swinging upper semi-cylindrical shell connected to said hinge means, one of said clamps being fixedly mounted on said frame against linear movement, the other of said clamps being movably mounted on said frame for linear movement toward and away from the fixedly mounted clamp; a carriage mounted on the upright section of said frame above the hinge axis of the upper and lower hinge shells for movement parallel to the axis of said clamps; a facer hingedly mounted on said carriage on an axis radially outboard of and substantially parallel to the axis of said clamps for selective swinging between a position intermediate said clamps and a position totally outboard of them; and a heater hingedly mounted on said carriage on an axis radially outboard of and substantially parallel to the axis of said clamps for selective swinging between a position intermediate said clamps and a position totally outboard of them independently of said facer.

4,008,119

LABELLING DEVICE

Klaus Dieter Hermann, Klingenstrasse 13, 6932 Hirschhorn, Germany

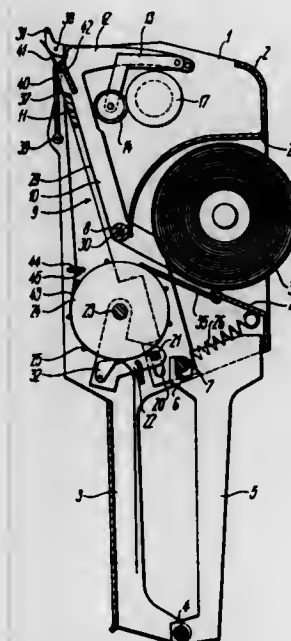
Filed June 27, 1972, Ser. No. 266,709

Claims priority, application Germany, July 8, 1971, 2134074

Int. Cl.² B65C 11/00

U.S. Cl. 156-541

14 Claims



1. Labelling device comprising:
a label supply means for supplying a backing strip with a plurality of adhesive labels attached thereto,
a deflection edge means for separating the labels from the backing strip in response to movement of the backing strip therearound,
a pressure member spaced from the deflection edge means in the direction of movement of the labels, said pressure member being engageable with a separated label which has been separated from the backing strip for pressing said separated label against an object to be labelled,
and a pusher member means engageable with the side of said separated label which was in contact with the backing strip for aiding in guiding and moving said separated label away from the deflection edge means and into engagement with said pressure member.

4,008,120

PROCESS OF DELIGNIFICATION AND BLEACHING A LIGNOCELLULOSE PRODUCT

Jacques E. Carles, and Louis J. Berge, both of Saint Gaudens, France, assignors to Groupement Europeen De La Cellulose, Paris, France

Filed Dec. 18, 1974, Ser. No. 533,774

Claims priority, application France, Dec. 21, 1973, 73.45930

Int. Cl.² D21C 9/12, 9/14

U.S. Cl. 162-89

12 Claims

1. A process for the delignification and bleaching of lignocellulose product which comprises mixing an aqueous suspension of the product with a pair of chlorine and oxygen containing compounds which are members selected from the group of pairs consisting of NaOCl/CO_2 , $\text{Ca}(\text{OCl})_2/\text{CO}_2$, and $\text{Na}_2\text{CO}_3/\text{Cl}_2$, said compounds reacting in situ to release a member of the group consisting of chlorine and oxygen and mixtures thereof, which in turn react with the lignocellulose product at a temperature of less than 100°C for less than 60 minutes to delignify and bleach said product.

4,008,121

METHOD OF CURTAIN COATING PIGMENT PARTICLES ON PAPER PLIES

John Douglas Coleman, Surrey Hills, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

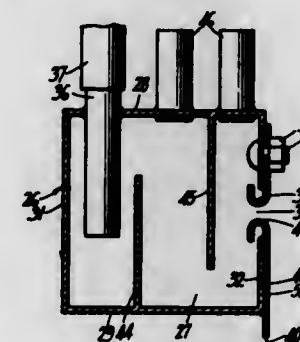
Filed Dec. 4, 1974, Ser. No. 529,584

Claims priority, application Australia, Dec. 10, 1973, 5934/73; Sept. 9, 1974, 8820/74

Int. Cl.² D21H 1/02, 1/22, 1/24

U.S. Cl. 162-124

5 Claims



1. A method of making multi-ply paperboard, comprising the steps of forming a first ply and building further plies onto the first ply, wherein a suspension of pigment particles in a liquid binder is spread on at least one of the ply surfaces onto which the further plies are formed and before the respective further ply is formed, the suspension being spread on said ply surface by moving said ply surface horizontally in an upwardly facing condition, forcing the suspension through a horizontal slot so that it wets both upper and lower edges of the slot and is extruded generally horizontally from the slot to fall downwardly under gravity across an upright surface of a wall which terminates at a bottom blade edge located above the horizontally moving said ply surface whereby to establish a falling curtain of said suspension over said surface which curtain is thinner than the vertical width of the slot and allowing the established curtain to fall away from said surface at the blade edges and thence onto said ply surface.

4,008,122

PAPER MAKING MACHINE WITH FACING FELT AND FORMING WIRE

Ernst Welte, Ravensburg, Germany, assignor to Escher Wyss G.m.b.H., Ravensburg, Germany

Filed Mar. 26, 1975, Ser. No. 562,058

Claims priority, application Switzerland, Apr. 9, 1974, 4985/74

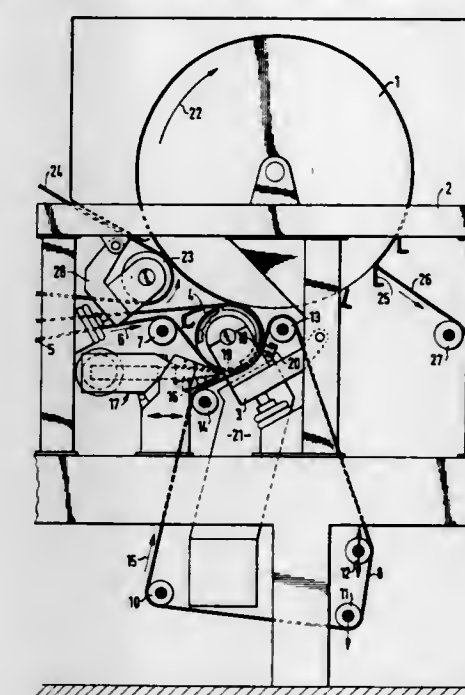
Int. Cl.² D21F 9/00

U.S. Cl. 162-290

8 Claims

1. A paper making machine comprising a breast box system having a duct for delivering paper pulp; a movable wire on one side of said breast box system to receive the pulp;
a felt web on an opposite side of said breast box system in facing relation to said wire to form a paper web of the pulp between said wire and said felt web;
a drying roll; and
a plurality of guide rolls (a) for guiding said felt web and said wire into facing relation with said felt and said wire passing over a part of the circumference of one of said rolls to press said wire against said felt web to form the paper web therebetween and (b) for guiding said felt web and said wire away from each other to permit transfer of the paper web to said drying roll from the felt web, said

one of said guide rolls being positioned at a point of separation of the paper web from said wire and being



pressed in the direction of said drying roll for pressing said felt web and the paper web against said drying roll.

4,008,123

BEAM-DEFLECTION COMPENSATING STRUCTURE FOR HEADBOXES

Alvi Kirjavainen, Jyväskylä, Finland, assignor to Valmet Oy, Helsinki, Finland

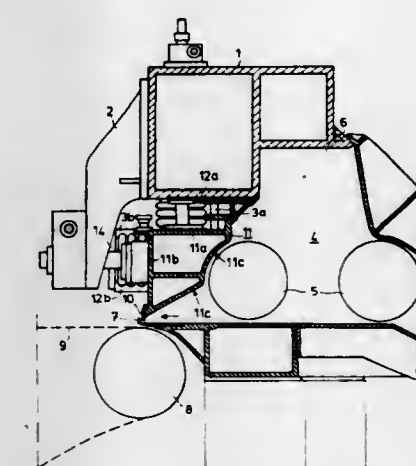
Filed July 3, 1975, Ser. No. 592,985

Claims priority, application Finland, July 8, 1974, 2096/74

Int. Cl.² D21F 1/02

U.S. Cl. 162-336

6 Claims



1. In a headbox apparatus of a paper machine, an elongated beam and support means supporting said beam at least at a pair of locations situated inwardly of the ends of the beam and spaced from the center thereof so that due to loading, temperature-differential, and the like said beam tends to become deflected from a straight condition to a curved condition where the beam extends along a curve extending between said locations and beyond the latter to the ends of said beam, and force means engaging said beam at the region of said ends thereof for opposing the tendency of said beam to assume said deflected condition, said support means including a frame means and a connecting means connecting said beam to said frame means to be supported by the latter at said locations, said force means being capable of expansion and contraction and being situated between said frame means and beam at the region of the ends of the latter, said beam and frame means forming part of a front wall structure of the headbox, said beam being situated at a lower part of said front wall structure

and having a lower edge region carrying structure which forms an upper lip of a slice of the headbox, said frame means including an upper frame member situated over and extending along said beam while being spaced therefrom and said force means including an upper pair of expandable and contractable units situated between said upper frame member and said beam at the region of the ends thereof.

4,008,124

PROCESS FOR THE ISOMERIZATION OF GLUCOSE INTO FRUCTOSE

Yoshimasa Fujita, Tokyo; Akioyoshi Matsumoto, Hino; Hachiro Ishikawa, Chofu; Tadashi Hishida; Hideo Kato, both of Tokyo, and Hiroshi Takamizawa, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd. and Seikagaku Kogyo Co., Ltd., both of Tokyo, Japan
Filed June 20, 1975, Ser. No. 588,823

Claims priority, application Japan, June 26, 1974, 49-73125
Int. Cl.² C12D 13/02

U.S. Cl. 195—31 F

12 Claims

1. A process for the isomerization of glucose into fructose by contacting an aqueous glucose solution with glucose isomerase wherein iron ion together with magnesium ion is present in the reaction mixture at concentrations of 0.005 to 5 mm/l and 2 to 20 mm/l, respectively.

4,008,125

NEW CYCLOPENTENE-DIOLS AND NEW ACYL ESTERS THEREOF AND PROCESS FOR THEIR PREPARATION

Seizi Kurozumi; Takeshi Toru; Toshio Tanaka; Shuzi Miura; Makiko Kobayashi; Sadakazu Matsubara, all of Hino, and Sachio Ishimoto, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 10, 1975, Ser. No. 630,711

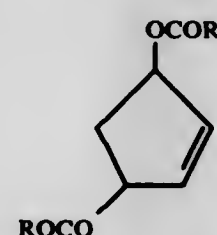
Claims priority, application Japan, Dec. 26, 1974, 49-148263; Dec. 26, 1974, 49-148266; Mar. 13, 1975, 50-29486; Apr. 17, 1975, 50-45793; Apr. 18, 1975, 50-46525; Apr. 21, 1975, 50-47408

Int. Cl.² C12D 13/02

U.S. Cl. 195—51 R

10 Claims

1. A process for converting a diacyl ester of cyclopent-1-en-3,5-diol to its monoacyl ester and/or its diol which comprises subjecting a diacyl ester of cyclopent-1-en-3,5-diol of the formula



wherein R is a monovalent hydrocarbon residue of 1-10 carbon atoms, said diacyl ester of cyclopent-1-en-3,5-diol containing at least one member of the group consisting of

1. a diacyl ester of (R)-trans-cyclopent-1-en-3,5-diol,
2. a diacyl ester of (S)-trans-cyclopent-1-en-3,5-diol, and
3. a diacyl ester of cis-cyclopent-1-en-3,5-diol,

to the action of a microorganism or enzyme having a selectivity in its rate of hydrolyzing the acyloxy group of (R) configuration and the acyloxy group of (S) configuration of said diacyl ester, selected from the group consisting of a yeast of the species *Saccharomyces*, a hydrolytic enzyme contained in the rinds of citrus fruits, a hydrolytic enzyme obtained from the filamentous fungus of the genus *Aspergillus*, or a hydrolytic enzyme contained in wheat germ.

4,008,126

IMMOBILIZATION OF PROTEINS BY IN-SITU POLYMERIZATION

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 15, 1976, Ser. No. 666,819
Int. Cl.² C07G 7/02

U.S. Cl. 195—63

18 Claims

1. In the process for immobilizing a protein on a support to form a biological active composite, the improvement comprising the steps of:

selecting a protein having the sum total of one-half of the cystine amino acid residues plus the cysteine amino acid residues equaling at least about 14 per mole of said protein;
depositing said protein on an inert support to form a protein/support composite; and
maintaining said composite at a pH which facilitates polymerization of said protein and maintaining said composite at a temperature and for a time sufficient to polymerize said protein and immobilize said protein in-situ on said support.

4,008,127

PROCESS FOR THE PREPARATION OF CHOLESTEROL OXIDASE

Wolfgang Gruber, Tutzing-Unterzeismering; Hans Ulrich Bergmeyer, Tutzing, Upper Bavaria; Michael Nelboeck-Hochstetter, Tutzing, Upper Bavaria; Klaus Beaucamp, Tutzing, Upper Bavaria; Günter Holz, Alchach; Johanna Gramsall, and Günter Lang, both of Tutzing, Upper Bavaria, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

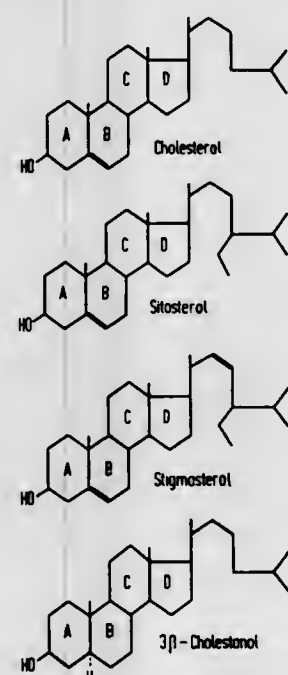
Filed Nov. 20, 1975, Ser. No. 633,997

Claims priority, application Germany, Nov. 29, 1974, 2456586

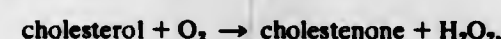
Int. Cl.² C12D 13/10

U.S. Cl. 195—65

14 Claims

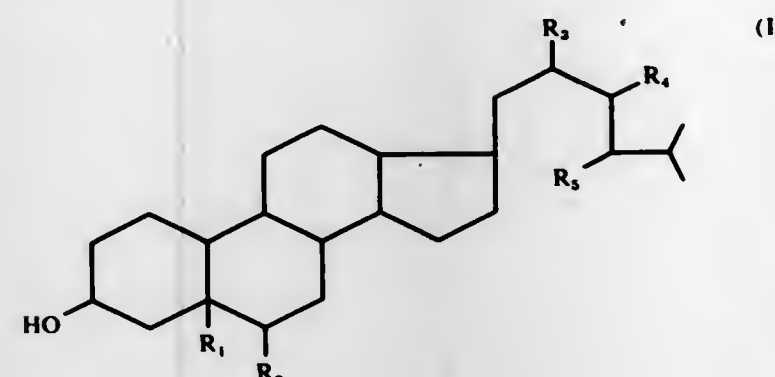


1. Process for the preparation of cholesterol oxidase, capable of catalyzing the oxidation of cholesterol according to the equation



which process comprises culturing *Nocardia erythropolis* ATCC 17895, *Nocardia erythropolis* ATCC 4277, *Nocardia formica* ATCC 14811 or *Proactinomyces erythropolis* NCIB 9158 first on a peptone-containing mineral salt medium and thereafter on at least one sterol compound as the sole source of carbon, and then isolating the cholesterol oxidase formed

from the cultured micro-organisms, wherein said sterol compound is of the formula



in which

R₁ and R₂ are hydrogen or together represent a double bond.
R₃ and R₄ are hydrogen or together represent a double bond; and
R₅ is hydrogen or alkyl containing up to 3 carbon atoms.

4,008,128

TUBE FURNACE, ESPECIALLY FOR THE CRACKING OF HYDROCARBONS

Armin Dörner, Balerbrunn, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

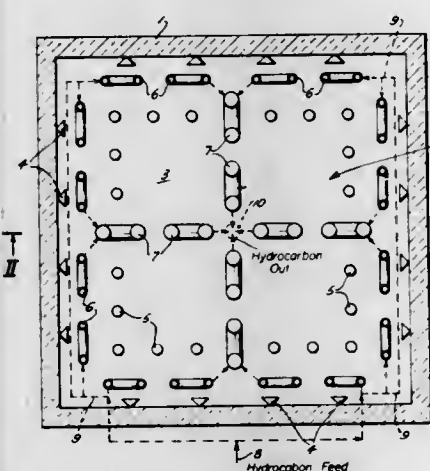
Filed May 6, 1974, Ser. No. 467,605

Claims priority, application Germany, May 9, 1973, 2323234

Int. Cl.² B01D 1/12; C10G 9/18

U.S. Cl. 196—110

3 Claims



1. In a tube furnace for the thermal cracking of hydrocarbons, said tube furnace comprising:
a rectangular combustion chamber having a plurality of angularly adjoining vertical walls and a floor,
a multiplicity of burners disposed along said walls and on said floor,
a pair of undulating first tubes along each of said walls and at least one undulating second tube of larger flow cross section than each of the respective first tubes in said chamber communicating with the respective pair of first tubes,
said first and second tubes all being formed with vertical conduit stretches interconnected by upper and lower bends,
feed means for feeding hydrocarbons to be cracked to said first tubes, and
outlet means for withdrawing cracked hydrocarbons from said second tube,
the improvement wherein:
a. each pair of said first tubes lies in a single plane parallel to and inwardly of the respective wall;
b. each of said second tubes lies in a plane perpendicular to

the plane of the pair of the respective first tubes and the latter lie to opposite sides of the plane of the respective second tube;

c. said second tubes meet at said outlet means and said outlet means is disposed at the center of said chamber; and
d. said feed means is connected to said first tubes at the corners of said chamber.

4,008,129

INTERMEDIATE HEAD FOR COKE OVEN BATTERIES

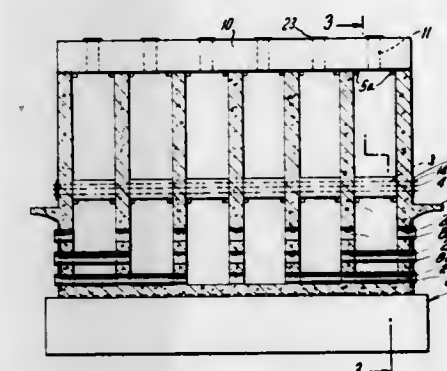
Manfred Strobel, Recklinghausen, Germany, assignor to Firma Carl Still, Germany

Filed Feb. 24, 1975, Ser. No. 552,217

Int. Cl.² C10B 29/04, 45/00

U.S. Cl. 202—268

7 Claims



1. In an intermediate coke oven head comprising spaced-apart substantially parallel steel concrete side walls, cross walls between said side walls dividing the space between said side walls into a plurality of individual compartments, the improvement comprising an aeration and ventilation system connected to said compartments comprising a plurality of air inlets arranged vertically at distinct levels one above the other and extending inwardly from each end of said intermediate head with the lowermost of said air inlets being connected to the innermost of said compartments and with successively higher inlets being connected respectively to the next successively adjacent outer compartment, and at least one air outlet connected to the top of said compartments.

4,008,130

METHOD FOR DISTILLING A TERNARY AZEOTROPE OF FLUOROSILICIC ACID, HYDROGEN FLUORIDE AND WATER

Joel F. M. Leathers, Midland, Mich., and Donald W. Calvin, Zachary, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 23, 1976, Ser. No. 660,294

Int. Cl.² B01D 3/36

U.S. Cl. 203—6

5 Claims

1. A method of distilling an aqueous solution containing H₂SiF₆ while avoiding the formation of unwanted SiO₂ during the distillation, said method comprising providing in said solution at least about 10 parts by weight of HF and at least about 54 parts by weight of H₂O for each 36 parts by weight of H₂SiF₆, subjecting the solution to distillation to remove low boiling components, and continuing said distillation to separate the ternary azeotrope comprising about 36% H₂SiF₆, about 10% HF, and about 54% H₂O from any higher boiling or non-volatile components.

groups having 1 to 4 carbon atoms; X and Y may be the same or different and either or both may be omitted.

4,008,139

FLUORINATED COMPOUNDS

Joseph H. Johnson; Alvin S. Gordon, both of China Lake, and William P. Norris, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1975, Ser. No. 643,271

Int. Cl.² B01J 1/10; C07C 31/34

U.S. Cl. 204—162 R

5 Claims

- 1,1,4,4-Tetrakis(trifluoromethyl)butan-1,4-diol.
- 1,1-Bis(trifluoromethyl)propanol-1.
- A method for preparing tetrakis(trifluoromethyl) butan-1,4-diol and 1,1-bis(trifluoromethyl)propanol-1 comprising the steps of:

- A. charging a transparent container with a mixture of gaseous ethane and hexafluoroacetone;
- B. exposing the container to sunlight whereby a solid fraction and a liquid fraction are achieved;
- C. separating 1,1-bis(trifluoromethyl)propanol-1 from the liquid fraction by distillation; and
- D. separating 1,1,4,4-tetrakis(trifluoromethyl)butan-1,4-diol from the solid fraction by distillation.

4,008,140

ELECTRODEPOSITED COATINGS

Peter Fritsche, Hiltrup, Germany, assignor to Glasurit Werke M. Winkelmann GmbH, Hamburg, Wandsbek, Germany

Continuation of Ser. No. 149,792, June 3, 1971, abandoned.

This application Aug. 20, 1973, Ser. No. 389,794

Claims priority, application Germany, June 4, 1970, 2027428

Int. Cl.² C08L 61/06

U.S. Cl. 204—181

2 Claims

1. Coatings on electrically conductive bases produced by connecting said bases as the anode and dipping them into a liquid aqueous coating composition containing:

- I. about 10 – 50 percent by weight of a non-heat reactive phenol-aldehyde resin; and
- II. about 50 – 90 percent by weight of a copolymer acrylic resin, said copolymer resin containing sufficient water-soluble amine compound to impart anionic polyelectrolyte behavior, said copolymer acrylic resin comprising:
 - a. about 50 – 85 percent by weight of an ester of acrylic acid or methacrylic acid with an alcohol having 1 – 10 carbon atoms;
 - b. about 5 – 20 percent by weight of a compound selected from the group consisting of drying oil or drying oil fatty acids containing olefinically unsaturated acids;
 - c. about 5 – 15 percent by weight of an α,β -olefinically unsaturated carboxylic acid having 3 – 5 carbon atoms; and
 - d. about 3 – 20 percent by weight of an amide selected from the group consisting of acrylamide, methacrylamide, methylol acrylamide, methylol methacrylamide, an ether of methylol acrylamide with an alcohol having 1 – 8 carbon atoms, an ether of methylol methacrylamide with an alcohol having 1 – 8 carbon atoms and mixtures thereof, the improvement comprising, dispersing additionally in said liquid aqueous coating composition a solution of cyclized rubber, the ratio of weight between cyclized rubber and the weight of said coating composition of I and II being from about 40 – 70 percent cyclized rubber to about 30 – 60 percent coating composition of I and II and air drying the electrodeposited coating at a temperature between about room temperature and 85° C, said cyclized rubber having a specific gravity of about 0.97 – 1.02, a melting point of about 135° – 150° C and a viscosity of about 700 – 1050 seconds as measured in a viscosimeter at 50 percent

solution of analytical benzene according to German Industrial Standard 53,211.

4,008,141

COMBINATION PH ELECTRODE

Haruo Kotani, Takatuki; Toshihiko Kunifusa, and Kazunori Sasaki, both of Kyoto, all of Japan, assignors to Horiba, Ltd., Kyoto, Japan

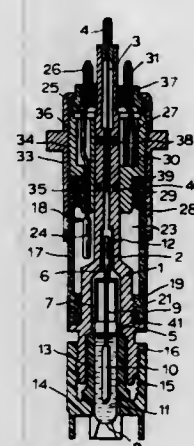
Filed Aug. 29, 1975, Ser. No. 609,150

Claims priority, application Japan, Oct. 4, 1974, 49-114970

Int. Cl.² G01N 27/36

U.S. Cl. 204—195 G

1 Claim



1. A combination electrode for measuring pH values, comprising: a central body having a glass electrode receiving recess therein with a contact pin having a lead pin receiving recess therein at the internal end of said glass electrode receiving recess; a glass electrode having a glass membrane, an internal electrode in said glass membrane, a cap and a lead pin thereon with an internal lead extending from said internal electrode to said lead pin, said glass electrode being removably fitted into said glass electrode receiving recess with said lead pin in said lead pin receiving recess, the glass membrane projecting beyond the end of said central body; a protecting cap removably mounted on said central body around said glass electrode and having a lower open end projecting beyond the end of the glass membrane for protecting the glass electrode in the glass electrode receiving recess; a packing around said glass electrode in said glass electrode receiving recess and engaged by said protecting cap for being held in position in said recess; a second body mounted on said central body, defining with said bodies an internal solution receiving space, an internal electrode removably mounted in said internal solution receiving space and having a lead and a lead pin extending out of the end of the combination electrode remote from said protecting cap, a thermistor removably mounted in said second body and having leads and lead pins extending out of the end of said combination electrode remote from said protecting cap, a further lead pin connected to said contact pin in said central body also extending out of the end of the combination electrode remote from said protecting cap, and a second protecting cap removably mounted around the outside of said second body.

4,008,142

APPARATUS FOR OPERATING THE FURNACES OF AN ELECTROLYSIS PLANT

Christfried Doring, Langensendelbach; Johann Thomas, Erlangen; Manfred Volcker, Nurnberg; Volker Sparwald, Grevenbroich, and Walter Habersack, Stade, all of Germany, assignors to Siemens Aktiengesellschaft, Munich and Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, both of Germany

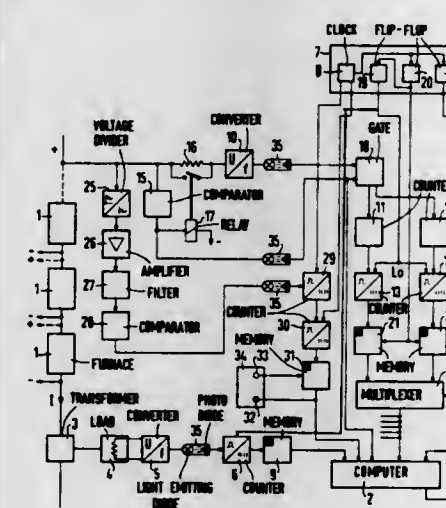
Filed July 25, 1974, Ser. No. 491,699

Claims priority, application Germany, July 25, 1973, 2337797

Int. Cl.² C25C 3/06, 3/16

U.S. Cl. 204—225

9 Claims



1. In an apparatus for operating an electrolysis plant including a plurality of furnaces, and in which the anode spacing of each of said furnaces is controlled by a computer as a function of furnace resistance, the latter being calculated by said computer from the furnace current and furnace voltage, electronic circuit means interposed between said furnaces and said computer, said circuit means comprising:

- first means, coupled to said furnaces and said computer, for measuring the furnace current and storing the measured current values;
- second means, coupled to said furnaces, for detecting furnace voltage variation peaks which exceed a first specified voltage level selected therefor;
- third means, coupled to said second means and to said computer, for counting the number of furnace voltage variation peaks which exceed said specified voltage level and are detected by said second means, and for generating an output signal when a predetermined number of said peaks are counted; and
- fourth means, coupled to said furnaces and said computer, and responsive to said furnace voltage level, for separately detecting, counting and storing furnace voltage measurements which are less than a second specified voltage level and thereby indicate the absence of an incipient anode effect, and which are greater than said second specified voltage level and thereby indicate the occurrence of an incipient anode effect.

4,008,143

ELECTRODE ASSEMBLY FOR AN ELECTROLYTIC CELL

Morton S. Kircher, Oakville, Canada, and Judson A. Wood, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 482,295, June 24, 1974, Pat. No. 3,932,261. This application Jan. 6, 1976, Ser. No. 646,816

Int. Cl.² C25B 1/26, 9/02, 1/102

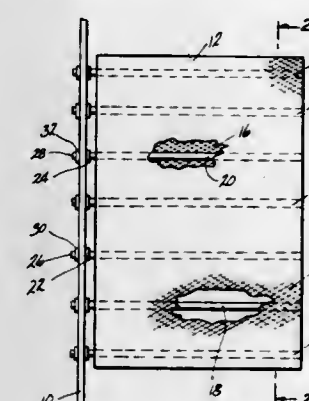
U.S. Cl. 204—257

8 Claims

1. A diaphragm cell for the electrolysis of an aqueous solution of an alkali metal chloride having at least one cathode

having a diaphragm thereon, said cathode being attached to a cathode plate positioned vertically and opposite an anode assembly which comprises:

- a. an anode plate positioned vertically,
- b. two anode surfaces positioned in parallel and having a space between said anode surfaces,
- c. at least two conductive supports, one said conductive support attached to each of said electrode surfaces and positioned in said space between said anode surfaces,



- d. openings in said anode plate for attachment of said conductive supports, said conductive supports being attached substantially perpendicular to said anode plate, said conductive supports conducting current between said anode plate and said anode surfaces, said conductive supports permitting continuous but restricted flow of said alkali metal chloride solution up through said space between said anode surfaces.

4,008,144

METHOD FOR MANUFACTURING OF ELECTRODE HAVING POROUS CERAMIC SUBSTRATE COATED WITH ELECTRODEPOSITED LEAD DIOXIDE AND THE ELECTRODE MANUFACTURED BY SAID METHOD

Eiichi Torikai, Yao, and Yoji Kawami, Kawachi-Nagano, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

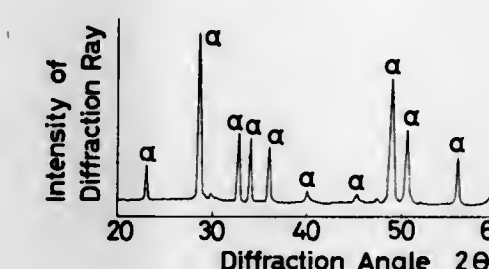
Filed Aug. 21, 1975, Ser. No. 606,351

Claims priority, application Japan, Aug. 22, 1974, 49-96889

Int. Cl.² C25B 1/30, 1/116

U.S. Cl. 204—290 R

8 Claims



7. An electrodeposited lead dioxide composite for use as an electrode, comprising a porous ceramic substrate, a layer preponderantly of α -lead dioxide deposited on the surface and in the porous surface layer of the substrate, and a layer of $\alpha + \beta$ lead dioxide deposited on said deposited layer of α -lead dioxide.

4,008,145

CONVERTING SOLID FUELS TO GASEOUS AND LIQUID FUELS

Arnold Marcel Leas, 115 S. Line St., Columbia City, Ind. 46725

Filed May 14, 1975, Ser. No. 577,504
Int. Cl.² C10G 1/04

U.S. Cl. 208—8

6 Claims

1. A process for the production of gaseous and liquid fuels from solid fuel sources which comprises:
 1. subjecting said solid fuel to oil extraction and hydrogenation in an oil extractor at a temperature of from about 500° to about 900° F;
 2. removing top vent gases from said oil extractor to a cobalt oxide treater, removing hydrogen sulfide therefrom by reaction with said cobalt oxide to form cobalt sulfide, and recovering desulfurized low heat content gaseous fuel;
 3. reacting the cobalt sulfide with steam and air to produce elemental sulfur and regenerate cobalt sulfide;
 4. removing said elemental sulfur;
 5. removing solids-oil slurry from said oil extractor to a hydrocracker, reducing high molecular weight compounds to lower molecular weight compounds therein;
 6. removing the hydrocracked solids-oil slurry to a solids reactor, admixing said slurry with hot recirculating sand at a temperature of from about 900° to about 1300° F in a downward flow, producing high heat content gaseous fuel and vaporized gasoline and diesel fuels therein;
 7. separating said gaseous and vaporized fuels;
 8. hydrogenating and recycling said diesel fuel to said oil extractor;
 9. recovering said gasoline fuel;
 10. recycling a portion of said high heat content fuel gas to the diesel hydrogenator, desulfurizing and recovering the remainder as product;
 11. removing ash from said solids reactor;
 12. separating solid alkali metals therefrom;
 13. decarbonizing said sand in said solids reactor with air, removing carbon dioxide, carbon monoxide and hydrogen therefrom during said decarbonization; and
 14. recycling said sand and said carbon dioxide to said solids reactor.

4,008,146

METHOD OF SLUDGE DISPOSAL RELATED TO THE HOT WATER EXTRACTION OF TAR SANDS

Frederick A. Bain, Willowdale, and John O. L. Roberts, Toronto, both of Canada, assignors to Great Canadian Oil Sands Limited, Toronto, Canada

Filed May 27, 1975, Ser. No. 580,853
Int. Cl.² C10G 1/04

U.S. Cl. 208—11 LE

11 Claims

1. In a hot water process for extracting bitumen from tar sands wherein a waste water stream containing at least 20% sand by weight is discharged and in which a retention pond having a sludge layer is employed to store waste water, the method of reducing the sludge content of the material stored in the retention pond comprising the steps of:
 - A. withdrawing a sludge stream containing at least 12% solids by weight from the retention pond sludge layer;
 - B. admixing the sludge stream with the waste water stream;
 - C. settling the mixture of streams in a settling zone to form a substantially aqueous upper layer and a lower layer comprised of an aqueous/sand/sludge mixture; and
 - D. dispensing the aqueous/sand/sludge mixture over an inclined sand pile zone to provide additional sand layers thereon having at least a part of the sludge in the mixture entrapped within the interstices of the sand layers.

4,008,147

METHOD FOR TREATMENT OF HEAVY FRACTION RECOVERED THROUGH THERMAL CRACKING OF HIGH MOLECULAR-WEIGHT HYDROCARBONACEOUS MATERIALS

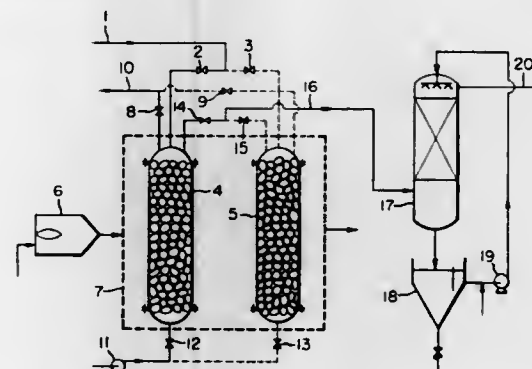
Masaki Kondo, Tokyo, Japan, assignor to Sumitomo Shipbuilding & Machinery Co., Ltd., Tokyo, Japan
Filed Mar. 29, 1974, Ser. No. 456,145

Claims priority, application Japan, Apr. 16, 1973, 48-043521

Int. Cl.² C10G 9/26, 34/00

U.S. Cl. 208—126

5 Claims



1. A method for treating the heavy liquid fraction comprising evaporable liquid hydrocarbons and non-evaporable materials obtained by thermal cracking of high molecular weight hydrocarbonaceous materials, which consists essentially of the steps of: feeding a stream of said heavy fraction into a vessel packed with a stationary bed of refractory inorganic particles and simultaneously externally heating said bed at an elevated temperature effective to vaporize said evaporable liquid hydrocarbons and to leave said non-evaporable materials deposited on said particles, and removing the vapor of said evaporable hydrocarbons from said vessel; discontinuing the feed of said heavy fraction when said bed contains sufficient deposited non-evaporable materials so as to require regeneration; then feeding molecular oxygen-containing gas into said vessel while continuing to externally heat said bed of refractory inorganic particles at said elevated temperature to incinerate said non-evaporable materials and to regenerate said refractory inorganic particles, and removing the gaseous products of the incineration from said vessel.

4,008,148

METHOD FOR THE PREPARATION OF INSULATING OIL Midori Masunaga, Tokyo; Yoshiki Kohno, Kawasaki, and Tadashi Ohmori, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

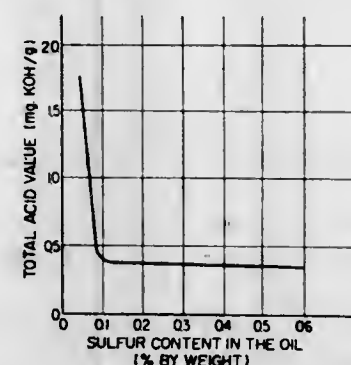
Filed Apr. 30, 1975, Ser. No. 573,575

Claims priority, application Japan, Oct. 23, 1974, 49-121521

Int. Cl.² C10G 34/00

U.S. Cl. 208—211

6 Claims



1. Method for the preparation of insulating oil having good oxidation stability, electric characteristics and resistance to

copper corrosion which comprises subjecting a distillate within a temperature having a boiling range from 250° to 400° C. at atmospheric pressure to solvent refining to provide a raffinate oil in which 30 to 75% by weight of the sulfur present in the distillate is removed in said solvent refining step, said distillate having been obtained from a paraffin base crude oil or mixture base crude oil, subjecting said raffinate to hydrogenating refining with hydrogen and a hydrogenation catalyst to reduce from 40 to 90% by weight of the sulfur present in the raffinate and subjecting said hydrogenated oil to solvent dewaxing to provide said insulating oil having a sulfur content from 0.1 to 0.35 percent by weight.

4,008,149

PROCESS OF HYDRO-REFINING HYDROCARBON OILS Takuji Itoh, Sayama; Satoshi Sakurada, Omiya; Shohei Okano, Tokorozawa, and Takashi Obayashi, Ohi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1976, Ser. No. 668,609

Claims priority, application Japan, Apr. 18, 1975, 50-47271
Int. Cl.² C10G 23/02

U.S. Cl. 208—216

10 Claims

1. A process for hydro-refining hydrocarbon oils which comprises contacting a hydrocarbon oil containing sulfur compounds, nitrogen compounds, asphalt and metal-containing compounds with hydrogen and with a hydro-refining catalyst under hydro-refining reaction conditions to remove sulfur, nitrogen and metals from said oil, said catalyst comprising at least one hydrogenation metal selected from Group VI-B and at least one hydrogenation metal selected from Group VIII of the Periodic Table supported on an alumina carrier containing from about 5 to about 25 weight % silica, said catalyst having a specific surface area in the range of from about 250 to about 300 m²/g and a pore volume distribution characterized in that (1) the volume of pores having a diameter of 60 - 150 Å is at least about 80% of the volume of pores having a diameter of 0 - 150 Å, (2) the volume of pores having a diameter of 150 - 300 Å is less than about 20% of the volume of pores of 0 - 300 Å, (3) the volume of pores having a diameter of 0 - 600 Å is in the range of from about 0.45 to about 0.60 ml/g, as measured by the nitrogen adsorption method, and (4) the volume of pores having a diameter of 150 - 2000 Å as measured by the mercury porosimetric method, is less than about 0.01 ml/g.

4,008,150

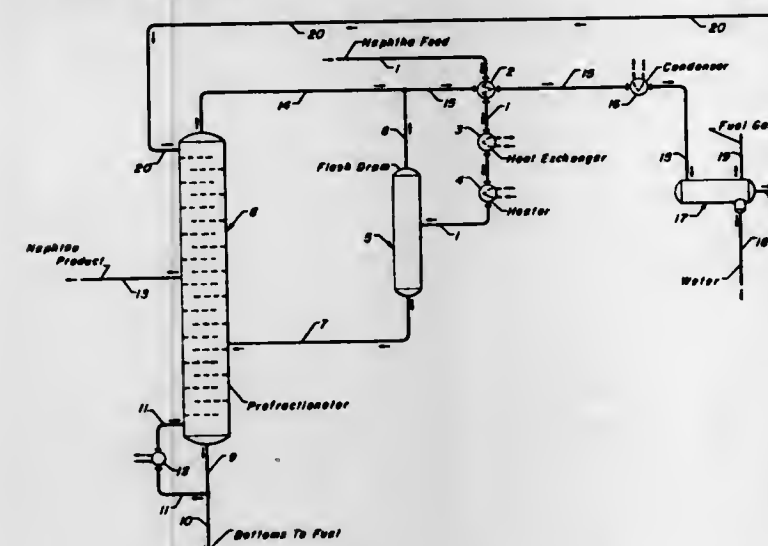
FRACTIONATION TO REMOVE A HIGH-BOILING MATERIAL AND A DISSOLVED SUBSTANCE Steve A. Gewartowski, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 4, 1975, Ser. No. 583,740

Int. Cl.² B01D 3/06; C01G 7/00

U.S. Cl. 208—352

5 Claims



1. A method for removing a high-boiling material and a

volatile dissolved substance chosen from the group consisting of hydrogen, oxygen, methane, ethane, propane, butane, and water from a naphtha feed stream comprising hydrocarbons having boiling points in the range of about 40° C. to about 260° C. which comprises the steps of:

- a. passing said feed stream into a flash zone and effecting the vaporization of about 25 to 75 vol. % of said feed stream and the formation of a single flash vapor stream comprising substantially all of the volatile dissolved substances and a single flash liquid stream comprising substantially all of the high-boiling material;
- b. passing said single flash liquid stream into a fractionation column at a first intermediate point and effecting the fractional distillation of said single flash liquid stream;
- c. removing an overhead vapor stream from said fractionation column, and passing said overhead through a condensation zone and into an overhead receiver to remove at least a portion of the volatile dissolved substances therein and to condense said overhead vapor stream;
- d. passing said single flash vapor stream through a condensation zone and into said overhead receiver to remove at least a portion of said volatile dissolved substances before charge to said fractionation zone and to condense said single flash vapor stream to a liquefied flash stream;
- e. removing a reflux stream comprising an admixture of said condensed overhead stream and said liquefied flash stream from said overhead receiver and passing said reflux stream into the upper portion of said fractionation column;
- f. removing a vapor stream comprising said dissolved substances from said overhead receiver;
- g. removing a substantially dissolved volatile and high boiling material free product stream from the fractionation column at a second intermediate point located above the first intermediate point; and
- h. removing a bottoms liquid stream comprising the high-boiling material from the fractionation column.

4,008,151

PROCESS FOR ENRICHMENT, BY FLOTATION, OF PHOSPHATE ORES WITH GANGUES CONTAINING CARBONATES

Smaïl Mohammed Smani, Rabat, Morocco, assignor to Office Cherifien des Phosphates, Rabat, Morocco

Filed Oct. 29, 1974, Ser. No. 519,012

Claims priority, application France, Oct. 29, 1973, 73.38413

Int. Cl.² B03B 1/04

U.S. Cl. 209—9

8 Claims

1. The process for enrichment, by flotation, of sedimentary phosphate ores with gangues containing carbonates, comprising:

first subjecting the ore to a treatment modifying the surface physical-chemical properties of the phosphated particles which the ore to be treated contains, with the aid of agents to modify said physical-chemical properties, which agents consist essentially of at least one metal salt having iron or aluminum cations and at least one complexing agent which exerts a chelating action on the phosphated particles previously conditioned by the metal salt, to form a surface complex on said particles; then, during a second stage, adding a flotation collector of the carbonates, consisting essentially of an anionic surfactant with a hydrocarbon chain containing 8 to 20 carbon atoms, which achieves flotation of the carbonate, the formation of the surface complex on the phosphated particles preventing fixation of the collecting agent on the said particles; and recovering the depressed product, essentially comprised of the sought-after phosphated concentrate.

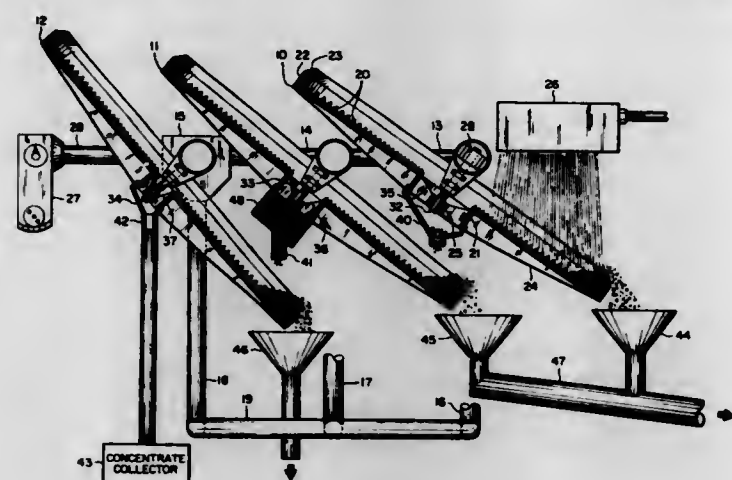
4,008,152

METAL SEPARATING PROCESS AND APPARATUS
Johnny Hilmer Kleven, 1325 N. Fairview, Burbank, Calif. 91505

Filed Sept. 15, 1975, Ser. No. 613,366
Int. Cl.² B03B 5/74

U.S. Cl. 209-444

9 Claims



1. A process of separating metals in the free state from ore which comprises the steps of:

- applying the ore containing the metal successively to a plurality of downwardly inclined, rotatable, flat pan-shaped separating wheels, said wheels being driven by a common shaft and providing (i) a peripheral retaining lip, (ii) a central annulus, and (iii) a plurality of spiral grooves disposed on the upper surface of each wheel and directed from the wheel periphery to the annulus, each of said wheels being concentrically rotatable about its central annulus;
- forming a water slurry with the ore on each wheel;
- washing lighter waste ore out of the grooves and downwardly over the outer retaining lip;
- forwarding the slurry of beneficiated ore inwardly and upwardly along the spiral grooves to the central annulus and downwardly through a funnel positioned around the annulus;
- applying the slurry to the next succeeding wheel; and
- repeating the process until at least three wheel separations have been effected.

4,008,153

REACTOR FOR PURIFICATION OF WATER BY FLUID FILTRATION

Svatopluk Mackrie, Brno; Vladimir Mackrie, Prague, and Oldrich Dracka, Brno, all of Czechoslovakia, assignors to Agrotechnika, narodny podnik, Zvolen, Czechoslovakia
Filed Apr. 29, 1975, Ser. No. 572,748

Claims priority, application Czechoslovakia, Apr. 29, 1974, 3061/74

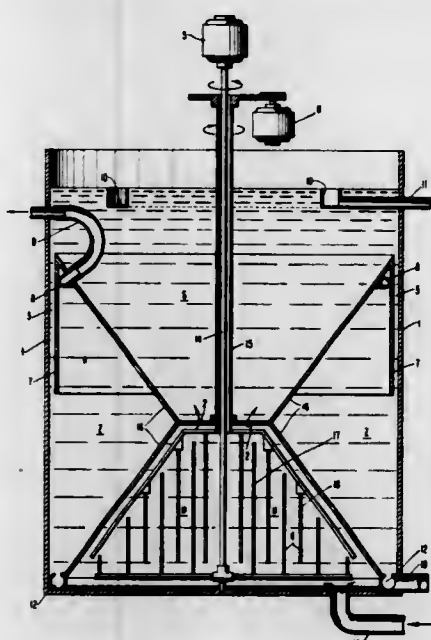
Int. Cl.² C02B 3/06

U.S. Cl. 210-208

7 Claims

- In a reactor for the purification, by fluid filtration of water introduced into the reactor via a first inlet conduit, the reactor comprising a vertically oriented tank, first partition means supported in an upper portion of the tank for defining a separating zone, second partition means supported in a lower portion of the tank beneath and in communication with the separating zone and including a pair of upwardly and inwardly extending oblique walls, rotatable impeller means disposed between the oblique walls of the second partition means to define a homogenizing zone, means including an upper apertured wall of the second partition means for effecting communication of liquid in the homogenizing zone with the separating zone, the portion of the tank extending outwardly of the first and second partition means defining a thickening zone, and third partition means extending into the

thickening zone from an outer portion of the top of the first partition means, the improvement wherein the first partition means includes a pair of downwardly and inwardly extending oblique walls terminating in contact with the upper end of the upwardly and inwardly extending walls of the second partition



4,008,154

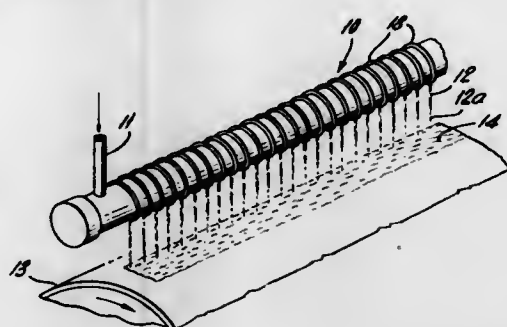
ROTARY FILTER WASH DISTRIBUTOR

John F. Richards, Baton Rouge, La., and Robert G. Tripp, Houston, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 456,157, March 29, 1974, abandoned. This application July 11, 1975, Ser. No. 595,236
Int. Cl.² B01D 33/06

U.S. Cl. 210-217

2 Claims



- A wash liquid distributor for washing a cake deposited on a rotary drum filter comprising in combination: at least one elongated hollow distributor pipe mounted radially outward of and above said drum and parallel to the axis thereof such that liquid deposited by said pipe on said drum produces a continuous narrow pool of wash liquid on the cake, said pipe having a multiplicity of uniformly spaced axially aligned holes of about 0.015 to 0.025 inch diameter disposed on said pipe and providing communication between the interior of said pipe and a diffusion channel located externally of said pipe, said channel bounded by the exterior of said pipe and a solid cover partially surrounding said pipe and overlying said holes, said channel containing a coarse mesh screen positioned to present its edge to liquid passing through said channel whereby liquid jets produced by said holes are dampened and the liquid diffused throughout said channel, and overwrap means securing said cover to said pipe and collecting and redistributing said liquid exiting from said channel at a plurality of spaced

drip points along said pipe, whereby a plurality of streams of liquid fall by gravity from said pipe onto said drum without damaging said cake.

4,008,155

APPARATUS FOR DISPOSAL OF EFFLUENTS

William Gummer Castell, 47 Victoria St., London, England
Continuation of Ser. No. 417,616, Nov. 20, 1973, abandoned.

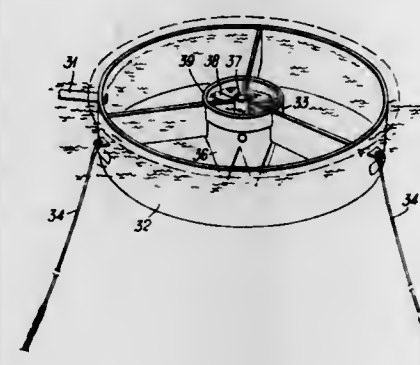
This application. Mar. 20, 1975, Ser. No. 560,489

Claims priority, application United Kingdom, Nov. 21, 1972, 53732/72; Oct. 26, 1973, 49961/73

Int. Cl.² E02B 15/04

U.S. Cl. 210-242 R

2 Claims



- Self-contained completely floating waste material treatment apparatus for use at sea without physical support from land, said apparatus comprising means including a first, annular, enclosure, defined by outer and inner concentric vertical walls circular in plan, for the treatment of waste material therein, a second enclosure defined within said inner wall, means including an open-bottom chamber located centrally in said second enclosure and at least one pipe connecting said first enclosure to said chamber for conveying treated effluent from said first enclosure to said chamber, removing substantially all turbulence from said effluent to still the same, and discharging the still effluent to said second enclosure, said enclosures and said chamber being structurally interconnected as a unit, flotation means for floatably supporting said unit upon a body of water, means for loosely anchoring said unit to permit the same to rise and fall with the body of water, and means for supplying waste material to be treated to said first enclosure, at least said second enclosure being closed at the bottom thereof for the accumulation of material which separates from the treated effluent transferred to said chamber, said bottom of said second enclosure comprising a plurality of tapered chambers arranged side-by-side and defined by walls which diverge upwardly, whereby material denser than water is separated from the rest of the waste.

4,008,156

DEVICE FOR SUCKING THE UPPER LAYER OF A POLLUTED WATER SURFACE

Lucien Chastan-Bagnis, 21 Avenue Isola Bella, 06400 Cannes, France

Filed July 3, 1975, Ser. No. 592,904

Claims priority, application France, July 4, 1974, 74.24592

Int. Cl.² E02B 15/04

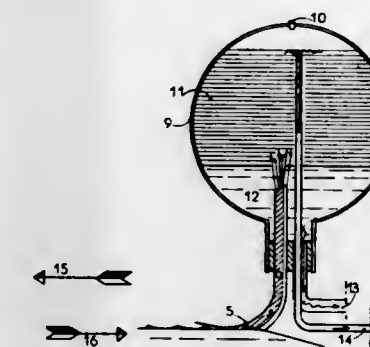
U.S. Cl. 210-242 R

3 Claims

- Apparatus for collecting floating polluting material from a body of water, comprising:

supporting means having an inlet opening in the forward portion thereof;
channel means in communication with said inlet opening, said channel means being defined by opposed vertically extending sidewalls constructed and arranged to be spaced apart a greater distance adjacent said inlet opening than at a location removed from said inlet opening, whereby as polluted water flows through said channel from said inlet opening toward the portion of said channel

at said removed location the level of said polluted water is raised;
a collecting chamber carried on said supporting means, adapted to separate the polluting material from the water according to their specific gravities;
first conduit means connected at one end with said collecting chamber, the other end of said first conduit means having a mouthpiece thereon mounted to extend downwardly into said channel means at said removed location, to contact the raised, polluted upper level of water flowing through said channel at said removed location;



means connected with said collecting chamber operable for creating a negative pressure therein, whereby suction is placed on said first conduit means for drawing said polluted upper level of water into said collecting chamber;
second conduit means in communication at one end thereof with the region of said collecting chamber containing the separated polluting materials, and operable to effect the removal thereof from said chamber; and
third conduit means in communication at one end thereof with the region of said collecting chamber containing the separated water, and operable to effect the removal thereof from said chamber.

4,008,157

END SEAL CONSTRUCTION FOR SEMIPERMEABLE MEMBRANE

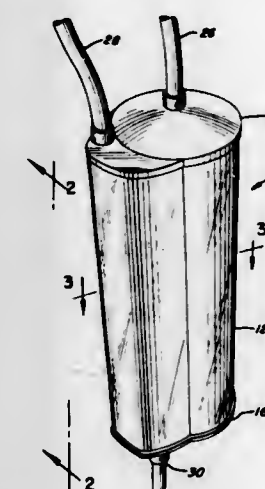
Jimmy L. Miller, Waukegan, and William J. Schnell, Arlington Heights, both of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 8, 1975, Ser. No. 620,546

Int. Cl.² B01D 13/00

U.S. Cl. 210-321 B

5 Claims



- A coil dialyzer for use in an artificial kidney system, which includes an elongated, open-ended tubularly shaped, semipermeable membrane for carrying a fluid to be treated in the dialyzer, and an end sealing system for preventing fluid flow from at least one end of said membrane other than through inlet and outlet conduits, said system comprising: at least one end of said membrane having a flap portion folded so as to define a fold line extending between the longitudinal

edges of said membrane; means defining a membrane receiving groove; and wedge means for engaging said folded membrane and for cooperating with said groove means to maintain said fold line and retain said folded membrane in said groove.

4,008,158

DEWATERING MACHINE

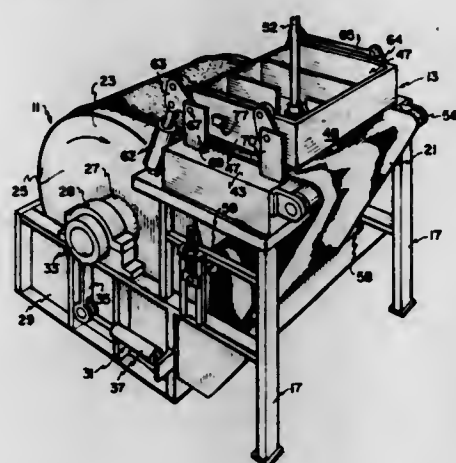
Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Continuation of Ser. No. 519,893, Oct. 31, 1974, abandoned. This application June 19, 1975, Ser. No. 588,257

Int. Cl.² B01D 33/04

U.S. Cl. 210-386

21 Claims



1. An integral machine for filtering and dewatering solids from a slurry comprising:

- a rotary drum vacuum filter mounted for at least partial immersion in a tank containing slurry;
- an endless belt of filter medium trained about the rotary drum of said filter to cover at least the immersed sectors of the drum so that vacuum applied through said filter causes a cake of solids from the slurry to build upon the belt;
- an expression device inclusive of drainage means supported at a location spaced from said drum and arranged to present a drainage deck over which said endless belt passes, a flexible impervious diaphragm which is supported in face-to-face relationship with said drainage deck and spaced apart therefrom in a relaxed position, and pressurizing means for selectively applying fluid pressure against said diaphragm to urge the same from the relaxed position to a distended position whereat said diaphragm exerts pressure against a cake of solids on a section of said filter medium belt overlying said drainage deck to express liquid from said cake; and
- indexing means operatively connected to said rotary drum for intermittently indexing the same so that said filter belt carries solids cake from said slurry and onto said drainage deck, said pressurizing means and said indexing means being cooperatively operative such that said drum is indexed only when said diaphragm is relaxed and such that said pressurizing means applies pressure against said diaphragm only at such times as said drum is not being indexed.

4,008,159

RENOVATION OF WASTE WATER

Ferdinand Besik, Mississauga, Canada, assignor to Ontario Research Foundation, Sheridan Park, Canada

Filed Jan. 21, 1975, Ser. No. 542,716

Int. Cl.² C02C 1/04

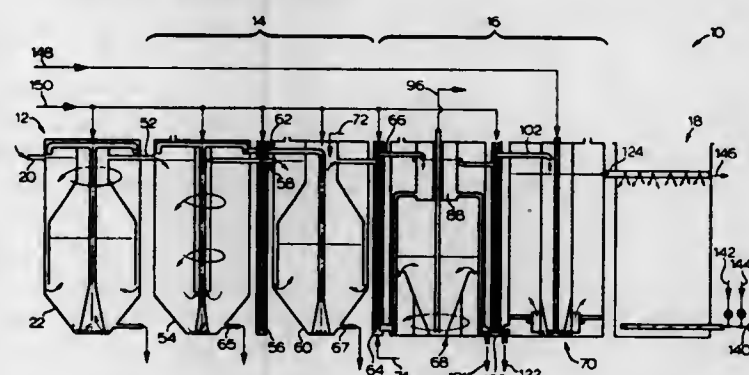
U.S. Cl. 210-7

11 Claims

1. A process for the renovation of waste water containing a plurality of contaminants including suspended solids, dissolved organic material, nitrogenous material including organic nitrogen-, ammoniacal nitrogen-, nitrite nitrogen- and

nitrate nitrogen-containing materials, phosphate material, odor-imparting materials, turbidity-providing materials and bacteria, which comprises:

- passing said waste water to a first reaction zone,
- removing a part of said suspended solids, dissolved organic materials, nitrogenous material, phosphate material and turbidity-providing materials by subjecting said waste water to a primary treatment in said first reaction zone, said first reaction zone being constituted by a first single upright tank and said primary treatment comprising:
- separating said first tank into a first vertically-extending zone extending the height of the tank and a second vertically-extending zone extending through the tank to a location adjacent to and vertically spaced from the lower end of the tank and in fluid flow communication with said first zone at the lower end of the tank and in fluid flow communication with said first zone at the lower end thereof only,
- establishing a liquid level in each of said zones and a flow path of liquid through said first tank downwardly through said first zone and upwardly through said second zone,
- feeding said waste water to said first zone adjacent the liquid level therein,
- mixing said fed waste water with a recycled mixture of suspended solids and liquid at said first zone liquid level in such a manner as to form a rotating body of liquid in said first zone to subject said waste water to centrifugal forces to concentrate suspended solids in the liquid in said first zone,
- accumulating said concentrated suspended solids in the bottom of said first tank,



- flowing liquor in said flow path from said first zone and into and upwardly through said second zone to separate treated liquid from said accumulated solids for discharge from said primary treatment by withdrawal from said first tank at the downstream end of said flow path treated liquid having a decreased suspended solids- and dissolved organic material-content,
- anaerobically decomposing at least a portion of said accumulated solids at the bottom of said first tank,
- removing accumulated solids from the accumulation thereof substantially at the rate of mixing of suspended solids and waste water, and
- recycling said removed accumulated solids to said first zone as said recycled mixture of suspended solids and liquid,
- passing the effluent from said primary treatment from said first reaction zone to a second reaction zone,
- removing from said effluent from said primary treatment phosphate material and substantial quantities of suspended solids, dissolved organic material, nitrogenous material and turbidity-providing materials by subjecting said effluent from said primary treatment to an adsorption-biooxidation treatment utilizing activated carbon and microorganisms in said second reaction zone,
- removing from said effluent from said adsorption-biooxidation treatment substantial quantities of phosphate material, suspended solids, dissolved organic material, nitrogenous material and turbidity-providing materials and substantially completely said bacteria and odor-imparting material by subjecting said effluent from said adsorption-biooxidation treatment to chemical treatment in said third reaction zone,

said chemical treatment being effected in two separate treatment steps, the first chemical treatment step being carried out in a second single upright reaction tank and comprising:

- separating said second reaction tank into a first vertically-extending zone extending upwardly from the bottom of the tank for part of the height thereof, a second vertically-extending zone extending upwardly from the bottom of the tank the height of the first zone and in fluid flow communication with said first zone at the upper end only thereof, and a third vertically-extending zone extending upwardly from the upper extremity of the first and second zones in fluid flow communication with said first and second zones,
- establishing a liquid level in said second tank and a flow path of liquid through said second tank downwardly through said third and first zones respectively out of fluid flow communication therewith and upwardly through said first and third zones respectively,
- establishing and maintaining a rotating fluidized bed of chemical sludge in said first zone,
- mixing said effluent from said adsorption-biooxidation treatment with said chemical coagulant,
- feeding said mixture by gravity along said flow path from the upstream end thereof tangentially into the lower end of said first zone,
- passing said mixture through said rotating fluidized bed of chemical sludge in said first zone,
- chemically coagulating said phosphate materials in said fluidized bed,
- passing treated liquid along said flow path through said third zone,
- passing chemical sludge from said fluidized bed into said second zone to achieve separation of said treated liquid from chemical sludge,
- discharging treated liquid having a decreased phosphate-materials content from said third zone at the downstream end of said flow path, and
- accumulating said passed chemical sludge in said second zone,
- said second chemical treatment step being carried out in third single upright reaction tank and comprising:
- separating said third reaction tank into a first vertically-extending zone extending upwardly from the bottom of the tank extending the height of the tank and a second vertically-extending zone extending the height of the tank in fluid flow communication with said first zone at the lower end thereof only,
- establishing a liquid level in each of said zones and a flow path of liquid through said third tank downwardly through said first zone and upwardly through said second zone,
- feeding the effluent from the second tank to said first zone at the liquid level therein,
- feeding a gaseous mixture of ozone and oxygen into said first zone at the lower end thereof,
- allowing said gaseous mixture to rise in said first zone counter-currently to said effluent flowing in said flow path,
- absorbing ozone and oxygen from said gaseous mixture in said effluent in said first zone,
- passing said effluent having gases absorbed therein from said first zone to said second zone,
- oxidizing contaminants in said effluent with said absorbed oxygen and ozone in said second reaction zone,
- filtering solids formed in said second zone from the treated liquid adjacent the downstream end of said flow path, and
- withdrawing treated liquid having a decreased contaminants content from the downstream end of said flow path, and recovering renovated waste water substantially free from said contaminants from said third reaction zone,
- fluid flow of waste water from one reaction zone to another and within each reaction zone being achieved solely by a combination of gravitational forces and airlift forces whereby said primary treatment, adsorption-biooxidation

treatment and chemical treatment are fluidly interconnected for continuous flow of waste water from one treatment to the next.

4,008,160

PROCESS FOR REMOVING OIL FROM OILY WASTE WATER STREAMS

Mohan Vadekar, and Herbert S. Wilson, both of Sarnia, Canada, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 30, 1975, Ser. No. 600,460

Int. Cl.² B01D 13/00

U.S. Cl. 210-23 R

9 Claims

1. A process for removing emulsified and free oil from oil-containing aqueous streams, comprising passing said streams over a bed of at least one unprocessed, granular polymeric compound, which compound contains at least 50 mole % of vinyl chloride or its equivalent in carbon-chlorine bonds, thereby removing the oil from the aqueous stream.

4,008,161

TREATMENT OF PULP MILL EFFLUENTS

Alfred Wong, Pointe Claire; Steven Prahacs, Beaconsfield, and Joseph Dorica, Lachine, all of Canada, assignors to Pulp and Paper Research Institute of Canada, Canada

Filed Nov. 29, 1974, Ser. No. 528,478

Claims priority, application Canada, Nov. 28, 1973, 186907 Int. Cl.² C02C 5/02

U.S. Cl. 210-30 R

19 Claims

1. A multi-step physical-chemical method for the purification by adsorption, catalytic oxidation and chemical precipitation of kraft pulp mill effluent waste water containing undesirable solid materials in suspended and/or dissolved form, which comprises the following sequential steps:

- passing an oxygen-containing gas through the waste water at a rate of 0.05 scfh/1-5.0 scfh/1. while the waste water is in intimate contact with a finely divided activated carbonaceous material present in a concentration of 10-8000 mg/l to catalytically oxidize said undesirable materials;
- adding a clarification agent selected from the group consisting of a coagulant, a flocculant, a polyelectrolyte and mixtures thereof with the provision that when a polyelectrolyte is provided, it is in a concentration of 0.1-20 mg/l and when a coagulant and/or flocculant is provided, it is in a concentration of 10-2000 mg/l, to resultant waste water provided by step (1) to chemically precipitate said undesirable materials; and
- separating suspended solids in the form of sludge from the waste water by gravitation, flotation or centrifugation.

4,008,162

WASTE TREATMENT OF FLUOROBORATE SOLUTIONS

Theodore Frank Korenowski; Jerry Lee Penland, both of Zelenople, and Chalmer John Ritzert, Butler, all of Pa., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 5, 1975, Ser. No. 602,180

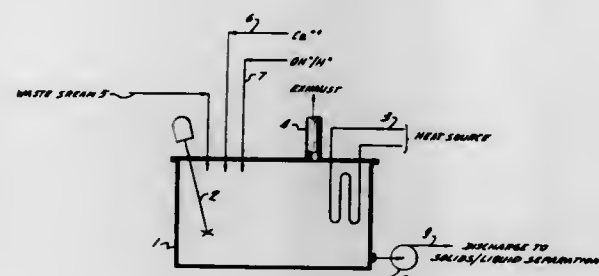
Int. Cl.² C02B 1/20

U.S. Cl. 210-45

10 Claims

1. A process for removal of fluoride values from a solution containing fluoroborate compounds which comprises: hydrolyzing said solution at an acid pH of about 4 or less and at an elevated temperature of at least 130° F in the presence of calcium ions to liberate fluoride values,

wherein the total amount of said calcium ions is sufficient to provide at least 0.25 times the potential molar fluoride



value of the solution, and removing said liberated fluoride values from solution.

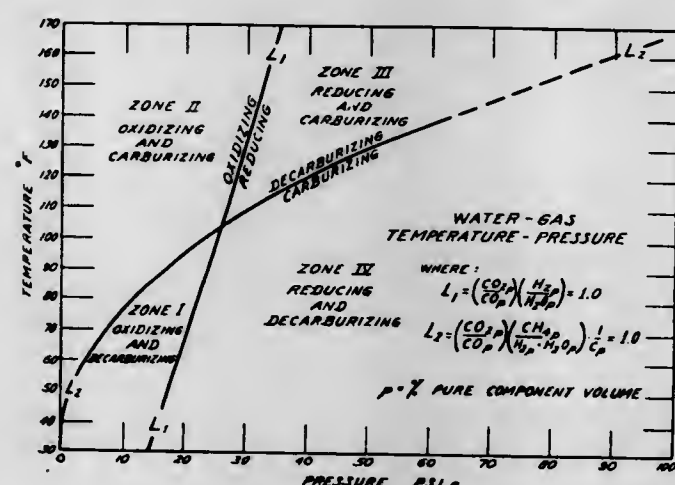
4,008,163

METHOD OF PREPARING A SATURATED FLUID MIXTURE

Glenn R. Ingels, 11607 Windy Lane, Houston, Tex. 77024
Division of Ser. No. 28,192, April 14, 1970, Pat. No. 3,655,172, which is a continuation of Ser. No. 719,613, April 8, 1968, abandoned, which is a continuation-in-part of Ser. No. 604,515, Nov. 28, 1966, abandoned, which is a continuation-in-part of Ser. No. 292,280, July 2, 1963, abandoned. This application Mar. 13, 1972, Ser. No. 234,307
Int. Cl.² C09K 3/00

U.S. Cl. 252-1

4 Claims



1. A method of preparing a saturated fluid mixture suitable for treatment of metallic and non-metallic materials comprising, saturating liquid water with gases of a gas mixture selected from the group consisting of carbon dioxide and hydrogen, carbon dioxide and methane, and methane and oxygen, in the presence of a carbonaceous material, while maintaining the liquid water at controlled temperatures of from about 32° F. to about 160° F., and the gas mixture under controlled pressures from ambient atmospheric up to 218.5 atmospheres, thereby forming the saturated fluid mixture having properties determined by the controlled temperatures and pressures, and discharging the formed saturated fluid mixture, while maintaining its formed properties and characteristics.

4,008,164

PROCESS FOR SCALE INHIBITION

James D. Watson, Houston, and James R. Stanford, Sugar Land, both of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 21, 1974, Ser. No. 453,215

Int. Cl.² C02B 5/06

U.S. Cl. 252-8.55 B

4 Claims

1. A process for preventing scale deposits from the class consisting of calcium sulfate and calcium carbonate and mixtures thereof from water containing said scale forming chemicals and sodium chloride which consists essentially in adding to said water an effective scale inhibiting amount of a copolymer of acrylic acid and methyl acrylate having a molecular weight within the range of 6,000 to 8,000 and obtained by copolymerizing acrylic acid and methyl acrylate using a molar ratio of acrylic acid to methyl acrylate of 4:1 to 5:1, said copolymer of acrylic acid and methyl acrylate being stable at a pH up to at least pH 10 over a period of at least one hour at temperatures of at least 160° F. against precipitation at 1% by weight dosage in a 5% by weight sodium chloride aqueous brine containing 5000 mg/l of calcium, calculated as calcium carbonate.

4,008,165

SURFACTANT OIL RECOVERY PROCESS USABLE IN HIGH TEMPERATURE FORMATIONS HAVING HIGH CONCENTRATIONS OF POLYVALENT IONS

Jim Maddox, Jr., and Jack F. Tate, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 558,404, March 14, 1975, Pat. No. 3,939,911. This application July 7, 1975, Ser. No. 593,394

Int. Cl.² 252 355; E21B 43/22

U.S. Cl. 252-8.55 D

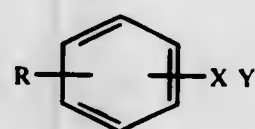
6 Claims

1. An aqueous surfactant-containing fluid for use in flooding subterranean formations which contain petroleum and water having dissolved therein from 200 to 14,000 parts per million divalent ions comprising calcium, magnesium and mixtures thereof, said formation having a temperature from about 125° F. to about 225° F. comprising:

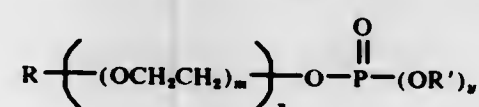
a. from about 0.05 to about 5.0 percent by weight of an anionic surfactant with an average molecular weight not to exceed about 360 having one of the following two formulas:

(R-X) Y

wherein R is an alkyl radical, linear or branched, having from 8 to 14 carbon atoms, X is a sulfonate radical, and Y is sodium, potassium or ammonium, or

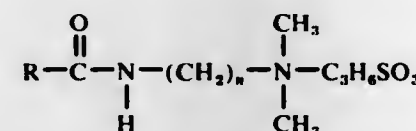


wherein R, X and Y have the same meaning as above;
b. from about .05 to about 5.0 percent by weight of a phosphate ester surfactant with an average molecular weight not to exceed about 1000 having the following formula:



wherein R is alkylphenyl or an alkyl radical having from 12 to 24 carbon atoms, m is an integer between 1 and 20, x and y are 1 or 2 and the sum of x and y is 3, and R' is hydrogen, sodium, potassium or ammonium;

c. from about 0.05 to about 5.0 percent by weight of a sulfonated betaine having the following structure:



wherein R is an alkyl group having from 12 to 24 carbon atoms and n is an integer from 1 to 5 inclusive; and
d. from about 200 to about 1400 parts per million divalent ions selected from the group consisting of calcium, magnesium and mixtures thereof.

4,008,166

OPTICALLY BRIGHTENING WITH A SYNERGISTIC MIXTURE

Christian Luthi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 16, 1974, Ser. No. 497,970

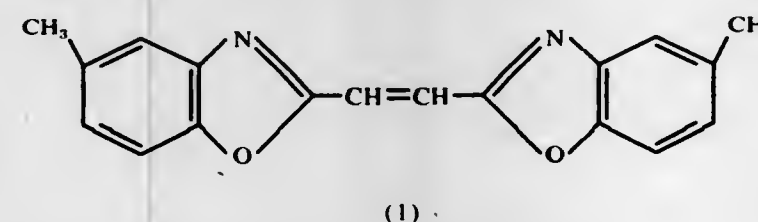
Claims priority, application Switzerland, Sept. 5, 1973, 12736/73

Int. Cl.² C11D 3/395, 3/42

U.S. Cl. 252-89 B

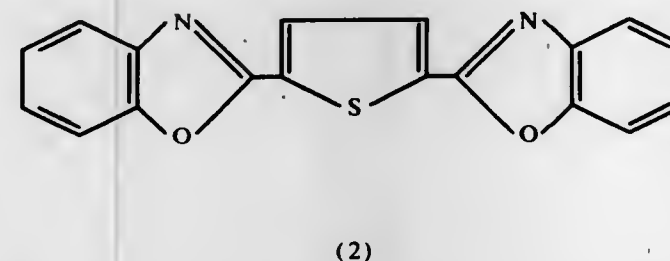
1 Claim

1. A detergent composition consisting essentially of 0.05 to 0.5% of a fluorescent brightener, which consists of a mixture of 33 to 67% of a compound of the formula



(1)

and 67 to 33% of a compound of the formula



(2)

and the balance of the composition being conventional detergent components.

4,008,167

FOAMING BLEACHING COMPOSITION

Yunosuke Nakagawa, Koshigaya; Masaaki Nishimura, and Koitsu Sato, both of Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1975, Ser. No. 555,573

Claims priority, application Japan, Mar. 18, 1974, 49-30791

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.² C11D 7/56

U.S. Cl. 252-99

12 Claims

1. A foamable bleaching composition consisting essentially of from 10 to 100 percent by weight of a mixture of
a. heat treated sodium percarbonate which has been heated at a temperature in the range of 75° to 135° C for a heating time ranging from (1) 2 to 6 hours at 75° C to (2) from 5 to 30 minutes at 135° C, and
b. an activating agent selected from the group consisting of

glucose pentaacetate, sorbitol hexaacetate, sodium acetoxybenzene sulfonate, tetraacetyl glycoluril, tetraacetyl ethylenediamine, succinic anhydride and phthalic anhydride, said mixture containing from 5 to 200 weight percent of (b), based on the weight of (a),

and the balance of said composition is one or more water-soluble inorganic builder salts, or an anionic, nonionic or amphoteric household clothes washing surfactant, or a mixture of said salts and said surfactants.

4,008,168

POLYBUTENE COMPOSITION CONTAINING HALOGEN-CONTAINING ADDITIVES AND USE THEREOF

Imre Puskas, Glen Ellyn, and John A. Cengel, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 358,911, May 10, 1973, Pat. No. 3,954,812. This application Nov. 19, 1975, Ser. No. 633,454
Int. Cl.² C07C 7/18; C08F 255/08

U.S. Cl. 252-182

9 Claims

1. An olefin polymer composition comprising the olefin polymer having a M_n in the range of about 300 to about 3000 and having 5 to 200 ppm based on the weight thereof of a halogen-containing carboxylic or sulfonic acid, or N-haloamide or N-haloimide of such acid or additive.

4,008,169

PREPARATION OF IRON OXIDE SORBENT FOR SULFUR OXIDES

Patrick John McGauley, 7 Plymouth Road, Port Washington, N.Y. 11050

Division of Ser. No. 403,953, Oct. 5, 1973, abandoned. This application Mar. 7, 1975, Ser. No. 556,347

Int. Cl.² C01B 17/00; C09K 3/00

U.S. Cl. 252-191

5 Claims

1. A process for the preparation of an improved iron oxide sorbent active for use in the purification of sulfur and oxygen-containing gases comprising:

- providing a quantity of iron sulfate-bearing solids,
- advancing said solids to a decomposition zone,
- contacting the solids with hot reducing gas at a temperature of from about 300° to about 700° C. under conditions to produce both a solid that contains magnetite and a product gas that contains both sulfur dioxide and reducing agents,
- separating the above magnetite-bearing solids from the gas, and
- oxidizing said magnetite-bearing solids at a temperature below about 450° C. to form an iron oxide-bearing solid sorbent.

4,008,170

DRY WATER

Barry D. Allan, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1975, Ser. No. 636,328

Int. Cl.² C09K 3/00

U.S. Cl. 252-194

2 Claims

1. The powdered reaction product of liquid water and a submicroscopic particulate silica that is at least 99.9 percent silica and that has a particle size range from about 15-20 μ , said submicroscopic particulate silica prepared in a hot gaseous environment at about 1100° C by the vapor phase hydrolysis of a silicon compound, said powdered reaction product prepared by adding slowly, while stirring, liquid water in ratio in weight percent of about 1 part water to about 9 parts water to 1 part of said submicroscopic particulate silica to yield said powdered reaction product containing from about 50 weight percent up to about 90 weight percent adsorbed water.

4,008,171

VOLUME REDUCTION OF SPENT RADIOACTIVE ION EXCHANGE RESIN

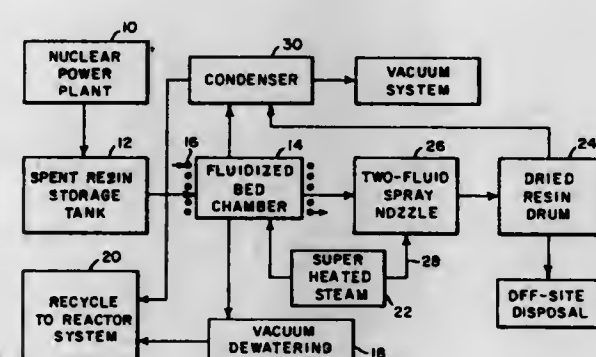
Erich W. Toppel, Export; Pang K. Lee, Pittsburgh; Arnold S. Kitzes, Pittsburgh, and Donald L. Grover, McMurray, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1973, Ser. No. 395,803

Int. Cl.² G21F 9/30

U.S. Cl. 252-301.1 W

5 Claims



1. A process for reducing the volume of spent radioactively contaminated ion exchange material comprising the steps of: generating a slurry of water and ion exchange material and supplying the slurry to a fluid bed chamber; removing the free water from said slurry thus leaving wet ion exchange material; externally heating said chamber and the ion exchange material therein to a temperature between 40° to 150° C; evacuating said chamber to a pressure between 15 and 29 mercury and then while maintaining said pressure and external heat, introducing superheated steam thereinto at a temperature between 200°-500° F to remove at least a portion of the intrinsic water in said material to thereby reduce the volume of the material; conducting the steam and said removed intrinsic water, from said chamber to a condenser; and discharging the dehydrated ion exchange material to a disposal drum.

4,008,172

AGENT FOR BRIGHTENING AND REMOVING GREYNESS FROM TEXTILES

Richard von Rütte, Riehen, and Walter Gasser, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,890

Claims priority, application Switzerland, Nov. 29, 1973, 16761/73

Int. Cl.² C09K 11/00; D06L 3/12

U.S. Cl. 252-301.21

10 Claims

1. Agent for the preparation of the baths for brightening the colour of and removing the greyiness from white and pastel coloured textiles which are made from synthetic fibres or which are provided with an easy-care finish and are made from cotton or blends thereof with synthetic fibres, which consists essentially of an organic polymer which is soluble or emulsifiable in water and is a homopolymer of acrylic or methacrylic acid or an ester or amide thereof, a copolymer of acrylic or methacrylic acid or an ester or amide thereof with acrylic or methacrylic acid alkylpolyalkylene glycol ester, a polyvinyl alcohol or a polyvinyl acetate, and a mixture thereof and a fluorescent brightener which is of the class of the distyrylbiphenyls, the bis-(s-triazinylamino)-stilbene-2,2'-disulphonic acids or of the bis-(triazolyl)-stilbenes, which at 25° C has a solubility of at least 0.5 g/l water.

4,008,173

DEFOAMER COMPOSITION

Stephen A. Davis, Philadelphia, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Continuation of Ser. No. 289,712, Sept. 15, 1972, abandoned. This application Apr. 21, 1975, Ser. No. 569,736

Int. Cl.² B01D 19/04

U.S. Cl. 252-358

9 Claims

1. A hydrophobic defoamer base suitable for preparing defoamers for aqueous systems, having a pH of 2 to 5.5 consisting of an amorphous, precipitated hydrophilic metal silicate having a particle size of 10 to 200 mu, the pH of said silicate being adjusted to a value of 1.8 to 5.0 by acid addition and being selected from the group consisting of aluminum silicate (alumino silicate), magnesium silicate, calcium silicate and sodium aluminum silicate (sodium alumino silicate) said hydrophilic metal silicate being rendered hydrophobic by coating with 2 to 30% of an organosiloxane having a viscosity of 10 to 3000 centistokes and heating said coated silicate at a temperature between 230° and 320° C for 4 to 20 hours.

4,008,174

PROCESS FOR REGENERATING A SOLID COPPER-CHROMIUM REACTANT USED IN THE REMOVAL OF HYDROGEN SULFIDE FROM HYDROGEN RECYCLE GAS

Robert L. Jacobson, Pinole, and Kirk R. Gibson, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 480,071, June 17, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,476

Int. Cl.² B01J 23/92, 23/94

U.S. Cl. 252-411 S

5 Claims

1. A process for regenerating a solid reactant comprising copper and chromium disposed on a high-surface-area carbon support, said reactant having reacted to form a solid sulfur compound by contact with a hydrogen sulfide-containing recycle hydrogen stream in a hydrocarbon reforming system for removing substantially all the hydrogen sulfide from said hydrogen stream, said regeneration process comprising the steps of:

- forming sulfate by reacting said sulfur compound with oxygen in an oxygen-containing gas comprising an inert gas and about 0.1 to about 2 weight percent oxygen at a temperature between about 200° F and 425° F, whereby reduction of the surface area of said carbon support is prevented, and removing the resulting gas from contact with the resulting solid;
- forming sulfur dioxide by reacting said sulfate with hydrogen at a temperature of about 300° F to about 500° F, whereby a portion of the sulfur dioxide is adsorbed on said resulting solid, and removing the resulting gas from contact with said resulting solid; and
- desorbing sulfur dioxide from said resulting solid by contacting said solid with an inert gas at a temperature of 450° F to 600° F and removing the resulting gas from contact with said solid.

4,008,175

ORGANIC ACID ANHYDRIDE-PEROXYDICARBONATE COMPOSITION

James A. Barter, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

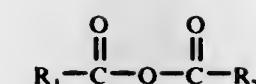
Division of Ser. No. 476,117, June 3, 1974, Pat. No. 3,923,766, which is a continuation-in-part of Ser. No. 284,025, Aug. 28, 1972, abandoned, and Ser. No. 385,787, Aug. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 284,024, Aug. 28, 1972, abandoned. This application July 9, 1975, Ser. No. 594,411

Int. Cl.² C08F 4/34, 4/38

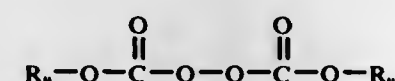
U.S. Cl. 252-426

7 Claims

1. A composition of matter consisting essentially of organic acid anhydride represented by the general formula,



wherein R₁ and R₂ are each selected from the group consisting of C₁-C₂₀ alkyl, C₆-C₁₀ cycloalkyl and C₆-C₁₀ aryl radicals, and a peroxydicarbonate ester represented by the formula,



wherein R₃ is an aliphatic group of from one to 20 carbon atoms or an aromatic group of from six to eight carbon atoms, the mole ratio of anhydride to peroxydicarbonate ester being from 0.1:1 to 20:1.

4,008,176

PROCESS FOR THE MANUFACTURE OF A CATALYST

Kurt Rust, Frankfurt am Main; Erwin Schrott, Sulzbach, Taunus; Helmut Strametz, Frankfurt am Main, and Hans-Jürgen Kablitz, Liederbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 27, 1975, Ser. No. 553,811

Claims priority, application Germany, Jan. 30, 1975, 2503689

Int. Cl.² C08F 4/64

U.S. Cl. 252-429 B

10 Claims

1. In a process for the manufacture of a polymerization catalyst which comprises reacting titanium tetrachloride in an inert hydrocarbon solvent with an aluminum organic compound containing an aluminum dialkyl chloride at a temperature of from -20° to +20° C in a molar proportion of aluminum dialkyl chloride to TiCl₄ of from 0.8 : 1 to 1.5 : 1, separating and washing the reaction product, subsequently thermally treating the TiCl₃-containing reaction product suspended in the hydrocarbon solvent in the presence of an ether (said reaction product being component A), mixing with an aluminum dialkyl halide (component B), the improvement which comprises subjecting the suspension containing the solid washed reaction product, component A, to a thermal treatment at a temperature of from 40 to 50° C in the presence of a dialkyl ether in a molar ratio of TiCl₃ to ether of from 1 : 0.6 to 1 : 1.2 and also in the presence of a cyclopolyene in a molar ratio of TiCl₃ to cyclopolyene of from 1 : 0.001 to 1 : 0.15, and then effecting an after-treatment of component A with an aluminum alkyl halide at a temperature of from 0 to 60° C in a molar ratio of aluminum alkyl halide to TiCl₃ of from 0.8 : 10 : 1.

4,008,177

PROCESS FOR THE MANUFACTURE OF A CATALYST

Kurt Rust, Frankfurt am Main; Erwin Schrott, Sulzbach, Taunus; Helmut Strametz, Frankfurt am Main, and Hans-Jürgen Kablitz, Liederbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 27, 1975, Ser. No. 553,812

Claims priority, application Germany, Jan. 30, 1975, 2503688

Int. Cl.² C08F 4/66

U.S. Cl. 252-429 B

8 Claims

1. In a process for the manufacture of a catalyst which comprises reacting titanium tetrachloride in an inert hydrocarbon solvent with an aluminum-organic compound containing an aluminum dialkyl chloride at a temperature of -20° to +20° C. and in a molar proportion of aluminum dialkyl chloride to TiCl₄ of 0.8:1 to 1.5:1, separating and washing the reaction product, then thermally treating the TiCl₃-containing

reaction product suspended in a hydrocarbon solvent in the presence of an ether at a temperature of 40° to 150° C. to form a component A, subjecting component A to an after-treatment with an aluminum alkyl halide and mixing the after-treated component A with an aluminum dialkyl halide (component B), the improvement which comprises carrying out said after-treatment with the aluminum alkyl halide in the presence of an unsaturated compound selected from the group consisting of cyclopolyenes, olefins and mixtures thereof at titanium trichloride/unsaturated compound molar ratios of from 1:0.001 to 1:1 for the cyclopolyenes present and from 1:1 to 1:100 for the olefins present.

4,008,178

ALKYLATION CATALYST FOR PRODUCTION OF MOTOR FUELS

James W. Brockington, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 520,595, Nov. 4, 1974, Pat. No. 3,922,319.

This application Apr. 11, 1975, Ser. No. 567,329

Int. Cl.² B01J 27/00, 27/02

U.S. Cl. 252-434

2 Claims

1. An alkylation catalyst consisting essentially of HFSO₃ and H₂SO₄ in a weight ratio of from about 0.11/1 to about 0.32/1 respectively, water in the range of from about 0 to about 3 weight percent, and acid oils in the range of from about 0 to about 10 weight percent, said catalyst having a titratable acidity of from about 16.5 to about 18.5 meq/gm.

4,008,179

CATALYST COMPOSITION

Edward James Gasson, Dollar, Scotland; Thomas Charles Krosnar, deceased, late of Polmont, Scotland, by Alena Krosnar, legal representative, and Stanley Frederic Marrian, Fife, Scotland, assignors to BP Chemicals International Limited, London, England

Filed Oct. 1, 1975, Ser. No. 618,505

Claims priority, application United Kingdom, Oct. 3, 1974, 42915/74

Int. Cl.² B01J 21/06, 23/84, 23/88, 27/18

U.S. Cl. 252-437

7 Claims

1. A catalyst oxide composition suitable for catalysing the reaction of organic compounds which consists essentially of oxygen and the metal elements antimony, tin, copper, iron and titanium, and molybdenum or tungsten, and uranium or vanadium, and which has been heat treated at a temperature between about 700° and 900° C in a molecular oxygen-containing gas either before or after addition of the molybdenum or tungsten.

4,008,180

DEHYDROGENATION METHOD AND MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 480,793, June 19, 1974, Pat. No. 3,898,154, which is a continuation-in-part of Ser. No. 376,841, July 5, 1973, Pat. No. 3,846,283, which is a continuation-in-part of Ser. No. 201,576, Nov. 23, 1971, Pat. No. 3,745,112, which is a continuation-in-part of Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application Apr. 24, 1975, Ser. No. 571,338

The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.² B01J 27/04, 23/58

U.S. Cl. 252-439

9 Claims

1. A catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.1 to about 5 wt. % tin, and about 0.01 to about 5 wt. % alkali metal or alkaline earth metal, wherein the platinum or palladium, rhodium, tin, and alkali metal or alka-

line earth metal are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and rhodium are present in the elemental metallic state, wherein substantially all of the tin and alkali metal or alkaline earth metal are present in an oxidation state above that of the elemental metal and wherein substantially all of the tin is present in a particle size which is less than 100 Angstroms in maximum dimension.

9. A catalytic composite as defined in claim 1 in sulfided form and containing about 0.01 to about 0.5 wt. % sulfur.

4,008,181

STEAM DEALKYLATION CATALYST AND PROCESS FOR PREPARING IT

Tansukhlal G. Dorawala, Wappingers Falls; Russell R. Reinhard, Hopewell Junction, and John H. Estes, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed Sept. 4, 1975, Ser. No. 610,198

Int. Cl.² B01J 21/04, 23/84, 23/86, 23/88

U.S. Cl. 252-465

15 Claims

1. The process for preparing a catalyst characterized by its ability to catalyze hydrocarbon conversion reactions which comprises

treating a calcined supported catalyst bearing oxides of (i) a Group VIII metal, (ii) a Group VI B metal of chromium, molybdenum or tungsten, and (iii) a Group I A metal in the presence of hydrogen for 4-16 hours at 950°-1400° F thereby forming a treated catalyst; and recovering said treated catalyst.

4,008,182

LOW DENSITY REFRACTORY INORGANIC OXIDE PARTICLES HAVING HIGH MICROPOROUS VOLUME

Vladimir Haensel, Hinsdale, and John C. Hayes, Palatine, both of Ohio, assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 429,435, Dec. 28, 1973, abandoned. This application Oct. 28, 1975, Ser. No. 626,516

Int. Cl.² B01J 21/04, 23/62

U.S. Cl. 252-466 PT

2 Claims

1. A cogelled composite of alumina and tin comprising 0.1 to 5 wt. % tin, and having deposited thereon from about 0.01 to about 2.0 wt. % platinum group metal, said composite characterized by an average bulk density of from about 0.25 to about 0.4 grams per cubic centimeter, with from about 0.6 to about 0.8 cubic centimeters per gram of the total pore volume being associated with pores having an average diameter of up to about 600 Angstroms.

4,008,183

HIGH TEMPERATURE ANTICORROSIVE MOLDED PRODUCT

Masaji Ishii; Akio Mikogami, and Tetsuo Torigai, all of Ma-chida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,839

Claims priority, application Japan, Aug. 15, 1974, 49-93574

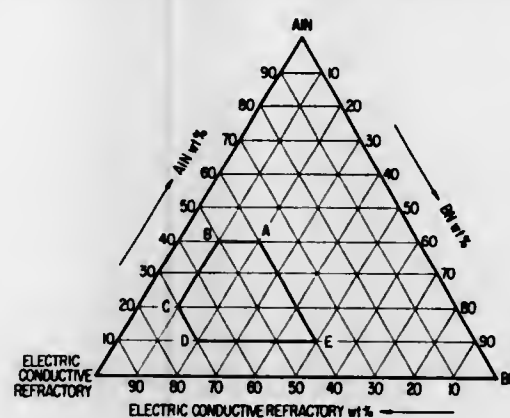
Int. Cl.² H01B 1/02

U.S. Cl. 252-512

3 Claims

1. A high temperature, anticorrosive molded product produced by hot pressing a mixture, comprising 1-10 parts by weight of powdered aluminum and 100 parts by weight of a powdered composition of an electrically conductive refractory, boron nitride and aluminum nitride wherein said powdery composition is encompassed by the range electrically conductive refractory: boron nitride: aluminum nitride as shown in the basal triangle of 40:20:40, 50:10:40, 70:10:20,

70:20:10 and 40:50:10 of FIG. 1, and wherein said electrically conductive refractory is a material having a specific resistance



of less than 100μΩ-cm at room temperature and a melting point greater than 2300° C.

4,008,184

6,10 DIMETHYL BICYCLO(4,4,0)DECANE OR DECENE ALCOHOL AND ESTER PERFUME COMPOSITIONS

Bruno Maurer, Collonge-Bellerive; Michel G. Fracheboud, and Günther Ohloff, both of Bernex-Geneva, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 363,192, May 23, 1973, abandoned. This application Feb. 20, 1976, Ser. No. 659,897

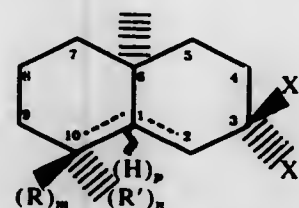
Claims priority, application Luxembourg, June 29, 1972, 65499

Int. Cl.² C11B 9/10

U.S. Cl. 252-522

7 Claims

1. A perfume composition comprising at least one bicyclic compound of formula



containing a single or a double bond in one of the positions indicated by the dotted lines and wherein the indexes *m*, *n* and *p* represent the integers zero or 1, one of the symbols X represents a hydroxyl or an O-acetyl group and the other represents a hydrogen atom, and wherein the symbol R represents a methyl group when both *n* and *p* are identical and equal to zero and *m* is 1; or one of the symbols R and R' represents a methyl group and the other is a hydrogen atom when both *m* and *n* are identical and equal to 1 and *p* is zero; or one of the symbols R and R' represents a methyl group and the other is a hydrogen atom when all indexes *m*, *n* and *p* are equal to 1 and an inert diluent or a carrier.

4,008,185

PROCESS FOR PREPARING RAPID-SETTING POLYURETHANES

Franciszek Ostowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 29, 1974, Ser. No. 456,093

Int. Cl.² C08G 18/18

U.S. Cl. 260-2.5 AC

5 Claims

1. A process for preparing polyurethanes which comprises 1. admixing the components of a composition comprising

A. a polyol free from nitrogen groups or mixture of such polyols having from 2 to about 8 hydroxyl groups and an OH equivalent weight of from about 30 to about 200;

B. an organic, aromatic polyisocyanate, and

C. at least a catalytic quantity of a triazine which does not react with or cause a reaction, at room temperature, of

an organic aromatic polyisocyanate; wherein components (A) and (B) are present in quantities so as to provide an NCO:OH equivalent ratio of from about 0.8:1 to about 1.2:1, with the proviso that when Component (A) has an average functionality of about 2, then Component (B) has an average functionality of at least about 2.5;

2. placing the admixed composition into a suitable mold or container wherein said composition solidifies within less than about 15 minutes; and
3. subsequently removing the resultant article from the mold or container.

4,008,186

NOVEL FIRE-RETARDANT POLYMER

Anthony L. Scaggs, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 3, 1975, Ser. No. 619,335

Int. Cl.² C08F 122/40; C08J 9/02, 9/06

U.S. Cl. 260-2.5 FP

5 Claims

1. Poly[N-(3-(1-hydroxyethyl)phenyl)maleimide].

4,008,187

POLYURETHANE FOAMS HAVING REDUCED FLAMMABILITY

Richard J. Turley, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

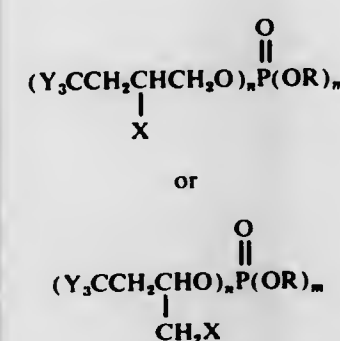
Continuation-in-part of Ser. No. 334,336, Feb. 21, 1973, Pat. No. 3,883,620. This application Jan. 29, 1975, Ser. No. 545,080

Int. Cl.² C08G 18/14

U.S. Cl. 260-2.5 AJ

19 Claims

1. A polyurethane foam prepared from a reaction mixture which comprises a flame retarding proportion of a tetrahalobutyl phosphate ester of the formula:



wherein

R represents an alkyl group having 1 to 4 carbon atoms, X represents chlorine or bromine, each Y represents independently chlorine or bromine, n represents an integer from 1 to 3, and m represents an integer from 0 to 2, with the proviso that *m* + *n* = 3.

4,008,188

ON-SITE GENERATION OF POLYURETHANE FOAM

Roy P. Alexander, Killingworth, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 24, 1975, Ser. No. 561,392

Int. Cl.² C08G 18/14

U.S. Cl. 260-2.5 AP

16 Claims

1. In a process for the on-site generation of rigid polyurethane foam, by means of a portable foaming apparatus, wherein a polyether polyol reactant is mixed and reacted with an isocyanate-terminated prepolymer in the presence of a frothing agent, a foaming agent and a reaction catalyst, the improvement of employing as a reactant a prepolymer of (a) a polymethylene polyphenylisocyanate having an average

NCO functionality of 2.2-3.5 and (b) a halogenated polyether polyol which is comprised of the product of reacting a polyhydroxy compound with an alkylene oxide having at least one halogen substituent selected from chlorine, bromine or a mixture thereof, said prepolymer having a ratio of NCO:OH groups ranging from about 20:1 to 90:1.

4,008,189

HYDROPHILIC POLYURETHANE FOAM

Bruce G. van Leuwen, Trumbull, and Clifford J. Maxwell, Milford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 475,694, June 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 382,390, July 25, 1973, abandoned. This application Nov. 4, 1975, Ser. No. 628,727

Int. Cl.² C08G 18/48, 18/14

U.S. Cl. 260-2.5 AD

13 Claims

1. A process for preparing flexible, hydrophilic polyurethane foam from a reaction mixture comprised of an organic polyisocyanate, a foaming agent, a reaction catalyst, and three polyether polyols, namely,

- a. a first polyol having a molecular weight of about 3,000-5,000 which is the product of sequentially oxyalkylating an aliphatic triol first with ethylene oxide and then with propylene oxide using a molar ratio, ethylene oxide: propylene oxide, from about 0.3:1 to about 1.6:1, said first polyol being used in a weight proportion from about 10 to about 50 percent of the combined weights of said three polyols,
- b. a second polyol having a molecular weight of about 2,000-5,000 which is the product of sequentially oxyalkylating an aliphatic diol first with ethylene oxide and then with propylene oxide using a molar ratio, ethylene oxide: propylene oxide, from about 0.3:1 to about 1.4:1, said second polyol being used in a weight proportion of about 20-50 percent of the combined weights of said three polyols, and
- c. a third polyol having a molecular weight of about 2,400-5,000 which is the product of oxyalkylating an aliphatic triol with a random mixture of ethylene oxide and propylene oxide, the content of ethylene oxide in the mixture being about 5-25% by weight, said third polyol being used in a proportion of about 10-50 percent of the combined weights of said three polyols.

4,008,190

VULCANIZATES OF EPDM AND DIENE RUBBER BLENDS

Ray D. Taylor, Brecksville, and Robert A. Krueger, Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

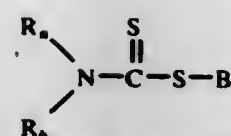
Continuation-in-part of Ser. No. 320,266, Jan. 2, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,335

Int. Cl.² C08L 7/00, 9/00, 23/16

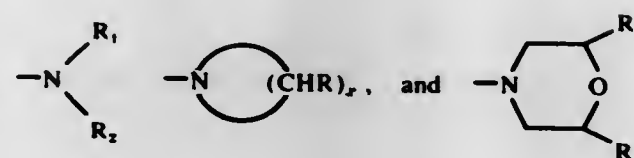
U.S. Cl. 260-5

14 Claims

1. A vulcanizable composition comprising (1) from about 1% to about 99% by weight of the polymer blend of an ethylene-higher α-olefin-polyene polymer, (2) from about 1% to about 99% by weight of the polymer blend of a highly unsaturated rubber, having an olefinic content from about 20% to about 45% by weight based upon the total weight of the polymer (3) as the vulcanizing agent, sulfur or a sulfur donor used at a level of from about 0.5 to 10 parts by weight based upon 100 parts by weight of the polymer blend, and (4) as the vulcanization accelerator used at a level from about 0.1 to about 10 parts by weight based upon 100 parts by weight of the polymer blend, a thiocarbamylsulfenamide of the formula



where B is selected from the group consisting of



wherein R_1 and R_2 are selected from the group consisting of alkyl radicals containing 1 to about 4 carbon atoms and cycloalkyl radicals containing 4 to 7 carbon atoms in the ring; R is hydrogen or an alkyl radical containing 1 to 2 carbon atoms; x is 4 to 7; and R_1 and R_2 are alkyl radicals containing 6 to about 30 carbon atoms.

4,008,191

POLYMER ALLOY MEMBRANES CONSISTING OF INHERENTLY ENTANGLED BLENDS OF POLYMERIC PHOSPHONATE AND SECOND POLYMER COMPONENT CONTAINING ESTER GROUPS OR POLYSTYRENE

Joseph Jagur-Grodzinski; David Vofsi, both of Rehovot, and Israel Cabasso, Jerusalem, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel
Continuation of Ser. No. 358,061, May 7, 1973, abandoned.
This application Apr. 17, 1975, Ser. No. 569,055

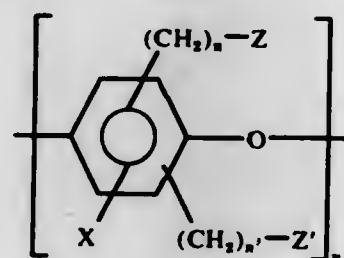
Claims priority, application Israel, May 12, 1972, 39426

Int. Cl.² B01D 13/00; C08L 1/10

U.S. Cl. 260—17 R

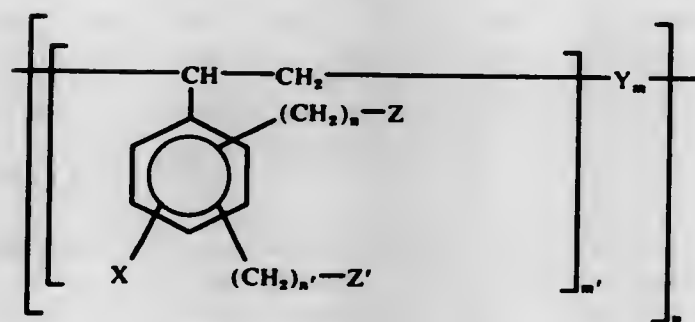
9 Claims

1. A highly permeable membrane containing a dense selective "skin" and a porous support suitable for solvent separation in a pervaporative cell, said membrane having enhanced permeability while retaining its selectivity, comprising an inherently entangled polymer alloy composition of between 20 and 60 percent of a first phosphorus and halogen-containing polymer component having the formula:



(I)

or



(II)

wherein

m and n are zero or any integer and m' and n' are integers, p is an integer higher than 10, X is hydrogen, halogen or a phosphorus-containing group, Y is CH_2CHCl or CH_2CCl_2 , and

Z and Z' are hydrogen or a phosphonate group (at least one being a phosphonate group); and from 40 to 80 percent of a second polymer component containing ester groups and/or a polystyrene polymer.

4,008,192

POLYISOCYANATES BLOCKED WITH HYDROXAMIC ACID ESTERS OR ACYL HYDROXAMATES

Willem Jacobus Mijs, Rozendaal (Gld.), and Johan Bernard Reesink, Didam (Gld.), both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 28, 1975, Ser. No. 635,986

Claims priority, application Netherlands, Dec. 3, 1974, 2415726

Int. Cl.² C08G 18/04

U.S. Cl. 260—18 TN

15 Claims

1. A process for the preparation of thermosetting coating compositions comprising incorporating in a polymer having free hydroxyl groups an organic polyisocyanate blocked with a hydroxamic acid ester or an acyl hydroxamate.

4,008,193

STABILIZER COMBINATION FOR HALOGEN-CONTAINING POLYMERS

Franz Scheidl, and Herbert Nies, both of Gersthofen, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 23, 1975, Ser. No. 616,071

Claims priority, application Germany, Sept. 27, 1974, 2446116

Int. Cl.² C08L 91/00

U.S. Cl. 260—23 XA

8 Claims

1. A stabilizer combination for halogen-containing polymers consisting of a mixture of metal salts of aliphatic mono- or dicarboxylic acids having from 6 to 40 carbon atoms, optionally alkyl or alkoxy substituted aromatic mono-, di-, or tri-carboxylic acids having from 7 to 25 carbon atoms in the molecule, the mixtures being composed of 10 to 70% by weight of an aluminum salt, 10 to 80% by weight of a calcium salt and 10 to 70% by weight of a zinc salt of the aforesaid carboxylic acids.

4,008,194

COMPOSITIONS FOR PLUGS OF REFRACTORY MATERIAL

Tsuneo Shintani, Kitakyushu, Japan, assignor to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

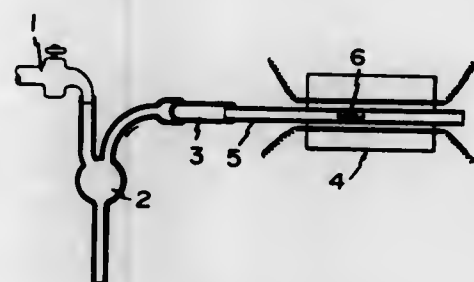
Filed Nov. 18, 1975, Ser. No. 632,946

Claims priority, application Japan, Nov. 27, 1974, 49-136677

Int. Cl.² C08L 95/00; C04B 35/66; C21B 7/12

U.S. Cl. 260—28 R

6 Claims



1. Compositions for refractory plugs of blast furnaces comprising 100 parts by weight of a refractories aggregate composition, as a binder 5-30 parts by weight of at least one petroleum pitch which has a softening point of 150°-230° C and 10-30 parts by weight of at least one alcohol selected from the group consisting of polyethyleneglycol and polypropyleneglycol.

4,008,195

AQUEOUS INSULATING VARNISHES

Takashi Ishizuka, and Naoki Miwa, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Aug. 16, 1974, Ser. No. 498,020

Claims priority, application Japan, Aug. 16, 1973, 48-91849

Int. Cl.² B32B 15/08; C08L 79/08

U.S. Cl. 260—29.2 N

14 Claims

1. An aqueous insulating varnish which comprises an aqueous medium containing dissolved therein a resin containing ester groups, imide groups and free carboxyl groups in the resin molecule having an acid number of 20 to 100, with a volatile base selected from the group consisting of ammonia and a volatile organic amine to render the resin soluble, the resin comprising the reaction product of (A) 100 parts of a carboxyl group containing polyol containing ester groups in the molecule comprising the reaction product of

1. an organic carboxylic acid component comprising
a. about 15 to 100 mol% of at least one of an aromatic tricarboxylic acid and the anhydride thereof in which up to 30 mol% of the aromatic tricarboxylic acid and the anhydride thereof can be replaced by at least one of an aromatic tetracarboxylic acid and the anhydride thereof, and

2. an organic alcohol component comprising at least one organic polyhydric alcohol;

B. 2.5 to 250 parts of a member selected from the group consisting of butanetetracarboxylic acid, an imide-forming derivative thereof and mixture; and

C. at least one organic diamine, the molar ratio of butanetetracarboxylic acid or said imide-forming derivative thereof to organic diamine being 1/4 to 5.

4,008,196

PROCESS FOR PREPARATION OF AMPHOTERIC RESINOUS AQUEOUS EMULSIONS

Kazuo Matsuda; Hidemasa Ohmura, both of Wakayama, and Yukihisa Niimi, Osaka, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 605,018

Claims priority, application Japan, Aug. 20, 1974, 49-95236

Int. Cl.² C08G 18/71; D06M 15/52

U.S. Cl. 260—29.2 TN

10 Claims

1. A process for preparing an amphoteric polyurethane aqueous emulsion, which comprises:

1. reacting, in the liquid phase and in a ketone solvent, at a temperature of from -20° to +70° C, (A) isocyanate-terminated urethane prepolymer prepared by reacting organic polyol having a molecular weight in the range of from 200 to 10,000 with an excess of organic polyisocyanate, with (B) an excess of polyalkylene polyamine having at least two primary or secondary amino groups, the total mole number of primary and secondary amino groups in the polyalkylene polyamine being greater than the total mole number of isocyanate groups in the isocyanate-terminated urethane prepolymer, the reaction being carried out until the presence of -NCO groups cannot be detected, whereby to form polyurethane-urea-polyamine, 2. reacting with the polyurethane-urea-polyamine of step 1, a substance selected from the group consisting of alkyl isocyanates having an alkyl group containing 12 to 22 carbon atoms and a α -olefin epoxides having from 12 to 22 carbon atoms, to form an alkyl-substituted polyurethane-urea-polyamine, the amount of said substance being from 10 to 80 mole %, based on the number of moles of amino groups in the molecule of said polyurethane-urea-polyamine, 3. reacting the reaction product of step 2 with a material selected from the group consisting of β -propiolactone, δ -valerolactone, ϵ -caprolactone, 1,3-propane sultone and 1,4-butane sultone to render amphoteric the alkyl-substituted polyurethane-urea-polyamine, the amount of said

material being from 0.5 to 2.0 moles per mole of amino groups in said alkyl-substituted polyurethane-urea-polyamine.

4. treating the reaction product of step 3 to remove the solvent therefrom and adding water thereto to form an aqueous amphoteric polyurethane emulsion.

4,008,197

MINERAL OIL EXTENDED POLYURETHANE SYSTEM CONTAINING A COUPLING AGENT FOR DECONTAMINATING AND SEALING THE INTERIOR SPACES OF AN INSULATED ELECTRICAL DEVICE

Melvin Brauer, E. Brunswick, and Thaddeus Frank Kroplinski, Bound Brook, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 432,479, Jan. 11, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,180

Int. Cl.² C08K 5/01, 5/07, 5/10

U.S. Cl. 260—31.6

8 Claims

1. A mineral oil extended polyurethane system comprising the reaction product of an isocyanate terminated prepolymer with a polyol in the presence of a mineral oil and a liquid coupling agent for compatibilizing said mineral oil with said polyurethane, said polyurethane system containing from about 8 to about 20 parts of said urethane polymer, from about 60 to about 75 parts mineral oil and from about 10 to about 25 parts of coupler, all parts expressed on a weight basis, said liquid coupling agent being miscible in all proportions with said mineral oil, said coupling agent selected from the group consisting of a ketone and an ester of an organic compound selected from the group consisting of a diol and a diacid, said agent having a boiling temperature above 220° F., a solubility parameter between 7.0 and 9.5 and a hydrogen bonding index number in the range from 8.2 to 8.8, said isocyanate terminated prepolymer selected from the group consisting of cycloaliphatic diisocyanate, aliphatic diisocyanate and aromatic diisocyanate; said polyol selected from the group consisting of castor oil and polyether wherein at least one of said urethane forming reactants include a hydroxy bearing polybutadiene constituent, the mineral oil extended polyurethane when cured retaining the mineral oil within its structure, thereby preventing the oil from spewing and exuding from said cured composition, said composition possessing a gel-like consistency.

4,008,198

PROCESS FOR PREPARING HIGHLY TRANSPARENT ELASTOMERS

Herbert Krohberger, Neutetting; Jürgen Burkhardt, and Jörg Patzke, both of Burghausen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 2, 1975, Ser. No. 574,052

Claims priority, application Germany, May 15, 1974, 2423531

Int. Cl.² C08L 83/04

U.S. Cl. 260—37 SB

20 Claims

1. A composition which is convertible to highly transparent or optically clear elastomers comprising (1) an organopolysiloxane having a viscosity of at least 500,000 cSt at 25° C., (2) at least 0.02 percent by weight based on the weight of the organopolysiloxane (1) of a nitrogen containing compound selected from the class consisting of N-triorganosilylcarbamate acid esters, N-triorganosilylureas, O-triorganosilyloxyamines, aminoorganosiloxanes and triorganosilyloxy-N-triorganosilylamines, (3) from 4 to 40 percent by weight based on the weight of the organopolysiloxane (1) of a hexaorganodisilazane and (4) from 10 to 150 percent by weight based on the weight of the organopolysiloxane (1) of silicon dioxide having a surface area of at least 50 m²/g.

4,008,199

HEAT STABILIZED POLYALKYLENE TEREPHTHALATE RESIN COMPOSITION

John S. Gall, North Haledon, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,800

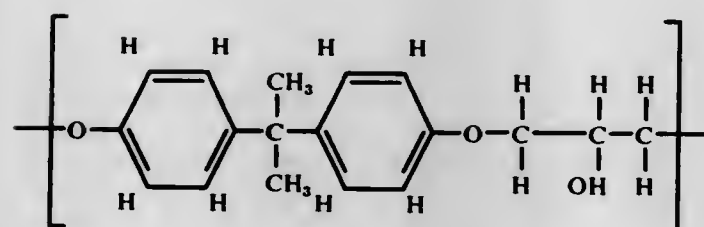
Int. Cl.² C08K 3/40

U.S. Cl. 260—40 R

7 Claims

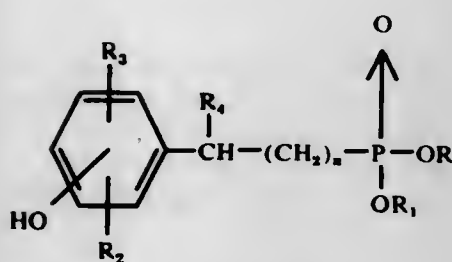
1. In a molding resin comprising a reinforcing filler and a polyalkylene terephthalate selected from the group consisting of the polymer reaction product of 1,3-propanediol and terephthalic acid or dimethyl terephthalate and the polymer reaction product of 1,4-butanediol and terephthalic acid or dimethyl terephthalate, said polyalkylene terephthalate having an intrinsic viscosity in the range of about 0.4 to about 1.2 deciliters per gram, as measured in an 8 weight percent solution, based on the polymer weight, of orthochlorophenol at 25° C.; the improvement comprising an intimate blend of said molding resin and the combination of stabilizing amounts of additives of each of

- a linear polyamide polymer having a relative viscosity in the range from 35 to 100
- a thermoplastic phenoxy resin having a repeating structure:



and an average molecular weight in a range from about 15,000 to about 75,000

- an organic phosphonate of the formula:



wherein n is 0 or 1 and

- when n is 1, each of R and R_1 is alkyl having from 12 to 24 carbon atoms and each of R_2 and R_3 is alkyl having from 1 to 6 carbon atoms, and R_4 is hydrogen; and
- when n is 0, R_2 , OH and R_3 are fixed, respectively, in the 3, 4 and 5 positions of the benzene ring portion of the benzylphosphonate; each of R and R_1 is alkyl of 14 to 30 carbon atoms, R_2 is alkyl of from 1 to 6 carbon atoms, R_3 is tertiary-butyl, and R_4 is a member selected from the group consisting of hydrogen and methyl.

4,008,200

METHOD OF STABILIZING ORGANIC MATERIALS EMPLOYING PYRAZOLE COMPOUNDS AND STABILIZED COMPOSITIONS THEREOF

Lajos Avar, Binningen; Kurt Hofer, Munchenstein, and Martin Preiswerk, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

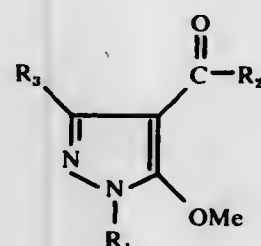
Continuation-in-part of Ser. No. 485,298, July 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 447,922, March 4, 1974, abandoned. This application Apr. 11, 1975, Ser. No. 567,308

Int. Cl.² C08K 1/00

U.S. Cl. 260—45.75 N

16 Claims

1. A method of stabilizing a natural or synthetic polymeric material susceptible to degradation under the effect of heat, oxidation or ultra-violet light which comprises treating said material with a stabilizing effective amount of a compound of the formula:



wherein

R_1 is alkyl (C_1-C_{22}); cycloalkyl (C_5-C_{12}); cycloalkyl (C_5-C_{11}) alkyl (C_1-C_7); alkyl (C_1-C_{21}) thioalkyl (C_1-C_{21}) with C_2-C_{22} in the aggregate thereof; cycloalkyl (C_5-C_{11}) alkyl (C_1-C_6) thioalkyl (C_1-C_6) with C_7-C_{11} in the aggregate thereof; aralkyl (C_7-C_{12}); aralkyl (C_7-C_{12}) substituted on the aryl nucleus by 1 or 2 hydroxyl groups, 1 or 2 alkyl (C_1-C_{12}) groups, cycloalkyl (C_5-C_{12}) and/or cycloalkyl (C_5-C_{11}) alkyl (C_1-C_{11}); phenyl; phenyl substituted by 1 to 3 halogen atoms, cyano, 1 or 2 hydroxyl groups, 1 or 2 alkyl (C_1-C_{12}) groups, 1 or 2 alkoxy (C_1-C_{12}) groups, phenyl, $-SO_3H$ and/or a radical R_4-O- or R_4-SO_2- , wherein R_4 is phenyl or phenyl substituted by 1 or 2 alkyl (C_1-C_6) groups;

R_2 has one of the significances of R_1 or is a furan, thiophene, benzothiophene, indole, pyridine or quinoxaline radical, each of which is either unsubstituted or substituted by halogen, alkyl (C_1-C_4) and/or alkoxy (C_1-C_4) with 1 or 2 substituents in the aggregate thereof;

R_3 has one of the significances of R_1 or is cyano or $-COOR_5$, wherein R_5 is alkyl (C_1-C_{12}), cycloalkyl (C_5-C_{12}), cycloalkyl (C_5-C_{11}) alkyl (C_1-C_7), phenyl or phenyl substituted by hydroxy and/or 1 to 2 alkyl (C_1-C_6) groups, and Me is hydrogen or an equivalent of a bivalent metal ion.

4,008,201

HALOGENATED RESINS STABILIZED WITH NOVEL COMPOSITIONS

Lewis B. Weisfeld, Princeton, N.J., assignor to Carlisle Chemical Works, Inc., Reading, Ohio

Continuation of Ser. No. 223,623, Feb. 4, 1972, abandoned.

Continuation-in-part of Ser. No. 803,084, Feb. 27, 1968, Pat. No. 3,640,950, which is a continuation-in-part of Ser. No. 577,844, Sept. 8, 1966, abandoned. This application July 18, 1975, Ser. No. 597,233

The portion of the term of this patent subsequent to Feb. 8, 1989, has been disclaimed.

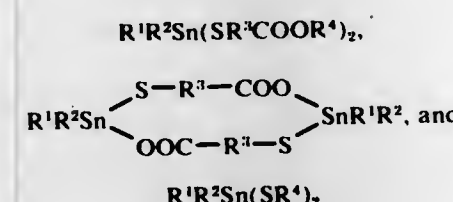
Int. Cl.² C08K 5/58

U.S. Cl. 260—45.75 S

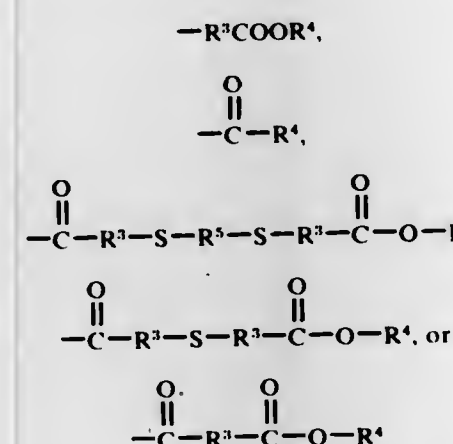
16 Claims

1. A vinyl halide resin composition comprising a resin selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, copolymers of vinyl chloride with other ethylenically unsaturated monomers and copolymers of vinyl-

dene chloride with other ethylenically unsaturated monomers and a stabilizing effective amount of a tin composition comprising in synergistic combination a diorganotin mercapto compound having a formula selected from the group consisting of



and a monoorganotin compound having the formula $R'Sn(Z)_n(Z'Y)_{3-2n}$ wherein R' and R'' are methyl or butyl, Z and Z' are each oxygen or sulfur, n is zero to 1.5 and Y is hydrogen, alkyl, cycloalkyl,



wherein R^3 is alkylene, alkenylene, cycloalkyldiene, cycloalkylene, arylene, alkarylene or aralkylene, R^4 is hydrogen, alkyl, aryl, cycloalkyl or aralkyl, R^5 is alkylene, cycloalkyldiene, alkyldiene, alkenyldiene or cycloalkylene, said monoorganotin compound being present in amount sufficient to provide tin in amount from 50 to 98 percent by weight of the total tin content of the combination of said diorganotin mercapto compound and said monoorganotin compound.

4,008,202

AQUEOUS THICKENING AGENTS DERIVED FROM VINYL BENZYL ETHER POLYMERS

Syamalarao Evani, and Frederick P. Corson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 29, 1972, Ser. No. 267,570

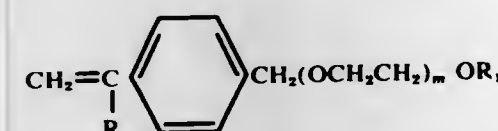
Int. Cl.² C08F 15/10, 15/14, 15/02

U.S. Cl. 260—47 UA

11 Claims

1. A polymer comprising in polymerized form

- about 0.2 to 15 mole percent of a vinyl benzyl ether monomer having the formula



wherein R is hydrogen or methyl and R_1 is an alkyl, alkaryl or aralkyl group of 10 to about 22 carbon atoms, and m is about 10 to 100, and;

- the balance to make 100 mole percent of one or more copolymerizable monomers provided a water solubilizing amount of at least one monomer having a carboxylic acid group, an anhydride group, a sulfate group, a sulfonate group or a hydroxyl group is present.

4,008,203

POLYSULPHONES AND METHOD OF PREPARATION

Michael Edward Benet Jones, Hitchin, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 31, 1963, Ser. No. 320,508

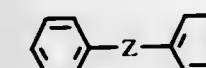
Claims priority, application United Kingdom, Nov. 6, 1962, 41976/62; Mar. 18, 1963, 10592/63

Int. Cl.² C08G 75/20, 75/23

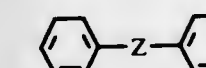
U.S. Cl. 260—49

48 Claims

1. A film-forming polymeric material selected from the group consisting of (i) polymers consisting essentially of repeating units having the structure $-Ar-SO_2-$ and (ii) polymers consisting essentially of units having the structure $-Ar-SO_2-$ and units having the structure $-Ar-CO-$ where Ar is selected from (a) a divalent aromatic radical obtained by removal of two aromatically bound hydrogen atoms from a compound selected from the group consisting of benzene, polynuclear hydrocarbons containing not more than two aromatic rings, diphenyl, compounds having the structure



where Z is selected from the group consisting of $-O-$ and $-S-$ and where said compound contains two aromatic rings, one of said hydrogen atoms being removed from each ring, and (b) substituted derivatives of said divalent aromatic radicals in which at least one of the aromatically bound hydrogen atoms is substituted by a monovalent radical selected from the group consisting of halogen atoms, alkyl groups containing from 1 to 4 carbon atoms and alkoxy groups containing from 1 to 4 carbon atoms, at least some of the Ar units being a radical derived from said compounds of the structure



or said substituted derivatives thereof.

4,008,204

POLYSULPHONES AS INSULATORS

Michael Edward Benet Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 126,970, March 22, 1971,

abandoned, which is a division of Ser. No. 320,508, Oct. 31, 1963. This application Aug. 25, 1972, Ser. No. 283,656

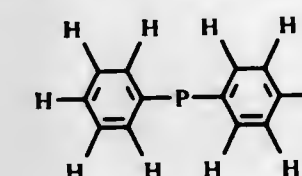
Claims priority, application United Kingdom, Nov. 6, 1962, 41976/62; Mar. 18, 1963, 10592/63; Oct. 3, 1963, 38973/63

Int. Cl.² C08G 75/20, 75/23

U.S. Cl. 260—49

11 Claims

1. Switch gear containing as electrical insulant a shaped polymeric material formed of repeating units having the structure $-Ar-SO_2-$ where Ar is a divalent aromatic residue derived from benzene, a polynuclear hydrocarbon, diphenyl, a compound having the structure



where P is $-O-$, $-S-$, $-SO-$, a divalent hydrocarbon radical, a substituted divalent hydrocarbon radical or a residue of a diol containing only carbon atoms or groups of the structure $-C-O-C-$ or $-C-S-C-$ in the chain between the hydroxyl groups, or substituted derivatives of any such aromatic residues in which one or more of the hydrogen atoms

bound to the aromatic rings are substituted by other monovalent atoms or groups, and Ar may vary from unit to unit in the polymer chain.

4,008,205

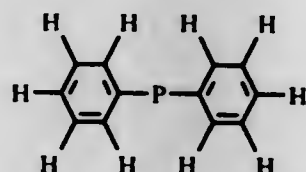
POLYSULPHONES AS INSULATORS

Michael Edward Benet Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 126,894, March 22, 1971, abandoned, which is a division of Ser. No. 320,508, Oct. 31, 1963. This application Aug. 25, 1972, Ser. No. 283,655
Claims priority, application United Kingdom, Nov. 6, 1962, 41976/62; Mar. 18, 1963, 10592/63; Oct. 3, 1963, 38973/63
Int. Cl.² C08G 75/20, 75/23

U.S. Cl. 260—49

11 Claims

1. Transformer parts containing as electrical insulant a shaped polymeric material formed of repeating units having the structure $-\text{Ar}-\text{SO}_2-$ where Ar is a divalent aromatic residue derived from benzene, a polynuclear hydrocarbon, diphenyl, a compound having the structure



where P is $-\text{O}-$, $-\text{S}-$, $-\text{SO}-$, a divalent hydrocarbon radical, a substituted divalent hydrocarbon radical or a residue of a diol containing only carbon atoms or groups of the structure $-\text{C}-\text{O}-\text{C}-$ or $-\text{C}-\text{S}-\text{C}-$ in the chain between the hydroxyl groups, or substituted derivatives of any such aromatic residues in which one or more of the hydrogen atoms bound to the aromatic rings are substituted by other monovalent atoms or groups, and Ar may vary from unit to unit in the polymer chain.

4,008,206

SOLID STATE POLYMERIZATION

Gary R. Chipman, Naperville, and Ronald E. Bockrath, Aurora, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 2, 1974, Ser. No. 511,166

Int. Cl.² C08G 63/26

U.S. Cl. 260—75 M

7 Claims

1. The method of producing a relatively high inherent viscosity polyester resin without agglomeration which comprises polymerizing a polyester having an initial starting inherent viscosity of about 0.3–0.7 dl/g under solid state polymerization conditions together with an organic crystalline polycarboxylic acid anti-stick agent having a melting point of at least 230° C wherein said anti-stick agent is present in a concentration of 0.05–10 parts by weight per each 100 parts by weight polyester and the inherent viscosity is determined in a 60:40 phenol: tetrachloroethane at 30° and 0.4 g/dl.

4,008,207

PROCESS FOR PREPARING POLYESTERS FOR OPAQUE FILM USE

Yorihiko Omoto, and Tetsuo Matsumura, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 5, 1975, Ser. No. 574,733

Claims priority, application Japan, May 11, 1974, 49-51744
Int. Cl.² C08G 63/14

U.S. Cl. 260—75 R

4 Claims

1. In preparing a polyester by carrying out the ester-interchange reaction of a lower alkyl ester of terephthalic acid and a glycol and thereafter effecting the polycondensation reaction of the resulting product, the improvement for preparing a polymer for opaque film use which comprises carrying out

said ester-interchange reaction in the presence of a calcium compound and a lithium compound having ester-interchange catalysis capacities in amounts satisfying all of the following relationships:

$$0.03 \leq \text{Ca} \leq 0.50$$

1.

$$0.10 \leq \text{Li} \leq 0.80$$

2.

$$0.30 \leq 0.5 \text{ Ca} + \text{Li} \leq 1.00$$

3.

and

$$0.10 \leq \frac{P}{0.5 \text{ Ca} + \text{Li}} \leq 0.55 \quad (4)$$

wherein Ca, Li and P are respectively the mol percentages of calcium, lithium and phosphorus compounds based on the lower alkyl ester of terephthalic acid, and thereafter adding to the reaction system a phosphorus compound of the formula



wherein R is a member selected from the group consisting of the alkyl, aryl and hydroxyalkyl groups, n is selected from the class consisting of 0 and 1, l is a whole number up to 2, including 0, m is a whole number from 1 to 3, with the proviso that the sum of l and m is 3, in an amount satisfying said relationship (4), the addition being made at a point in the process up until completion of said polycondensation reaction.

4,008,208

COMPOSITIONS HAVING INHIBITED ABILITY TO PROMOTE PLATELET AGGREGATION OR FIBRIN CLOT FORMATION

Daniel Lednicher, Portage, and Edward E. Nishizawa, Schoolcraft, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 258,016, May 30, 1972, Pat. No. 3,888,833. This application Mar. 17, 1975, Ser. No. 559,333
Int. Cl.² C08F 8/36, 28/02

U.S. Cl. 260—79.3 R

9 Claims

1. A composition which comprises a sulfonyl aromatic diazonium salt chemically bonded at the sulfonyl grouping through a nitrogen-containing bond to a material which is susceptible to interaction with a nitrene which induces deposition of blood cells and fibrin when in contact with mammalian blood.

4,008,209

NONAPEPTIDE AMIDE ANALOGS OF LUTEINIZING RELEASING HORMONE

Masahiko Fujino, Takarazuka; Tsunehiko Fukuda, and Susumu Shinagawa, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 509,357, Sept. 24, 1974, abandoned. This application July 11, 1975, Ser. No. 595,308

Claims priority, application Japan, Sept. 29, 1973, 48-109951; Mar. 8, 1974, 49-27442

Int. Cl.² C07C 103/52; A61K 37/00

U.S. Cl. 260—112.5 LH

16 Claims

1. A compound of the formula



wherein

R₁ is Tyr or Phe,R₂ is D-Nle, D-Nva, D-Abu, α-Aibu, D-Phe or D-Ser,R₃ is Leu, Ile or Nle, andR₄ is alkyl of 1 to 3 carbon atoms which may be substituted with hydroxyl.

4,008,210

SOLVENT EXTRACTION OF OIL FROM OIL SEEDS

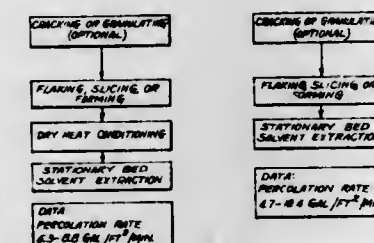
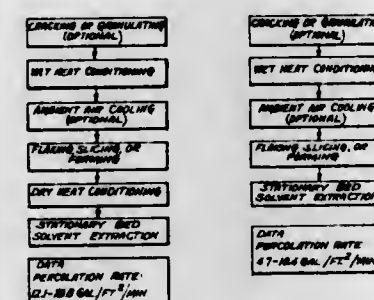
Bobby C. Steele, Conyers; Douglas R. Barr, Norcross; Charles T. Hunt, Lithonia, and James L. Ayres, Stone Mountain, all of Ga., assignors to Gold Kist Inc., Lithonia, Ga.

Filed Nov. 5, 1974, Ser. No. 521,145

Int. Cl.² A23J 1/14; C11B 1/10

U.S. Cl. 260—123.5

21 Claims



1. A method for the direct solvent extraction of oil from peanuts to produce a low-fat proteinaceous material which comprises, wet heat conditioning at a temperature of from 160° to 240° F whole peanuts, peanut splits, peanut granules, or cracked peanuts to a moisture content of more than 6 but less than 12%, flaking said wet heat conditioned peanuts, dry heat conditioning said flaked peanuts to a moisture content of from 1.9 to 6% and treating said dry heat conditioned flakes with a solvent selected from the group consisting of alcohols, ketones, hydrocarbons, and halogenated hydrocarbons, for the removal of oil contained in said flakes.

4,008,211

BETAINIC AZO DYESTUFFS CONTAINING COBALT IN COMPLEX UNION WITH A COLORLESS, TRIDENTATE LIGAND

Paul Lienhard, Riehen near Basel; Fabio Beffa, Basel, and Charles Soiron, Riehen near Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

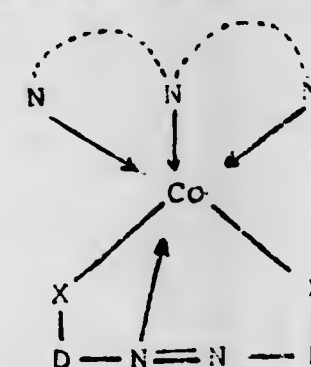
Continuation of Ser. No. 57,017, June 9, 1970, abandoned, which is a division of Ser. No. 496,651, Oct. 15, 1965, abandoned. This application July 30, 1973, Ser. No. 383,697
Claims priority, application Switzerland, Oct. 20, 1964, 13579/64

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² C09B 45/20, 45/30; D06P 3/24

U.S. Cl. 260—147

7 Claims

1. A betainic cobalt complex dyestuff of the formula

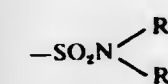


wherein the symbol

represents a member selected from the group consisting of diethylenetriamine, dipropylenetriamine and monoethylene-mono-propylene-triamine, said triamines being unsubstituted or N-lower alkyl-substituted,

α,β,γ-triaminopropane,
α,β,δ-triaminobutane,
α,γ-diamino-β-(aminomethyl)-propane,
N,N-bis-(β-phenylaminoethyl)-N-ethylamine,
N,N'-dibenzyl-diethylenetriamine,
N,N-bis-(β-N'-piperidinoethyl)-N-ethylamine,
1-amino-2-(β-amino-ethylamino)-cyclohexane,
2,2'-diaminodicyclohexylamine,
1-amino-2-(β-amino-ethylamino)-benzene,
2,2'-diamino-diphenylamine,
2,6-(di-2'-pyridyl)-pyridine,
8-(2'-amino-phenylamino)-quinoline,
(2-pyridylmethylene-aminoethyl)-diethylamine,
1-(diethylamino)-2-(2'-pyridyl-methylene-amino)-benzene,
1-(dimethylamino)-2-(2'-pyridyl-methylene-amino)-cyclohexane,
2-(2'-pyridyl-methylene-amino-methyl)-pyridine,
8-(2'-pyridyl-methylencamino)-quinoline,
2,6-bis-(benzyl-aminomethylene)-pyridine,
2,6-bis-(aminomethyl)-pyridine,
pyridine-2,6-dialdehyde dioxime,
pyridine-2,6-dialdehyde-dihydrazone,
2-methoxy-4,6-dihydrazino-1,3,5-triazine and
2-amino-4,6-dihydrazino-1,3,5-triazine; and

wherein
—D—N=N—E— is the divalent radical of a dyestuff selected from a benzene-azo-benzene dyestuff, a benzene-azo-naphthalene dyestuff, a benzene-azo-(1-phenyl-5-hydroxy-pyrazole) dyestuff, a benzene-azo-(1-phenyl-5-amino-pyrazole) dyestuff, a benzene-azo-acylaceto-phenylamide dyestuff, a benzene-azo-benzene-azo-naphthalene dyestuff, a naphthalene-azo-naphthalene dyestuff and a naphthalene-azo-(1-phenyl-5-hydroxy-pyrazole) dyestuff, any substituents of said dyestuffs being selected from hydrogen, chlorine, bromine, lower alkyl, lower alkoxy, nitro, hydroxyl, lower-alkyl-sulfonyl, phenylsulfonyl, methylphenylsulfonyl, methylphenylsulfonylamino, methylsulfonylamino, acetylaminio, carbo-ethoxy-amino, a radical of the formula



wherein

R₁ represents hydrogen, lower alkyl, hydroxyethyl, phenyl or lower alkylphenyl and R₂ represents hydrogen, lower alkyl or hydroxyethyl; carboxylic acid-N-phenylamide and lower alkyl carbonyl, phenoxycarbonyl, phenylazo or naphthylazo; and wherein one —SO₂— group is attached to either D or E;

X is linked in ortho-positions to the azo bridge to a ring carbon atom of D and represents —O—, —COO— or lower-alkylsulfonamido, and

X' is linked in ortho-positions to the azo bridge to a ring carbon atom of E and represents —O—, —N—(lower alkyl)—, —N—(hydroxy-lower-alkyl)—, —N—(phenyl)— or —NH—, said dyestuff being capable of forming a bicyclic metal complex with cobalt;

and wherein said lower alkyl and lower alkoxy moieties have from one to five carbon atoms.

4,008,212

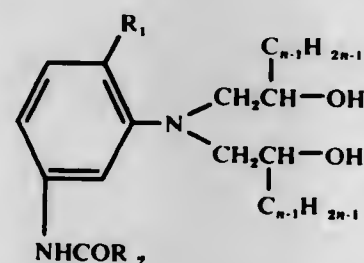
MONOAZO DYE MIXTURES DERIVED FROM 7-AMINO-4-NITROBENZOTRIAZOLE AND BIS-HYDROXYALKYLAMINO ACYLANILIDES REACTED WITH ACID HALIDES AND AMIDES

Edgar E. Renfrew, Flemington, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.
Division of Ser. No. 374,771, June 28, 1973, Pat. No. 3,860,389. This application Apr. 4, 1974, Ser. No. 457,979
Int. Cl.² C09B 29/08, 29/26, 43/18

U.S. Cl. 260-157

7 Claims

1. The monoazo dyestuff consisting essentially of the reaction product of
a. the diazo base of 7-amino-4-nitrobenzotriazole; and
b. a coupling component of the formula



wherein R₁ is H or lower alkoxy; R₂ is an alkyl radical having 1-4 carbon atoms, phenyl, tolyl, or chlorophenyl; and n has a value of 1-2; the hydroxyalkyl groups of the coupling component being reacted prior or subsequent to coupling with at least stoichiometric quantities of both:

- a lower alkyl chlorocarbonate, lower alkanoyl chloride, benzoylchloride, methylbenzoylchloride, ethylbenzoyl chloride, phthaloyl chloride, isophthaloyl chloride, terephthaloyl chloride or lower alkylsulfonyl chloride, and
- a mono- or di-lower alkyl formamide or acetamide, at a temperature of 30°-100° C. until the reaction mixture is substantially free of unreacted hydroxyalkyl groups.

4,008,213

AZO DYESTUFFS CONTAINING A CINNAMONITRILE RESIDUE

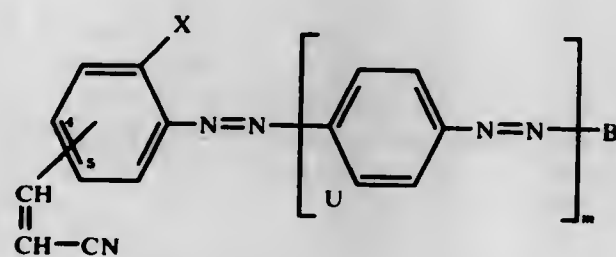
Claude Marie Henri Emile Brouard, Sotteville-les-Rouen; Jean Marie Louis Leroy, St. Etienne du Rouvray, and Jean-Pierre Henri Stiot, Saint Pierre les Elbeuf, all of France, assignors to Ugine Kuhlmann, Paris, France
Filed Mar. 11, 1971, Ser. No. 123,414

Claims priority, application France, Mar. 12, 1970, 7008829
Int. Cl.² C09B 29/08, 29/10, 29/26, 29/28

U.S. Cl. 260-160

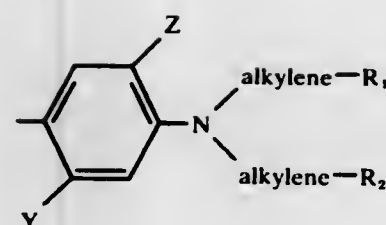
3 Claims

1. Dyestuffs of the formula:



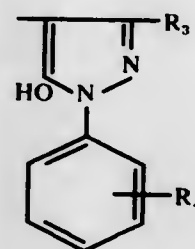
in which the radical -CH=CH-CN is fixed in the 4- or 5-position, X is hydrogen or chlorine, U is hydrogen, chlorine, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, benzoylamino, cinnamoylamino, or aliphatic acylamino containing up to 2 carbon atoms, m is zero or one, and B is

- a. the radical of the formula:



wherein Y is hydrogen, chlorine, methyl, methoxy, acetylamino, benzoylamino or cinnamoylamino, Z is hydrogen, methyl or methoxy, each alkylene bridge contains 1 to 4 carbon atoms, R₁ and R₂ are the same or different and each represent hydrogen, cyano, hydroxy, alkoxy, carbonyl, acetyl, benzoyloxy, cinnamoyloxy, acetyl, benzoyl, cinnamoyl, alkylsulfonyl, carbonamido, or alkoxy, carbonyloxy, the alkyl and alkoxy groups containing 1 to 4 carbon atoms.

- b. the radical of the formula:



wherein R₃ is hydrogen, methyl, carbonamido, N-alkyl- or N,N-dialkylcarbonamido, or alkoxy, carbonyl, the alkyl and alkoxy groups containing 1 to 4 carbon atoms, and R₄ is hydrogen, chlorine, cyano, nitro, methyl or sulphonamido,

- the p-hydroxyphenyl, 2-hydroxy-5-methylphenyl, 2-acetylamino-4-hydroxyphenyl, 2-hydroxy-1-naphthyl, or (dioxo-4,4 thiomorpholino)-4 phenyl radical,
- the 3-hydroxy-2-dibenzofuranyl or 7-hydroxy-8-coumarinyl radical,
- the 7-hydroxy-4-indazolyl radical,
- the 2-hydroxy-3-carboazolyl radical,
- the N-alkyl-4-hydroxy-2-oxo-3-quinolinyl radical, alkyl containing 1 to 4 carbon atoms or,
- the 2-phenyl-3-indolyl radical.

4,008,214

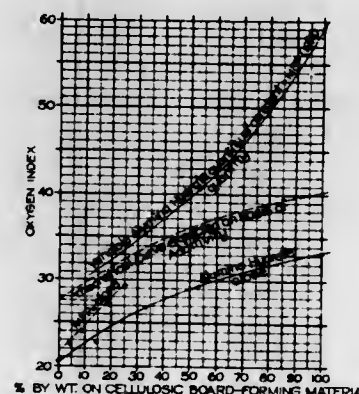
SYNERGISTIC FLAME-RETARDING COMPOSITIONS FOR CELLULOSIC BOARDS

Igor Sobolev, Orinda, and Erwin Panusch, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Dec. 8, 1975, Ser. No. 638,401

Int. Cl.² C08L 1/02

U.S. Cl. 260-17.3

16 Claims



1. A synergistically acting flame-retarding composition for cellulosic boards which comprises alumina hydrate in combination with an organic, phosphate-containing compound se-

lected from the group consisting essentially of melamine-formaldehyde-phosphate, urea-formaldehyde-phosphate and dicyandiamide-formaldehyde phosphate, wherein the alumina hydrate quantity is not less than 30% by weight of the flame-retarded board and the organic, phosphate-containing compound in the board is in the range of about 8 to about 22% by weight of the board forming cellulosic material.

4,008,215

SULFONIC-ACID SUBSTITUTED DISAZO DYESTUFFS
Hans Kramb, San Cugat del Valles, Spain, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 9, 1974, Ser. No. 513,240

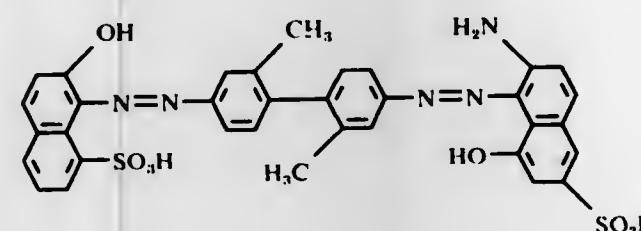
Claims priority, application Germany, Oct. 12, 1973, 2351293

Int. Cl.² C09B 35/08, 33/02, 31/02; D06P 3/06

U.S. Cl. 260-183

1 Claim

1. Disazo dyestuff, which in the form of the free acid corresponds to the formula



4,008,216

BENZENESULPHONYLBENZENESULPHONAMIDEAZOPHENYL-OR-NAPHTHYL-AZOLHYDROXYLOWERALKOXYPHENYL DYESTUFFS

Richard Sommer, Leverkusen, and Gerhard Wolfrum, Bergisch-Neukirchen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 3, 1975, Ser. No. 554,616

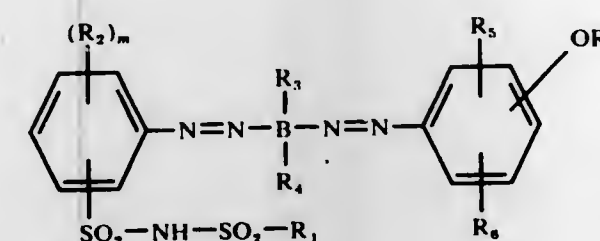
Claims priority, application Germany, Mar. 9, 1974, 2411291

Int. Cl.² C09B 31/06, 43/00; D06P 1/06, 3/24

U.S. Cl. 260-186

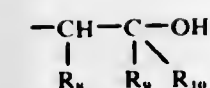
11 Claims

1. Disazo dyestuff which in the form of the free acid corresponds to the formula



wherein

- B is 5,6,7,8-tetrahydro-1,4-naphthylene, 1,4-naphthylene, or 1-4 phenylene;
R₁ is phenyl; phenyl substituted by C₁-C₄-alkyl, C₁-C₄-alkoxy, halogen, nitrile, or nitro; C₁-C₄-alkyl;
R₂ is chlorine, bromine, or alkyl or alkoxy having 1-4 carbon atoms;
R₃ and R₄ independently of one another are hydrogen, chlorine, bromine, or alkoxy or alkyl having 1-4 carbon atoms;
R₅ and R₆ independently of one another are hydrogen, alkyl having 1-4 carbon atoms, or alkoxy having 1-4 carbon atoms;
R₇ represents



R₈ and R₉ independently of one another are hydrogen or methyl;

R₉ is methyl, ethyl, phenyl, hydroxymethyl, C₁-C₄-alkoxymethyl, benzyloxymethyl, C₁-C₄-alkyl-carbonyloxymethyl or C₂-C₄-alkenylcarbonyloxymethyl;
the radical OR₇ is in the o- or p- position relative to the azo bridge, and
m is a number from 0 to 2.

4,008,217

1'-VARIABLE-1',1'-DIHALO-HALOBENZENEAZOMETHANES

Malcolm W. Moon, Kalamazoo, and Victor L. Rizzo, Paw Paw, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

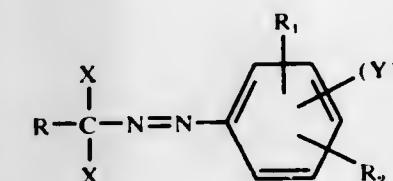
Continuation of Ser. No. 468,767, May 10, 1974, abandoned, which is a division of Ser. No. 138,269, April 28, 1971, Pat. No. 3,834,892. This application Nov. 5, 1975, Ser. No. 629,014

Int. Cl.² A01N 9/24; C07C 107/00

U.S. Cl. 260-192

19 Claims

1. A 1'-variable-1',1'-dihalo-halobenzeneazomethane of the structural formula



wherein R is hydrogen; alkyl of from 1 to 7 carbon atoms, inclusive; cycloalkyl of from 3 to 7 carbon atoms, inclusive; haloalkyl of from 1 to 7 carbon atoms, inclusive; halocycloalkyl of from 3 to 7 carbon atoms, inclusive; alkoxyalkyl of from 2 to 8 carbon atoms, inclusive; hydroxyalkyl of from 1 to 7 carbon atoms, inclusive; and phenyl optionally having 1, 2, or 3 substituents, e.g., halogen atoms, lower-alkyl of from 1 to 4 carbon atoms, inclusive, and lower-alkoxy of from 1 to 4 carbon atoms, inclusive; the X's are independently bromine, chlorine, or fluorine; m is an integer 0, 1, 2, or 3; and R₁, R₂, and Y are independently halogen, lower-alkyl of from 1 to 4 carbon atoms, inclusive; halolower-alkyl of from 1 to 4 carbon atoms, inclusive; or lower-alkoxy of from 1 to 4 carbon atoms, inclusive; providing however, that at least one R₁ and R₂ is halogen, and that the sum of the carbon atoms in substituents R₁, R₂, and Y may not be more than 15.

4,008,218

1-N-((S)-α-SUBSTITUTED-ω-AMINOACYL)-NEAMINE OR -RIBOSTAMYCIN AND THE PRODUCTION THEREOF
Eiichi Akita, Kamakura; Tsutomu Tsuchiya, Yokohama; Shinichi Kondo, Yokohama; Shuntaro Yasuda, Yokohama; Sumio Umezawa, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Meiji Seiki Kaisha, Ltd., Tokyo, Japan
Division of Ser. No. 390,217, Aug. 21, 1973. This application Mar. 19, 1975, Ser. No. 559,771

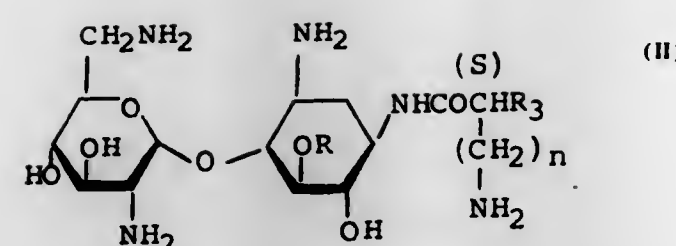
Claims priority, application Japan, Aug. 25, 1972, 47-84633

Int. Cl.² C07G 11/00

U.S. Cl. 536-17

2 Claims

1. A process for the production of a 1-N-((S)-α-substituted-ω-aminoalkanoil-neamine or -ribostamycin of the formula:



wherein R is a hydrogen atom or β -D-ribofuranosyl group of the formula:



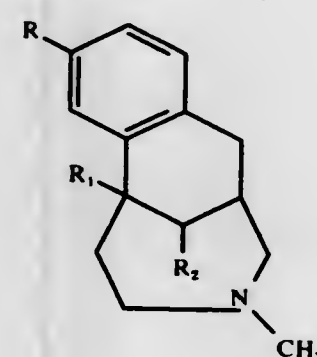
and the pharmaceutically acceptable acid addition salts thereof, wherein R is hydrogen, hydroxy or alkoxy of up to 3 carbon atoms;

R₁ is hydrogen or alkyl of up to 3 carbon atoms;

R₂ is hydrogen, methyl or ethyl; and

R₃ is hydrogen, straight or branched alkyl of up to 4 carbon atoms, straight or branched alkenyl of up to 4 carbon atoms, mono- or dihydroxyalkyl of up to 2 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, or phenyl-methyl.

7. In the process for the preparation of a compound selected from the group consisting of a 4-benzazone of the formula:

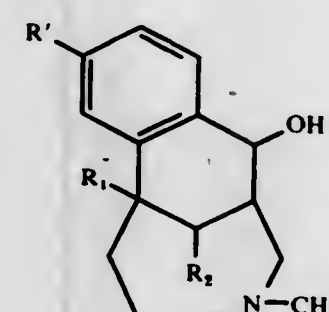


and the pharmaceutically acceptable acid addition salts thereof, wherein

R is hydrogen or hydroxy;

R₁ is hydrogen or alkyl of up to 3 carbon atoms; and

R₂ is hydrogen, methyl or ethyl; the step which consists essentially of treating a compound of the formula:



wherein R' is hydrogen or methoxy and each of R₁ and R₂ are as herein defined with hydriodic acid and red phosphorus.

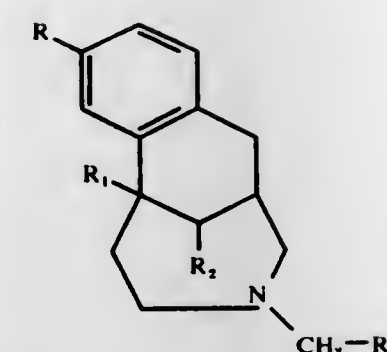
8. In the process for the preparation of a compound selected from the group consisting of a 4-benzazone of the formula:

4,008,219
4-BENZAZONINE DERIVATIVES AND PROCESS FOR PREPARATION THEREOF
Masao Ikeda; Shigeo Miyamoto; Tutomu Nozawa; Akira Kurobe, all of Toyama, and Osamu Futsukaichi, Shinminato, all of Japan, assignors to Nihon Iyakuin Kogyo Co., Ltd., Japan

Filed May 6, 1974, Ser. No. 467,520
Claims priority, application Japan, May 8, 1973, 48-51458; May 8, 1973, 48-51459; May 8, 1973, 48-51460; May 8, 1973, 48-51461; Jan. 16, 1974, 49-7683; Feb. 5, 1974, 49-15282; Feb. 5, 1974, 49-15281

Int. Cl.² C07D 225/06
U.S. Cl. 260—239 BB
1. A compound selected from the group consisting of a 4-benzazone of the formula:

18 Claims



and the pharmaceutically acceptable acid addition salts thereof, wherein

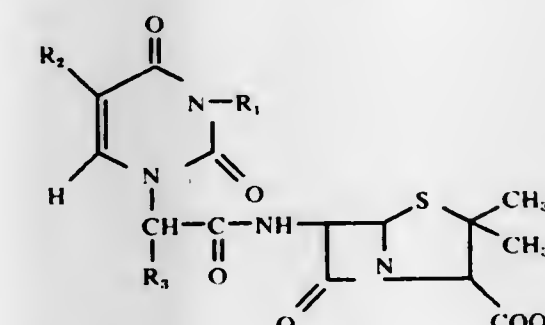
R is hydrogen or alkoxy of up to 3 carbon atoms;

R₁ is hydrogen or alkyl of up to 3 carbon atoms;

R₂ is hydrogen, methyl or ethyl; and

R₃ is hydrogen, straight or branched alkyl of up to 4 carbon atoms, mono- or dihydroxyalkyl of up to 2 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or phenyl-methyl,

the steps which consists essentially of hydrogenating a compound of the formula:

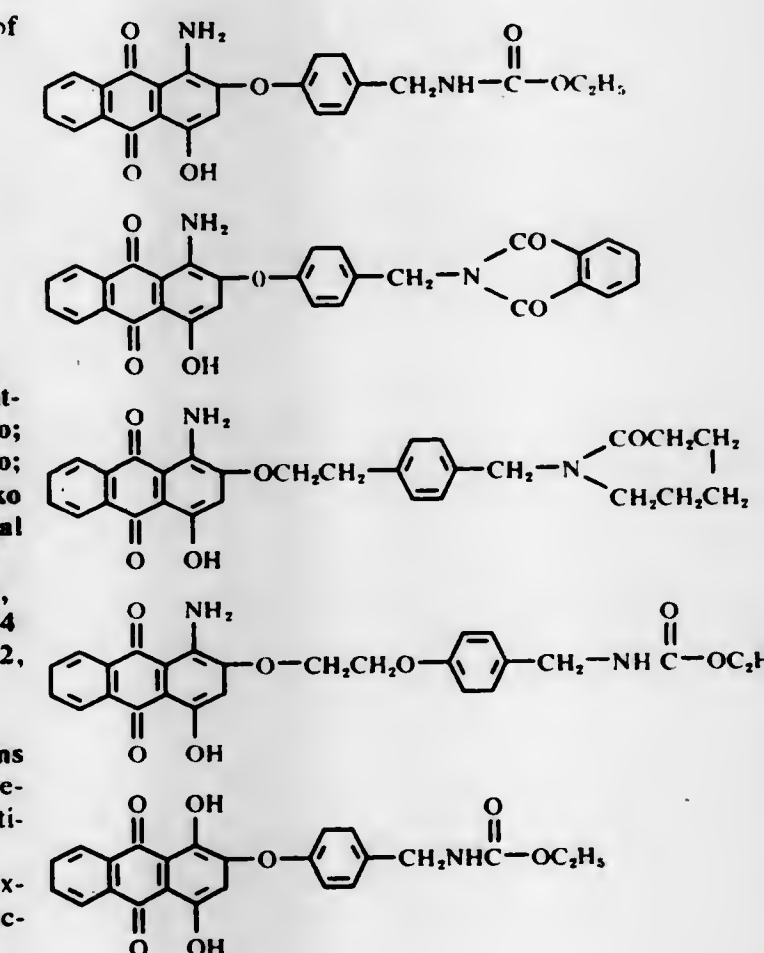


wherein

R₁ is hydrogen and methyl;

R₂ is selected from the group consisting of hydrogen, halogen, hydroxyl, lower alkyl, trifluoromethyl, nitro, amino, acetyl, cyano, carboxy, carbomethoxy and carbethoxy; R₃ is selected from the group consisting of hydrogen, methyl, phenyl, carboxy, carbomethoxy and carbethoxy; and the pharmaceutically acceptable salts thereof.

4,008,222
ANTHRAQUINONE DYESTUFFS
Heinz Machatzke, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Dec. 16, 1966, Ser. No. 602,140
Int. Cl.² C07D 223/10; C07C 49/95
U.S. Cl. 260—239.3 T
1. Dyestuff selected from the group consisting of

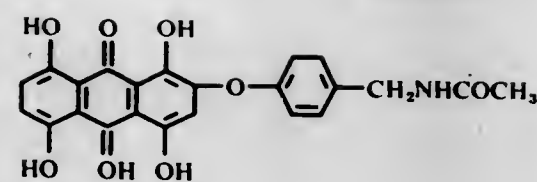


in a polar solvent over a palladium catalyst at a temperature of at least about 50° C.

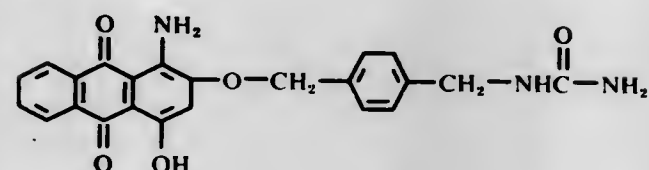
4,008,220
PENICILLINS
Hisao Tobiki, Osaka; Hirotada Yamada, Hyogo; Iwao Nakatsuka, Osaka; Kozo Shimago, Hyogo; Shigeru Okano, Hyogo; Takenari Nakagome, Hyogo; Toshiaki Komatsu, Hyogo; Akio Izawa, Osaka; Hiroshi Noguchi, Hyogo, and Yasuko Eda, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan
Continuation-in-part of Ser. No. 341,723, March 15, 1973, abandoned. This application Aug. 8, 1974, Ser. No. 495,914
Claims priority, application Japan, Mar. 15, 1972, 47-26759

Int. Cl.² C07D 499/48
U.S. Cl. 260—239.1
20 Claims
1. D- α -(4-Ethoxycarbonyloxy-2,3-cyclopenteno-pyridine-5-carboxamido)benzylpenicillin and non-toxic, pharmaceutically acceptable salts thereof.
2. D- α -(4-Hydroxy-2,3-cyclopenteno-pyridine-5-carboxamido)benzylpenicillin and non-toxic, pharmaceutically acceptable salts thereof.

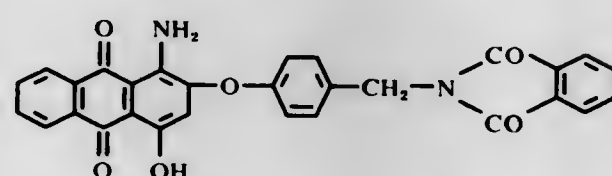
-continued



and



3. Dyestuff of claim 1 of the formula



4,008,223

6-AZA-3H-1,4-BENZODIAZEPINES

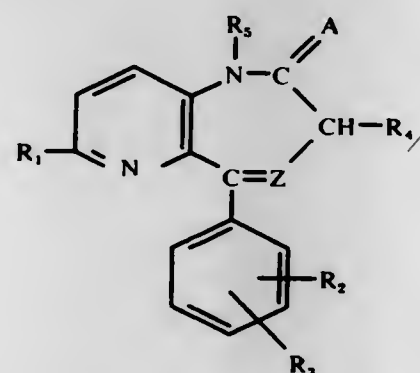
Walter Von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 313,542, Dec. 8, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 507,605
Claims priority, application Austria, Dec. 9, 1971, 10604/71; Argentina, Mar. 20, 1974, 252867

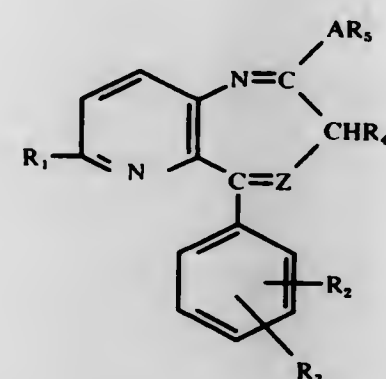
Int. Cl.² C07D 471/04

U.S. Cl. 260—239.3 B

1. A compound of the formula:



or its tautomer of the formula:



where R_1 is a halogen, R_2 and R_3 are hydrogen, halogen, trifluoromethyl, nitro, nitrile, hydroxy, lower alkyl or lower alkoxy, R_4 is hydrogen, hydroxyl, hydroxyl acylated with an alkanolic acid of 2 to 6 carbon atoms or an alkandioic acid of

3 to 6 carbon atoms, lower alkoxy, lower alkyl, benzyl, carboxyl or carb-lower alkoxy, Z is nitrogen or NO, R_5 is hydrogen, lower alkyl, lower alkyl substituted with cycloalkyl of 3 to 6 carbon atoms, lower alkenyl, cycloalkyl of 3 to 6 carbon atoms, hydroxy lower alkyl, benzyl, acyl of alkanolic acid of 2 to 6 carbon atoms, aminoalkyl of 2 to 7 carbon atoms, mono or di lower alkyl substituted aminoalkyl of 2 to 7 carbon atoms, lower alkyl substituted with morpholino or piperidino, and A is oxygen, sulfur, or two hydrogen atoms or in the tautomeric form $-NHNHCOCH_3$, $-NHCH_3$, $-OR_5$ or $O-SR_5$ and pharmacologically acceptable salts thereof.

4,008,224

PROCESS FOR THE MANUFACTURE OF CYANO-SUBSTITUTED STILBENE COMPOUNDS

Adolf Emil Siegrist, Basel, and Vincenzo Coviello, Marly, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 30, 1974, Ser. No. 519,164

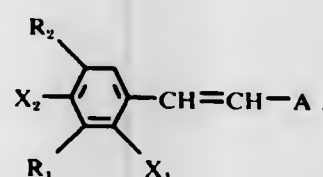
Claims priority, application Switzerland, Nov. 19, 1973, 16246/73; Nov. 19, 1973, 16247/73

Int. Cl.² C07D 307/78, 307/79

U.S. Cl. 260—240 CA

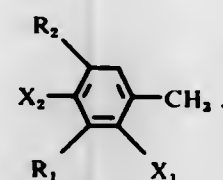
11 Claims

1. A process for the manufacture of cyano-substituted stilbene compounds of the formula



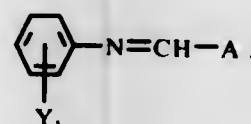
(I)

wherein either X_1 represents the cyano radical and X_2 represents hydrogen, chlorine or fluorine or together with R_1 represents a fused benzene ring, or X_2 represents the cyano radical and X_1 represents hydrogen, chlorine or alkyl with 1 to 4 carbon atoms or together with R_1 represents a fused benzene ring, R_1 represents hydrogen, chlorine, fluorine or alkoxy with 1 to 4 carbon atoms or together with X_1 or X_2 represents a fused benzene ring, R_2 represents hydrogen, chlorine, fluorine or alkoxy with 1 to 4 carbon atoms and A represents a dibenzofuran-3-yl, 4-(benzo[b]furan-2-yl)-phenyl or 2-phenyl-benzo[b]furan-6-yl radical, which is unsubstituted or substituted by chlorine and/or alkoxy with 1 to 4 carbon atoms which comprises reacting a toluene derivative of the formula



(III)

wherein X_1 , X_2 , R_1 and R_2 have the meaning given above, with a Schiff's base of the formula



(IV)

wherein Y_1 represents chlorine or hydrogen, and A has the meaning given above, in dimethyl formamide and in the presence of sodium alcoholate at a temperature of 0° to 40° C.

4,008,225

PROCESS FOR THE MANUFACTURE OF BIS-AZOMETHINE METAL COMPLEX COLORANTS

Francois L'Eplattenier; Laurent Vuitel, both of Therwil, and André Pugin, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 28, 1975, Ser. No. 599,444

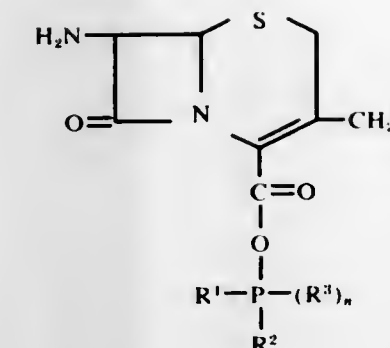
Claims priority, application Switzerland, July 31, 1974, 10585/74

Int. Cl.² C07F 3/06, 3/08, 15/00

U.S. Cl. 260—240 G

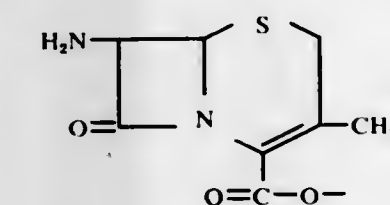
13 Claims

1. Process for the manufacture of bis-azomethine metal complex colorants of the formula

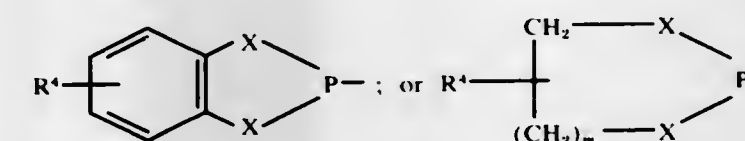


wherein:

R is selected from the class consisting of hydrogen, (lower) alkanoyloxy containing 2 to 8 carbon atoms, phenoxy, naphthoxy and a quaternary ammonium radical; R^1 and R^2 are selected from the class consisting of (lower)alkoxy, (lower)alkylthio, phenyl, naphthyl, phenoxy, naphthoxy, halo, phenylthio, phenyl(lower)alkyl, phenyl(lower)alkylthio, phenyl(lower)alkoxy, (lower)alkyl, halo(lower)alkoxy, a radical of the formula



R^1 and R^2 when joined together form with the phosphorus atom the ring



R^3 is the oxygen atom which when present is linked by a double bond to the phosphorus atom; X is selected from the class consisting of oxygen, sulfur and methylene; R^4 is selected from the class consisting of hydrogen and (lower)alkyl; n is an integer from 0 to 1; m is an integer from 1 to 6.

4,008,227

CEPHALOSPORINS

Michihiko Ochiai, Osaka; Osami Aki, Kawanishi; Akira Morimoto, Osaka, and Taiti Okada, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed June 25, 1974, Ser. No. 483,083

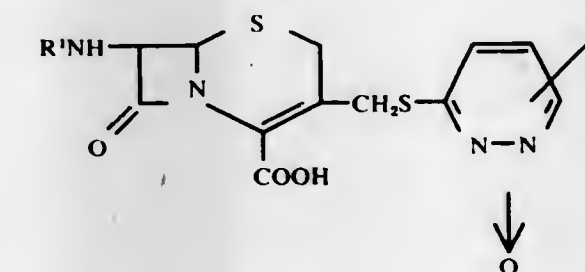
Claims priority, application Japan, June 25, 1973, 48-71526; Aug. 18, 1973, 48-92677

Int. Cl.² C07D 501/36

U.S. Cl. 260—243 C

17 Claims

1. A compound of the formula:



wherein R^1 represents mandeloyl or 2-(3-sydnone)-acetyl and R^2 represents hydrogen, chlorine, bromine, C_1-C_3 alkyl or C_1-C_4 alkoxy, or a pharmaceutically acceptable salt thereof.

4,008,226

INTERMEDIATES FOR PREPARING SEMI-SYNTHETIC CEPHALOSPORINS AND PROCESSES RELATING THERETO

John H. Sellstedt, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 217,942, Jan. 14, 1972, Pat. No. 3,962,215, which is a continuation-in-part of Ser. No. 186,397, Oct. 4, 1971, Pat. No. 3,896,110. This application July 28, 1975,

Ser. No. 599,565

Int. Cl.² C07D 501/18

U.S. Cl. 260—243 C

14 Claims

1. A hydrohalide salt of the formula:

4,008,228

PROCESS FOR PREPARING 3-METHYL-3-CEPHEM ANTIBIOTICS

Robert R. Chauvette, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

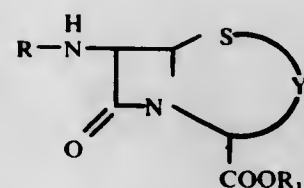
Continuation of Ser. No. 205,291, Dec. 6, 1971. This application July 14, 1975, Ser. No. 595,965

Int. Cl.² C07D 501/02

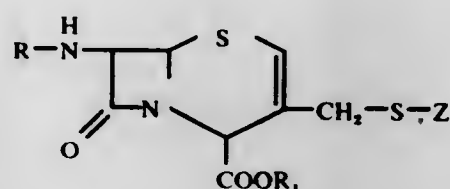
U.S. Cl. 260-243 C

6 Claims

1. The method for preparing a compound of the formula



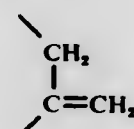
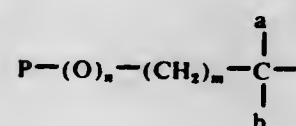
which comprises reducing in an inert solvent a 3-thiosubstituted methyl 2-cephem compound of the formula



with a reducing agent selected from the group consisting of a) hydrogen in the presence of a nickel, cobalt, or palladium hydrogenation catalyst and b) metallic zinc in the presence of formic acid and dimethylformamide, where in the above formulae Y is or

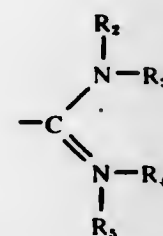


or

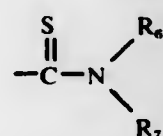
R is hydrogen, C₁-C₈ alkanoyl, benzoyl, aminoadipoyl, or a group of the formulawherein P is α -thienyl, β -thienyl, α -furyl, β -furyl, phenyl, or substituted phenyl substituted by halogen, C₁-C₄ alkyl, C₁-C₄ alkoxy or hydroxy,

n is 0 or 1,

m is 0 or an integer of from 1 to 3

a is hydrogen or C₁-C₃ alkyl,b is hydrogen, C₁-C₃ alkyl, hydroxy, or amino; with the limitation that when n is 1, P is phenyl of substituted phenyl and b is hydrogen or C₁-C₃ alkyl;R₁ is hydrogen, benzyl, benzhydryl, p-nitrobenzyl, 3,5-dimethoxybenzyl or trichloroethyl, or an alkali metal or alkaline earth metal cation;Z is C₂-C₄ alkanoyl, C₂-C₄ haloalkanoyl, benzoyl, substituted benzoyl substituted by halogen, C₁-C₄ alkyl, C₁-C₄ alkoxy or hydroxy, C₁-C₄ lower alkyl, C₁-C₁₂ alkoxythionocarbonyl, an amidino group of the formulawherein R₂, R₃, R₄ and R₅ are the same or different and represent hydrogen, C₁-C₆ alkyl, phenyl, benzyl, or phenylethyl,

a thiocarbamoyl group of the formula

wherein R₆ and R₇ when taken separately are the same or different and are hydrogen C₁-C₆ alkyl or phenyl, and when taken together are pyrrolidino, piperidino, morpholino, thiomorpholino or piperazino;

a monocyclic heteroaryl group selected from the group consisting of 2-pyridyl, 3-pyridyl, 2-pyrimidyl, 2-imidazolyl, 2-thiazolyl, 2-tetrazolyl, 1-methyl-2-tetrazolyl, 1,3,4-thiadiazolyl and 5-methyl-1,3,4-thiadiazolyl; or a sulfo group of the formula

wherein M⁺ is an alkali metal or alkaline earth metal cation; and when Z is said amidino group, R₁ is hydrogen, and when Z is -SO₃⁻M⁺, R₁ is M⁺.

4,008,229

HALO SUBSTITUTED β -LACTAM ANTIBIOTICS

Wayne A. Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

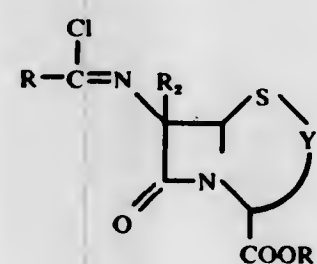
Filed July 11, 1974, Ser. No. 487,702

Int. Cl.² C07D 501/16

U.S. Cl. 260-243 C

4 Claims

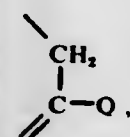
1. A compound of the formula



wherein

R is C₂-C₇ 1-alkenyl; phenyl; substituted phenyl, in which the substituent is halo, C₁-C₄ alkoxy, nitro, C₁-C₄ alkyl, or phenyl; furyl; thienyl; naphthyl; styryl; or substituted styryl, in which the substituent is halo or nitro;R₁ is a carboxyl protecting ester forming group;R₂ is halo;

Y is:



Wherein Q is methyl or acetoxymethyl.

4,008,230

PROCESS FOR PREPARING 3-HYDROXY CEPHALOSPORINS

Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

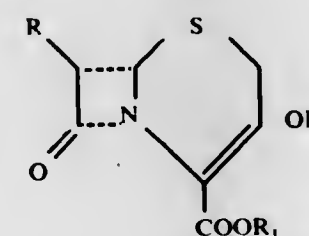
Filed Oct. 29, 1975, Ser. No. 626,684

Int. Cl.² C07D 501/02

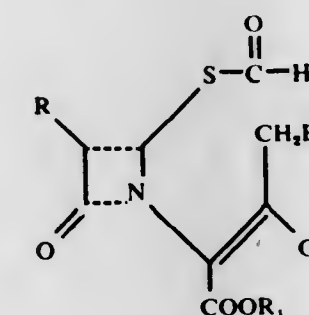
U.S. Cl. 260-243 C

11 Claims

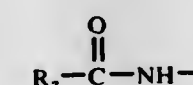
1. A process for preparing a 3-hydroxycephalosporin of the formula



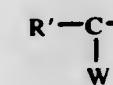
which comprises the step of reacting a compound of the formula

with mercuric acetate in an inert solvent medium, and adding a mercuric ion precipitator to the resulting reaction mixture, in which, in the above formulae, R₁ is a carboxylic acid protecting group, and R is

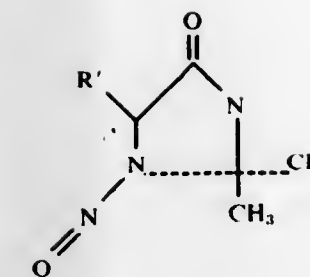
- phthalimido;
- an amido group of the formula

in which R₂ is

- hydrogen, C₁-C₃ alkyl, halomethyl, thienyl-2-methyl, 4-protected-amino-4-protected carboxybutyl, benzyloxy, 4-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy;
- a group of the formula R'-(O)_m-CH₂- in which m is 0 or 1, and R' is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C₁-C₄ alkyl, or C₁-C₂ alkoxy;
- a group of the formula



in which R' is as defined above and W is protected hydroxy, protected carboxy, or protected amino; or c. an imidazolidinyl group of the formula



in which R' is as defined above.

4,008,231

PREPARATION OF

3-METHOXYMETHYLCEPHALOSPORINS

Ian G. Wright, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

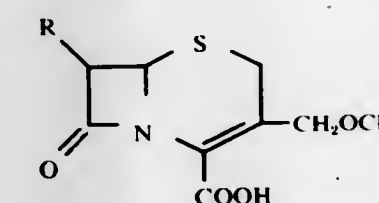
Filed Sept. 15, 1975, Ser. No. 613,388

Int. Cl.² C07D 501/26, 501/28, 501/30

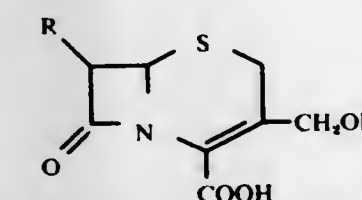
U.S. Cl. 260-243 C

9 Claims

1. A process for preparing a 3-methoxymethylcephalosporin of the formula

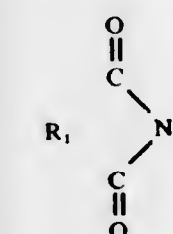


which comprises contacting a 3-hydroxymethylcephalosporin of the formula

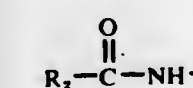


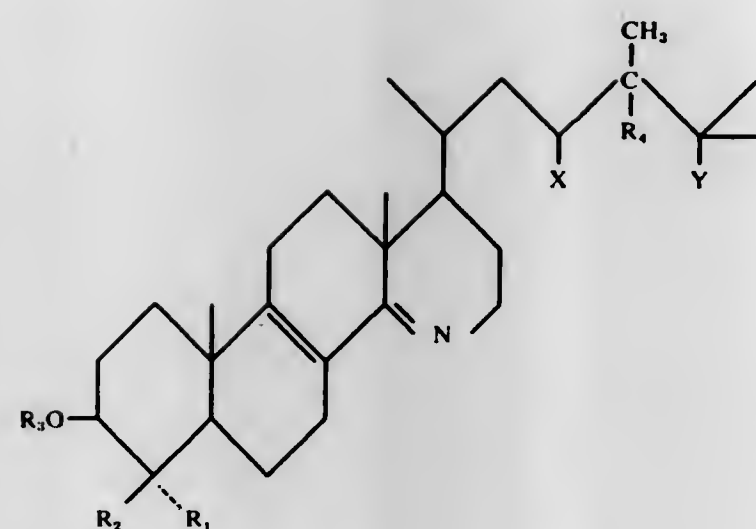
with at least four equivalents of an activating agent selected from the group consisting of trifluoroacetic anhydride, phosphorus trichloride, phosphorus oxychloride, and thionyl chloride at a temperature of from about -30° to about +20° C. to produce an intermediate compound, separating the resulting intermediate from excess activating agent by treating the reaction mixture at reduced pressure and at a temperature not in excess of about 50° C., and reacting said intermediate with an excess of methanol at a temperature of from about 45° to about 75° C. to produce the aforementioned product, in any of the above in which R is

- an imido group of the formula



- an amido group of the formula

in which R₂ is



wherein:

- R₁ and R₂ are both hydrogen or both methyl;
 R₃ is hydrogen;
 R₄ is halogen or hydroxyl, or when taken together with X or with Y forms a double bond;
 X is hydrogen, or together with R₄ forms a double bond;
 Y is hydrogen, or together with R₄ forms a double bond;
 and the pharmaceutically acceptable salts thereof.

4,008,239

PREPARATION OF 4-(3-NITROPHENYL)PYRIDINE
 Philip M. Carabateas, and Gordon L. Williams, both of Scho-dack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.
 Division of Ser. No. 588,380, June 19, 1975, Pat. No. 3,970,662. This application Feb. 20, 1976, Ser. No. 659,695
 Int. Cl.² C07D 213/26

U.S. Cl. 260—290 P

13 Claims

1. The process which comprises reacting 3-nitrobenzaldehyde with two molar equivalents of di-(lower-alkyl) oxalacetate in the presence of piperidine and/or its acetate at about 25° to 40° C. to produce tetra-(lower-alkyl) 3-(3-nitrophenyl)-1,5-pentanedione-1,2,4,5-tetracarboxylate, reacting said 1,5-pentanedione with ammonia at about 30° to 120° C. to produce tetra-(lower-alkyl) 1,4-dihydro-4-(3-nitrophenyl)-2,3,5,6-pyridinetetracarboxylate, reacting said 1,4-dihydro-pyridine at about 25° to 100° C. with an oxidizing agent selected from aqueous nitric acid, sodium nitrite in acetic acid, chromium trioxide or sodium dichromate in acetic acid, nitrogen oxide, or nitrogen dioxide or heating said 1,4-dihydro-pyridine in the presence of a palladium-on-charcoal catalyst at about 100° to 200° C. to produce tetra-(lower-alkyl) 4-(3-nitrophenyl)-2,3,5,6-pyridinetetracarboxylate, hydrolyzing the latter ester either under acidic or alkaline conditions at about 25° to 100° C. to produce 4-(3-nitrophenyl)-2,3,5,6-pyridinetetracarboxylic acid and heating said pyridinetetracarboxylic acid at about 200°-250° C. to produce 4-(3-nitrophenyl)pyridine.

4,008,240

XANTHENE AND THIOXANTHENE DERIVATIVES
 Arthur D. Sill, and Francis W. Sweet, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

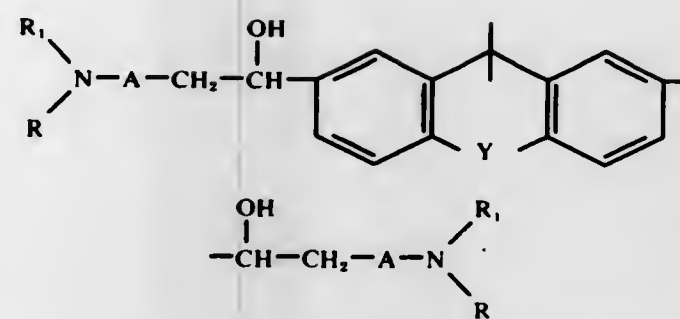
Filed Dec. 21, 1972, Ser. No. 317,148

Int. Cl.² C07D 409/14

U.S. Cl. 260—293.58

5 Claims

1. A 2,7-bis basic alkanol derivative of xanthene and thioxanthene having the general formula:



wherein Y is oxygen or sulfur; A is a straight or branched alkylene chain having from 1 to 4 carbon atoms; R and R₁ are each selected from the group consisting of, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than in the 1-position of the alkenyl group, and when R and R₁ are taken together with the nitrogen atom to which they are attached represent the pyrrolidinyl, morpholino or piperidino radical; and the pharmaceutically acceptable acid addition salts thereof.

4,008,241

NICOTINAMIDE PRODUCTION

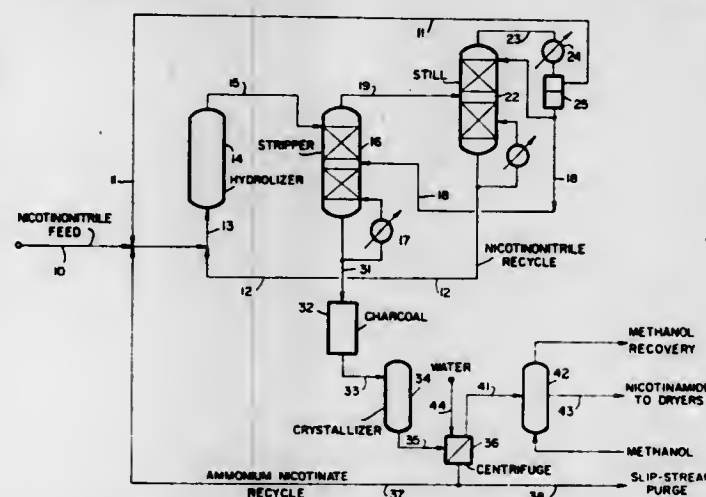
Abraham P. Gelbein, Plainfield; John E. Paustian, Whittany, and Morgan C. Sze, Upper Montclair, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Sept. 2, 1975, Ser. No. 609,626

Int. Cl.² C07D 213/56

U.S. Cl. 260—295.5 A

9 Claims



1. A continuous process for producing nicotinamide, at essentially 100% nicotinamide selectivity, comprising:

- hydrolyzing nicotinonitrile in an aqueous ammonia solution, said hydrolysis being effected at a nicotinonitrile concentration, expressed as parts by weight of product amide per 100 parts of water, of at least 100 parts and no greater than 300 parts, said hydrolysis being effected at a nicotinonitrile conversion of at least 30% and no greater than 70%, said hydrolysis being effected in the presence of ammonium nicotinate in an amount sufficient to essentially eliminate net production thereof to produce a hydrolysis effluent containing nicotinamide, ammonia, unconverted nicotinonitrile and ammonium nicotinate at a nicotinamide selectivity of essentially 100%;
- separating unconverted nicotinonitrile and ammonia from the hydrolysis effluent;
- recovering nicotinamide from the hydrolysis effluent to produce solid nicotinamide and a mother liquor containing nicotinamide and ammonium nicotinate; and
- recycling at least a portion of the mother liquor to the hydrolysis of step (a) in order to provide ammonium nicotinate.

4,008,242

PROCESS FOR THE PREPARATION OF S-TRIAZOLO[3,4-b]BENZOTHAZOLES

Charles J. Paget, Indianapolis, and James H. Wikel, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

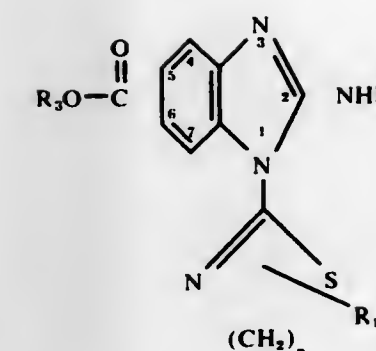
Division of Ser. No. 449,141, March 7, 1974, Pat. No. 3,937,713. This application Aug. 25, 1975, Ser. No. 607,848

Int. Cl.² C07D 513/04

U.S. Cl. 260—305

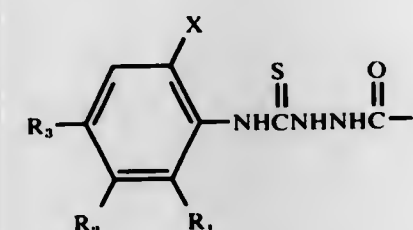
16 Claims

1. The process which comprises commingling a molar equivalent of base selected from the group consisting of lithium alkyls and alkali metal alkoxides, amides, carbonates, hydrides and hydroxides, in a substantially anhydrous amide solvent at a temperature from about 60° to about 200° C with a 1-acyl-4-(o-halophenyl)-3-thiosemicarbazide compound of the formula



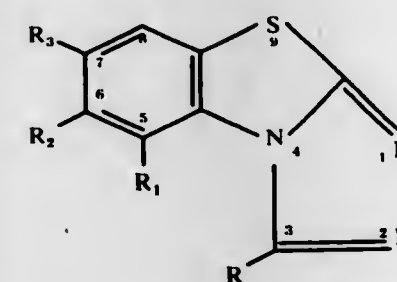
wherein

- R₁ is hydrogen or C₁-C₃ alkyl;
 R₂ is hydrogen, formyl, acetyl or propionyl;
 R₃ is C₁-C_n alkyl, C₃-C₇ cycloalkyl, (C₃-C₇ cycloalkyl)-methyl, 1-(C₃-C₇ cycloalkyl)ethyl, benzyl or α-methylbenzyl;



is at the 5 or 6 position; and n is 2 or 3.

to yield a s-triazolo[3,4-b]benzothiazole compound of the formula



wherein

- R is hydrogen, C₁-C₁₁ alkyl, cyclopropyl or trifluoromethyl;
 R₁ is hydrogen, bromo, chloro or fluoro;
 R₂ and R₃ are independently hydrogen, C₁-C₃ alkyl, C₁-C₃ alkoxy, bromo, chloro, fluoro or trifluoromethyl, with the limitation that at least one of R₂ and R₃ is hydrogen;
 X is bromo, chloro or fluoro;
 subject to the further limitation that when R₁ is halogen, R is other than hydrogen and R₂ is hydrogen.

4,008,243

ANTIVIRAL THIAZOLINYL OR THIAZINYL BENZIMIDAZOLE ESTERS

James H. Wikel, Greenwood, and Charles J. Paget, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

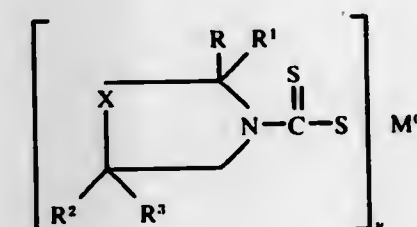
Filed Nov. 19, 1975, Ser. No. 633,203

Int. Cl.² C07D 417/04

U.S. Cl. 260—306.7 T

15 Claims

1. A compound of the formula



where X is sulfur or oxygen, R, R¹, R² and R³ are independently selected from the group consisting of hydrogen, lower alkyl having from 1 to 8 carbon atoms, CCl₃, phenyl and substituted phenyl wherein there are not more than two substituents selected from the group consisting of NR⁴R⁵, OH, OR⁶ and Cl wherein R⁴ and R⁵ are independently selected from the group consisting of hydrogen and methyl, R⁶ is a lower alkyl having from 1 to 8 carbon atoms, not more than one of R and R¹ is phenyl and not more than one of R² and R³ is phenyl; M is selected from the group consisting of sodium, potassium, tri-(C₁-C_n) alkyl substituted ammonium and phenyl-di-(C₁-C_n) alkyl substituted ammonium; and y is 1.

4,008,244
**OXAZOLIDINE AND THIAZOLIDINE
 CARBODITHIOATES**

Ivan Christoff Popoff, Ambler, and Paul Gordon Haines, Lafayette Hill, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 438,819, Feb. 1, 1974, Pat. No. 3,943,143, which is a continuation-in-part of Ser. No. 356,034, April 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,900, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 116,250, Feb. 17, 1971, Pat. No. 3,674,701. This application Aug. 15, 1975, Ser. No. 604,981

Int. Cl.² C07D 277/04, 263/04

U.S. Cl. 260—306.7 R

8 Claims

1. A compound of the structure

4,008,253

BICYCLOALKANES

Gerhard Sauer, Berlin; Helmut Hauser, Unna; Gregor Haffer, Berlin; Jürgen Ruppert, Berlin; Ulrich Eder, Berlin, and Rudolf Wiechert, Berlin, all of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Dec. 22, 1972, Ser. No. 317,549

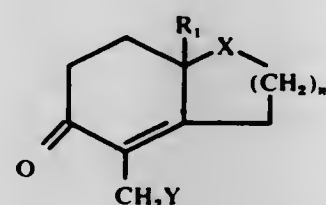
Claims priority, application Germany, Dec. 24, 1971, 2165320; Apr. 29, 1972, 2221704; Nov. 2, 1972, 2254175

Int. Cl.² C07D 319/12; A01N 9/28

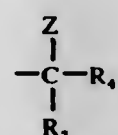
U.S. Cl. 260—340.7

11 Claims

1. A bicycloalkane derivative of the formula



wherein n is 1 or 2, R_1 is alkyl of 1-4 carbon atoms, X is alkylendioxy-methylene of 1-10 carbon atoms and Y is $-S-R_2$, $-SO_m-R_2$ or



where m is 1 or 2, R_2 is alkyl, aryl or aralkyl of 1-12 carbon atoms, R_3 is hydrogen or alkyl of 1-4 carbon atoms, R_4 is alkoxycarbonyl of 2-11 carbon atoms, acyl of 2-16 carbon atoms, phenyl or phenyl substituted by alkoxy of 1-4 carbon atoms, benzyloxy or acyloxy of 2 to 8 carbon atoms, Z is nitro, alkoxycarbonyl of 1-4 carbon atoms, alkanoyl of 2-4 carbon atoms, alkylsulfinyl of 1-4 carbon atoms or alkylsulfonyl of 1-4 carbon atoms.

4,008,254

CERIA CATALYZED CONVERSION OF PHENOLS TO DIBENZOFURANS IN THE PRESENCE OF WATER VAPOR

David E. Gross, St. Charles, and Norman A. Fishel, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 8, 1975, Ser. No. 603,063

Int. Cl.² C07D 307/91

U.S. Cl. 260—346.2 M

15 Claims

1. Process for the production of a dibenzofuran compound which comprises contacting a phenolic compound feedstock comprising a phenol having an unsubstituted ortho position selected from phenols and polycyclic phenols having no substituents other than alkyl, hydroxy, aryl, aralkyl and alkaryl in the vapor phase in combination with water vapor at a temperature of 300° to 700° C at a gas hourly space velocity of from 1 hr⁻¹ to 2,000 hr⁻¹ with a catalyst essentially composed of a member of the class of ceria and combinations of ceria with an oxide of a metal of the group consisting of aluminum, silicon, titanium, zirconium, hafnium, magnesium, calcium, potassium, sodium, lanthanum, neodymium, praseodymium, samarium, thorium, and uranium and mixtures thereof.

4,008,255

RECOVERY OF PHTHALIC ANHYDRIDE

Friedrich Wirth; Wolfgang Kube; Paul Hornberger; Otto Leman; Joachim Wagner, all of Ludwigshafen, and Dieter Karau, Ostersheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

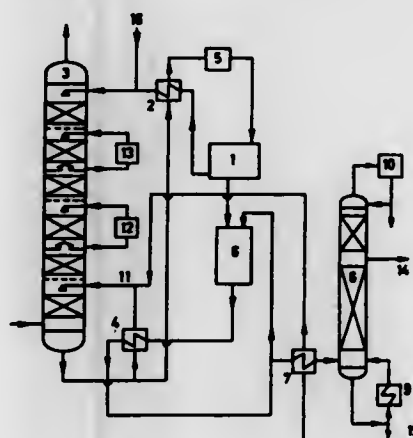
Continuation of Ser. No. 451,135, March 14, 1974,

abandoned. This application June 23, 1975, Ser. No. 589,566
Claims priority, application Germany, Mar. 17, 1973, 2313306

Int. Cl.² C07D 307/89

U.S. Cl. 260—346.4

6 Claims



1. A process for the continuous recovery of phthalic anhydride from process gases obtained in the catalytic atmospheric oxidation of *o*-xylene or naphthalene which comprises: washing said process gases in an absorption column at a temperature of 60° to 170° C with a solvent consisting essentially of C26-44 paraffins or with a hydrocarbon mixture having a boiling point of at least 360° C at atmospheric pressure and containing at least 55% by weight of C26-44 paraffins, whereby phthalic anhydride from said process gases is dissolved in said paraffins; cooling said paraffins laden with phthalic anhydride to form solid phthalic anhydride, separating said solid phthalic anhydride from the major portion of the solvent by mechanical means to form a slurry of phthalic anhydride crystals, melting said crystals and distilling said phthalic anhydride from said slurry; and recycling said paraffins to said absorption column.

4,008,256

ESTERIFICATION OF FURFURYL ALCOHOL AND ITS DERIVATES

Ilkka Renval, Suomenoja, and Tapio Mattila, Kivenlahti, both of Finland, assignors to Kemira Oy, Finland

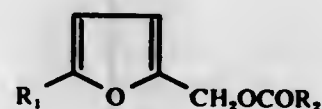
Filed Aug. 7, 1975, Ser. No. 602,550

Claims priority, application Finland, Aug. 15, 1974, 2424/74
Int. Cl.² C07D 307/46

U.S. Cl. 260—347.4

7 Claims

1. A method for producing an ester of a furfuryl alcohol of formula



wherein R_1 is hydrogen, a nitro group, a halogen atom or an alkyl group with 1-3 carbon atoms, and R_2 is alkyl or alkyl substituted by a halogen atom which comprises reacting a furfuryl alcohol of formula

4,008,259

DOUBLE SALTS COPPER ALKYLPHENOLSULFONATE AND BASIC CALCIUM AND METHOD OF PREPARATION

Toyocho Yonezawa, Kyoto, Japan, assignor to Yonezawa Chemical Ind. Co., Ltd., Kyoto, Japan

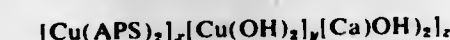
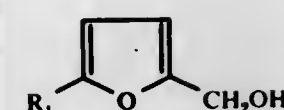
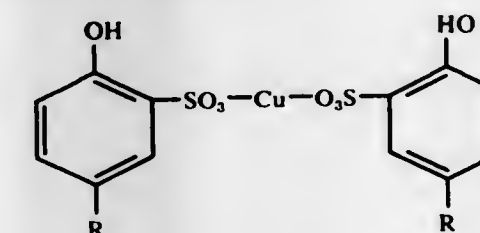
Filed Aug. 19, 1975, Ser. No. 605,923

Int. Cl.² C07F 1/08

U.S. Cl. 260—438.1

3 Claims

1. A compound of the formula

wherein $Cu(APS)_2$ represents

wherein R_1 is as in Formula I, in the absence of a solvent with a lower alkanic acid anhydride of formula $R_2COOCOR_2$ in which R_2 is as defined hereinabove in the proportion of 1 mole of said furfuryl alcohol with 1-1.2 mole of said lower alkanic acid anhydride and catalysing the reaction with 0.05-0.5 mole of an aliphatic tertiary amine.

4,008,257

2,2-DIMETHYL-2-[(7,15,16,17-TETRAHYDRO-17,17-DIMETHYL-6H-CYCLOPENTA[a]PHENANTHRENE-3-YL)OXY]ETHYL ALKANEDIOATES AND INTERMEDIATES THERETO

John H. Dygos, Northbrook, and Karlene W. Salamon, Chicago, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

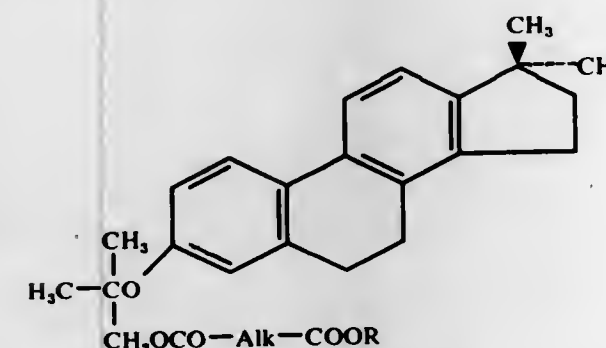
Filed Mar. 10, 1976, Ser. No. 665,362

Int. Cl.² C07J 9/00

U.S. Cl. 260—397.1

6 Claims

1. A compound of the formula



wherein Alk represents 1,2-ethanediyl or 1,3-propanediyl and R represents hydrogen or alkyl containing fewer than 8 carbons.

4,008,258

CYCLOPROPYL METHYL ESTERS

Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zeecon Corporation, Palo Alto, Calif.

Division of Ser. No. 350,708, April 13, 1973, Pat. No.

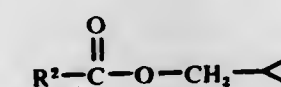
3,923,871, which is a continuation-in-part of Ser. No. 263,902, June 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 255,368, May 22, 1972, abandoned. This application June 30, 1975, Ser. No. 591,689

Int. Cl.² C09F 5/08, 7/10

U.S. Cl. 260—410

14 Claims

1. A compound of the formula:



wherein, R^2 is alkyl of 10 to 22 carbon atoms; alkenyl of 10 to 22 carbon atoms; or alkynyl of 10 to 22 carbon atoms, said alkyl, alkenyl, or alkynyl optionally having one or two substituents selected from alkoxy of one to four carbon atoms.

4,008,261

METHOD OF PREPARING PHOSPHONIUM SILOXANES AND PRODUCTS THEREOF

Eric D. Brown, and Roger G. Chaffee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 2, 1975, Ser. No. 537,877

Int. Cl.² C07F 7/18

U.S. Cl. 260—448.2 E

16 Claims

1. A method of preparing a catalyst suitable for polymerizing polyorganosiloxanes which comprises
a. mixing

where
 R is alkyl of 4 to 12 carbon atoms, the ratio of $Y:X$ being 0.3-0.6:1, and the ratio of $Z:X$ being 0.05-0.8:1.
2. A method for the preparation of a double salt of copper alkylphenolsulfonate and basic calcium which comprises reacting an aqueous or methanol solution of copper alkylphenolsulfonate having at the para position an alkyl group of from 4 to 12 carbon atoms and at the ortho position the sulfonic acid group, said solution having a concentration of about 30%, with an aqueous suspension of calcium hydroxide and isolating the thus produced double salt.

4,008,260

PROCESS FOR PREPARING COBALT(III)ACETYLACETONATE

Gerhard Künstle, Raitenhaslach, and Herbert Siegl, Haiming, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Mar. 24, 1975, Ser. No. 561,463

Claims priority, application Germany, Apr. 29, 1974, 2420691

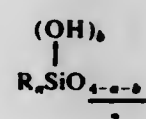
Int. Cl.² C07F 15/06

U.S. Cl. 260—439 R

5 Claims

1. A process for the preparation of cobalt (III) acetylacetonate having a black fine crystalline structure and a water content of less than 0.05% by weight, comprising the steps of:
a. dissolving cobalt (II) acetylacetonate in an organic solvent;
b. adding to the solution at a temperature between about 20° and about 60° C at least the stoichiometric amount of acetylacetone to provide an additional mol thereof;
c. adding aqueous 25% to 35% hydrogen peroxide solution in an excess amount of 1.5 to 2.5 mols, with stirring, at a temperature between about 20° and 100° C until oxidation is complete; and
d. boiling off excess hydrogen peroxide, cooling the solution, and recovering the precipitated solid cobalt(III)acetylacetonate therefrom.

2. a benzene-soluble organosilicon compound of the average unit formula



where R is a radical of 1 to 18 carbon atoms selected from the group consisting of monovalent hydrocarbon radicals, monovalent fluorinated aliphatic radicals and monovalent halogenated aryl radicals, *a* has an average value of from 1 to 3 and *b* has an average value of from 0 to 1,

2. a quaternary phosphonium compound of the formula



where each R' is a monovalent hydrocarbon radical of 1 to 18 carbon atoms free of aliphatic unsaturation and X is chlorine, bromine, or iodine,

3. a basic compound of the formula MOH where M is an alkali metal and

4. water in at least sufficient quantity to dissolve the basic compound (3), wherein the quaternary phosphonium compound is present in an amount equal to from 0.03 moles to 1.5 moles for each 1,000 grams of the organosilicon compound and the basic compound is present in an amount equal to from 90% to 110% by moles, based on the number of moles of the quaternary phosphonium compound,

- b. removing substantially all of the water from the mixture of (a) at a temperature of from at least 30° to about 100° C., and

- c. recovering the remainder of the mixture as an anhydrous phosphorous containing organo-silicon catalyst, containing an insoluble, non-catalytic, by-produced salt, MX, where M and X are as defined above.

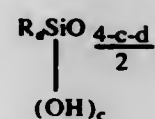
2. The method of claim 1 wherein the by-produced salt, MX, is removed from said anhydrous phosphorous containing organo-silicon catalyst and the remainder is recovered as a homogeneous anhydrous catalyst.

9. A catalyst produced by the method of claim 2.

10. A method of increasing the molecular weight of a polyorganosiloxane which comprises

- A. mixing,

- i. a benzene-soluble polyorganosiloxane of the average unit formula



wherein R is a radical of 1 to 18 carbon atoms selected from the group consisting of monovalent hydrocarbon radicals, monovalent fluorinated aliphatic radicals and monovalent halogenated aryl radicals, *c* has an average value of from zero to 1.0 and *d* has an average value of from 1.0 to less than 3.0, with

- ii. a catalytic amount of the catalyst produced by the method of claim 2, and

- B. heating the mixture from (A) at a temperature in the range from at least 30° C. to less than 130° C. and removing substantially all of any water from said mixture until an increase in molecular weight of said polyorganosiloxane is effected.

4,008,262 α-(N-ALKYL-4-FORMYLANILINO)-TOLUENESULFONAMIDES

Edgar Earl Renfrew, Lock Haven, Pa., and Guido Ruggiero Lorenzo Genta, Snyder, N.Y., assignors to American Color & Chemical Corporation, Charlotte, N.C.

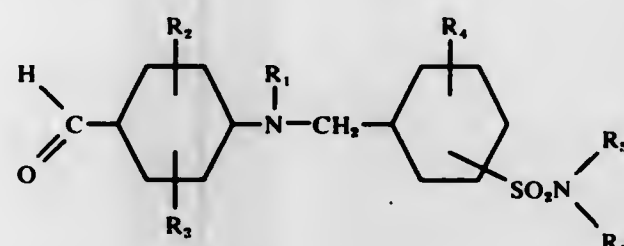
Division of Ser. No. 517,746, Oct. 24, 1974, Pat. No. 3,954,830, which is a division of Ser. No. 248,483, April 28, 1972, Pat. No. 3,858,254. This application Feb. 12, 1976, Ser. No. 657,639

Int. Cl.² C07C 121/78, 121/80, 143/78

U.S. Cl. 260—465 E

1 Claim

1. A dye intermediate of the formula:



wherein R₁ is a member selected from the group consisting of lower alkyl, hydroxy lower alkyl and cyano lower alkyl; R₂, R₃ and R₄ are members selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, chlorine and bromine, and R₅ and R₆ are members selected from the group consisting of hydrogen, lower alkyl, cyano lower alkyl and hydroxy lower alkyl.

4,008,263 RACEMIC FLUORO-SUBSTITUTED PGF₂ ANALOGS

William P. Schneider, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

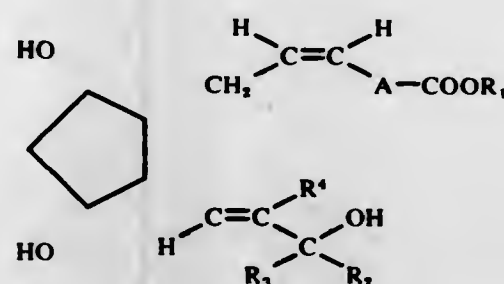
Continuation-in-part of Ser. No. 807,405, March 14, 1969, abandoned. This application Dec. 6, 1974, Ser. No. 530,413

Int. Cl.² C07C 177/00

U.S. Cl. 260—468 D

17 Claims

1. A racemic compound of the combination of the formula:



wherein the side-chain hydroxy is in S configuration, and the mirror image of that formula; wherein R₁ is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R₂ is —(CH₂)_a—CH₃ wherein *a* is 2, 3, 4, 5, or 6, or —(CH₂)_d—X wherein *d* is zero, one, 2, 3, or 4 and X is isobutyl, tert-butyl, 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl; wherein R₃ and R₄ are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein A is —CH₂—Z— wherein Z is ethylene substituted with one or 2 fluoro; and pharmacologically acceptable salts thereof when R₁ is hydrogen.

11. A racemic compound of the combination of the formula:

4,008,265 NOVEL BISPHENOXY CARBOXYLIC ACID DERIVATIVES AND THEIR SALTS

Yoshio Suzuki, Itami; Masayoshi Minal, Minoo; Noritaka Hamma, Ibaragi; Eiichi Murayama, Takarazuka, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

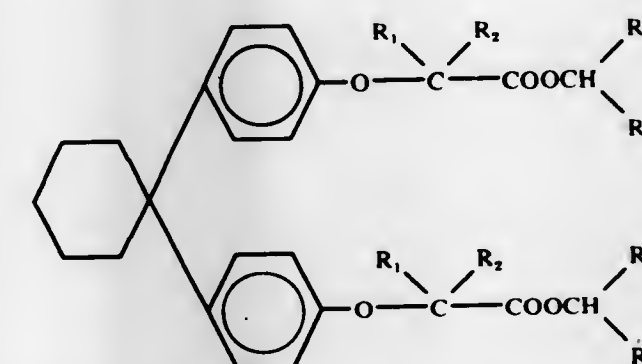
Continuation of Ser. No. 255,244, May 19, 1972, abandoned. This application July 23, 1974, Ser. No. 491,033

Int. Cl.² C07C 69/66

U.S. Cl. 260—473 G

5 Claims

1. A bisphenoxy carboxylic acid derivative represented by the general formula,



wherein R₁ and R₂ represent lower alkyl groups, R₃ is hydrogen and R₄ represents an amino-lower-alkyl group or an N-lower-alkylaminoalkyl group and its acid addition salt.

4,008,264 PROCESS FOR THE PREPARATION OF AROMATIC THIOCARBOXYLIC ACID AMIDES

Henning Lübbes, Schwalbach, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 23, 1975, Ser. No. 580,484

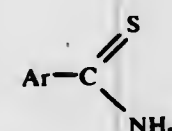
Claims priority, application Germany, May 25, 1974, 2425414; Dec. 10, 1974, 2458282

Int. Cl.² C07C 149/40, 153/063, 153/067

U.S. Cl. 260—470

12 Claims

1. A process for the preparation of an aromatic thiocarboxylic acid amide having the formula



wherein Ar is an unsubstituted aromatic hydrocarbon, or an aromatic hydrocarbon substituted by substituent groups which are substantially inert under the process conditions, said process comprising reacting a compound of the formula



wherein Ar is as defined above, with hydrogen thiocyanate, or an inorganic metal salt or ammonium salt of thiocyanic acid and carrying out the reaction in at least 90 weight percent hydrofluoric acid, wherein the hydrogen thiocyanate or said salt of thiocyanic acid is added to the hydrofluoric acid at a temperature of about —70° to 0° C, the aromatic hydrocarbon compound II is added and the reaction mixture temperature is subsequently gradually increased to a temperature of from about 0° to 120° C.

4,008,266 COUPLING OF AROMATIC COMPOUNDS IN THE PRESENCE OF MOLECULAR OXYGEN, A MERCURIC OXYANION COMPOUND, AND A GROUP VIII METAL OR GROUP VIII METAL OXYANION COMPOUND

George M. Intille, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

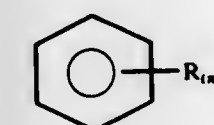
Continuation-in-part of Ser. No. 302,713, Oct. 18, 1973, abandoned. This application Jan. 2, 1974, Ser. No. 430,280

Int. Cl.² C07C 69/76

U.S. Cl. 260—475 R

30 Claims

1. A catalytic process for coupling aromatic compounds of the formula



where

- (II), *n* is an integer from 0 to 5 and each of the R groups is hydroxy, alkoxy, alkyl, aryloxy, aryl, acyl, alkanoate, carboxyl, carboxylic esters, halogen or nitro, and where two R groups, located on adjacent carbon atoms of the benzene ring, can be joined to form a carbocyclic or heterocyclic ring

with molecular oxygen to produce coupled aromatic compounds comprising coupling said aromatic compounds with at least about 200 psi molecular oxygen in the presence of a mercuric oxyanion compound and a Group VIII metal or Group VIII metal oxyanion compound.

4,008,267

3,3'-DI(SULFONYLOXY-GROUP-CONTAINING)SUBSTITUTED BENZIDINE DERIVATIVES

Nils Ake Jönsson, Solna; Ferenc Merényi, and Lars-Erik Westlund, both of Taby, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

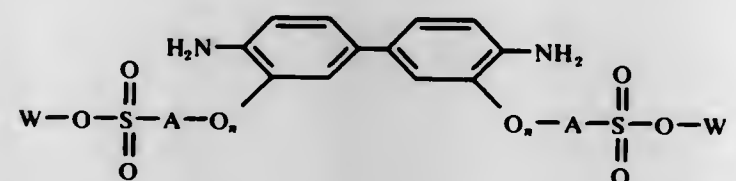
Continuation-in-part of Ser. No. 118,531, Feb. 24, 1971, Pat. No. 3,859,341. This application Oct. 16, 1974, Ser. No. 515,195

Int. Cl.² C07C 143/64, 143/56

U.S. Cl. 260—509

12 Claims

1. A 3,3'-disubstituted benzidine derivative having the general formula



wherein (i) W is hydrogen or an alkali metal, and (ii) the subscript n is zero or one and zero when A is a divalent alkylene chain from 2 to about 7 carbons, and n is one when A is a straight chain trimethylene or tetramethylene.

4,008,268

PROCESS FOR ISOMERIZATION OF A CYCLOPROPANECARBOXYLIC ACID

Toshio Mizutani, Toyonaka; Nobushige Itaya, Nishinomiya; Toshiko Nishijima, Yokohama, and Osamu Magara, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed June 10, 1975, Ser. No. 585,592

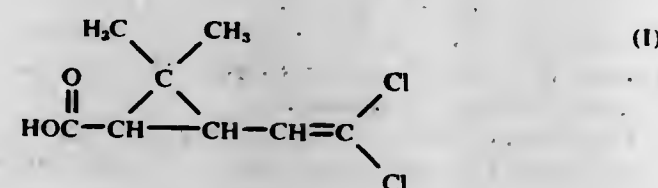
Claims priority, application Japan, June 15, 1974, 49-68282

Int. Cl.² C07C 61/18

U.S. Cl. 260—514 H

6 Claims

1. A process for isomerizing 2-(β,β-dichlorovinyl)-3,3-dimethylcyclopropanecarboxylic acid represented by the formula



from the cis to the trans form, which comprises heating the acid of the formula (I) in the presence of anhydride of the acid or a reagent producing the acid anhydride in the reaction system selected from the group consisting of acetic anhydride and thionyl chloride, wherein the reaction is carried out in the presence of a catalytic amount of a Lewis acid selected from the group consisting of paratoluenesulfonic acid and sulfuric acid.

4,008,269

PHENYLACETIC ACIDS

Julius Diamond, Lafayette Hill, and Norman Julian Santora, Rostyn, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

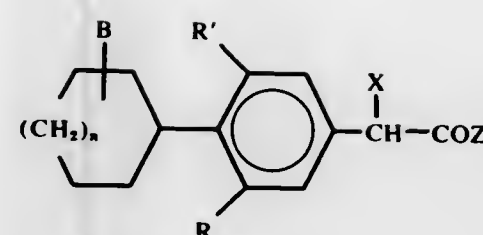
Division of Ser. No. 152,387, June 11, 1971, which is a continuation-in-part of Ser. Nos. 34,870, May 5, 1970, Pat. No. 3,864,384, and Ser. No. 152,387, June 11, 1971, Pat. No. 3,852,323. This application Dec. 10, 1973, Ser. No. 423,444 The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.² C07C 63/33, 69/76

U.S. Cl. 260—515 A

9 Claims

1. A compound of the formula



where:

n is

0-2;

B is

hydrogen or

loweralkyl;

R is

hydroxy,

loweralkoxy,

acetyloxy,

acetyl or

loweralkyl;

R' is

hydrogen,

fluoro,

chloro,

bromo,

trifluoromethyl or

nitro;

X is

halo;

Z is

-OH,

loweralkoxy,

arloweralkoxy, or

-OM where M is an alkali, alkaline earth or aluminum

metal or an ammonium salt.

4,008,270

PROCESS FOR PREPARING 2-(SUBSTITUTED PHENYL)PROPIONIC ACIDS

David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

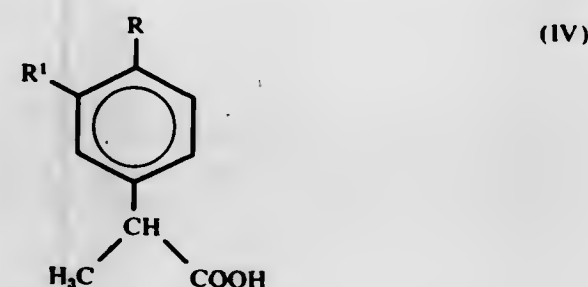
Filed Oct. 14, 1975, Ser. No. 622,130

Int. Cl.² C07C 63/04

U.S. Cl. 260—515 R

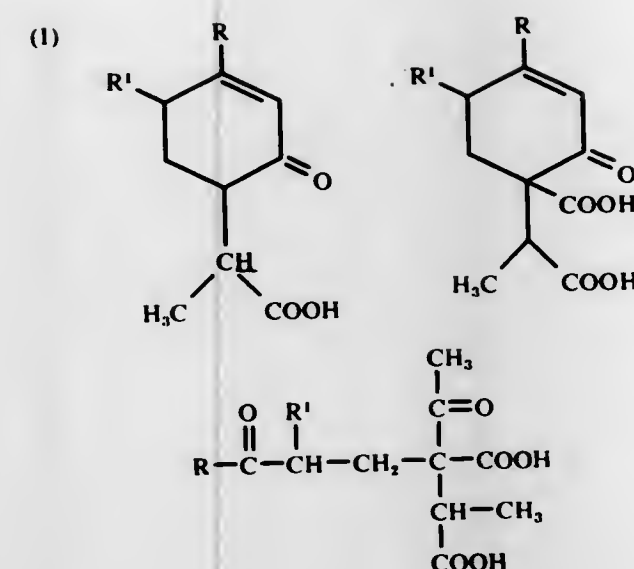
10 Claims

1. Process for preparing a 2-(substituted phenyl)propionic acid of the formula



wherein R is phenyl or C₁ to C₆-alkyl and R' is hydrogen or fluoro, which comprises

(a) forming a mixture containing a dehydrating agent which is stable at the heating temperature and is selected from the group consisting of di(C₁ to C₆-alkyl)carbodiimides, diphenylcarbodiimide, di-p-tolylcarbodiimide, dicyclohexylcarbodiimide, florasil, phenylisocyanate and organic acid anhydrides and at least one compound having a formula selected from the group consisting of



wherein R and R' are as defined above

b. heating the mixture from step (a) to from about 150° C. to below the decomposition point of the formula IV acid until aromatization has occurred, and (c) recovering the 2-(substituted phenyl)propionic acids from the resulting mixture.

4,008,271

PROCESS FOR PREPARING A MIXED ANHYDRIDE OF A SULFONIC ACID AND A CARBOXYLIC ACID

Karl E. Wiegand, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 451,817, March 18, 1974, Pat. No.

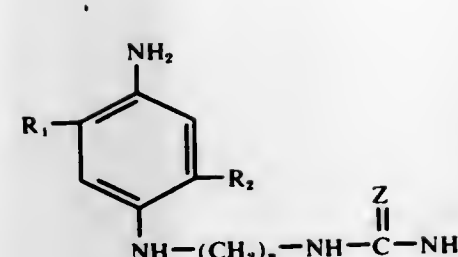
3,935,216. This application June 23, 1975, Ser. No. 589,090

Int. Cl.² C07C 51/54, 153/00, 154/00

U.S. Cl. 260—545 R

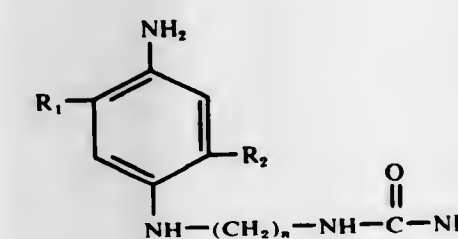
8 Claims

1. A process for preparing a mixed anhydride of a sulfonic acid and a carboxylic acid which comprises reacting a sulfonic acid selected from the group consisting of methane sulfonic acid and toluene sulfonic acid with the anhydride of a carboxylic acid selected from the group consisting of benzoic acid, mono-substituted benzoic acid and poly-substituted benzoic acid wherein the substituent groups are selected from the group consisting of halo, lower alkyl, trifluoromethyl, lower alkoxy, nitro, amino, cyano and methylthio in the presence of a solvent selected from the group consisting of halogenated hydrocarbons and nitroalkanes, separating the free by-product carboxylic acid formed and recovering the mixed anhydride from the solvent phase.

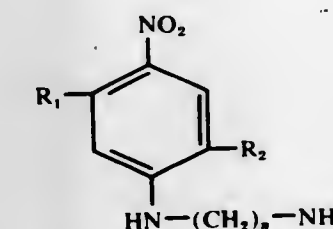


wherein R₁ and R₂ each independently are selected from the group consisting of hydrogen, halogen, alkyl having 1-3 carbon atoms and alkoxy having 1-3 carbon atoms, n is a whole number ranging between 2 and 4 Z is selected from the group consisting of oxygen and sulfur.

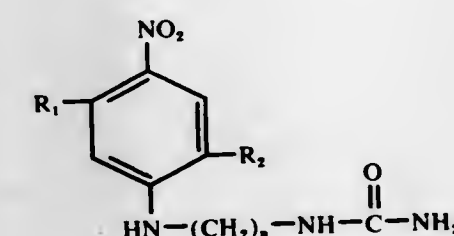
7. A method for preparing N-(β-ureido alkyl) paraphenylene-diamine of the formula



wherein R₁ and R₂ each independently are selected from the group consisting of hydrogen, halogen, alkyl having 1-3 carbon atoms and alkoxy having 1-3 carbon atoms and n is a whole number between 2-4 inclusive comprising (a) reacting alkaline isocyanate with a member selected from the group consisting of the monohalogenohydrate and monoacetate of a compound of the formula



wherein R₁, R₂ and n have the meaning given above in an aqueous medium to produce a compound of the formula



wherein R₁ and R₂ have the meaning given above, (b) recovering the compound from step (a), (c) adding to the compound recovered from (b) methanol and as a reducing agent, hydrazine hydrate, and a Raney nickel catalyst, (d) heating the resulting mixture until said mixture becomes colorless whereby the nitro substituent of said compound is reduced to amino and (e) recovering said N-(β-ureidoalkyl) paraphenylene-diamine.

4,008,272

N-THIOUREIDO AND N-UREIDO PHENYLENE DIAMINES AND METHOD OF PREPARING SAME

Gregoire Kalopissis; Jean Gascon, both of Paris; Andree Bugaut, Boulogne sur Seine; Jacqueline Gallien, La Garenne-Colombes, and Hubert Gaston-Breton, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 247,892, April 26, 1972, abandoned, which is a division of Ser. No. 854,784, Sept. 2, 1969, Pat. No. 3,697,215. This application May 16, 1975, Ser. No. 578,318

Claims priority, application Luxembourg, Sept. 9, 1968, 56846; Jan. 16, 1969, 57792

Int. Cl.² C07C 85/102, 87/52

U.S. Cl. 260—552 R

12 Claims

1. A compound for dyeing keratinic fibers and in particular human hair having the formula:

4,008,273

TERTIARY ALKYL SEMICARBAZIDES AND THEIR METHOD OF PREPARATION

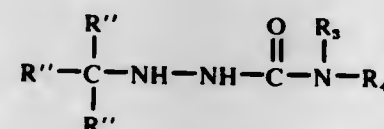
Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Kenmore, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 149,042, June 1, 1971, abandoned, which is a division of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a

continuation-in-part of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application Apr. 7, 1975, Ser. No. 565,898 Int. Cl.² C07C 133/02

U.S. Cl. 260—554

1. A composition having the formula:



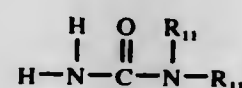
where: (a) R'' is a lower alkyl, benzyl, phenethyl, phenyl radical or hydrocarbon substituted phenyl radical and not more than one phenyl radical or hydrocarbon substituted phenyl radical may be present; and

b. R₃ and R₄ are hydrogen, lower aliphatic or cycloaliphatic radicals.

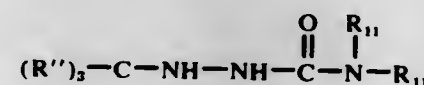
3. A process which comprises: reacting a hydrazine salt of the formula



with a urea of the formula



in an aqueous medium at a temperature between about 40° C. and 100° C. to form a semicarbazide of the formula



where:

- R₁₁ is hydrogen or lower alkyl radical;
- X' is chloro, bromo, iodo, or HSO₄ radical; and
- R'' is a lower alkyl, and recovering the semicarbazide formed.

4,008,274

CERTAIN SALICYLANILIDES

Kenichi Sawatari; Toshihiko Mukai, both of Nakatsu; Satoshi Oda, Yoshitomi; Hiroyuki Akashi, Fukuoka, and Masanori Kohara, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed June 25, 1974, Ser. No. 482,916

Claims priority, application Japan, June 25, 1973, 48-71969

Int. Cl.² C07C 103/26

U.S. Cl. 260—559 S

13 Claims

- The compound 2',5-Dimethyl-4'-nitrosalicylanilide.
- The compound 5-Tert-amyl-4'-nitrosalicylanilide.
- The compound 5-Tert-amyl-2'-methoxy-4'-nitrosalicylanilide.

4,008,275

PROCESS FOR ISOLATING

4,4'-DIAMINODIPHENYLMETHANE

Adnan A. R. Sayigh, North Haven; Kwok K. Sun, Hamden, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

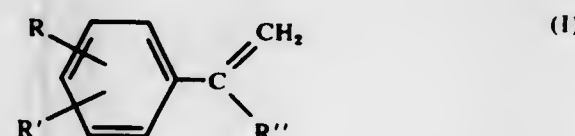
Filed Aug. 18, 1975, Ser. No. 605,752

Int. Cl.² C07C 85/26

U.S. Cl. 260—570 D

15 Claims

1. A process for selectively removing 2,2'- and 2,4'-diaminodiphenylmethane from admixtures thereof with 4,4'-diaminodiphenylmethane which process comprises heating said mixture of diamines at 30° to 100° C in the presence of (i) a compound of the formula:



wherein R and R' are each independently selected from the group consisting of hydrogen and amino and R'' is selected from the group consisting of hydrogen and alkyl from 1 to 4 carbon atoms, inclusive, and (ii) a catalyst selected from the group consisting of aqueous mineral acid, clays, diatomaceous earths and zeolites.

4,008,276

PHENYL-LOWER-ALKYLAMINES

Bernard L. Zenitz, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 542,552, Jan. 20, 1975, Pat. No.

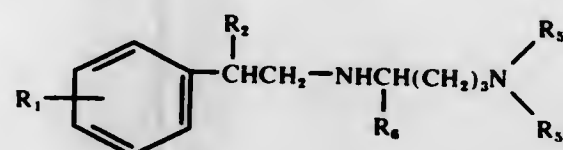
3,965,105. This application Dec. 22, 1975, Ser. No. 642,758

Int. Cl.² C07C 91/28

U.S. Cl. 260—570.5 P

2 Claims

1. A compound having the formula:



where R₁ represents lower-alkyl containing from one to four carbon atoms; R₂ represents methyl; R₃ represents ethyl; and R₄ represents methyl.

4,008,277

BENZO-BICYCLONONENE DERIVATIVES

Colin Leslie Hewett, and David Samuel Savage, both of Glasgow, Scotland, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 31, 1975, Ser. No. 563,435

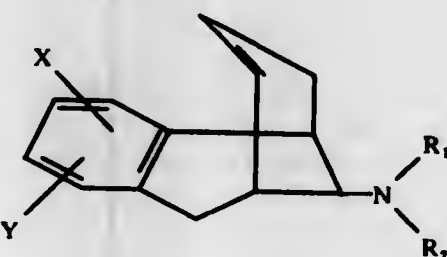
Claims priority, application United Kingdom, Apr. 8, 1974, 15,558/74

Int. Cl.² C07C 87/40, 91/16, 87/28; A01N 9/20

U.S. Cl. 260—571

4 Claims

1. A compound of the formula:



and pharmaceutically acceptable salts thereof, in which

R₁ and R₂ stand for hydrogen, alkyl of 1 to 6 carbon atoms, or alkenyl of 2 to 6 carbon atoms, and
X and Y stand for hydrogen, hydroxy, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro and trifluoromethyl.

4,008,278

PREPARATION OF

2-AMINO-5-HALOBENZOTRIFLUORIDE

Max M. Boudakian, Pittsford, N.Y., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 4, 1975, Ser. No. 610,130

Int. Cl.² C07C 87/60, 85/24

U.S. Cl. 260—578

6 Claims

1. An improved process for preparing 2-amino-5-halobenzotrifluoride comprising reacting an aminobenzotrifluoride selected from the group consisting of o-aminobenzotrifluoride, o-acetaminobenzotrifluoride, and o-formylaminobenzotrifluoride with a halogen source selected from the group consisting of hydrochloric, hydrobromic and hydroiodic acid in the presence of an oxidant selected from the group consisting of hydrogen peroxide, sodium peroxide, potassium chlorate, potassium bromate and potassium permanganate to produce a product consisting essentially of said 2-amino-5-halobenzotrifluoride.

4,008,279

PROCESS FOR DEHALOGENATION AND/OR PREVENTION OF HALOGENATION

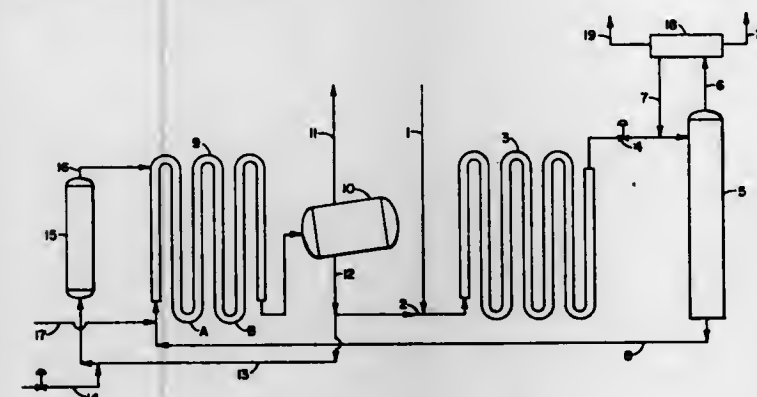
Jorge A. Blay, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 15, 1974, Ser. No. 497,609

Int. Cl.² C07C 47/06, 47/14

U.S. Cl. 260—601 R

4 Claims



1. In a continuous conversion process or converting an alkene to an aldehyde alkane product, which conversion process comprises the steps of:

- passing said alkene through an alkene reaction zone concurrently with an acidic oxidant catalyst solution comprising a liquid containing a noble metal oxidation catalyst, cupric ions, and chloride ions, whereby said alkene is oxidized to form a reaction product comprising predominantly said aldehyde alkane product admixed with said catalyst solution in a chemically reduced condition;
- separating said reaction product into fractions comprising (i) an aldehyde alkane product fraction and (ii) a reduced catalyst solution fraction containing said noble metal and copper in a reduced form, including cuprous chloride in solution and as cuprous chloride crystals, and also containing hydrochloric acid, and also containing amounts of said aldehyde alkane as well as alpha chlorinated aldehyde alkane;
- in an elongated plug-flow reoxidizer reoxidizing said reduced catalyst solution with a gas comprising molecular oxygen to oxidize a portion of the copper values contained therein to the cupric form; and
- recycling the resulting reoxidized catalyst solution to said

alkene reaction zone; the improvement which comprises adding said gas comprising molecular oxygen to said catalyst reoxidation zone in a plurality of increments, each increment being added to said catalyst reoxidation zone at different points situated along the length of said zone; the first of said points being at the beginning of said zone.

4,008,280

PROCESS FOR PRODUCTION OF ACROLEIN

Yoshihisa Watanabe; Toshiyuki Sugihara; Kenji Takagi; Makoto Imanari, and Naohiro Nojiri, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Continuation of Ser. No. 312,732, Dec. 29, 1971, abandoned.

This application Oct. 1, 1974, Ser. No. 511,473

Claims priority, application Japan, Dec. 29, 1970, 50-121235; Dec. 29, 1970, 50-121238; Dec. 29, 1970, 50-121239

Int. Cl.² C07C 45/04

U.S. Cl. 260—604 R

10 Claims

1. A process for producing acrolein by vaporphase catalytic oxidation of propylene with molecular oxygen, which comprises oxidizing propylene with molecular oxygen at a temperature of 240° to 450° at a pressure of 0.5 to 10 atmospheres of pressure over a catalyst of a composition represented by the formula



the boron having been introduced in the catalyst in the form of a sodium borate and the subscript characters a through j designate the respective numbers of atoms are as follows:

- $$\begin{array}{l} a = 12 \\ b = 0.1 \text{ to } 10 \\ c = 0 \text{ to } 10 \\ d = 0 \text{ to } 10 \\ e + f = 0.1 \text{ to } 15 \\ e = 0.05 \text{ to } 8 \\ f = 25 \text{ to } 120 \\ g = 0.01 \text{ to } 2 \\ h = 0.01 \text{ to } 2 \\ g + h = 0.02 \text{ to } 4 \\ j = 0 \text{ to } 40. \end{array}$$

4,008,281

ASYMMETRIC CATALYSIS

William S. Knowles, St. Louis; Milton J. Sabacky, Ballwin, and Billy D. Vineyard, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

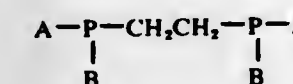
Continuation-in-part of Ser. No. 421,463, Dec. 3, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,987

Int. Cl.² C07F 9/50, 9/53

U.S. Cl. 260—606.5 P

16 Claims

1. An optically active compound represented by the structural formula



wherein A and B each independently represent substituted and unsubstituted alkyl of from 1 to 12 carbon atoms, substituted and unsubstituted cycloalkyl having from 4 to 7 carbon atoms, substituted and unsubstituted aryl, provided that such substituents provide no significant interference with the steric requirements around the phosphorus atom, either A or B must be an aryl group having an alkoxy substituent at the ortho position and A and B are different.

4,008,282

PREPARATION OF TRIARYL PHOSPHINES

John Melvin Townsend, Belleville, and Donald Herman Valentine, Jr., Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 425,012, Dec. 14, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,326. Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976.

Int. Cl.² C07F 9/02

U.S. Cl. 260—606.5 P

14 Claims

1. A process for producing a tertiary aryl phosphine from the corresponding tertiary aryl phosphine oxide comprising reacting said phosphine oxide with hydrogen in the presence of sulfur or selenium catalyst, said reaction being carried out in the presence of silicon tetrahalide as an auxiliary agent, said reaction taking place at a temperature of from 50°C. to 400°C. and pressures of from 100 p.s.i.g. to 2000 p.s.i.g.

4,008,283

1,1-BIS(1-METHYL-2-VINYL-4,6-HEPTADIENOXY) ALKANE AND METHOD FOR THE PRODUCTION THEREOF

Satoru Enomoto, Fujisawa; Yutaka Mukaida, Tokyo; Mikiro Yanaka, Matsudo; Sadao Nishita, Tokyo; Hisayuki Wada, Tokyo, and Hitoshi Takita, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan. Filed June 17, 1976, Ser. No. 696,929.

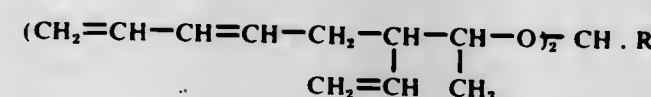
Claims priority, application Japan, Aug. 5, 1975, 50-094690.

Int. Cl.² C07C 43/30

U.S. Cl. 260—615 A

4 Claims

1. A 1,1-bis(1'-methyl-2'-vinyl-4',6'-heptadienoxy)alkane of the generic formula:



wherein R denotes H or an alkyl group of 1 to 7 carbon atoms.

4,008,284

NOVEL PHENOL DERIVATIVES

Kuniaki Goto, Tokyo; Harumi Asai, Kamakura, and Tadao Natsume, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan.

Filed June 9, 1975, Ser. No. 584,931.

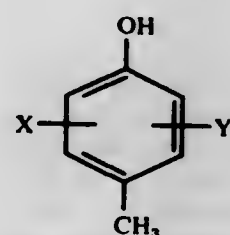
Claims priority, application Japan, June 19, 1974, 49-69171.

Int. Cl.² C07C 39/12

U.S. Cl. 260—619 D

4 Claims

1. A compound of the formula



wherein X and Y each represent a cyclopentyl group.

4,008,285

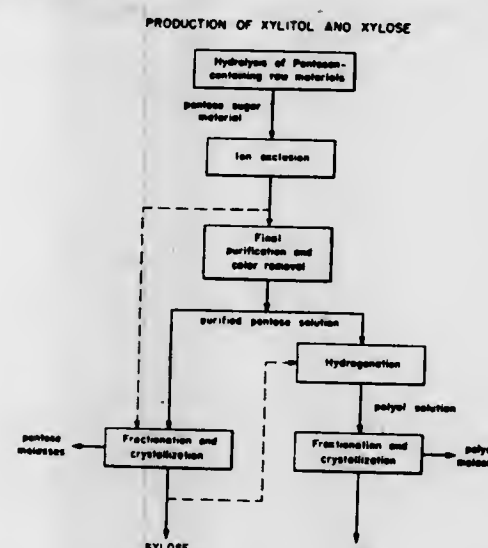
PROCESS FOR MAKING XYLITOL

Asko J. Melaja, Niittypolku 6, Kantvik, and Lauri Hämmäläinen, Rajakallio C, 02460 Kantvik, both of Finland. Division of Ser. No. 463,037, April 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,391, April 25, 1973, abandoned. This application June 18, 1975, Ser. No. 588,022.

Int. Cl.² C07C 31/18; C13K 13/00

U.S. Cl. 260—635 C

16 Claims



1. A method for the production of xylitol on a commercial scale from a pentose-rich solution obtained by acid hydrolysis of a pentosan-containing raw material which comprises the steps of

- removing suspended solids from the solution by mechanical filtration;
- removing inorganic salts and the major portion of organic impurities and color from the solution by ion exclusion;
- removing the balance of color and other organic impurities by treating the solution with a material selected from the group consisting of an ion exchange resin and activated carbon;
- fractionating the solution thus obtained by ion exchange chromatographic techniques to provide a xylose solution of high purity;
- catalytically hydrogenating the xylose solution; and
- subjecting the xylitol solution thus produced to ion exchange chromatographic fractionation to recover a xylitol fraction of high purity.

4,008,286

PROCESS FOR PREPARING GLYCOLS

Isao Hirose, and Hiroyuki Okitsu, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan.

Filed Feb. 20, 1976, Ser. No. 659,853.

Claims priority, application Japan, Feb. 20, 1975, 50-20351; Feb. 5, 1976, 51-10816.

Int. Cl.² C07C 29/02

U.S. Cl. 260—635 H

13 Claims

1. A process for making glycols comprising contacting an aliphatic olefin with 2-4 carbon atoms with an aqueous medium containing

- at least one cation selected from the group consisting of copper ions and iron ions, and
- an anion which at least includes a bromine ion and can solubilize copper and/or iron at 100°-200° C., to form a glycol corresponding to the starting olefin, which is characterized in that the concentrations of the cation and anion and the ratio therebetween are controlled to satisfy the following conditions:

$$0.4 \leq [\text{Cu}'] \leq 2.5$$

(1)

$$0.8 \leq [\text{Br}^-] \leq 4.0$$

(2)

$$1.75 [\text{Cu}'] \leq [\text{A}'] \leq 2.0 [\text{Cu}']$$

(3)

$$0.8 [\text{Cu}'] \leq [\text{Br}^-] \leq 1.95 [\text{Cu}']$$

(4)

II. when the cation in the aqueous medium is an iron ion,

$$0.3 \leq [\text{Fe}'] \leq 2.0$$

(5)

$$0.5 \leq [\text{Br}^-] \leq 6.0$$

(6)

$$2.0 [\text{Fe}'] \leq [\text{A}'] \leq 3.0 [\text{Fe}'] + 4.0$$

(7)

$$1.0 [\text{Fe}'] \leq [\text{Br}^-] \leq 3.0 [\text{Fe}'] + 1.0$$

(8)

and

III. when the cation in the aqueous medium consists of copper and iron ions,

$$0.05 \leq [\text{Cu}'] + [\text{Fe}'] \leq 1.6$$

(9)

$$0.01 \leq [\text{Cu}']$$

(10)

$$0.01 \leq [\text{Fe}']$$

(11)

$$0.5 \leq [\text{Br}^-] \leq 4.0$$

(12)

$$2.0 \{[\text{Cu}'] + [\text{Fe}']\} \leq [\text{A}'] \leq 3.5 \{[\text{Cu}'] + [\text{Fe}']\} + 4.0$$

(13)

$$1.0 \{[\text{Cu}'] + [\text{Fe}']\} \leq [\text{Br}^-] \leq 3.5 \{[\text{Cu}'] + [\text{Fe}']\}$$

(14)

provided that, in the foregoing formulae (1) through (14), $[\text{Cu}']$, $[\text{Br}^-]$, $[\text{A}']$ and $[\text{Fe}']$ respectively denotes the total ion concentration per liter of the aqueous medium,

$[\text{Cu}']$ being the total ion concentration (gram-atom/liter) of ionized copper (Cu^+ and Cu^{++}),

$[\text{Br}^-]$ being the total ion concentration gram-atom/liter) of the bromine ion which can solubilize copper and/or iron,

$[\text{A}']$ being the total ion concentration (gram-ionic equivalent/liter) of the anion which at least includes a bromine ion and can solubilize copper and/or iron, all calculated as converted to monovalent anions, and

$[\text{Fe}']$ being the total ion concentration (gram-atom/liter) of ionized iron (Fe^{++} and Fe^{+++}).

4,008,287

PROCESS FOR THE PREPARATION OF CYCLOPROPANE DERIVATIVES

Pieter A. Verbrugge, and Elisabeth W. Uurbanus, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

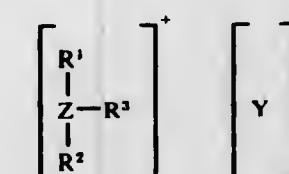
Continuation-in-part of Ser. No. 359,930, May 14, 1973, abandoned. This application June 17, 1975, Ser. No. 587,783.

Int. Cl.² C07C 23/04, 23/18, 17/00

U.S. Cl. 200—648 D

6 Claims

1. In a process for preparing gem-dihalocyclopropane derivatives by reacting an alkene optionally substituted by one or more aromatic groups or halogen atoms with a dihalocarbene in the presence of a catalyst, the improvement which comprises employing as catalyst an onium compound having the general formula



(1)

in which R^1 , R^2 and R^3 each is alkyl or cycloalkyl of up to 40 carbon atoms, Z is an atom of an element of Group VIA of the Periodic Table of the Elements having an atomic number of more than 15 and Y is an anion.

4,008,288

HYDROCARBON ISOMERIZATION PROCESS USING PLATINUM/ALUMINA CATALYST ACTIVATED AND COOLED WITH HCL

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 458,700, April 8, 1974, Pat. No. 3,970,589. This application Mar. 5, 1976, Ser. No. 664,217.

Int. Cl.² C07C 5/30

U.S. Cl. 260—666 P

14 Claims

1. A hydrocarbon conversion process which comprises contacting an isomerizable hydrocarbon selected from the group consisting of acyclic paraffins and naphthenes under isomerization conditions with an active alumina supported platinum catalyst prepared by contacting said catalyst at a temperature within the range of 600°-1500° F with a dry activating gas comprising 30 to 100 volume percent anhydrous hydrogen chloride for at least 0.1 hour;

and thereafter cooling the thus-activated catalyst for a time of at least 0.5 hour in the presence of a dry carrier gas containing 1 to 20 volume percent anhydrous hydrogen chloride.

4,008,289

ADSORBENT TREATING METHOD

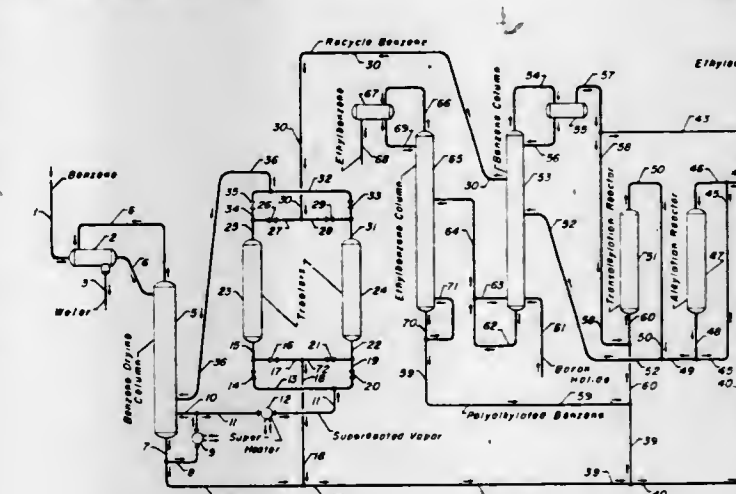
Dennis J. Ward, South Barrington, and George R. Winter, III, Des Plaines, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 7, 1975, Ser. No. 594,142.

Int. Cl.² C07C 7/12

U.S. Cl. 260—671 R

7 Claims



1. A method of removing adsorbed material from a solid adsorbent in a process employing a fractionation column, which comprises the steps of:

- removing a liquid hydrocarbon bottoms stream from the lower portion of said column and reboiling the same to form vapors;
- returning a portion of said vapors to the lower portion of the column;
- superheating another portion of said vapors to a temperature sufficient to vaporize the adsorbed material from said adsorbent;
- contacting the superheated vapors with the adsorbent and thereby removing adsorbed material from the adsorbent; and
- supplying the resultant vapor stream to the lower portion of said fractionation column.

6. In a process for the alkylation of benzene wherein:

- benzene is passed into a benzene drying column to form a dry benzene feed stream;
- the dry benzene feed stream is reacted with an olefin in an alkylation zone containing a boron halide promoted catalyst, and an alkylation zone effluent comprising benzene, an alkylaromatic hydrocarbon and boron oxide hydrates is removed from the alkylation zone and passed into a fractionation zone;
- the formation of a volatile complex containing the boron oxide hydrate is effected by admixing the boron oxide

hydrates with a boron halide within the fractionation zone, and the complex is removed from the fractionation zone dissolved in a distillate stream comprising benzene; and,

d. the distillate stream is passed through a bed of a solid adsorbent which is periodically replaced and which removes the complex from the distillate stream, the improvement in the method of replacing the solid adsorbent which comprises drying the solid adsorbent with a vapor stream formed by vaporizing and superheating liquid removed from the bottom of the benzene drying column, and then returning the vapor stream to the benzene drying column and using the vapor stream as stripping vapor.

7. A method of drying a solid adsorbent used to treat a recycle benzene stream in a process for the alkylation of benzene wherein an alkylation zone effluent is formed by reacting benzene with ethylene in the presence of a boron halide promoted catalyst and the recycle benzene stream is formed by fractionating the alkylation zone effluent in a first fractionation column, which method comprises the steps of:

- withdrawing a hydrocarbon stream comprising monoalkylated and polyalkylated benzenes from the first fractionation column and passing the hydrocarbon stream into a second fractionation column;
- withdrawing a liquid stream comprising a polyalkylated benzene from the second fractionation column, and effecting the formation of a vapor stream by vaporizing the liquid stream;
- superheating the vapor stream;
- contacting the solid adsorbent with the vapor stream and effecting the drying of the solid adsorbent; and,
- injecting the vapor stream into the second fractionation column at a point above the lowest distillation tray contained within the second fractionation column.

4,008,290

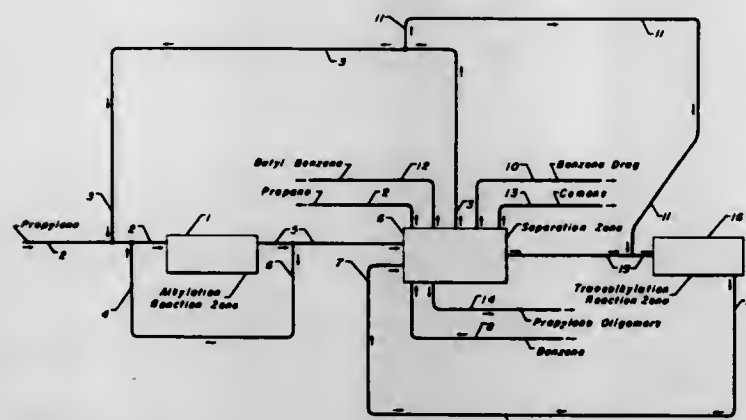
CUMENE PRODUCTION

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 557,010, March 10, 1975, abandoned. This application Apr. 19, 1976, Ser. No. 678,005
Int. Cl.² C07C 3/62, 3/54

U.S. Cl. 260—672 T

11 Claims



1. A process for the production of cumene which comprises the steps of:

- reacting propylene with an excess of benzene in the presence of an alkylation catalyst at alkylation reaction conditions in an alkylation reaction zone;
- dividing the total liquid effluent of said zone into at least two portions of like composition;
- recirculating one of said portions of the effluent to said reaction zone;
- introducing another of said portions of said effluent and a transalkylation zone effluent stream, formed as hereinafter set forth, into a separation zone;
- separating from the admixed effluents in the separation zone a benzene-rich stream, a cumene product stream and a di- and triisopropylbenzene-rich stream;
- transalkylating the last named stream with benzene in the

presence of a transalkylation catalyst in a transalkylation zone to form additional cumene;

- supplying the effluent of the last mentioned zone to said separation zone as said transalkylation zone effluent stream;
- passing at least a portion of said benzene-rich stream from the separation zone to said alkylation reaction zone; and
- recovering said cumene product stream from the separation zone.

4,008,291

SIMULATED MOVING BED ALKYLATION PROCESS

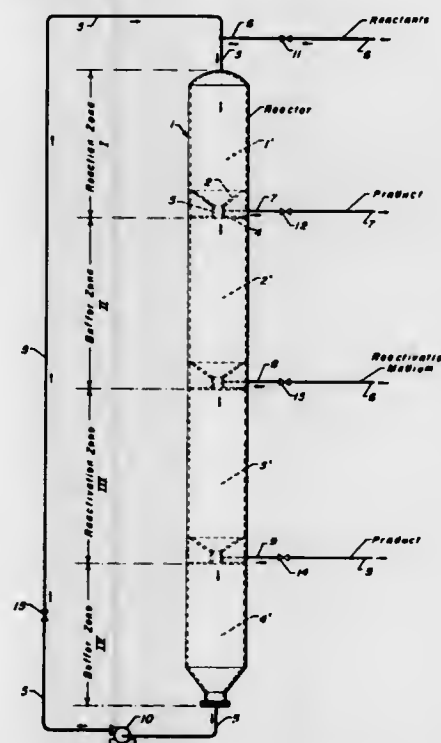
Robert F. Zabransky, Oak Brook, and Robert F. Anderson, La Grange Park, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 16, 1975, Ser. No. 587,470

Int. Cl.² C07C 3/52

U.S. Cl. 260—683.43

14 Claims



1. A continuous fixed bed catalytic alkylation reaction and catalyst reactivation process comprising the steps of:

- providing a crystalline aluminosilicate zeolite catalyst composited with a Group VIII metal hydrogenation agent in a fixed bed containing four zones and having a fluid flow connecting path between said zones to interconnect said zones;
- arranging said zones in a series and providing fluid flow connecting means between the last zone and the first zone of the series to provide a directional circular flow path through said zones;
- providing a point between each two successive zones for introducing an inlet stream or withdrawing a product stream;
- introducing a reactivation stream including alkylatable hydrocarbon and hydrogen at a first point located between two successive zones (zone II and zone III) to effect catalyst reactivation and to provide alkylatable hydrocarbon as a continuous component throughout said fixed bed of catalyst;
- simultaneously withdrawing a first product stream from a second point located between said zone III and the next successive zone in the direction of flow (zone IV);
- simultaneously introducing reactants consisting essentially of isobutane or isopentane or a mixture thereof and at least one C₂-C₃ olefin into said fixed bed of catalyst at a third point located between said zone IV and the next successive zone in the direction of flow (zone I) and reacting said reactants at a temperature of from about 100° to about 400° F. to effect an alkylation reaction, a result of which is deactivation of said catalyst, said alkylation and catalyst reactivation being the principal reactions of the process;

g. simultaneously withdrawing a second product stream from a fourth point located between said zone I and the next successive zone in the direction of flow (zone II); and,

g. periodically advancing downstream the points of charging said reactants and said reactivation stream, and the points of withdrawal of said product streams to the next successive point for introducing inlet stream or withdrawing an outlet stream.

7. A continuous fixed bed catalytic alkylation reaction and catalyst reactivation process comprising the steps of:

- providing a crystalline aluminosilicate zeolite catalyst composited with a Group VIII metal hydrogenation agent in a fixed bed containing three zones and having a fluid flow connecting path between said zones to interconnect said zones;
- arranging said zone in a series and providing fluid flow connecting means between the last zone and the first zone of the series to provide a directional circular flow path through said zones;
- providing a point between each two successive zones for introducing an inlet stream or withdrawing a product stream;
- introducing a reactivation stream including alkylatable hydrocarbon and hydrogen at a first point located between two successive zones to effect catalyst reactivation and to provide alkylatable hydrocarbon as a continuous component throughout said fixed bed of catalyst;
- simultaneously withdrawing a first product stream from a second point located between another two successive zones;
- simultaneously introducing reactants consisting essentially of isobutane or isopentane or a mixture thereof and at least one C₂-C₃ olefin into said fixed bed of catalyst at a third point located between the remaining two successive zones and reacting said reactants at a temperature of from about 100° to about 400° F. to effect an alkylation reaction, a result of which is deactivation of said catalyst, said alkylation and catalyst reactivation being the principal reactions of the process; and
- periodically advancing downstream the points of charging said reactants and said reactivation stream, and the point of withdrawal of said product stream to the next successive points for introducing an inlet stream or withdrawing an outlet stream.

4,008,292

RECYCLE OF ISOPARAFFIN-BUTYLENE HYDROCARBON TO ISOPARAFFIN-PROPYLENE ALKYLATION REACTION

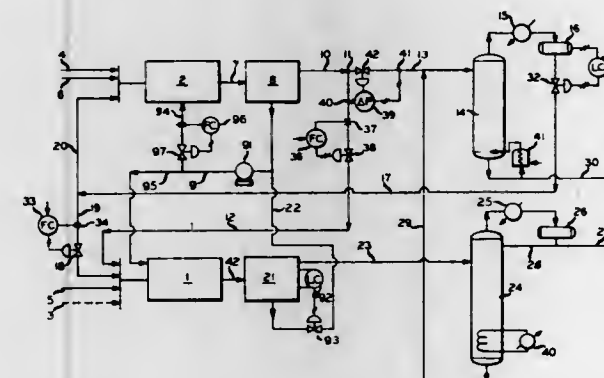
John P. James, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 13, 1976, Ser. No. 657,817

Int. Cl.² C07C 3/54

U.S. Cl. 260—683.45

8 Claims



1. An alkylation process in which an alkylate is produced from an isoparaffin having 4 to 6 carbon atoms and a mono-olefin having 3 to 5 carbon atoms comprising

- contacting a first isoparaffin feed stream with a propylene

stream and a hydrogen fluoride alkylation catalyst in a first alkylation zone,

- removing a first alkylation effluent from said first alkylation zone and separating it into a first catalyst phase and a first hydrocarbon phase,
- contacting a second isoparaffin feed stream with a butylene stream and a hydrogen fluoride alkylation catalyst in a second alkylation zone,
- removing second alkylation effluent from said second alkylation zone and separating it into a second catalyst phase and second hydrocarbon phase,
- splitting said second hydrocarbon phase into a first portion and a second portion,
- introducing said first portion of said second hydrocarbon phase into said first alkylation zone,
- recovering the alkylation product from the second portion of said second hydrocarbon phase and from said first hydrocarbon phase.

4,008,293

CROSSLINKABLE COATING COMPOSITIONS AND METHOD OF USING THE SAME

Rudolf Maska, Pittsburgh, and Donald P. Hart, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1974, Ser. No. 493,798

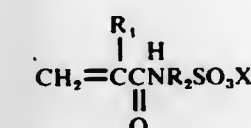
Int. Cl.² C08L 61/26; C08F 20/58

U.S. Cl. 260—856

12 Claims

1. A crosslinkable coating composition free of external strong acid catalyst and having a binder consisting essentially of

- an acrylic interpolymer formed from
 - an amount of a plurality of ethylenically unsaturated monomers having at least one site for crosslinking with an aminoplast resin in the range of from about 1 to about 50 percent by weight based on the weight of said interpolymer, said monomers comprising
 - hydroxy ester of ethylenically unsaturated monocarboxylic acid, and
 - acrylic acid or methacrylic acid;
 - an amount of ethylenically unsaturated monomer which is free of sites for crosslinking with an aminoplast resin in the range of from about 45 to about 98 percent by weight based on the weight of said interpolymer;
 - an amount of at least one ethylenically unsaturated sulfonic monomer represented by the formula



wherein

R₁ is hydro, lower alkyl, lower cycloalkyl, phenyl, furyl or halo,

R₂ is a bivalent saturated hydrocarbon radical having its valence bonds on different carbon atoms,

X is hydro, ammonium or amine, in the range of from about 0.25 to about 1.5 percent by weight based on the weight of said interpolymer; and

- an aminoplast resin wherein
- said binder constitutes from about 5 to about 100 percent by weight of said crosslinkable coating composition;
- said binder contains from about 25 to about 97 percent by weight of said acrylic interpolymer; and
- said binder contains from about 30 to about 95 percent by weight of said aminoplast resin.

4,008,294

THICKENED POLYESTER COMPOSITION CONTAINING ULTRAFINE POLYPROPYLENE FIBERS

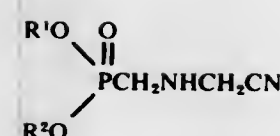
Nelson S. Marans, Silver Spring; Thomas E. Ferington, Columbia, both of Md., and Philip Messina, Colonia, N.J., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 527,514, Nov. 27, 1974, abandoned. This application July 22, 1975, Ser. No. 598,099
Int. Cl.² C08K 7/02

U.S. Cl. 260—862

2 Claims

1. In a liquid ethylenically unsaturated polyester resin composition comprising a curable ethylenically unsaturated polyester resin composition comprising a polyester resin of a polyhydric alcohol and an ethylenically unsaturated polycarboxylic acid admixed with styrene, the improvement comprising the presence in the composition of an amount of short ultrafine polypropylene fibers effective for causing the composition to have a thixotropic index of 1.5-8 over a 10 fold change in the rate of spindle rotation, the viscosity being determined with a Brookfield viscometer using a number 4 spindle, the spindle rotating 6 and 60 times per minute respectively.



wherein R¹ and R² each represent an alkyl radical of from 1 to 6 carbon atoms.

4,008,297

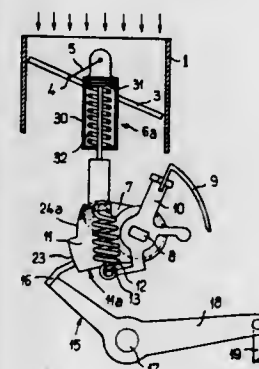
AUTOMATIC STARTING DEVICE OF CARBURETOR
Andre Nartowski, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault; Boulogne-Billancourt, Automobiles Peugeot, Paris, both of, France

Filed Sept. 16, 1975, Ser. No. 613,872
Claims priority, application France, Sept. 23, 1974, 74.32010

Int. Cl.² F02M 1/10

U.S. Cl. 261—39 B

1 Claim



1. The automatic starting device of carburetors of internal combustion engines, which comprises a strangler starter shutter disposed upstream of a starter jet, a linkage for controlling said shutter incorporating a variable angular position shaft operatively connected to a temperature responsive element capable in the cold engine condition to keep said shutter closed and to gradually open same as the engine warms up, a cam freely rotatable relative to said shaft and connected through spring means to an element movable with said shaft and adapted to co-act with the linkage means positively controlling the carburetor throttle, said cam comprising a first cam face controlling the normal starter idling position of said throttle, followed by another cam face adapted to set said throttle in an accelerated idling position, said strangler starter shutter control linkage further comprising resilient connecting means adapted to yield when said shutter is fully open while said accelerated idling throttle control cam face has such amplitude that it can still co-act along a predetermined stroke with said positive throttle control linkage after said strangler starter shutter has reached its fully open position.

4,008,298
CARBURETOR

Norman G. Quantz, Algonac, Mich., assignor to Lectron Products, Inc., Troy, Mich.

Filed May 16, 1975, Ser. No. 578,265

Int. Cl.² F02M 9/06

U.S. Cl. 261—44 R

12 Claims

1. A carburetor comprising a body with inlet and outlet ends, a throat extending through said body from one end to the other, a throttle slide in said body extending transversely to said throat at an intermediate portion thereof, said slide being movable to vary the unblocked portion of said throat, guide means on opposite sides of said throat coacting with complementary guide means on said slide to support the slide during said movement, a fuel tube extending transversely to said throat and having an opening into the throat, a pin disposed in said tube and being tapered with the widest portion of

4,008,296

ESTERS OF N-PHOSPHONOMETHYLGLYCINONITRILE

John Edward Duncan Barton, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 405,258, Oct. 11, 1973, Pat. No. 3,923,877. This application Aug. 15, 1975, Ser. No. 605,173
Claims priority, application United Kingdom, Nov. 8, 1972, 51442/72

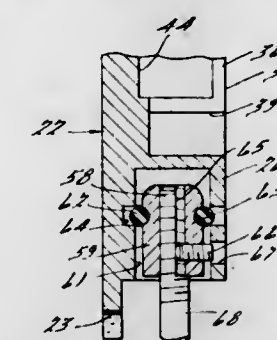
Int. Cl.² C07F 9/09; A01N 9/36

U.S. Cl. 260—940

2 Claims

1. An ester of N-phosphonomethylglycinonitrile, having the formula:

the taper adjacent said opening, and means mounting the end of said pin adjacent said widest portion of the taper, said mounting means being so constructed as to permit limited translatory as well as pivotal movement of said end of the pin with respect to said slide in directions transverse to the extent of said tube, so as to compensate for tolerance variations



between said guide means on the throat and said opening, said mounting means comprising a bore in the underside of said slide, an enlargement on said end of the pin within and narrower than said bore, and interfitting ring-and-groove means on said enlargement and bore permitting said translatory and pivotal movements.

4,008,299

METHOD OF MAKING A FIBRE OF ALUMINIUM PHOSPHATE

James Derek Birchall, and John Edward Cassidy, both of The Heath, Runcorn, Cheshire, England

Division of Ser. No. 274,964, July 25, 1972, Pat. No. 3,870,737, which is a continuation of Ser. No. 42,499, June 1, 1970. This application Oct. 21, 1974, Ser. No. 516,777
Claims priority, application United Kingdom, June 12, 1969, 29862/69

Int. Cl.² C04B 35/64, 35/76

U.S. Cl. 264—63

14 Claims

1. A method of preparing an aluminium phosphate fibre comprising the steps of fibrising a composition containing a solution of a halogen-containing complex phosphate of aluminium containing at least one chemically-bound molecule of a hydroxy compound R-OH wherein R is a hydrogen atom or an aliphatic group having from 1 to 10 carbon atoms, the ratio of the number of gram atoms of aluminium to the number of gram atoms of phosphorus being in the range 1:2 to 2:1, in a solvent selected from the group consisting of water, aliphatic alcohols, esters, polyhydric alcohols, and mixtures thereof, and drying the aluminium phosphate fibre so formed.

4,008,300

MULTI-CONDUCTOR ELEMENT AND METHOD OF MAKING SAME

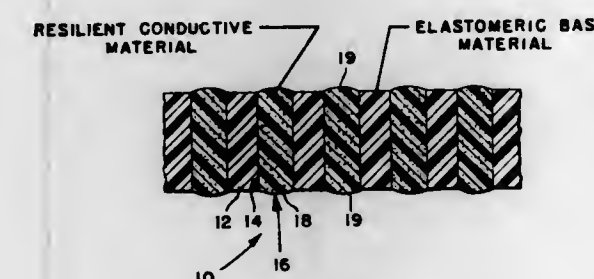
Timothy R. Ponn, Cleveland, Ohio, assignor to A & P Products Incorporated, Painesville, Ohio

Filed Oct. 15, 1974, Ser. No. 514,572

Int. Cl.² H01R 13/24; H05K 1/04

U.S. Cl. 264—104

3 Claims



1. The method of producing a multi-conductor element, which comprises the steps of forming a plurality of holes through a board made of a resiliently deformable and electri-

cally insulative material, resiliently deforming the board to diametrically enlarge the holes in the same, filling the thus enlarged holes with a slurry of electrically conductive material in an uncured flowable vehicle that is resilient when cured, curing the vehicle in the enlarged holes, and then releasing the board from deformation for return of the holes to normal diameter, such relative constriction of the holes applying sufficient radial force on the cured resilient conductors therein as to cause the latter to bulge outwardly beyond the surfaces of the board.

3. The method of producing a multi-conductor element, which comprises the steps of forming a plurality of holes through a board made of a resiliently deformable and electrically insulative material, resiliently deforming the board to enlarge the holes in the same by filling the holes under pressure with a slurry of electrically conductive material in an uncured flowable vehicle that is resilient when cured, curing the vehicle in the enlarged holes, and then releasing the board from deformation for return of the holes to normal diameter, such relative constriction of the holes applying sufficient radial force on the cured resilient conductors therein as to cause the latter to bulge outwardly beyond the surfaces of the board.

4,008,301

PROCESS FOR THE PRODUCTION OF NONWOVEN CELLULOSE ACETATE LAMINATE CURED WITH PHENOLIC RESIN

Katsuharu Arisaka, Sakai; Hideo Sawada, Osaka, and Kozo Shimoguchi, Sakai, all of Japan, assignors to Daicel, Ltd., Osaka, Japan

Filed Jan. 22, 1975, Ser. No. 543,180

Claims priority, application Japan, Jan. 24, 1974, 49-10495
Int. Cl.² B29G 7/00

U.S. Cl. 264—137

7 Claims

1. A process for manufacturing a molded article made of a non-woven cellulose acetate fiber web, which consists essentially of the steps of:

- impregnating substantially uniformly a nonwoven web of fibers consisting essentially of from 50 to 100 weight percent of cellulose acetate fibers, the balance being another fiber selected from the group consisting of polyvinyl chloride fibers, polyethylene glycol terephthalate fibers, polyacrylonitrile fibers and mixtures thereof, with a liquid composition consisting of 35 to 100 weight percent of liquid resol resin, the balance being a plasticizer for cellulose acetate, said impregnated web containing from 5 to 40 weight percent of said liquid resol, based on the total weight of the impregnated web;
- placing said web between molding surfaces defining a mold cavity;
- pressing said web to conform same to the shape of said cavity;
- injecting, simultaneously with step (c), superheated steam at a pressure of from 0.05 to 3.0 kg/cm² and a temperature of from 80° to 150° C through said web at a rate that is effective to prevent condensation of water in said web and for a period of time effective to cure said resol resin;
- terminating the injection of said steam; and
- removing the cured cellulose acetate fiber web from said mold.

4,008,302

METHOD OF MOLDING PLASTIC ELEMENTS ON A CONTINUOUS WEB

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1972, Ser. No. 318,003

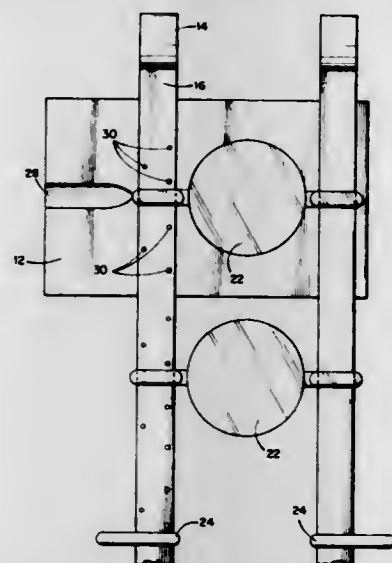
Int. Cl.² B29D 7/08

U.S. Cl. 264—156

8 Claims

1. A method for forming a continuous web comprising plastic molded elements comprising:

inserting into a mold comprising a cavity a forward portion of at least one continuous runner element;
causing a section of said runner element to traverse a part of the mold cavity and protrude from the mold;
injecting into the mold cavity a liquid material capable of being cured to form a solid;
curing said liquid material in said mold cavity whereby the cured material is secured to the runner section in said mold cavity;



opening said mold and applying sufficient force to said runner to cause the molded part secured thereto to be ejected from the mold;
concomitantly positioning a subsequent portion of said continuous runner element in said cavity; and
closing the mold and repeating the molding and ejection cycle whereby a web comprising molded plastic parts secured to at least one continuous runner element is formed.

4,008,303

PROCESS FOR EXTRUDING GREEN POLYGLYCOLIC ACID SUTURES AND SURGICAL ELEMENTS

Arthur Glick, Danbury, and Lester Daniel Chirgwin, Jr., Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 176,291, Aug. 30, 1971, abandoned. This application Aug. 3, 1972, Ser. No. 277,537 Int. Cl.² D01D 5/12

U.S. Cl. 264—210 F

9 Claims

1. A method of coloring polyglycolic acid surgical elements comprising incorporating 1,4-bis(p-toluidino)-anthraquinone into molten polyglycolic acid to form an optically homogeneous solution and forming solid pellets therefrom, and later melt spinning the green colored polyglycolic acid pellets into filaments in which the 1,4-bis(p-toluidino)-anthraquinone is uniformly dispersed in an optically homogeneously solid solution, said 1,4-bis(p-toluidino)-anthraquinone providing both color and lubricity to aid in extension in the melt spinning.

4,008,304

PROCESS FOR PRODUCING CURED PHENOLIC FILAMENTS HAVING IMPROVED DRAWABILITY

Hiroaki Koyama, Osaka, and Isao Kimura, Suita, both of Japan, assignors to Nippon Kynol Incorporated, Osaka, Japan

Continuation of Ser. No. 331,811, Feb. 12, 1973, abandoned.

This application Apr. 16, 1975, Ser. No. 568,462

Claims priority, application Japan, Feb. 23, 1972, 47-18788

Int. Cl.² B29C 25/00

U.S. Cl. 264—236

4 Claims

1. A process for producing melt-spun and cured phenolic undrawn filaments consisting essentially of a fiber-forming polyamide resin selected from the group consisting of nylon-6, nylon-7, nylon-9, nylon-11, nylon-12, nylon-66, nylon-610,

nylon-611, nylon-612, nylon-6T, nylon-11T and a copolyamide consisting essentially of these polyamides in the amount of less than 50% by weight based on the total weight of the filaments and a novolak resin in the amount of not less than 50% by weight based on the total weight of the filaments having improved drawability which comprises melt-spinning a fiber-forming novolak resin containing less than 50% by weight of said resin mixture of said polyamide resin, curing the resulting filaments with an aldehyde in the presence of a basic or acid catalyst, and contacting said cured phenolic filaments with at least 25% by weight of a treating reagent in a vapor or liquid phase and selected from the group consisting of methanol and ethanol and a mixture thereof.

4,008,305

METHOD OF MANUFACTURING A BOOK BINDING ELEMENT

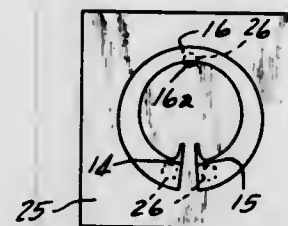
Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Division of Ser. No. 169,981, Aug. 9, 1971, abandoned. This application Apr. 16, 1975, Ser. No. 568,548

Int. Cl.² B29C 7/00

U.S. Cl. 264—336

4 Claims



1. A method of making a binding element of a resilient plastic material having a circular configuration of a C-ring with a radial slit forming a pair of ends which are closely adjacent each other, said plastic material having a characteristic of shrinking during cooling from a molding temperature, said method comprising providing a mold having a cavity configuration of the element in a spread condition with the adjacent ends spaced apart a distance greater than said slit, molding the element by inserting a plastic material into the mold cavity at a temperature above the melting point of the plastic material, removing the molded element from the mold, and cooling the element to shrink the adjacent ends of the element substantially together.

4,008,306

METHOD OF RECOVERING MANGANESE VALUES FROM A MIXTURE OBTAINED BY CATALYTICALLY OXIDIZING A PARAFFIN WITH GASEOUS OXYGEN

Takashi Yamashita, and Tadashi Takeshiro, both of Yokohama, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan Filed June 5, 1975, Ser. No. 584,151

Claims priority, application Japan, June 14, 1974, 49-67720; June 14, 1974, 49-67721

Int. Cl.² C01G 45/00

U.S. Cl. 423—50

5 Claims

1. A method of recovering manganese values from a liquid oxidation mixture obtained by oxidizing a paraffin having 10 to 40 carbon atoms with gaseous oxygen in the presence of a manganese-bearing catalyst, said mixture essentially consisting of an organic liquid phase containing mono-basic fatty acid produced by said oxidation, unsaponifiable matter, and a portion of said manganese values as a solute, which method comprises:

- (a) contacting said organic liquid phase with aqueous sulfuric acid until said manganese values accumulate substantially completely in a phase distinct from said organic liquid phase;
- (b) separating said organic liquid phase and said distinct phase; and

(c) recovering manganese values from said distinct phase.
2. A method as set forth in claim 1, wherein said aqueous sulfuric acid is at least 0.05-normal but not more than 5-normal, said aqueous sulfuric acid being contacted with said oxidation mixture in an amount stoichiometrically equivalent to 0.5 to 5 times the amount of metal in said oxidation mixture, said distinct phase being an aqueous liquid.

4. A method as set forth in claim 1, wherein said aqueous sulfuric acid is 5-normal to 36-normal sulfuric acid, said aqueous sulfuric acid being contacted with said oxidation mixture in an amount stoichiometrically equivalent to 1.0 to 3 times the amount of metal in said oxidation mixture, said distinct phase being solid.

4,008,307

PRODUCTION OF MONOBASIC POTASSIUM PHOSPHATE BY ION EXCHANGE

Kent W. Loest, Broomfield, and Vernon R. Ewing, Denver, both of Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Filed June 2, 1975, Ser. No. 582,807

Int. Cl.² C01B 15/16, 25/26; C01F 1/00, 7/02

U.S. Cl. 423—120

13 Claims

1. A process for producing aluminum and monobasic potassium phosphate from alunite and apatite rock which comprises:

- a. reacting apatite rock with sulfuric acid to produce phosphoric acid;
- b. roasting and leaching the alunite ore to remove water and compounds of sulfur and alkali metals, including potassium sulfate;
- c. separating the residue and solution of step (b);
- d. digesting the residue from step (c) with at least one alkali metal hydroxide at a concentration and at a temperature sufficient to dissolve substantially all of the aluminum values from said solid residue;
- e. separating the liquid and solid portions of the slurry resulting from step (d);
- f. removing silica from the liquid portion resulting from step (e) leaving a desilication product which is essentially sodium aluminum silicate;
- g. separating the liquid and solid portions resulting from step (f);
- h. precipitating aluminum hydroxide from the liquid portion resulting from step (g);
- i. separating the aluminum hydroxide precipitate from the mother liquor resulting from step (h);
- j. converting the phosphoric acid from step (a) and the potassium sulfate from step (c) by ion exchange into monobasic potassium phosphate, and
- k. recovering the monobasic potassium phosphate.

4,008,308

SEPARATION OF COBALT FROM NICKEL THIOCYANATES WITH ISOPHORONE

Patrick Bernard Sullivan, Peekskill, and Glenn Franklin Mitchell, Bedford Hills, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 642,306

Int. Cl.² C01G 51/00

U.S. Cl. 423—139

4 Claims

1. In the process for the separation of nickel and cobalt thiocyanate by extracting an aqueous solution thereof having a pH 1.6 to 2.6 with a water immiscible organic solvent whereby thiocyanate is selectively extracted into the organic phase leaving nickel thiocyanate in an aqueous phase, the improvement which comprises using isophorone as the water immiscible organic solvent and the aqueous solution of said nickel and cobalt thiocyanates contains ammonium thiocyanate at a concentration of at least 35 grams per liter of solution.

2. Process claimed in claim 1 where cobalt is recovered from the cyclic ketone organic phase by contacting said organic phase with an aqueous inorganic acid solution having a molarity of at least about five.

4,008,309

PROCESS FOR CRYSTALLIZING CALCIUM NITRATE

Juliu Virgil Florian Moldovan; Maria Suci, and Eugenia Tomescu, all of Bucharest, Romania, assignors to Institutul de Cercetari Chimice - Icechim, Bucharest, Romania

Continuation-in-part of Ser. No. 338,815, March 7, 1973, abandoned, which is a continuation of Ser. No. 103,327, Dec. 31, 1970, abandoned. This application May 12, 1975, Ser. No. 576,305

Claims priority, application Romania, Jan. 7, 1970, 62059 Int. Cl.² C01F 11/44

U.S. Cl. 423—167

6 Claims

1. A process for preparing large calcium nitrate tetrahydrate crystals comprising the steps of:

- a. digesting phosphate rock containing from about 10 to 60% CaO by weight with nitric acid of 30 to 70% concentration by weight to produce a phosphonitrate solution;
- b. cooling said solution at a substantially constant rate of substantially 6° to 30° C per hour to a temperature of substantially 17 to 22° C through a temperature fall break, a point of inflection in the characteristic curve of time plotted against temperature with constant cooling rate to crystallize calcium nitrate tetrahydrate and
- c. ceasing cooling upon the temperature dropping about 1° C below the temperature at said point thereby intentionally terminating the crystallization when only 40 to at most 60% of the calcium nitrate tetrahydrate is precipitated so as to produce a mother liquor with the resulting crystals in suspension;
- d. recovering the mother liquor from 20 to 80% of the suspension produced in step (c) by removing the calcium nitrate tetrahydrate crystals therefrom;
- e. combining the remainder of the suspension produced in step (c) with the mother liquor produced in step (d) to form a mixture thereof in a ratio of said remainder of the suspension: mother liquor of step (d) of from 1:2 to 1:0.1 and cooling the resultant mixture at a rate of substantially 12° to 40° C per hour and at a rate at least equal to that of step (b) to a temperature between substantially 12° C and -10° C to crystallize calcium nitrate tetrahydrate from the mixture and precipitate 80 to 85% of the calcium thereof in the form of the crystals of calcium nitrate tetrahydrate having a particle size of from 70 to 1100 microns to produce a crystal-containing liquid with a mother liquor/crystal ratio of substantially from 1:1 to 1:0.1; and
- f. removing said crystals with a particle size of from 700 to 1100 microns from said liquid.

4,008,310

REGENERATIVE SULFUR DIOXIDE SCRUBBING SYSTEM

Everett Gorin, Pittsburgh, Pa., assignor to Continental Oil Company, Ponca City, Okla.

Filed May 27, 1975, Ser. No. 581,074

Int. Cl.² C01B 17/00, 7/00

U.S. Cl. 423—242

5 Claims

1. In a regenerative system for the removal of SO₂ from an SO₂-containing gas having a scrubbing circuit which includes a scrubbing zone and a separate sulfite conversion zone in said circuit, and a regenerative section, and where

in said scrubbing circuit there is maintained a continuously recirculating aqueous solution which contains in solution either sodium or potassium thiosulfate in a concentration of at least ten percent by weight of said recirculating solution, and where

in said scrubbing zone the SO₂-containing gas is contacted

under sulfite-forming conditions, with said aqueous solution which contains sodium or potassium carbonate as the effective absorbent for the SO_2 to convert said effective absorbent to the corresponding sulfite, and where in said separate sulfite conversion zone said sulfite is converted to the corresponding thiosulfate by reaction with the corresponding hydrosulfide and where in said regenerative section a mixture of the required hydrosulfide and the required carbonate is produced in a regenerated aqueous solution, said regenerative section including a reduction zone in which thiosulfate contained in a slipstream withdrawn from said scrubbing circuit is reacted with a reducing gas containing CO as the effective reducing agent,

the IMPROVEMENT in the regenerative section, whereby the proper ratio of hydrosulfide to carbonate is maintained in said regenerated solution which is returned to said sulfite conversion zone, which improvement comprises:

1. conducting the reduction of thiosulfate in said reduction zone by the CO-containing reducing gas under conditions effective to produce an effluent aqueous solution which contains sodium or potassium hydrosulfide and sodium or potassium carbonate in admixture with other by-products in the following ratio, R:

$$R = \frac{2(S^0) + 3(S^{-2})}{\Sigma M}$$

where R has a value greater than 1 but less than 1.5 and (S^0) = gram atoms sulfur with valence number zero/100 grams solution,

(S^{-2}) = gram atoms sulfur with valence number equal to -2/100 grams solution, and

ΣM = gram atoms of M/100 grams solution present in said aqueous effluent as MHS , M_2S , M_2S_x , M_2CO_3 , MHCO_3 , and MOH (M is either Na or K) and thereafter

2. subjecting said effluent aqueous solution to flash decomposition in a flash decomposition zone under conditions effective to produce said regenerated aqueous solution having a value of R in the range of 0.75 to 1 inclusive.

4,008,311

COMPOSITION FOR CONTROLLING SEXUAL BEHAVIOR OF MAMMALS

Hiroomi Ono, Tokyo, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 14, 1975, Ser. No. 558,359

Claims priority, application Japan, Mar. 16, 1974, 49-30245

Int. Cl.² A61K 31/56

U.S. Cl. 424-240

2 Claims

1. A method for causing loss of sexual desire and sexual activity in a male dog comprising administering to said dog an injectable composition containing (1) hexesterol dicaprylate and (2) testosterone enanthate in a weight ratio of (1) to (2) of 1:1-3 as active ingredients and a pharmaceutically acceptable liquid carrier in a dosage of 0.5-3.0 mg/kg body weight of the active ingredients.

4,008,312

PREGNANE-21-OIC ACID DERIVATIVES

Klaus Annen; Helmut Hofmeister; Henry Laurent; Klaus Kieslich; Hans Wendt, and Peter Klaus Mengel, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Oct. 29, 1975, Ser. No. 626,775

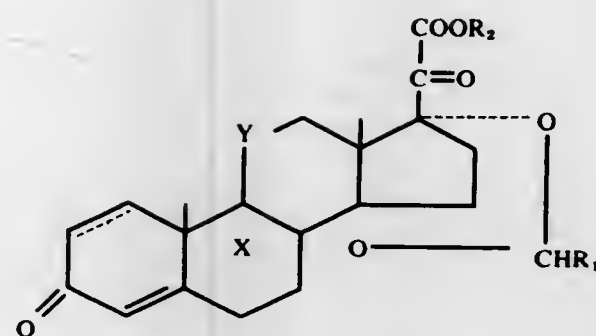
Claims priority, application Germany, Oct. 31, 1974, 2451971

Int. Cl.² A61K 31/58; C07J 1/00

U.S. Cl. 424-241

20 Claims

1. Pregnane-21-oic acid derivatives of the formula



wherein

the linkage represents a single bond or a double bond;

X is hydrogen, fluorine or chlorine;

Y is methylene, hydroxymethylene, alkanoyloxymethylene, carbonyl, fluoromethylene or chloromethylene;

R₁ is hydrogen, alkyl of 1-6 carbon atoms, phenyl or naphthyl substituted with 0-3 lower alkyl, lower alkoxy or chlorine; and

R₂ represents a hydrogen atom, the carboxylic acid salt cation of a physiologically compatible base or the residue of a physiologically acceptable aliphatic or cycloaliphatic alcohol of 1-18 carbon atoms optionally substituted by a member selected from the group consisting of lower alkyl, cyclopentyl, cyclohexyl, hydroxy, lower alkoxy, free or esterified carboxyl and the sodium and potassium salts thereof, amino, mono- or di-lower alkylamino and the hydrochloride, hydrobromide, sulfate, phosphate, oxalate, maleate or tartrate salts thereof.

15. A compound according to claim 1, wherein R₁ is phenyl or naphthyl substituted by 0-3 of lower alkyl, lower alkoxy or halogen.

4,008,313

NOVEL CORTICOIDS

Henry Laurent; Rudolf Wiechert; Peter Klaus Mengel, all of Berlin, and Karl-Heinz Kolb, Hamburg, all of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Oct. 7, 1975, Ser. No. 620,411

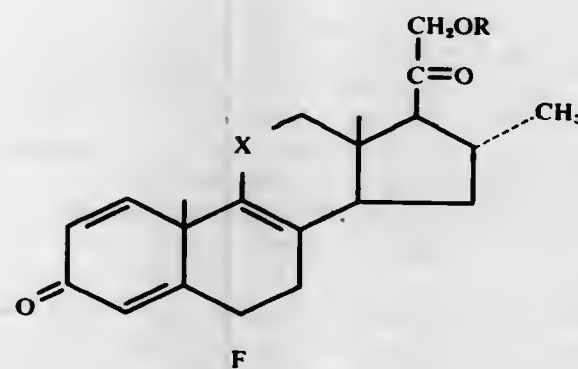
Claims priority, application Germany, Oct. 9, 1974, 2448662

Int. Cl.² A61K 31/56

U.S. Cl. 424-242

13 Claims

1. A corticoid of the formula



wherein X is β -hydroxymethylene or carbonyl, and R is a hydrogen atom or alkanoyl of 1 to 12 carbon atoms.

13. A method for the treatment of inflammations of the skin which comprises topically administering to the affected skin an anti-inflammatorily effective amount of a compound of claim 1.

4,008,314

MANUFACTURE OF SOLID AMMONIUM PHOSPHATE

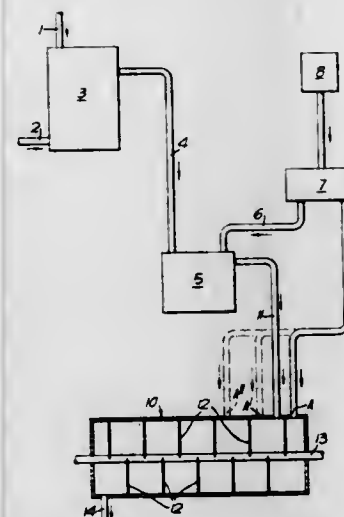
Eric Davidson, Edinburgh, Scotland, assignor to Scottish Agricultural Industries Limited, Edinburgh, Scotland
Filed Jan. 20, 1976, Ser. No. 650,755

Claims priority, application United Kingdom, Jan. 30, 1975, 4095/75

Int. Cl.² C01B 25/28

U.S. Cl. 423-309

8 Claims



1. A process for the production of a particulate solid product comprising ammonium phosphate of N:P atomic ratio 0.95 to 1.10 wherein a primary phosphoric acid-containing feed and ammonia are added to an aqueous slurry of ammonium phosphate of flowable consistency at the temperature of working and having an N:P atomic ratio of between 1.3 and 1.5 to form more slurry of substantially the same composition and concentration and flowable consistency, removing an amount of said slurry substantially equivalent to that produced by the addition of the phosphoric acid and ammonia and thereafter mixing the removed slurry with a secondary acid feed to reduce the N:P ratio to 0.95 to 1.10, wherein the removed slurry is first mixed separately with between 15% and 85% by volume of the secondary acid feed, followed by the addition of the remainder of the secondary acid at a later stage, so that the ammonium phosphate of the resulting product has an N:P atomic ratio in the range 0.95 to 1.10, the water contents of the removed aqueous slurry and the secondary acid feed being such that the resulting product solidifies in a moisture disengagement unit where it is treated for a sufficient period of time for said product to be solid at ambient temperature.

4,008,315

PROCESS FOR REDUCING NITROGEN OXIDE LOSSES FROM CERTAIN SLURRIES AND SOLUTIONS BY THE ADDITION OF PHOSPHATE SALTS

Ernst-Helmut Philippi, Polsum; Helmut Pokorny, Gelsenkirchen, and Wolfgang Mumme, Oer-Erkenschwick, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed Jan. 2, 1973, Ser. No. 320,389

Claims priority, application Germany, Dec. 31, 1971, 2165807

Int. Cl.² C01B 25/16

U.S. Cl. 423-319

5 Claims

1. A process for preventing nitrogen oxide loss from a liquid or slurry containing an oxide of nitrogen which comprises applying thereto salt solutions or suspensions of the phosphate of ammonium, the alkali metals and magnesium, individually or in mixtures, said salt solutions or suspensions being used in a concentration of at least 3% by weight and adjusted to a pH value of from 0.5 to 8.

4,008,316

APPARATUS FOR PRODUCING SO_3 AND SULPHURIC ACID BY A CATALYTIC OF GASES WHICH CONTAIN SO_2

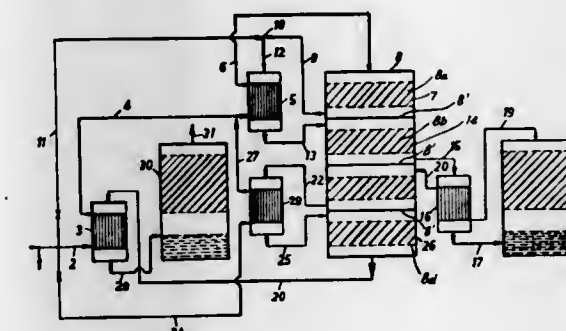
Herbert Drechsel; Karl-Heinz Dorr, and Hugo Grimm, all of Frankfurt am Main, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany
Continuation of Ser. No. 4,084, Jan. 19, 1970, which is a continuation of Ser. No. 768,958, Sept. 30, 1968, which is a continuation of Ser. No. 465,570, June 21, 1965. This application July 10, 1972, Ser. No. 270,396

Claims priority, application Germany, June 23, 1964, 61479; July 8, 1964, 61638

Int. Cl. C01B 17/72, 17/68, 17/70

U.S. Cl. 423-533

28 Claims



1. In a process for the production of SO_3 by catalytic conversion of SO_2 which comprises: passing a SO_2 -containing feed gas through a first catalyst contacting stage for conversion of a part of the SO_2 to SO_3 , the gas being heated by the conversion, cooling the gas from the first catalyst stage and passing the cooled gas through an absorber for removal of SO_3 therefrom, passing the gas from the absorber through a second catalyst contacting stage for conversion of SO_2 to SO_3 , the gas being heated by the conversion, and recovering SO_3 produced in the second contacting stage,

the improvement which comprises the first stage including only two catalyst beds providing a first and second bed in the first stage, the gas being cooled between the beds of the first stage, the conversion in the first stage based on SO_2 content of the starting gas being about 70-90%, said cooling of the gas from the first stage being carried out by first passing the first stage effluent gas in indirect heat exchange relation with the absorber effluent gas, and then passing the first stage effluent gas in indirect heat exchange relation with another heat exchange medium for further cooling of the gas, the second stage comprising only two catalyst beds; the gas from the absorber being passed through the first bed and thereafter the second bed, the gas being cooled after passage through the first bed and before introduction into the second bed, with substantial reduction in catalyst required for the process.

4,008,317

VARICELLA-ZOSTER VIRUS VACCINE AND PREPARATION THEREOF

Jacqueline Gits, La Hulpe, Belgium, assignor to Recherche et Industrie Therapeutiques (R.I.T.), Belgium

Filed Dec. 29, 1975, Ser. No. 644,787

Int. Cl.² A61K 39/12

U.S. Cl. 424-89

6 Claims

1. A live varicella zoster virus vaccine comprising an effective dose of a temperature sensitive N-methyl-N'-nitro-N-nitrosoguanidine induced mutant strain of a pathogenic varicella-zoster virus, said strain having a cut-off temperature of 37° C and being able to multiply in the dermic tissue of a susceptible organism but having inhibited replication in the internal organs, and a pharmaceutical diluent.

4,008,318

PHOSPHORYLATED THIOUREA FUNGICIDES

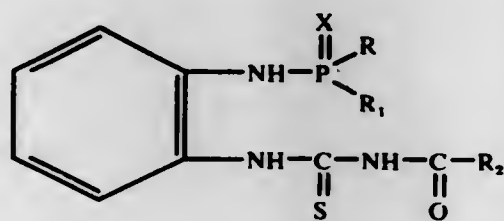
Alexander Mihalovski, Kensington, and Don R. Baker, Orinda, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 471,092, May 17, 1974, abandoned, which is a continuation of Ser. No. 335,415, Feb. 26, 1973, abandoned, which is a division of Ser. No. 336,110, Feb. 24, 1973, Pat. No. 3,847,980, which is a division of Ser. No. 213,714, Dec. 29, 1971, Pat. No. 3,767,734. This application Aug. 25, 1975, Ser. No. 607,516
Int. Cl.² A01N 9/36

U.S. Cl. 424-211

25 Claims

1. A method of selectively controlling fungi selected from the group consisting of *Penicillium italicum* and *Erysiphe polygoni* comprising contacting the habitat thereof with a fungicidally effective amount of a compound corresponding to the formula:



wherein X is selected from the group consisting of oxygen and sulfur, R and R₁ can be the same or different and are selected from the group consisting of lower alkyl having 1-4 carbon atoms and lower alkoxy having 1-4 carbon atoms, R₂ is selected from the group consisting of lower alkyl, lower alkoxy and lower thioalkyl each having from 1-4 carbon atoms.

4,008,319

O,S-DIALKYL O-BENZOYL-PHENYL PHOSPHOROTHIOATES AND PHOSPHORODITHIOATES, PESTICIDAL COMPOSITIONS AND METHODS OF USE

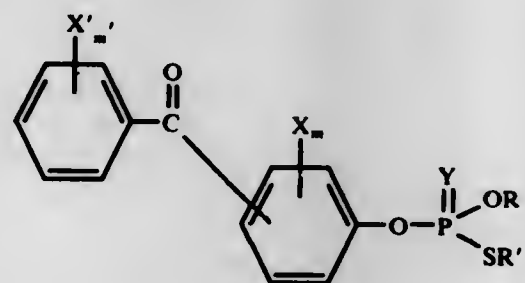
William S. Hurt, Collegeville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 532,128, Dec. 12, 1974, abandoned. This application May 12, 1975, Ser. No. 576,837
Int. Cl.² A01N 9/36; C07C 9/18

U.S. Cl. 424-214

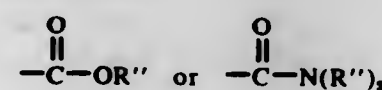
19 Claims

1. A compound of the formula:



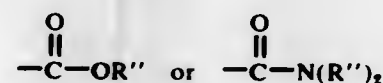
wherein

R is a (C₁-C₄) alkyl group;
R' is a (C₁-C₆) alkyl group;
Y is an oxygen atom or a sulfur atom;
X is a halogen atom, a (C₁-C₃) alkyl group, a (C₁-C₅) alkoxy group, a trifluoromethyl group, a cyano group, or a group of the formula:



wherein R'' is a hydrogen atom or a (C₁-C₃) alkyl group;
X' is a halogen atom, a nitro group, a (C₁-C₃) alkyl group,

a (C₁-C₃) alkoxy group, a trifluoromethyl group, a cyano group, or a group of the formula:



wherein R'' is a hydrogen atom or a (C₁-C₃) alkyl group;
and
m and m' are the same or different and are integers from 0 to 3.

15. A method of controlling pests which comprises applying directly to the pests or to the loci to be freed of or protected from attack by such pests, a pesticidally effective amount of the compound of claim 1.

4,008,320

AMIDOPHENYL-AZO-NAPHTHALENESULFONIC COMPLEMENT INHIBITORS AND METHOD OF USE THEREOF

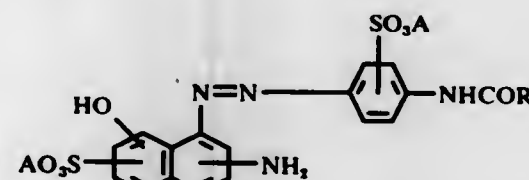
Ransom Brown Conrow, Pearl River; Seymour Bernstein, New City, both of N.Y., and Robert Herman Lenhard, Paramus, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,369
Int. Cl.² C07C 107/06, 107/07

U.S. Cl. 424-226

17 Claims

1. A compound, 6-amino-4-hydroxy-5-(2-sulfo-4-p-sulfo-benzamidophenylazo)-2-naphthalenesulfonic acid, trisodium salt.
2. A compound, 6-amino-4-hydroxy-5-(4-propionamido-2-sulfo-phenylazo)-2-naphthalenesulfonic acid, disodium salt.
3. A compound, 6-amino-4-hydroxy-5-[4-(p-nitrobenzamido)-2-sulfo-phenylazo]-2-naphthalenesulfonic acid, disodium salt.
4. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a compound of the formula:



wherein R is selected from the group (C₁-C₆) alkyl, phenyl, sulfophenyl sodium salt, p-nitrophenyl and m-fluorophenyl; and A is hydrogen, sodium and potassium, with the proviso that A is identical in the same compound.

4,008,321

COMPOSITION FOR A TOPICAL PREPARATION AND A PROCESS FOR PRODUCING THE SAME

Takuzo Kamishita, and Shigeyoshi Hiraki, both of Toyama, Japan, assignors to Toko Yakuhin Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 8, 1975, Ser. No. 638,916

Claims priority, application Japan, Dec. 20, 1974, 49-147110

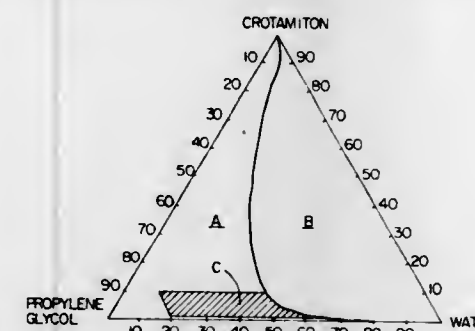
Int. Cl.² A61K 31/56

U.S. Cl. 424-243

10 Claims

1. A transparent, gelatinous topical composition which comprises a steroid selected from the group consisting of prednisolone, dexamethasone, triamcinolone, β-methasone and cortisone; crotamiton, propylene glycol and a carboxyvinyl polymer in an aqueous medium, said composition having been neutralized with an organic amine selected from the group consisting of alkylamines and alkanolamines, and containing crotamiton in an amount of from 0.5 to 10% by weight,

propylene glycol in an amount of from 20 to 80% by weight, water in an amount of from 10 to 80% by weight and carbox-



vinyl polymer in an amount of from 0.3 to 1.5% by weight of the composition.

4,008,322

TRIAZOLO(4,3-A)QUINOXALINES FOR CONTROL OF RICE

Barry A. Dreikorn, and Thomas D. Thibault, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

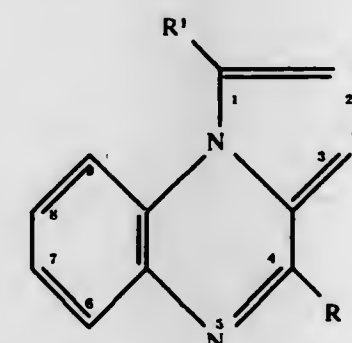
Filed June 10, 1975, Ser. No. 585,534

Int. Cl.² A01N 9/22

U.S. Cl. 424-250

6 Claims

1. A method of reducing the adverse effects of rice blast which comprises contacting *Piricularia oryzae* on the foliage of rice with an effective *Piricularia*-inhibiting amount of a compound of the formula



wherein

R represents chloro, amino, hydrazino or hydrogen;
R' represents methyl or hydrogen; and
provided that at least one of R and R' represents hydrogen.

4,008,323

METHOD OF REDUCING CHOLESTEROL USING CERTAIN AROMATIC KETO ACIDS

Henri Cousse; Gilbert Mouzin; Jean-Pierre Rieu, and Andre Delhon, all of Castres, France, assignors to Pierre Fabre S.A., Paris, France

Filed Mar. 21, 1975, Ser. No. 560,344

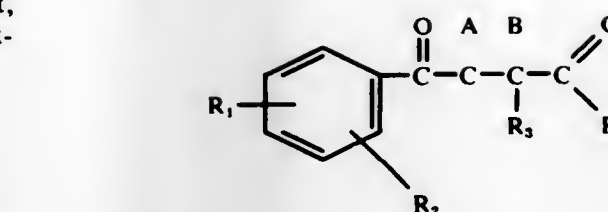
Claims priority, application France, Mar. 25, 1974, 74.10196; Feb. 17, 1975, 75.04912

Int. Cl.² A61K 31/495, 31/235, 31/205, 31/119

U.S. Cl. 424-250

14 Claims

1. A method of reducing blood cholesterol which comprises administering to a living animal body in need of blood cholesterol reduction an effective cholesterol reducing amount of a compound of the following formula:



wherein

R₁ is selected from the group consisting of hydrogen, halogen, phenyl, ortho-halophenyl, and phenoxy,
R₂ is selected from the group consisting of hydrogen and methoxy,
or wherein R₁ and R₂ taken, together with carbon atoms from the phenyl nucleus, form a ring selected from phenyl and cyclohexyl rings,
R₃ is selected from the group consisting of methyl (CH₃-) and methylene (CH₂-), provided that:
when R₃ is methyl, a double bond is present between the A and B carbons; when R₃ is methylene, a single bond is present between the A and B carbons; the remaining valences of the A carbon atom in any case being satisfied by hydrogen atoms, and
R₄ is selected from the group consisting of hydroxy and alkoxy or a pharmaceutically acceptable salt thereof.

4,008,324

PHENOXYALKYLCARBOXYLIC ACID SALT OF 1-CINNAMYL-4-DIPHENYLMETHYL PIPERAZINE, METHOD OF PREPARATION AND ANTIHYPERCHOLESTEREMIC

Gunter Metz, Blaubeuren, and Manfred Specker, Ehingen (Danube), both of Germany, assignors to Ludwig Merckle KG, Blaubeuren, Germany

Filed Jan. 20, 1976, Ser. No. 651,284

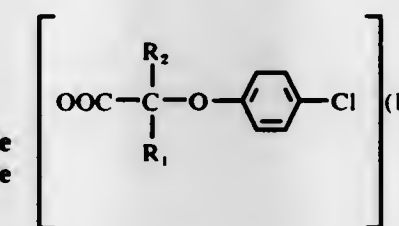
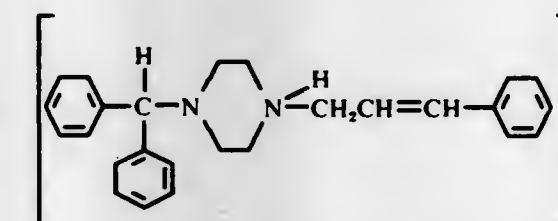
Claims priority, application Germany, Jan. 23, 1975, 2502679

Int. Cl.² C07D 295/00; A61K 31/495

U.S. Cl. 424-250

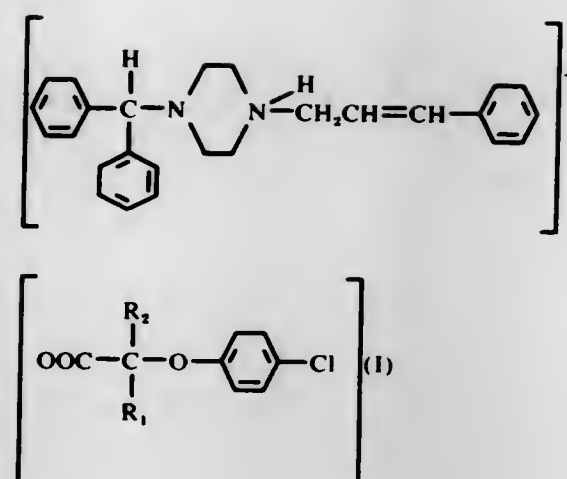
3 Claims

1. Phenoxyalkylcarboxylic acid derivatives of 1-cinnamyl-4-diphenylmethylpiperazine (cinnarizine) having the general formula:



wherein

R₁ is a hydrogen atom, an alkyl group of from 1 to 4 carbon atoms or a p-chlorophenoxy group, and
R₂ is a hydrogen atom or an alkyl group of from 1 to 4 carbon atoms.
3. Medicament, which comprises an antihypercholesteremic amount of one or more compounds of the formula:



wherein

R_1 is a hydrogen atom, an alkyl group of from 1 to 4 carbon atoms or a p-chlorophenoxy group, and
 R_2 is a hydrogen atom or an alkyl group of from 1 to 4 carbon atoms
 together with pharmaceutical acceptable carriers or adjuvants.

4,008,325

CONTROL OF RICE BLAST DISEASE EMPLOYING CERTAIN PYRIDO COMPOUNDS

Robert J. Bass, Birchington, England; Richard C. Koch, Niantic, Conn.; Hugh C. Richards, and John E. Thorpe, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

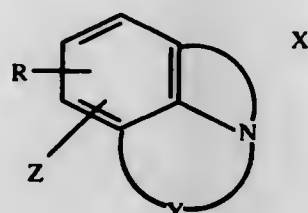
Division of Ser. No. 361,200, May 17, 1973, Pat. No. 3,917,838. This application July 25, 1975, Ser. No. 598,747
 Claims priority, application United Kingdom, May 17, 1972, 23158/72

Int. Cl.² A01N 9/22

U.S. Cl. 424-258

3 Claims

1. A method for the control of fungal diseases of rice plants and disease thereof caused by *Xanthomonas oryzae* comprising contacting the plants, or the seeds thereof, with a fungicidally or bactericidally effective amount in a compatible diluent of a compound of the formula



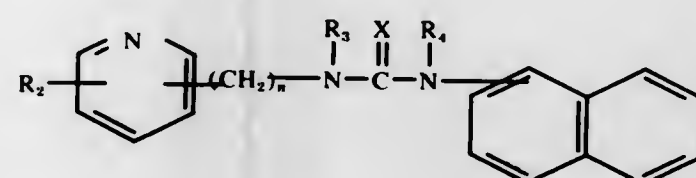
or a non-phytotoxic acid addition salt thereof; wherein each of X and Y completes a saturated or unsaturated pyridine ring;
 X and Y are each unsubstituted or substituted with up to two substituents which are halo, lower alkyl, phenyl, oxo or thio;
 R is hydrogen, lower alkyl, lower alkoxy, lower alkanoyl, benzoyl, hydroxy, lower alkanoyloxy, cyano, or halo; and Z is hydrogen or halo.

4,008,326
 SUBSTITUTED UREAS AND THIOUREAS AND PHARMACEUTICAL COMPOSITIONS THEREOF
 William A. Callahan, Richland; Eldridge Myles Glenn, Kalamazoo, and Douglas L. Rector, Parchment, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
 Continuation-in-part of Ser. No. 428,372, Dec. 26, 1973, abandoned. This application June 25, 1975, Ser. No. 590,272
 Int. Cl.² A61K 31/395; C07D 213/75

U.S. Cl. 424-263

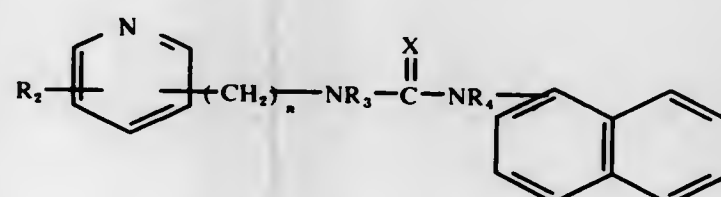
15 Claims

1. A compound of the formula



and pharmaceutically acceptable acid addition salts thereof wherein R_2 is hydrogen, alkyl of one to four carbon atoms, inclusive, or halogen; R_3 and R_4 are the same or different and are hydrogen or alkyl of one to four carbon atoms, inclusive; X is oxygen or sulfur; and n is one or two; provided that when R_2 and R_4 are hydrogen and X is sulfur, then R_3 is hydrogen and further provided that when R_2 is hydrogen or halogen, R_4 is hydrogen and X is oxygen, then R_3 is alkyl of one to four carbon atoms, inclusive, and still further provided that when a 2-naphthyl is present, the pyridyl ring is other than the four position.

14. A pharmaceutical dosage unit form, useful for increasing the production of endogenous prostaglandin F_2 by a mammal, which comprises an amount of a compound which is effective to increase the production of endogenous prostaglandin F_2 selected from the formula:



pyridyl N-oxides thereof and pharmaceutically acceptable acid addition salts thereof wherein R_2 is hydrogen, alkyl of one to four carbon atoms, inclusive, or halogen; R_3 and R_4 are the same or different and are hydrogen or alkyl of one to four carbon atoms, inclusive; X is oxygen or sulfur; and n is one or two; provided that when R_2 and R_4 are hydrogen and X is sulfur, then R_3 is hydrogen, and further provided that when R_2 is hydrogen or halogen, R_4 is hydrogen and X is oxygen, then R_3 is alkyl of one to four carbon atoms, inclusive, and still further provided that when a 2-naphthyl is present the pyridyl ring is other than the four position in association with a pharmaceutical carrier suitable for systemic administration.

4,008,327

TOLYLOXYPIVALOPHENONE DERIVATIVES

Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

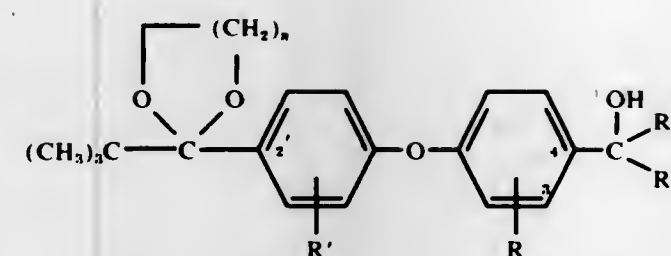
Filed June 16, 1975, Ser. No. 587,345

Int. Cl.² A61K 31/335

U.S. Cl. 424-278

16 Claims

1. A compound which is an acetal of the formula



4,008,329

SUBSTITUTED CYCLOHEXANES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND METHOD OF TREATMENT INVOLVING THEIR USE

Roland-Yves Mauvernay, Riom; Norbert Busch, Manzat; Jacques Moleyre, Riom; Jacques Simons, Chamalieres, and André Montell, Chatel-Guyon, all of France, assignors to Societe Anonyme dite: Centre Europeen de Recherches Mauvernay (C.E.R.M.), Riom, France

Filed Aug. 4, 1975, Ser. No. 601,864

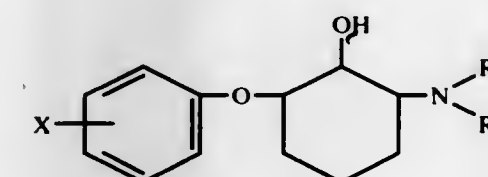
Claims priority, application France, Aug. 5, 1974, 74.27168

Int. Cl.² A01N 9/20

U.S. Cl. 424-330

13 Claims

1. Compounds of the general formula:



wherein each of

R and R' is, independently, a hydrogen atom, alkyl having from 1 to 4 carbons, or a halogen atom having an atomic weight of from about 19 to 36;

R^1 is alkyl having from 1 to 24 carbon atoms;

R^2 is a hydrogen atom or alkyl having from 1 to 4 carbon atoms; and

n is 1

provided that when any of R is at the 3-position, or R' is at the 2'-position, such substituent is not branched chain alkyl.

10. A pharmaceutical composition useful in treating diabetes comprising an anti-diabetic effective amount of a compound of claim 1, and a pharmaceutically acceptable carrier.

13. A method of treating diabetes in a mammal, comprising administering to a mammal in need of such treatment, an amount of a compound of claim 1, effective in reducing the level of glucose in the blood of said mammal.

in which X represents a halogen atom at the 3- or 4-position of the phenoxy group or a $-CF_3$ group at the 3- position of the phenoxy group and R_1 and R_2 both represent hydrogen, both represent lower alkyl or one represents hydrogen and the other represents an isopropyl, sec-butyl, n-butyl, isoamyl or 2-phenylisopropyl group, and pharmaceutically acceptable acid addition salts thereof.

9. A pharmaceutical composition for use as an antidepressant-psychotonic comprising a compound according to claim 1 in an amount of 50 to 100 mg. per dose as the active ingredient together with a pharmaceutically acceptable carrier which includes lactose, the amount of said carrier being greater than the amount of said active ingredient.

4,008,328

N-METHYL-N-(3-TRIFLUOROMETHYLPHENYLSULFENYL)-CARBONYLOXIME-CARBAMATES

Peter Siegle, Cologne; Engelbert Kühle, Bergisch-Gladbach; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath-Stellenbruck, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 24, 1975, Ser. No. 552,502

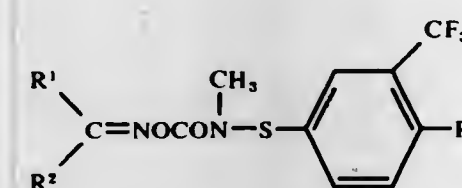
Claims priority, application Germany, Feb. 27, 1974, 2409463

Int. Cl.² A01N 9/00; C07C 83/08

U.S. Cl. 424-298

8 Claims

1. An N-sulfonylated oxime-carbamate of the formula



in which

R^1 and R^2 each independently is hydrogen, alkyl, alkenyl, alkynyl, alkoxy, alkylthio, alkoxy-carbonyl, aminocarbonyl or alkylthioalkyl,
 R^3 is hydrogen or halogen.

6. An insecticidal, acaricidal, nematocidal, fungicidal or bactericidal composition containing as active ingredient an insecticidally, acaricidally, nematocidally, fungicidally or bactericidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,008,330 METHOD FOR COMBATTING RODENTS AND RODENTICIDAL COMPOSITIONS

Hiroshi Yamamoto, Tokyo; Shoichi Kato, Ageo; Koji Ohgushi, and Iwao Tokumitsu, both of Fukuoka, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 286,058, Sept. 5, 1972, Pat. No.

3,892,864. This application Mar. 25, 1975, Ser. No. 561,980
 Claims priority, application Japan, Sept. 13, 1971, 46-70390

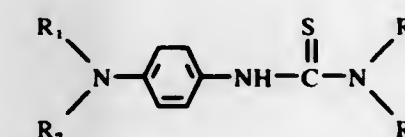
The portion of the term of this patent subsequent to July 1, 1992, has been disclaimed.

Int. Cl.² A01N 9/12, 9/20

U.S. Cl. 424-322

5 Claims

1. A method for combatting rodents comprising the step of applying to a surface which rodents may be expected to contact a rodenticidal powder other than a feed bait comprising 99.5-10% by weight of a suitable adjuvant and a rodenticidally effective amount of 0.5-90% by weight of a compound of the formula.



wherein R_1 is hydrogen or alkyl of 1 to 5 carbons, R_2 is alkyl of 1 to 5 carbons, R_3 is hydrogen or alkyl of 1 to 2 carbons, and R_4 is hydrogen or alkyl of 1 to 12 carbons, or a hydrochloric acid salt thereof.

4,008,331

ANTIDEPRESSANT

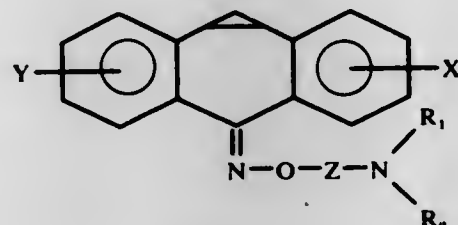
1,1a,6,10b-Tetrahydrodibenzo-[a,e]-cyclopropa-[c]-cyclohepten-6-substituted oximes
Roy Teruyuki Uyeda, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 616,483, Sept. 26, 1975, Pat. No. 3,960,956, which is a continuation-in-part of Ser. No. 525,877, Nov. 21, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,274

Int. Cl.² A61K 31/155

U.S. Cl. 424—327

12 Claims

7. A method of alleviating depression in a mammal which comprises administering to the mammal an effective antidepressant amount of a compound of the formula:



where

X or Y = H, F, Cl, Br, C₁-C₄ alkyl, C₁-C₄ alkoxy, CF₃, CH₃S, CH₃SO₂, SO₂ N(CH₃)₂, provided that one is H;

Z = C₂-C₃ alkylene;

R₁ and R₂ independently = H or C₁-C₄ alkyl; and its pharmaceutically suitable salts.

4,008,332

MICROCIDE

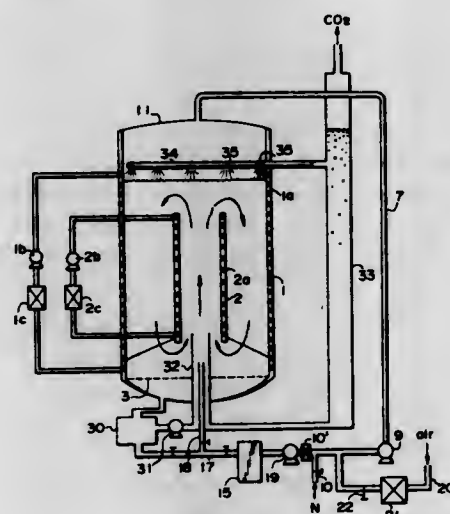
Richard Dean Thomas, 812 N. Euclid St., Fullerton, Calif. 92632

Continuation of Ser. No. 658,359, Aug. 4, 1967, abandoned. This application Dec. 23, 1969, Ser. No. 884,771

Int. Cl.² A61K 31/115; A61L 13/02

U.S. Cl. 424—334

9 Claims



1. A microcidal solution for the release of formaldehyde on surfaces to be disinfected comprising water, 2-hydroxymethyl-2-nitro-1,3-propanediol as an active ingredient for releasing formaldehyde, a pH adjusting agent to adjust the pH of the solution in the range of from about 7 to about 8.0 to maintain said active ingredient at a stage of activity at which it will release formaldehyde at a desired rate, formaldehyde in said solution in a ratio of at least about one part by weight, calculated as formalin, to about ten parts by weight of said active ingredient to prevent premature decomposition of said active ingredient prior to the application of the solution to said surfaces, and a hygroscopic material in an amount sufficient to pull in adequate moisture to allow substantially complete decomposition of the said active ingredient on said surfaces.

4,008,333

SOY SAUCE BREWING METHOD

Masahiko Izumi, 26-8, 5-chome, Hiikawa, Nishi, Fukuoka, Fukuoka, Japan

Filed May 21, 1975, Ser. No. 579,729

Int. Cl.² A23L 1/20

U.S. Cl. 426—44

5 Claims

1. A method of brewing soy sauce comprising charging soy sauce moromi to a closed type large capacity tank provided with a hollow internally disposed cylinder for moromi circulation, feeding an inert gas at the bottom of the cylinder including a necessary minimum amount of oxygen at 25° C to 35° C through the moromi thereby promoting circulation, pumping the inert gas to effect recirculation thereof from the top of said tank to the bottom of the cylinder thus creating a reduced pressure at the upper portion of the tank; withdrawing a part of the moromi from the bottom of the tank, discharging inert gas and carbon dioxide produced by fermentation from said withdrawn moromi in a gas-liquid separating tower, and re-circulating the degassed moromi to the upper part of the tank at the periphery thereof.

4,008,334

PROCESS FOR REMOVAL OF WATER-SOLUBLE CARBOHYDRATES IN THE PRODUCTION OF PLANT PROTEIN PRODUCTS

Ole Kase Hansen, Aarhus, Denmark, assignor to Aarhus Oliefabrik A/S, Aarhus, Denmark

Filed June 3, 1975, Ser. No. 583,164

Claims priority, application United Kingdom, June 5, 1974, 24845/74

Int. Cl.² A23L 1/20

U.S. Cl. 426—46

13 Claims

1. Process for removal of water-soluble carbohydrates in the production of plant protein products in which an aqueous solution or dispersion of the carbohydrate-containing material containing 1-60% dry matter is inoculated with a microorganism selected from the genus *Saccharomyces* and having the ability to degrade and assimilate flatus-causing carbohydrates and fermented for from 12 to 48 hours at a temperature of 20° to 40° C and at a pH of from 4 to 7 to remove substantially all water-soluble carbohydrates.

4,008,335

METHOD OF TREATING BAKER'S YEAST

Emanuel Akerman, Bronx, N.Y., and Seymour Pomper, Stamford, Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,038

Int. Cl.² C12C 1/16

U.S. Cl. 426—62

9 Claims

1. A method of treating baker's yeast comprising treating an aqueous suspension of said yeast with a sufficient amount of an acid to lower the pH of the suspension to a range of from about 0.9 to about 2 under conditions whereby the initial leavening activity of the yeast when added to sweet dough is not substantially detrimentally affected and incorporating into the acid treated yeast suspension a sufficient amount of a neutralizing agent to raise the pH of the suspension to the range of from about 2.5 to about 6, the major portion of the neutralizing agent being composed of a material which is a source of ammonium ions, thereby improving the filterability of the yeast suspension.

4,008,336

METHOD OF PREPARING AVOCADO-PEAR PULP POWDER CONTAINING CUCURBITA MOSCATO AS A STABILIZER AND PRODUCT

Lucien Haendler, Clichy, and Georges Mangeot, Macon, both of France, assignors to Institut Francais de Recherches Fruitières Outre-Mer (I.F.A.C.), Paris, France

Filed Mar. 10, 1975, Ser. No. 556,979

Claims priority, application France, Mar. 14, 1974, 74.08769

Int. Cl.² A23D 4/00

U.S. Cl. 426—270

8 Claims

1. In a method of preparing a dry powder from avocado-pear pulp the improvement which comprises mixing from 1 to 25% by weight of cucurbita moscata with said avocado-pear pulp to form a homogeneous paste and then converting said paste to a dry powder.

4,008,337

METHOD OF INJECTING POULTRY IN THE THIGH AND LEG PORTIONS WITHOUT PENETRATING THE SKIN

Arnold A. Bladow, Detroit Lakes, Minn., and Francis E. Ramsey, Shell Knob, Mo., assignors to Swift and Company Limited, Chicago, Ill.

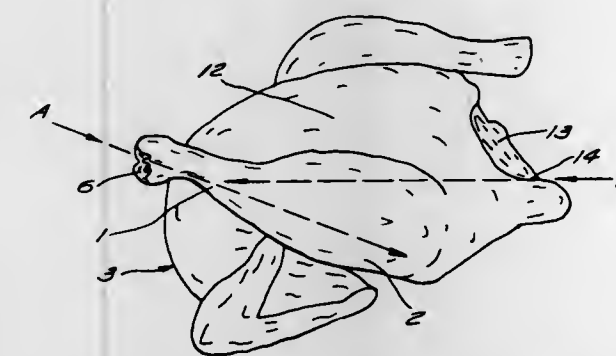
Filed June 24, 1974, Ser. No. 481,989

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² A23L 1/315

U.S. Cl. 426—281

3 Claims



1. A method for internally introducing an additive material into at least one of the interconnected thigh and leg portions of a poultry carcass, said method comprising: severing the feet from the poultry leg portions of a poultry carcass and pulling a number of tendons from said leg portions; engaging and fully extending a leg of said carcass before the attainment of rigor mortis, said leg being extended so as to substantially align the femur and fibular bones at a minimum angle to the back of the carcass; inserting a single long multiple orifice needle into an empty tendon sheath from which a tendon has been pulled and advancing said needle through said sheath and beneath the poultry skin substantially parallel to said fibula and through the flesh of said leg, across the joint between said fibula and femur and substantially through the length of the flesh portion of said thigh and substantially parallel to said femur without penetrating the skin of said thigh and leg portions; and introducing an additive under pressure through said needle orifices into the flesh of at least one of said interconnected thigh and leg portions.

4,008,338

METHOD FOR INJECTING A LIQUID ADDITIVE INTO POULTRY FLESH WITHOUT PENETRATING THE SKIN

Eldon J. Strandine, Chicago, and Carl H. Koonz, Northbrook, both of Ill., assignors to Swift and Company Limited, Chicago, Ill.

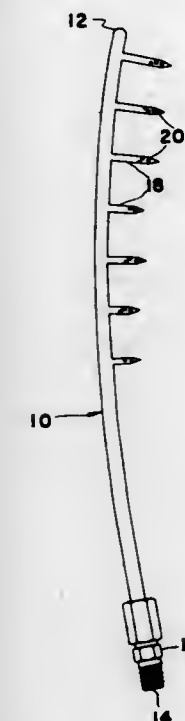
Filed Aug. 1, 1974, Ser. No. 493,686

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² A23L 1/315

U.S. Cl. 426—281

4 Claims



1. A method for injecting an additive material into the flesh of a poultry carcass, said method comprising: inserting a comb-like injector instrument between the flesh and the skin by pulling the skin away from the flesh at a point where the skin is cut open from the flesh and advancing said instrument along a portion of the carcass, said injector instrument having a hollow manifold portion and a plurality of hollow tines extending perpendicular thereto in a plane along said manifold, and said instrument being first held with the tines substantially parallel to the surface of said flesh; turning said injector instrument to point said tines into said flesh whereby the skin is stretched from said flesh; embedding said plurality of tines into said flesh without penetrating the skin and until said manifold rests against the surface thereof; and introducing an additive under pressure through said hollow manifold and through said tines and into said flesh while the tines are embedded therein.

4,008,339

PROCESS FOR REMOVING POLYPHENOLS IN VEGETABLE BEVERAGES

Shogo Matsuda, Tomio Kuriki, Kazuto Ohue, and Kunihiko Okajima, all of Osaka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 24, 1975, Ser. No. 644,339

Claims priority, application Japan, Dec. 28, 1974, 50-149174

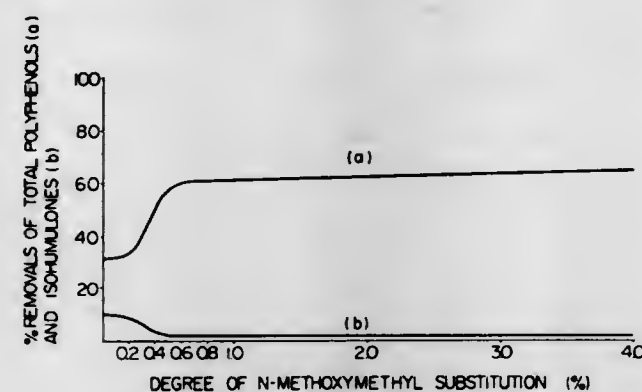
Int. Cl.² C12H 1/04

U.S. Cl. 426—330.4

7 Claims

1. A process for removing polyphenols present in vegetable beverages which comprises bringing a vegetable beverage into contact with an adsorbent material in the form of finely divided porous powders or flakes, said adsorbent material consisting essentially of a polyamide containing recurring amide groups as an integral part of the main polymer chain or a mixture of polyamides containing recurring amide groups as an integral part of the main polymer chain in which 0.5% to 65% in number of the hydrogen atoms linked to the nitrogen

atoms of the amide linkages in the main chain are substituted with substituents represented by the formula $-(CH_2)_n-R$



where n is an integer of 1 to 4 and R is at least one member selected from the group consisting of a hydrogen atom, a hydroxyl group and an alkoxy group having 1 to 4 carbon atoms and R s in the molecule are the same as or different from each other.

4,008,340

METHOD FOR STABILIZING COFFEE GRINDER GAS AROMA

Jo-Fen T. Kung, North Bergen, N.J.; William P. Clinton, Monsey, and Robert J. Soukup, New City, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 21, 1973, Ser. No. 362,603

Int. Cl.² A23F 1/04

U.S. Cl. 426-651

11 Claims

1. A method of stabilizing coffee grinder gas aroma comprising the steps of:

- disrupting the cellular structure of freshly roasted coffee beans,
- condensing the evolved gas as a frost, at a temperature below -80°C ,
- combining the condensed frost with powdered ascorbic acid or salts thereof in an amount between about 3 and 10% by weight of the condensate, thereafter
- permitting the frost to warm to a fluid consistency,
- briefly contacting the fluid condensate with a fluorinated hydrocarbon liquid in order to enable the liquid to extract the green tobacco and phenolic notes and thereafter
- separating the fluorinated-chlorinated hydrocarbon liquid from the condensate,
- thereafter, contacting the condensate with a mixed non-polar-polar solvent, containing 70 to 90% non-polar liquid on a volume basis, and at a level of at least 5 ml of the solvent mixture for each 100 grams of the grinder gas condensate, in order to permit the non-polar solvent to absorb most of the condensed aromatics, and then
- separating the condensed residue as an aqueous phase from the lighter, stabilized, aroma-containing solvent phase.

4,008,341

CURABLE LIQUID POLYMER COMPOSITIONS

Clifton L. Kehr, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. Nos. 92,200, Nov. 23, 1970, and Ser. No. 92,311, Nov. 23, 1970, and Ser. No. 470,091, May 15, 1974, which is a continuation-in-part of Ser. No. 92,309, Nov. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 766,948, Oct. 11, 1968, Pat. No. 3,623,879. This application Jan. 10, 1975, Ser. No. 540,057

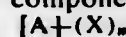
Int. Cl.² B05D 3/06

U.S. Cl. 427-44

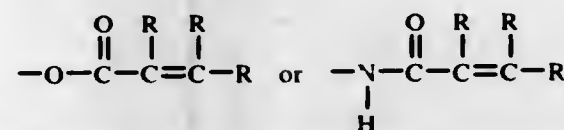
19 Claims

1. A composition curable in the presence of a free radical generating agent comprising:

I. 98 to 2% by weight of the composition of a liquid polyene component of the formula

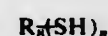


wherein m is an integer of at least 2, X is



and A is a polyvalent organic moiety, free of reactive carbon to carbon unsaturation and of highly water-sensitive members and consisting of atoms selected from the group consisting of carbon, hydrogen, oxygen, nitrogen, chlorine, bromine, fluorine, phosphorous and silicon; and R is a radical selected from the group consisting of hydrogen, phenyl and an alkyl containing 1 to 9 carbon atoms; and,

II. 2 to 98% by weight of the composition of a polythiol having a molecular weight in the range from about 95 to 20,000 of the general formula:

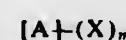


wherein R_n is a polyvalent organic moiety and n is at least 2, the reactive unsaturated carbon to carbon bonds per molecule in the polyene and the thiol groups per molecule in the polythiol being greater than 4.

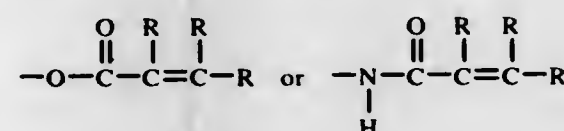
6. A process of forming a solid cured polythioether which comprises

1. admixing a composition comprising:

I. 98 to 2% by weight of the composition of a liquid polyene component of the formula

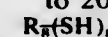


wherein m is an integer of at least 2, X is



and A is a polyvalent organic moiety free of reactive carbon to carbon unsaturation and of highly water-sensitive members and consisting of atoms selected from the group consisting of carbon, hydrogen, oxygen, nitrogen, chlorine, bromine, fluorine, phosphorous and silicon; and R is a radical selected from the group consisting of hydrogen, phenyl and an alkyl containing 1 to 9 carbon atoms;

II. 2 to 98% by weight of the composition of a polythiol having a molecular weight in the range from about 94 to 20,000 of the general formula:



wherein R_n is a polyvalent organic moiety and n is at least 2, the reactive unsaturated carbon to carbon bonds per molecule in the polyene and the thiol groups per molecule in the polythiol being greater than 4, and

2. exposing the mixture to a free radical generating agent.

4,008,342

WOOD TREATMENT WITH AMMONIACAL LIQUOR AND CARBON DIOXIDE

Neil George Richardson, Montreal, Canada, assignor to Domtar Limited, Montreal, Canada

Filed May 1, 1975, Ser. No. 573,557

Int. Cl.² B05D 3/00

U.S. Cl. 427-297

10 Claims

1. A method of treating wood with an aqueous ammoniacal treating liquor wherein ammoniacal chemical serves to solubilize a water-insoluble wood treating chemical, comprising charging the wood to be treated into a pressure vessel, submerging the wood in said ammoniacal treating liquor, maintaining an elevated pressure in said vessel thereby to impregnate said wood with a requisite amount of said liquor, releasing said pressure, withdrawing excess of said liquor from said vessel, some of said liquor remaining on surface of said wood,

subjecting said wood to an atmosphere containing carbon dioxide in an amount and for a time sufficient for said carbon dioxide to combine with the ammonia in said liquor remaining on said surface to form a member of the group consisting of ammonium carbonate and ammonium bicarbonate in an amount sufficient to substantially prohibit subsequent deposition of said treating chemical until substantially all of said liquor on said surface of said wood has disappeared.

4,008,343

PROCESS FOR ELECTROLESS PLATING USING COLLOID SENSITIZATION AND ACID RINSE

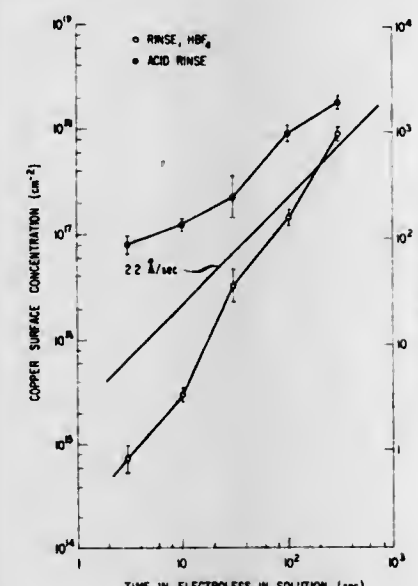
Richard Lewis Cohen, Berkeley Heights, N.J., and Ronald Lee Meek, Naperville, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 15, 1975, Ser. No. 605,068

Int. Cl.² B05D 3/10

U.S. Cl. 427-305

10 Claims



1. A process for electroless deposition of metallic substances on nonmetallic surfaces suitable for electroless metal plating in which the metallic substances are selected from the group consisting of copper and nickel and in which the process comprises the steps of

- preconditioning the nonmetallic surface so as to prepare the surface for a colloidal catalyst solution;
- exposing the preconditioned surface to a colloidal catalyst solution consisting essentially of an aqueous solution of tin and palladium ions so as to produce a catalytically prepared surface containing catalyst;
- rinsing the catalytically prepared surface;
- exposing the catalytically prepared surface to an electroless plating solution so as to electrolessly plate the metallic substance on the catalytically prepared surface wherein the improvement lies in the rinsing of the catalytically prepared surface which is carried out using an aqueous acid solution with pH less than 1.5, said aqueous acid solution consisting essentially of water and an acid selected from the group consisting of hydrochloric acid, perchloric acid and nitric acid, and this rinsing step is carried out immediately after application of the colloidal catalyst solution without exposing the surface to an aqueous solution with pH greater than 1.5 and in addition is carried out under conditions which insure that the catalyst substantially remains on the surface.

4,008,344

MULTI-COMPONENT FIBER, THE METHOD FOR MAKING SAID AND POLYURETHANE MATRIX SHEETS FORMED FROM SAID

Miyoshi Okamoto, Takatsuki; Koji Watanabe, Otsu; Zenji Izumi; Toshihiko Aya, both of Nagoya, and Hideaki Kitagawa, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

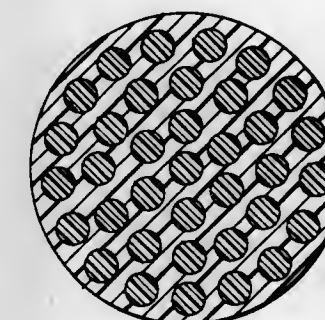
Continuation of Ser. No. 457,542, April 3, 1974, abandoned.

This application Nov. 28, 1975, Ser. No. 636,063

Claims priority, application Japan, Apr. 5, 1973, 48-38218

Int. Cl.² B05D 3/10; D01F 8/10, 8/14; D04H 3/12

U.S. Cl. 427-307 11 Claims



1. In a method of making a sheet-like material comprising bundles of fiber forming synthetic polyester fine fibers and a polyurethane binder, the steps which comprise (1) spinning a plurality of multi-component fibers comprising (A) a fiber forming synthetic polyester and (B) a component removable by dissolution in a solvent which does not dissolve the fine fibers comprising component (A), wherein said component (B) comprises substantially a copolymer of styrene and about 10 - 30% by weight of a higher alcohol ester of an acid selected from the group consisting of acrylic acid and methacrylic acid, said higher alcohol containing 6 - 20 carbon atoms and having a boiling point of at least 150°C at 760 mm Hg, (2) making a primary sheet material from said multi-component fibers, (3) impregnating said primary sheet material with a water soluble sizing agent, (4) dissolving out component (B) to make an intermediate sheet material comprising bundles of fiber forming synthetic polyester fine fibers and the water soluble sizing agent, (5) combining said bundles with a polyurethane binder, and (6) removing said water soluble sizing agent.

3. A multi-component fiber comprising at least two components (A) and (B) as defined hereinafter, wherein component (B) is removable by dissolution in a solvent, wherein component (A) consists essentially of fine fibers which are not dissolved by said solvent, wherein said component (B) comprises substantially a copolymer of styrene and about 10 - 30% by weight of a higher alcohol ester of an acid selected from the group consisting of acrylic acid and methacrylic acid, said higher alcohol containing 6 - 20 carbon atoms and having a boiling point of at least 150°C at 760 mm Hg, and wherein said component (A) comprises substantially a fiber forming synthetic polyester.

10. A method of making a multi-component fiber comprising at least two components (A) and (B), wherein component (B) is removable by dissolution in a solvent therefrom, wherein component (A) consists essentially of fine fibers which are not dissolved by said solvent, wherein said component (B) comprises mainly a copolymer of styrene and about 10 - 30% by weight of a higher alcohol ester of an acid selected from the group consisting of acrylic acid and methacrylic acid, the alcohol containing 6 - 20 carbon atoms and having a boiling point of at least 150°C at 760 mm Hg, and wherein said other component (A) comprises mainly a fiber forming synthetic polyester, the steps which comprise spinning said components into a multi-component fiber and drawing the fiber at least 2.6 times at a drawing temperature not more than about 100°C .

4,008,345

PROCESS FOR FIRE-PROOFING TREATMENT OF SHAPED ARTICLES OF AROMATIC POLYAMIDES

Yoshihiko Imanaka, Hino, and Hiroshi Uchiyama, Matsuyama, both of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Sept. 24, 1974, Ser. No. 508,907

Claims priority, application Japan, Oct. 5, 1973, 48-112115; Nov. 26, 1973, 48-131627; Feb. 25, 1974, 49-21371

Int. Cl.² B05D 3/02

U.S. Cl. 427—381

7 Claims

1. In a process for fire-proofing treatment of shaped articles of aromatic polyamides by contacting a shaped article of an aromatic polyamide with an aqueous solution of a phosphorus-containing inorganic compound free from halogen and sulfur, drying it and then post heat-treating it; the improvement which comprises contacting said shaped article with an aqueous solution of a halogen- and sulfur-free, phosphorus-containing inorganic acid or an ammonium, amine or urea salt thereof as a treating agent, said treating agent being selected from the group consisting of ortho-phosphoric acid, phosphorous acid, polyphosphoric acid, pyrophosphoric acid, hypophosphorous acid, ammonium dihydrogen orthophosphate, ammonium hydrogen phosphite, ammonium polyphosphate, ortho-phosphoric acid dihydrogen dimethylamine salt, ortho-phosphoric acid dihydrogen n-butylamine salt, ortho-phosphoric acid dihydrogen hexamethylene diamine salt, phosphorous acid dihydrogen aniline salt, polyphosphoric acid dimethylamine salt, urea ortho-phosphate and urea phosphite in a concentration of about 2% to about 30% by weight, drying said treated shaped article at a temperature of not more than about 150° C. and then post heat-treating said shaped article at a temperature of about 300° C. to about 450° C. in air or in an atmosphere of an inert gas.

4,008,346

PROCESS FOR PREPARING A POLYSILOXANE

Richard E. Moeller, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 18, 1974, Ser. No. 533,958

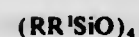
Int. Cl.² B05D 3/02

U.S. Cl. 427—387

9 Claims

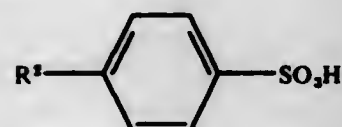
1. A process for rendering flexible sheet material non-adherent to surfaces which normally adhere thereto which process consists essentially of:

- a. treating the sheet material with an aqueous emulsion containing:
 - i. a neutralized polysiloxane emulsion produced by the process comprising:
 1. homogenizing a mixture which consists essentially of:
 - A. a compound of the formula $(R_2SiO)_x$, wherein R is a monovalent hydrocarbon free of unsaturation;
 - B. a compound of the formula:



wherein R is the same as hereinabove defined and R' is a hydrocarbon radical having vinyl unsaturation; and

C. a benzene sulfonic acid compound of the formula:

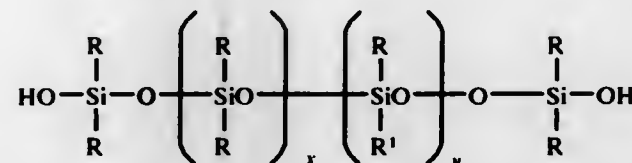


wherein R² is an alkyl group of from 6-18 carbon atoms and;

D. water;

2. heating the homogenized mixture of (1) to form said polysiloxane; and

3. adding a neutralizing amount of an alkanolamine to said mixture to neutralize said benzene sulfonic acid and to form a neutralized emulsion of said polysiloxane, said polysiloxane having the formula:



wherein R is a monovalent hydrocarbon radical free of unsaturation; R' is a hydrocarbon radical having vinyl unsaturation; x and y are positive integers so that the silanol stopped polysiloxane has from 0.1 to 1% by weight of R' groups and the viscosity of the polymer ranges between 25,000 centipoises and 1,000,000 centipoises;

- ii. an organic hydrogen polysiloxane having the formula: $(R)_a(H)_bSiO_{(4-a-b)/2}$

wherein R is a monovalent hydrocarbon radical free of unsaturation; a is from 0 to 3; b is from 0.005 to 2.0 and the sum of a plus b is from about 0.9 to 3, there being at least two silicon-bonded hydrogen atoms per molecule; and

- iii. a platinum catalyst effective to cause copolymerization of (i) (ii); and

- b. thereafter drying the treated material.

4,008,347

RECEPTACLE OF FOAMED PLASTIC LINED WITH UNORIENTED POLYOLEFIN FILM

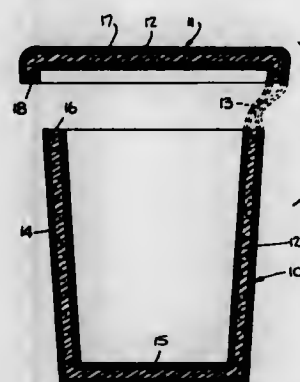
Stephen W. Amberg, Toledo, Ohio, and Frank S. Landers, Chicago, Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed June 24, 1974, Ser. No. 482,321

Int. Cl.² B29D 27/00; B32B 27/08; B65D 25/18, 5/56

U.S. Cl. 428—35

9 Claims



1. A receptacle comprising a base of cellular foam plastic material having a thickness of from substantially 15 to substantially 80 mils, a continuous liner of substantially unoriented polyolefin film having a thickness of from substantially 1/2 to substantially 5 mils covering the food contacting surfaces of the cellular foam base, and an adhesive comprising a resin plastic material selected from the group consisting of polyvinyl acetate-maleate copolymer, polyamide resin, a blend of polyvinyl acetate and polyvinyl acetate-acrylic copolymer, and ethylene-vinyl acetate copolymer, said adhesive being disposed between said foam base and said liner and securing said base to said liner.

4,008,348

PARTICULATE AND SOLAR RADIATION STABLE COATING FOR SPACECRAFT

Wayne S. Stemp, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

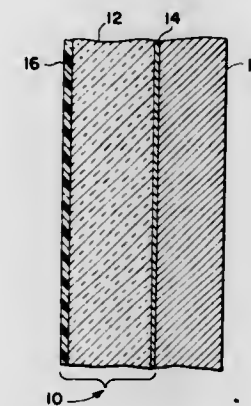
Continuation of Ser. No. 428,992, Dec. 27, 1973, abandoned.

This application May 16, 1975, Ser. No. 578,240

Int. Cl.² B32B 27/08, 15/08; C23C 13/00; B64C 1/00

U.S. Cl. 428—35

6 Claims



1. In combination:
 1. an enclosure and
 2. a thermal control coating for said enclosure serving to maintain temperature balance within said enclosure under extended exposure to both particulate and solar radiation,
- said enclosure serving as a substrate and said thermal control coating being applied to the substrate and including
 - a. a layer of a solar-radiation stable film having a lower and an upper surface;
 - b. a superstratum of a particulate-radiation stable film applied to the upper surface of said solar-radiation stable film; and
 - c. a substratum of a reflecting material applied to the lower surface of said solar radiation stable film, the reflective surface of said substratum being disposed such that solar radiation passing through said superstratum and said solar radiation stable film strikes the reflective surface of said substratum and is reflected back towards said solar radiation stable film and said substratum.

4,008,349

METHOD FOR CONTINUOUSLY APPLYING A UNIFORM RESINOUS COATING BY PASSING THE SUBSTRATE THROUGH A FREE HANGING LOOP CONTAINING THE COATING COMPOSITION

Frank E. Ehrenfeld, Jr., Morrisville, Pa., and Anthony N. Piante, Lawrenceville, N.J., assignors to Congoleum Corporation, Milwaukee, Wis.

Filed Aug. 28, 1974, Ser. No. 501,261

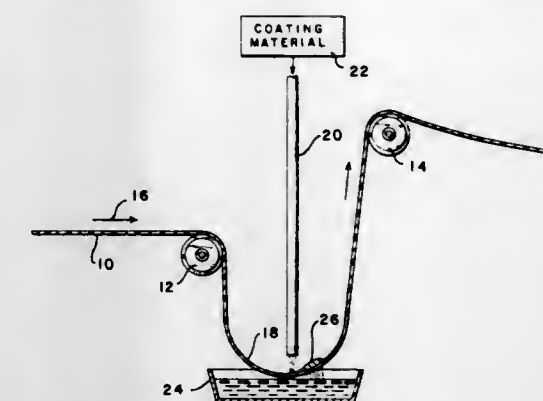
Int. Cl.² B32B 3/00

U.S. Cl. 428—161

20 Claims

1. A method for continuously applying a resin surface coating to a traveling substrate web consisting essentially of:
 - a. moving said web into a free hanging loop,
 - b. continuously feeding a liquid resin containing composition into said loop at a rate so as to maintain at least a slight overflow of said composition at the sides of the loop and to maintain a continuous rolling bank of said composition across the width of said web at the lower portion of said loop,

- c. withdrawing said web upwardly from said loop so that excess coating material on the web drains back down-



- wardly into the loop and
- d. heating the coated substrate for drying the coating.

4,008,350

VISCO-ELASTIC MATERIAL COMPRISING A POLYMERIC FOAM IMPREGNATED WITH AN ACRYLIC RESIN

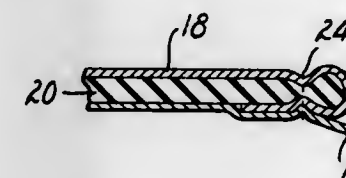
George H. Crawford, Dellwood, and Howell K. Smith, II, Grant Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1972, Ser. No. 285,320

Int. Cl.² B32B 3/26, 5/18

U.S. Cl. 428—311

2 Claims



1. A visco-elastic material having retarded recovery characteristics comprising a polymeric foam impregnated with an acrylic resin, said foam having a compression modulus at a compression rate of 2 inches per minute, of about 1-to-15 pounds per square inch and having a compression modulus versus time curve slope of about -0.3 to -2.0 pounds per square inch per second when compressed to 50 percent of the original thickness at rates ranging from 2-to-20 inches per minute.

4,008,351

FILM OR SHEET MATERIAL HAVING ANTIBACTERIAL AND ANTIFUNGAL ACTIVITIES

Mayumi Inoue; Masaru Shibata, both of Tokyo; Kenzo Takahashi, Yokohama, and Sadao Nakatani, Nishinomiya, all of Japan, assignors to Sumitomo Bakelite Company, Limited and Mayumi Inoue, both of Tokyo, Japan

Filed May 12, 1975, Ser. No. 576,316

Claims priority, application Japan, May 17, 1974, 49-54438
Int. Cl.² A01N 17/12, 9/02

U.S. Cl. 428—411

21 Claims

1. A film or sheet material with antibacterial and antifungal activities obtained by milling a mixture comprising a thermoplastic resin, and an amount sufficient to provide said plastic with antibacterial and antifungal properties of a mixture of 2-(4'-thiazolyl)-benzimidazole and N-(fluorodichloromethylthio)-phthalimide, and then shaping the milled mixture.

2. A film or sheet material with antibacterial and antifungal activities obtained by coating a base film or sheet material on one side or both sides with a coating material containing an amount sufficient to provide said film or sheet with antibacterial and antifungal properties of
 - a mixture of 2-(4'-thiazolyl)-benzimidazole and N-(fluorodichloromethylthio)-phthalimide, or
 - a mixture of 2-(4'-thiazolyl)-benzimidazole and N-dimethyl-N'-phenyl-N'-(fluorodichloromethylthio)-sulfamide, or

a mixture of N-(fluorodichloromethylthio)-phthalimide and N-dimethyl-N'-phenyl-N''-(fluorodichloromethylthio)-sulfamide.

4,008,352

HEAT LAMINATION OF THERMOPLASTIC FILMS

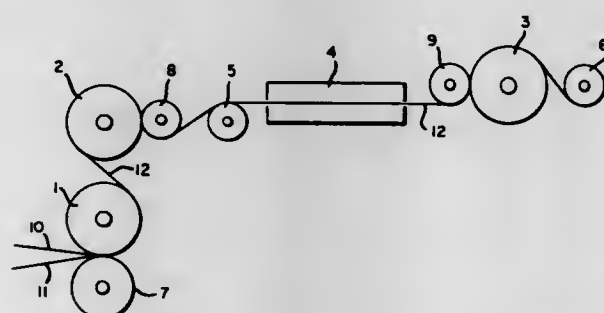
David Haddon Dawes, Westbrook, and Kashmiri Lal Gupta, Kingston, both of Canada, assignors to Du Pont of Canada Limited, Montreal, Canada

Filed Jan. 24, 1975, Ser. No. 543,924

Claims priority, application Canada, Apr. 30, 1974, 198499 Int. Cl.² B32B 31/28, 27/34, 27/32, 27/36

U.S. Cl. 428-474

17 Claims



1. A process for the manufacture of a thermoplastic film laminate wherein at least one surface of a thermoplastic first film selected from the group of polyethylene, polyamide, and polyester is laminated to a surface of a thermoplastic second film of polyethylene, at least the surfaces of said first and second films that are laminated having been treated with a corona discharge, said first and second films having similar melting points and at least one of said films is a film of low-melting polymer, said process comprising the steps of:

- bringing the corona discharge-treated surface of the first film into face-to-face contact with the corona discharge-treated surface of the second film,
- contacting the resulting combination of films with at least one roll heated to a temperature greater than the temperature required to form a laminate having low peel strength but less than the temperature at which the laminate adheres to the heated roll,
- increasing the peel strength of the laminate by passing the laminate through a heated zone, said heated zone being at a temperature at least as high as that of the heated roll, and
- cooling the laminate so formed.

14. A laminate of peel strength of at least 300 gm/inch, said laminate having been manufactured from thermoplastic films, in which at least one surface of a first film selected from the group consisting of polyethylene, polyamide, and polyester is laminated to a surface of a second film of polyethylene containing an adhesion promoter of fumaric acid, at least the surfaces of said first and second films that are laminated having been treated with a corona discharge, said first and second films having similar melting points and at least one of said films is a film of low-melting polymer, the process of manufacturing said laminate further comprising the steps of:

- bringing the corona discharge-treated surface of the first film into face-to-face contact with the corona discharge-treated surface of the second film and contacting the resulting combination of films with at least one roll heated to a temperature greater than the temperature required to form a laminate having a low peel strength but less than the temperature at which the laminate adheres to the heated roll,
- increasing the peel strength of the laminate by passing the laminate through a heated zone, said heated zone being at a temperature at least as high as that of the heated roll, and
- cooling the laminate so formed.

4,008,353

WATER SWELLABLE ARTICLES

James R. Gross, Lake Jackson, and Russell T. McFadden, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 450,650, March 13, 1974, Pat. No.

3,926,891. This application June 30, 1975, Ser. No. 591,740 Int. Cl.² B05D 5/04, 3/00; B32B 27/04, 27/12

U.S. Cl. 428-522

4 Claims

1. A method of preparing an absorbent article coated with a substantially dry, water swellable flexible polyacrylate which comprises

A. applying a coating on an article wherein the coating comprises a crosslinkable aqueous solution which is prepared by forming a polyacrylate solution having about 30 to about 70 weight percent alkali metal carboxylates by dissolving in an aqueous alkali metal hydroxide solution a polyacrylate comprising

- about 30 to about 92 percent by weight of an alkyl acrylate wherein the alkyl group has 1-10 carbon atoms, an alkyl methacrylate wherein the alkyl group has 4-10 carbon atoms, or mixtures thereof,
- about 8 to about 50 percent by weight of an olefinically unsaturated carboxylic acid, and
- about 0 to about 15 percent by weight of an omega hydroxy-alkyl acrylate having 1-4 carbon atoms in the hydroxy alkyl group

heating the solution until saponification is complete, and adding to said solution about 0.1 to about 10 weight percent, based on the dissolved polymer, of a water soluble crosslinking agent which is reactive with carboxylate salt groups

B. heating said coated article to a temperature greater than about 30° C to crosslink said polyacrylate.

4,008,354

PRESSURE VENT-SEALED PRIMARY AND SECONDARY ALKALINE CELLS

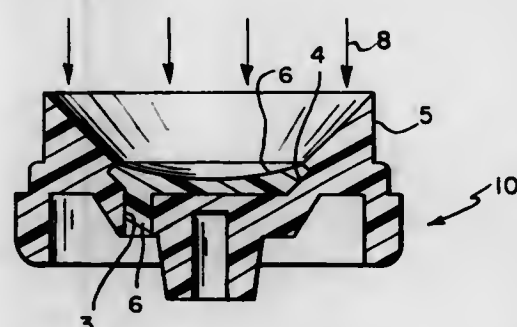
Arthur Fitchman, Yonkers, N.Y., and Terry Doug Wyatt, Cleveland, Tenn., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 12, 1975, Ser. No. 576,406

Int. Cl.² H01M 2/12

U.S. Cl. 429-56

6 Claims



1. A method of making a pressure responsive vent for and electrical device having a member with a vent hole therein wherein said vent hole is closed with a hot melt, extrudible material comprising the steps of pre-heating said member to a temperature which facilitates joining the extrudible material and the member, and applying said hot melt, extrudible material to said member to close said vent hole, whereupon said extrudible material and said member becomes bonded to each other and said extrudible material is capable of being extruded through the vent hole upon development of a predetermined abnormal pressure thereby allowing said abnormal pressure to be relieved through said vent hole.

4,008,355

STORAGE BATTERY WITH COMMON EXPANSION AND FILLER CHAMBER

Wilhelm Perkams, Oberrot, Germany, assignor to AS-Motor GmbH KG, Oberrot, Germany

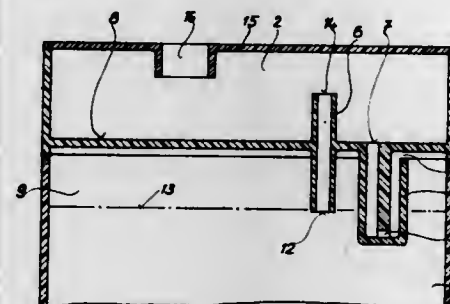
Filed Mar. 4, 1976, Ser. No. 663,757

Claims priority, application Germany, Apr. 19, 1975, 2517497

Int. Cl.² H01M 2/36

U.S. Cl. 429-63

10 Claims



1. Storage battery having a housing (1,4) defining a plurality of adjacently located cells (3) therein, each having an upper wall (8), and a gas expansion and filler chamber (2) common to all the cells, located above the upper wall of said cells (3), said housing being formed with electrolyte inlet means (16) communicating with said common expansion and filler chamber (2);

an inlet duct system comprising a general U-shaped inlet tube (5, 5') having a first downwardly extending portion and a second upwardly extending portion for each cell, in fluid communication with said common expansion and filler chamber (2), the upwardly extending portion being open to communicate with the respective cell (3); and an overflow tube (6) for each cell, each overflow tube having a lower end located just below the electrolyte level (13) of the respective cell, and below the outlet (10) of the respective U-shaped inlet tube (5, 5'), and extending in fluid communication into the common expansion and filler chamber (2),

wherein the improvement comprises

means presenting a greater flow resistance against reverse flow of electrolyte from the respective cell through the respective inlet tube to the common chamber than through the overflow tube, matched to the gas pressure arising in the space between the upper wall (8) of the cell and the electrolyte level (13) therein to draw excess electrolyte from the respective cell through the overflow tube (6) into the expansion and filler chamber (2) before electrolyte in said inlet tube (5, 5') is displaced by gases in said space to permit gas flow through the inlet tube into the expansion and filler chamber (2).

4,008,356

CELL RETAINING CASING FOR PHOTOGRAPHIC CAMERAS

Seizi Asano, Okegawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 22, 1975, Ser. No. 624,599

Claims priority, application Japan, Nov. 1, 1974, 49-132815[U]

Int. Cl.² H01M 2/10

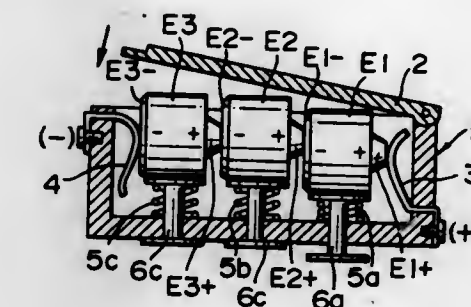
U.S. Cl. 429-98

8 Claims

1. A casing for retaining therein a series of dry cells for a photographic camera or the like comprising:

- a housing for retaining therein a series of dry cells connected in series in a line,
- a pair of oppositely disposed electrode springs provided on the opposite ends of the housing to sandwich the series of dry cells therebetween so that the series of dry cells arranged in a line are in pressure contact with each other, means for holding dry cells in the housing allowing the dry

cells to transversely move independently of each other and urging said cells in one transverse direction, and



means for moving said dry cells in the direction opposite to said transverse direction in which the cells are urged.

4,008,357

BERYLLIUM BATTERY

Hajime Nishimura, Tokyo, and Mitsuhsa Toda, Kawagoe, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

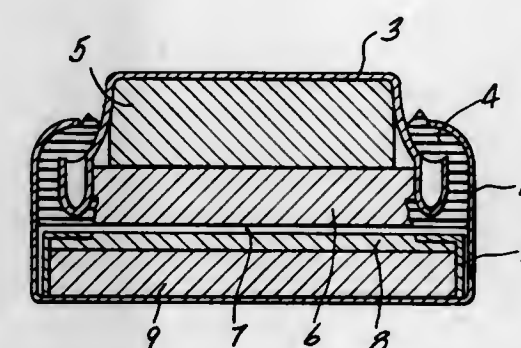
Filed Sept. 23, 1975, Ser. No. 615,887

Claims priority, application Japan, Sept. 27, 1974, 49-111088; Nov. 11, 1974, 49-129762

Int. Cl.² H01M 2/16

U.S. Cl. 429-142

5 Claims



1. A beryllium battery comprising:

- an outside casing having one open end;
- an aperture sealing plate, said aperture sealing plate closing said open end in said outside casing and being electrically insulated from said casing;
- an anode of beryllium metal coupled to said aperture sealing plate;
- a cathodic material, said cathodic material being coupled to the inside of said outside casing;
- a first permeable member in contact with said anode;
- a second permeable member in contact with said cathodic material;
- a separator means separating said first permeable member from said second permeable member;
- a retainer ring for holding said second permeable member in contact with said cathodic material; and
- an organic electrolyte disposed in said first and second permeable members.

4,008,358

PROCESS FOR POLYMERIZING OLEFIN

Toshizo Abe; Seiho Sakamoto; Yasuhiro Nishihara, and Hidetoshi Saruwatari, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed June 26, 1975, Ser. No. 590,506

Claims priority, application Japan, July 27, 1974, 49-73675

Int. Cl.² C08F 4/68, 4/64

U.S. Cl. 526-116

13 Claims

1. A process for polymerizing an olefin which comprises effecting said polymerization in contact with a catalyst which is a combination of (1) a solid component prepared by treat-

ing a mixture of (a) a titanium tetrahalide, (b) a vanadyl alcoholate and (c) a vanadyl trihalide, with an organoaluminum compound; and (2) an organoaluminum compound.

4,008,359

CHROME CATALYST

Jeffrey G. Meyer, and Glennis L. Phipps, both of Adrian, Mich., assignors to Anderson Development Company, Adrian, Mich.

Division of Ser. No. 456,123, March 29, 1974, Pat. No. 3,901,825. This application Jan. 20, 1975, Ser. No. 542,164 Int. Cl.² C08F 4/78, 10/02, 10/06

U.S. Cl. 526—129

7 Claims

1. The method comprising (1) mixing (A) a chromium trisdiorgano-orthophosphate of the formula $\text{Cr}[\text{OP}(\text{O})(\text{OR})_2]_3$ in which each R is selected from the class consisting of non-aromatic hydrocarbon groups free of aliphatic unsaturation and containing one to eight carbon atoms, alkoxyalkyl groups containing three to six carbon atoms and chlorinated and brominated derivatives thereof, (B) an alkyl aluminum of the general formula $\text{R}'_2\text{R}''\text{Al}$ in which each R' is an alkyl group of 1 to 6 carbon atoms and each R'' is selected from the group consisting of alkyl groups of 1 to 6 carbon atoms and hydrogen atoms, and (C) a halogenated olefin of from four to about eight carbon atoms, said olefin containing at least four halogen atoms at least two of which are attached to olefinic carbon atoms, there being at least one olefinic bond in conjugation with another double bond or at least one halogen atom attached to a carbon atom alpha to an olefinic double bond, the mole ratio of (A) to (B) to (C) being in the range of 0.001:1:1 to 1:10, with (D) at least one aliphatic hydrocarbon olefin containing no more than about 12 carbon atoms at a temperature and pressure and for a time sufficient to initiate the reaction of component (D) and (2) separating the resulting product from the mixture, the ratio of total moles of (A) + (B) + (C) per mole of (D) being in the range of 0.001:1 to 0.05:1.

4,008,360

PROCESS FOR PRODUCING PETROLEUM RESIN

Ken-ichi Kudo; Yoshihiko Kitagawa, and Hideyuki Kuribayashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 3, 1975, Ser. No. 538,406

Claims priority, application Japan, Jan. 8, 1974, 49-5753

Int. Cl.² C08F 240/00

U.S. Cl. 526—237

10 Claims

1. A process for producing a petroleum resin having a molecular weight, softening point, holding power, adhesion strength and rolling-ball tack suitable for use as an adhesive tape resin which comprises polymerizing in the presence of a Friedel-Crafts catalyst a C_5 -fraction from cracked naphtha or oil gas, having a composition consisting essentially of acyclic diolefins, cyclic diolefins and monoolefins wherein the weight ratio of acyclic diolefins to monoolefins and the weight ratio of cyclic diolefins to monoolefins are from 0.40 to 0.70 and from 0.07 to 0.35, respectively.

4,008,361

REMOVAL OF RESIDUAL VINYL HALIDE MONOMER FROM VINYL HALIDE POLYMERS BY RADIO FREQUENCY DIELECTRIC HEATING

Anthony John Park, South Croydon, and Brian Weeks, Epsom, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 11, 1975, Ser. No. 639,967

Claims priority, application United Kingdom, Oct. 23, 1975, 43580/75

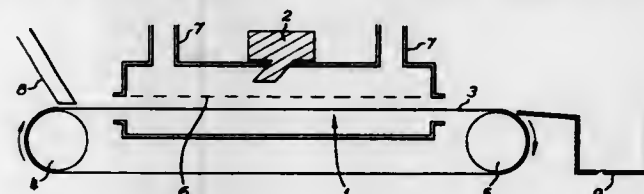
Int. Cl.² C08F 6/00

U.S. Cl. 528—503

18 Claims

1. The process for reducing the vinyl halide residual mono-

mer content of a polymer containing vinyl halide monomer which comprises heating a water-containing layer of the polymer in particulate form in a zone of radiofrequency dielectric heating in which zone a layer of material through which vinyl chloride can pass but which restricts the passage of water



4,008,362

1-N-((S)-α-SUBSTITUTED-ω-AMINOACYL)-NEAMINE OR-RIBOSTAMYCIN AND THE PRODUCTION THEREOF

Eiichi Akita, Kamakura; Tsutomu Tsuchiya, Yokohama; Shinichi Kondo, Yokohama; Shuntaro Yasuda, Yokohama; Sumio Umezawa, Tokyo, and Hamao Umezawa, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Aug. 21, 1973, Ser. No. 390,217

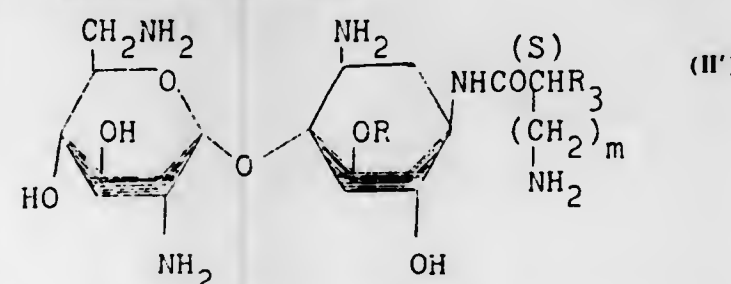
Claims priority, application Japan, Aug. 25, 1972, 47-84633

Int. Cl.² C02H 9/02

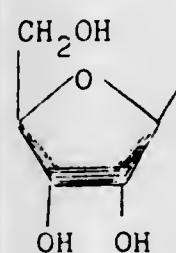
U.S. Cl. 536—17

6 Claims

1. A substance of the formula:



wherein R is a hydrogen atom or β-D-ribofuranosyl of the formula



R_2 is hydroxyl, $-\text{NH}_2$ or $-\text{NHR}$, in which R_1 is an alkanoyl of 1-4 carbon atoms, and m is a whole number of 1, 3 or 4, when R is β-D-ribofuranosyl and m is a whole number of 1, 2, 3, or 4 when R is a hydrogen atom.

4,008,363

PROCESS FOR THE PREPARATION OF ADENINE DERIVATIVES MADE FUNCTIONAL AND PRODUCTS OBTAINED THEREFROM

Luciano Re, Rome, and Piergiorgio Zappelli, Monterotondo, both of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed Apr. 29, 1975, Ser. No. 572,653

Claims priority, application Italy, Apr. 30, 1974, 22105/74

Int. Cl.² C07H 19/20

U.S. Cl. 536—28

2 Claims

1. Nicotinamide 6-(2-hydroxy-3-carboxypropylamino) purine dinucleotide.

ELECTRICAL

4,008,364

APPARATUS FOR CONTINUOUS REFINING OF METALS

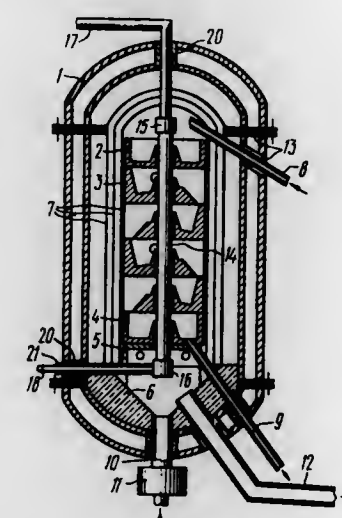
Jury Fedorovich Frolov, prospekt Karla Marxa, 8/2, kv. 70; Jury Anatolievich Naryshkin, ulitsa Bljukhera, 7, kv. 55; Vladimir Semenovich Cherednichenko, ulitsa Zorge, 269, kv. 79; Jury Fedorovich Piljukov, ulitsa Nemirovicha-Danchenko, 163, kv. 6; Gennady Ivanovich Orlov, ulitsa Vatutina, 27, kv. 20, all of Novosibirsk; Aron Semenovich Mikulinsky, ulitsa Bosova, 1, kv. 54, Istra Moskovskoi oblasti; Serafim Nikolaevich Sutorin, ulitsa Savvy Kozhevnikova, 2, kv. 22, Novosibirsk; Leonid Vladimirovich Slobodkin, ulitsa Gogolya, 34, kv. 32, and Konstantin Stepanovich Dashkov, prospekt Lenina, 52, kv. 10, both of Ust-Kamenogorsk Vostochno-Kazakhstanskoi Oblasti, all of U.S.S.R.

Filed July 24, 1975, Ser. No. 599,040

Int. Cl.² F27B 17/00; F27D 7/06

U.S. Cl. 13—20

8 Claims



1. An apparatus for the continuous refining of metals, comprising: an air-tight cooled casing (1) in which vacuum is maintained; a distillation column set up under the vacuum inside said casing and made up of a number of evaporation stages (3) and of an upper intake stage (2) that is continuously fed with molten metal which, being refined, flows off in succession through all said evaporation stages into a lower accumulating stage (4) wherein the refined metal is collected; condensing shields (7) surrounding said stages; an electric heater (14) including a group of graphite rods running through said stages along the entire height of said column; means (17, 18) for supplying electric energy to said rods; said evaporation stages constituting containers with metal overflows, the shape and arrangement of said containers ensuring continuous discharge of the molten metal from said intake stage to said accumulating stage in the form of a thin film passing in a zone of thermal influence of said heater which provides a temperature sufficient for the distillation from metal of volatilized impurities.

4,008,365

BUS TRAY ELECTRICAL DISTRIBUTION SYSTEM

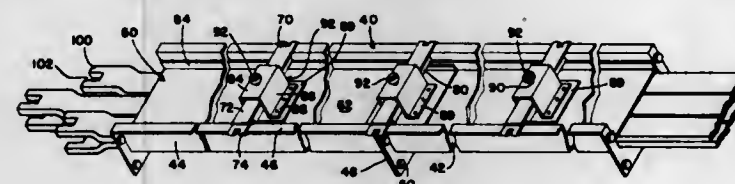
Elmer T. Carlson, Granby, Conn., assignor to Broadhill Development Corporation, Plainville, Conn.

Filed Mar. 3, 1975, Ser. No. 554,684

Int. Cl.² H02G 5/06

U.S. Cl. 174—68 B

7 Claims



7. In a bus tray electrical distribution system, a bus tray extending a substantial length and having side walls with

flanges extending out, flat insulated rigid and flexible bus bars side by side lying in the bus tray, a cover assembled with the bus tray to be located on top of the bus bars and be coextensive with the bus tray, means for holding the cover on and compressing the cover and bus bars into the trays including clamps having clamp ends extending around the outside edges of the flanges and including also only a single bolt per clamp.

4,008,366

COUPLING FOR BUS BAR SYSTEM

Gerhard Geyer, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

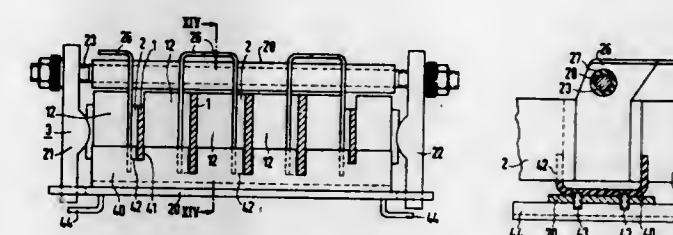
Filed Dec. 8, 1975, Ser. No. 638,659

Claims priority, application Germany, Dec. 12, 1974, 2458925

Int. Cl.² H02G 5/00; H02B 1/20; H01R 7/08

U.S. Cl. 174—88 B

5 Claims



1. A coupling for a bus bar system having a plurality of bus bars at different potentials arranged in a stack, the coupling including a clamping device for pressing together sections of bus bars of the same potential separated by insulating spacers from bars of different potential comprising:

- a support in the form of an insulated tray having a U-shaped cross section, the walls of said insulated tray having spaced slots conforming to the profiles of the bus bars to be supported such that, when said coupling is used, said tray will support each bar section in proper relation to the other bar sections;
- a clamping element spaced from the support, the open side of the U facing said clamping element;
- a pair of lever means extending between corresponding ends of the support and the clamping element and adapted to embrace a stack of bus bars; and
- adjustable clamping means mounted on the clamping element for applying pressure on a stack of bars through said lever means.

4,008,367

POWER CABLE WITH PLASTIC INSULATION AND AN OUTER CONDUCTING LAYER

Heinz Sünderrhauf, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

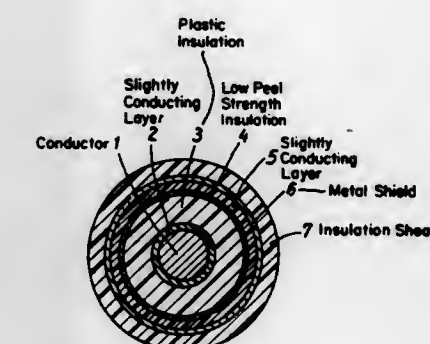
Filed June 23, 1975, Ser. No. 589,006

Claims priority, application Germany, June 24, 1974, 2430792

Int. Cl.² H01B 7/22

U.S. Cl. 174—107

10 Claims



1. In a power cable including a central conductor, an ex-

truded inner conducting layer surrounding said conductor, an inner layer of extruded insulation surrounding said inner conducting layer, an extruded outer conducting layer surrounding said insulating layer, a metal shield surrounding said outer conducting layer, and an outer insulating layer surrounding said metal shield, an improved construction permitting said outer insulating layer, metal shield and outer conducting layer to be peeled away from said inner insulating layer without damage to said outer conducting layer, comprising an intermediate insulating layer having a mechanical peel strength lower than the mechanical peel strength of the outer conducting layer and of said inner insulating layer, said intermediate insulating layer interposed between said inner insulating layer and said extruded outer conducting layer.

4,008,368

ELECTRICAL CONDUCTOR HAVING INHIBITED POLYMER COMPOSITIONS

Ottmar Leuchs, Hannover-Bothfeld, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hannover, Germany

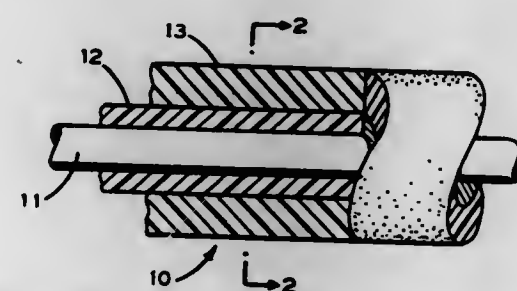
Division of Ser. No. 109,390, Jan. 25, 1971, Pat. No. 3,943,087, which is a continuation-in-part of Ser. No. 823,033, May 8, 1969, abandoned. This application Dec. 3, 1975, Ser. No. 637,314

Claims priority, application Germany, May 11, 1968, 1769343

Int. Cl.² C08K 5/49; H01B 7/00

U.S. Cl. 174-120 R

10 Claims



1. In an article, comprising an electrical conductor, an insulator and a jacket, the improvement comprising, at least one of said jacket and insulator being formed from a member selected from the group consisting of polyvinyl chloride and polychloroprene, said member being plasticized with a plasticizing amount of a non-flammable plasticizer, said member containing a material selected from the group consisting of the carbonates of calcium, barium, magnesium, strontium, sodium, potassium, lithium and mixtures thereof, said material having an average particle size which does not exceed 250 millimicrons and being present in an amount which is at least sufficient to combine with essentially the entire amount of hydrogen chloride which is evolved at temperatures which occur in a fire to thereby prevent evolution into the surrounding atmosphere of the hydrogen chloride when the article is subjected to said temperatures.

4,008,369

TELEPHONE INTERFACED SUBSCRIPTION CABLE TELEVISION SYSTEM ESPECIALLY USEFUL IN HOTELS AND MOTELS

Donald L. Theurer, and Paul M. Dormans, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Feb. 28, 1975, Ser. No. 554,347

Int. Cl.² H04N 7/16, 7/18

U.S. Cl. 358-84

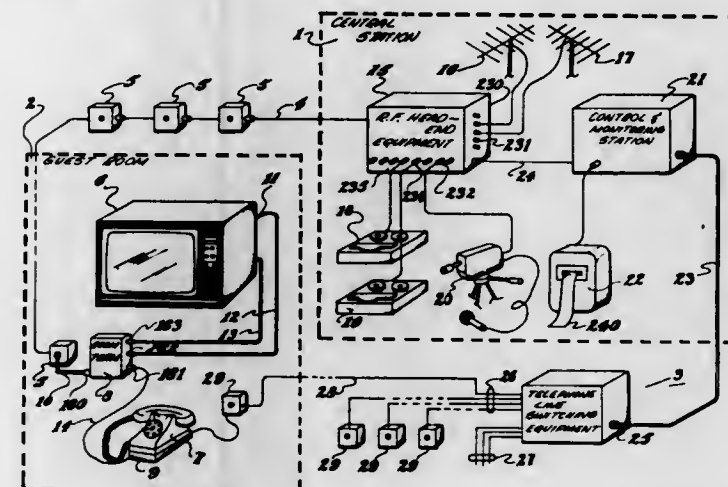
6 Claims

1. A control and monitoring device for use in a telephone interfaced subscriber television system for receiving from a telephone exchange system subscriber initiated telephone signals and for supplying signals to the automatic telephone

exchange system including enabling signals peculiar to the telephone signals, comprising:

first means having an input for receiving the telephone signals from the automatic telephone exchange system including a pulse train consisting of a predetermined number of one or more pulses, said pulse train representing a subscriber request for a particular television program signal, and responsive to the predetermined number of said one or more pulses in the pulse train for providing an output signal on a predetermined one of N number of separate outputs; and

second means connected to said first means and responsive to the output signal on the predetermined one of the N number of separate outputs of said first means for providing simultaneous output signals on a predetermined number of n number of separate outputs; and



third means including an enabling signal source for selectively generating simultaneously the predetermined number of n number of enabling signals each signal having a different signal frequency, said third means having an output adapted to be connected to the automatic telephone exchange system for supplying the enabling signals to said system and connected to said second means and responsive to the output signals on the predetermined number of the n number of separate outputs of said second means for providing at the output of said third means the predetermined number of the n number of enabling signals from said enabling signal source whereby said predetermined enabling signals are a function of the number of pulses in said pulse train.

4,008,370

AUTOMATIC NOISE GATE FOR A SYNCHRONIZING SIGNAL AMPLIFIER

Leslie Ronald Avery, Lightwater, England, assignor to RCA Corporation, New York, N.Y.

Filed Jan. 19, 1976, Ser. No. 649,973

Claims priority, application United Kingdom, Sept. 15, 1975, 37881/75

Int. Cl.² H04N 5/08

U.S. Cl. 358-155

5 Claims

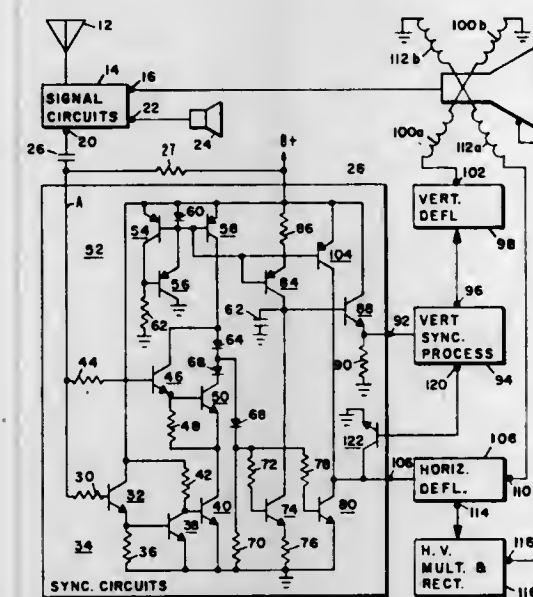
1. In a synchronizing signal amplifier, an automatic noise gate comprising:

a capacitor having a first terminal adapted to be coupled to a source of synchronizing signals, having a maximum level less than a first level, and noise signals, having a maximum level greater than said first level, and a second terminal;

means providing a first charging path, including an active current conducting device, coupled to said second terminal of said capacitor for charging said capacitor from said source of signals substantially in accordance with the characteristics of said first charging path when said active current conducting device is enabled; and

sensing means providing a second charging path coupled to

said second terminal of said capacitor and said means providing a first charging path for enabling said active current conducting device when signals produced by said source of signals is less than said first level and for disabling said active current conducting device when signals



produced by said source of signals is greater than said first level, thereby providing for charging of said capacitor from said source of signals substantially in accordance with the characteristics of said second charging path when signals produced by said source of signals are greater than said first level.

4,008,371

IMAGING SYSTEMS

Donald Robert Barron, Sunbury-on-Thames, England, assignor to EMI Limited, Hayes, England

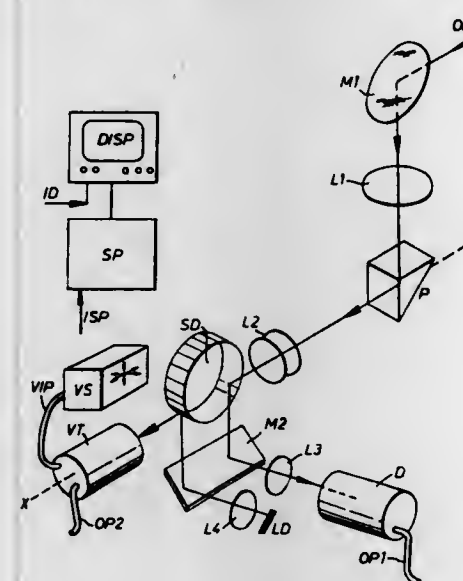
Filed Aug. 6, 1975, Ser. No. 602,412

Claims priority, application United Kingdom, Aug. 8, 1974, 35077/74

Int. Cl.² H04N 3/08, 7/18

U.S. Cl. 358-206

11 Claims



1. In a scanning imaging system of an objective lens supported for forming a first image with radiation collected from an area of view and a scanning arrangement operable to scan radiation from said first image over a detector to form the scanned image the improvement of a collimating lens between the objective and a rotating parallel-faceted scanning element smaller than that required for the first image for forming from said first image a second enlarged image of said area thereby to direct the radiation collected from the area toward a collimating lens exit pupil of smaller aperture than the radiation collecting aperture and occurring within the rotational sweep

4,008,372

TV CAMERA

Atsushi Ueno; Kiyoharu Sakai, and Showhey Fujimoto, all of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

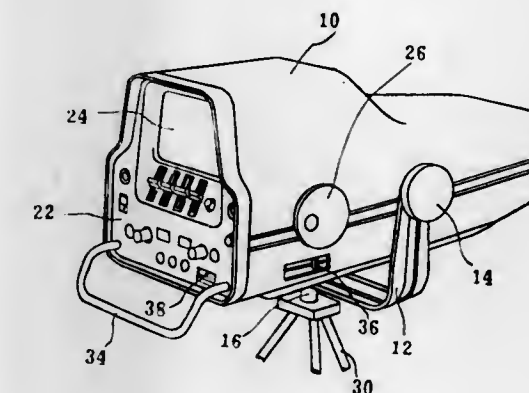
Filed Dec. 1, 1975, Ser. No. 636,423

Claims priority, application Japan, Nov. 28, 1974, 49-137171; Nov. 29, 1974, 49-139708; Nov. 29, 1974, 49-139710; Nov. 29, 1974, 49-139711

Int. Cl.² H04N 1/03

U.S. Cl. 358-227

10 Claims



1. A TV camera comprising a casing surrounding a body of the TV camera, electrical and optical components enclosed in the casing, and support means for supporting the body of said TV camera and for providing the body with pan and tilt movements, said support means comprising a shaft provided through the body of the TV camera at a position slightly above its center of gravity and means for rotatably supporting said shaft.

4,008,373

DIGITAL DIFFERENTIAL PHASE SHIFT KEYED MODULATOR

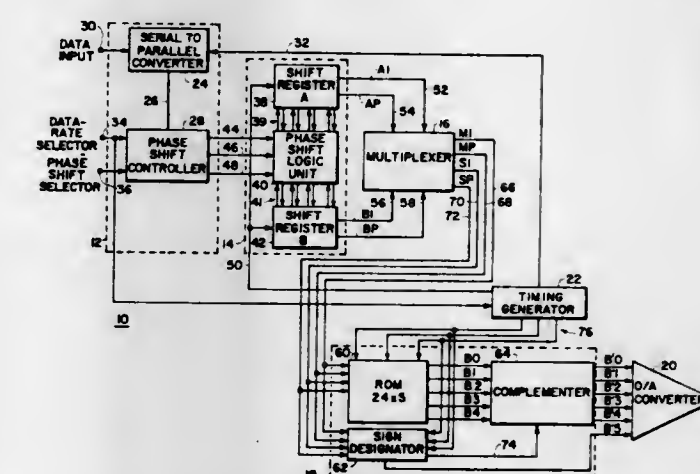
Harold Garth Nash, Tempe, Ariz.; Gene Arnold Schriber, Austin, Tex., and John Robert Linford, Broomfield, Colo., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 3, 1975, Ser. No. 619,439

Int. Cl.² H04L 27/18

U.S. Cl. 178-67

9 Claims



1. A digital differential phase shift keyed modulation system for encoding digital dibits of data comprising:

- a. timing means for generating timing signals;
- b. digital control circuit means responsive to said timing signals and a phase shift control signal for accepting digital dibits of data and for generating a digital control output signal;

- c. digital phase shifter means coupled to said control circuit means and responsive to said timing signals for generating a main and a secondary channel digital output signal alternately at a first and a second output terminal means during successive dibit intervals, said main channel digital output signal being phase shifted a predetermined amount with respect to a main channel digital output signal generated during a preceding dibit interval in response to said digital control output signal;
- d. multiplexer means coupled to said first and second output terminal means of said phase shifter means for transmitting said main channel digital output signal on a third output terminal means and said secondary channel digital output signal on a fourth output terminal means;
- e. digital number generator means coupled to said third and fourth output terminal means and responsive to said timing signals for generating a series of digital output signals, each representative of a predetermined analog magnitude.

4,008,374

LOUDSPEAKER SYSTEMS

Ivor S. Tiefenbrun, 1 Castle Court, Broomhill Ave., Newton Means, Renfrewshire, Scotland

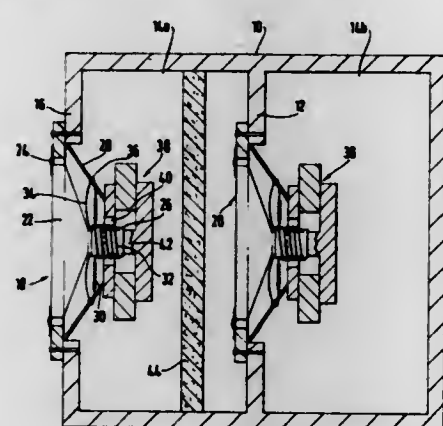
Filed Jan. 21, 1975, Ser. No. 542,821

Claims priority, application United Kingdom, Jan. 26, 1974, 03726/74

Int. Cl.² H04R 1/28

U.S. Cl. 179-1 E

6 Claims



1. A bass unit for a loudspeaker system comprising a casing, a first bass loudspeaker having front and rear faces, said first bass loudspeaker being so mounted in the casing that the front face of the said first bass loudspeaker faces outwardly of the casing, a second bass loudspeaker having front and rear faces, said second bass loudspeaker being mounted in the casing behind said first loudspeaker with its front face opposite the rear face of said first loudspeaker so as to define between said first and second loudspeakers a chamber of air, operating means for operating said first and second loudspeakers in phase such that the pressure of air in the chamber remains substantially constant, and a sound absorbing curtain located in said chamber between the rear face of said first bass loudspeaker and the front face of said second bass loudspeaker and arranged parallel to said faces to absorb distortion components resulting from different response characteristics of said first and second loudspeakers.

4,008,375

DIGITAL VOICE SWITCH FOR SINGLE OR MULTIPLE CHANNEL APPLICATIONS

Raymond H. Lanier, Hyattsville, Md., assignor to Communications Satellite Corporation (COMSAT), Washington, D.C.

Filed Aug. 21, 1975, Ser. No. 606,828

Int. Cl.² H04B 15/00

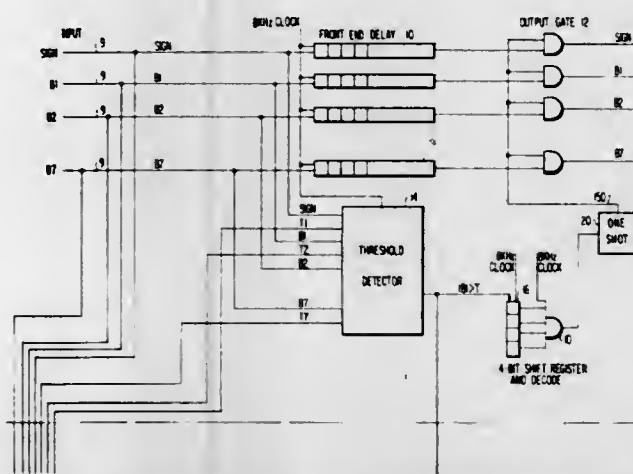
U.S. Cl. 179-1 VC

8 Claims

1. A voice switch of the type comprising means for storing a value representing a threshold level, threshold detector

means for providing an output threshold signal each time a voice sample applied thereto exceeds a threshold level applied thereto, means for connecting said value stored in said storing means to said threshold detector means, means for connecting periodic samples of a signal on a channel adapted to carry voice signals to said threshold detector, accumulator means for accumulating over a predetermined period of time a number representing the number of times that voice samples exceeds said threshold value, adder means having first and second inputs for adding the values applied to said first and second inputs and providing the sum at an output, said first input being connected to the output of said storing means, and means responsive to the output from said adder and to maximum and minimum threshold values for entering the output sum into said storing means if said output sum is between said maximum and minimum threshold values, the improvement comprising:

- a. first comparison means for comparing said accumulated number with first and second numbers which define predetermined ranges of the number of times that voice samples exceed said threshold within a given time period, said first comparison means providing a value represent-



ing a first positive increment to the second input of said adder means when said accumulated number is greater than said first number but less than or equal to said second number for a predetermined number of consecutive predetermined periods of time and for providing a value representing a second positive increment to the second input of said adder means when said accumulated number is greater than said second number for a predetermined number of consecutive periods of time,

- b. second comparison means for comparing an incoming voice sample to a predetermined level below the values stored in said storing means and providing an output when said incoming voice sample is less than said predetermined lower level below the level stored in said storing means, and
- c. accumulator and comparison means for accumulating the output of said second comparison means over said predetermined period of time and providing a value representing a negative increment to said second input of said adder means when the accumulated number from said second comparison means is less than said first number for a predetermined number of consecutive periods of time.

4,008,376

LOUDSPEAKING TELECONFERENCING CIRCUIT

James Loton Flanagan, Warren; Donald John MacLean, Jr., Scotch Plains, and James Edward West, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 17, 1975, Ser. No. 623,545

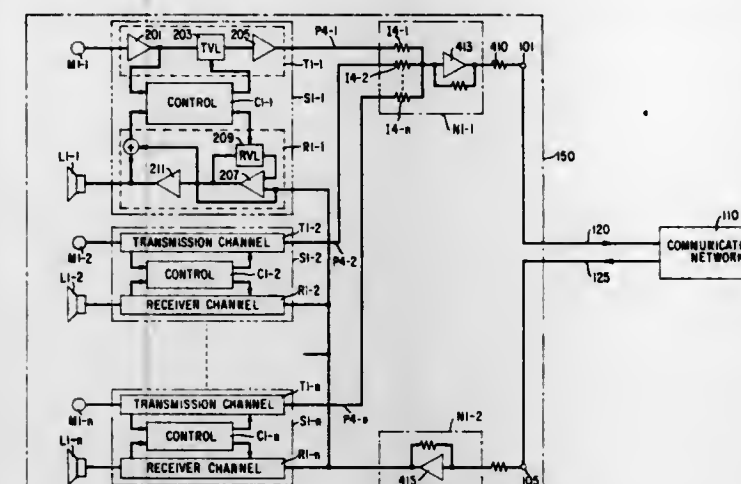
Int. Cl.² H04M 3/08

U.S. Cl. 179-1 CN

19 Claims

1. A conferencing system for a plurality of remote conference locations comprising a plurality of loudspeaking tele-

phone sets at each conference room location, an incoming terminal and an outgoing terminal at each conference room location, and a communication path between the incoming and outgoing terminals of said locations; each loudspeaking telephone set comprising a microphone, a loudspeaking device, a transmit channel having an input connected to said microphone and an output, a receive channel having an input connected to said incoming terminal and an output connected to said loudspeaking device, and control means jointly responsive to speech energy on said set transmit channel and speech energy on said set receive channel for selectively activating one of said set transmit and receive channels and concurrently



deactivating the other of said set transmit and receive channels, the control means of each loudspeaking telephone set being operative independently of the control means of the other loudspeaking telephone set, and means connected between the output of each transmit channel and said conference room location outgoing terminal for combining the outputs of said active transmit channels and for applying said combined output to said conference room location outgoing terminal, said communication path comprising means for coupling the combined output from the outgoing terminal of one conference room location to only the incoming terminals of the other remote locations.

4,008,377

ARRANGEMENT FOR REGISTERING AND READING OF MESSAGE UNITS IN TELEPHONE EXCHANGES

Jerzy W. Szczepanski, and Wieslaw Wilczynski, both of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

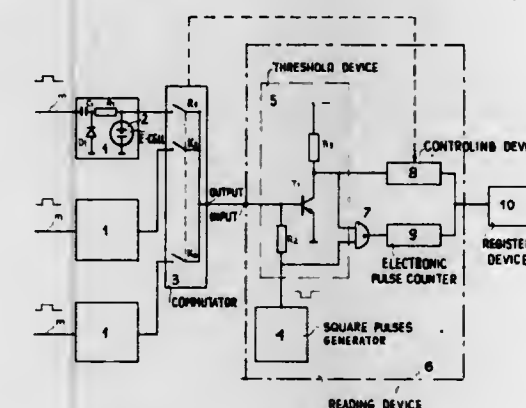
Continuation-in-part of Ser. No. 421,634, Dec. 4, 1973. This application Sept. 5, 1975, Ser. No. 610,733

Claims priority, application Poland, Dec. 7, 1972, 159356

Int. Cl.² H04M 15/12

U.S. Cl. 179-7 R

4 Claims



1. An arrangement for registering and reading message units in telephone or Telex exchanges comprising, in combination, electrochemical integrators, each having a first electrode connected to ground potential and having a second electrode, sources connected to corresponding integrators and supplying metering pulses to said integrators, a resistor connected be-

tween each source and the second electrode of the corresponding electrochemical integrator, a reading system for reading the outputs of said integrators, a commutator with a plurality of positions connecting selectively the second electrode of an integrator with said reading system, said reading system comprising a threshold device detecting an increase of voltage across the terminals of an integrator which is connected to said reading system, said threshold device having an output, and a generator generating standard square-wave pulses having their polarization opposite to that of the metering pulses, an AND gate having a first input connected to said generator and having a second input connected to the output of said threshold device, a pulse counter connected to the output of said AND gate for counting gated pulses from said generator, said pulse counter having an output, means for controlling the commutator and having an output for indicating the commutator position, and means connected to the output of said pulse counter and the output of said controlling means for registering pulses read out from said integrators and for registering the respective commutator position.

4,008,378

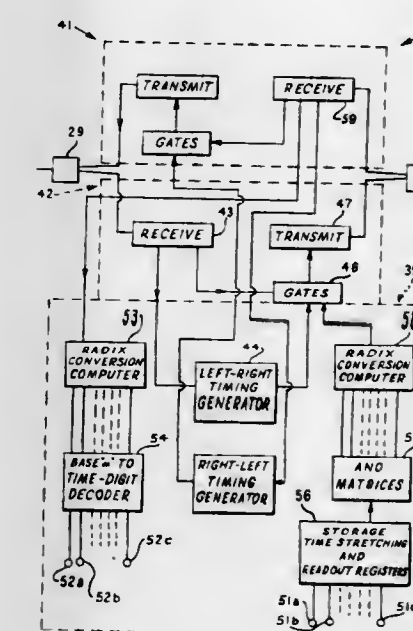
MULTI-RADIX DIGITAL COMMUNICATIONS SYSTEM WITH TIME-FREQUENCY AND PHASE-SHIFT MULTIPLEXING

W. Franklin Nance, Orange, and Robert L. Shacklett, Fresno, both of Calif., assignors to NS Electronics, Fresno, Calif. Continuation-in-part of Ser. No. 359,864, May 14, 1973, Pat. No. 3,872,255. This application Mar. 17, 1975, Ser. No. 559,127

Int. Cl.² H04L 27/10

U.S. Cl. 179-15 A

6 Claims



6. A communication system comprising a transmitter including

sampling means adapted to receive input signals and to sample such signals a plurality of times in each of successive time frames and producing binary pulse trains for each time frame, and phase-shifting means operated by said binary pulse trains for phase-shifting predetermined carrier signals of different frequency at predetermined times in each frame in accordance with the information of said binary pulse trains;

a transmission medium connected to the output of said transmitter for transmitting said phase-shifted carriers; and

a receiver connected to said transmission medium and including means for detecting the phase shift of individual cycles of separate carriers and discriminating against noise signals, and means reconstructing the input to said

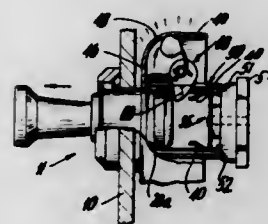
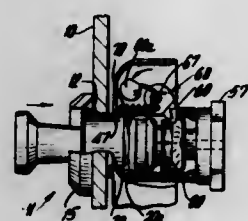
sponse to said substantially dominant convolutions within said single plane of said convoluted surface, second control means activating said first, second and third drive means in response to the signals from said mechanical sensor at each said dominant convolution, respectively, and at least one selectively programmable memory means, activated by said mechanical sensor, and continuously providing variable information to said first and second control means to control movement of said torch as said torch traverses each said dominant convolution, respectively.

4,008,385 AUTOMOBILE CIGARETTE LIGHTER

William Draghi, 37-24 95th St., Jackson Heights, N.Y. 11372
Filed Apr. 19, 1976, Ser. No. 678,217
Int. Cl.² F23Q 7/22

U.S. Cl. 219-269

9 Claims



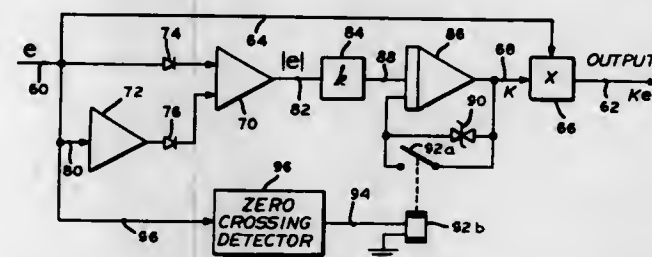
1. A cigarette and cigar lighter comprising a tubular casing, a push-pull unit comprising a sleeve slidable in said casing and a plug slidable in said sleeve, means to limit movement of said sleeve relative to said casing in one direction, in a predetermined position of said sleeve relative to said casing, said plug being movable relative to said sleeve, spring means interposed between said sleeve and plug and adapted to be loaded upon moving said plug relative to said sleeve in said direction, to a predetermined position of said plug relative to said casing, means to hold said plug in said predetermined position of said plug relative to said casing, an element on said plug adapted to heat up and glow upon receiving current, means to grip said element to complete an electric circuit through said element, to heat said element to glow, in said predetermined position of said plug relative to said casing and to automatically release said plug when said element is heated to a glowing condition, to allow said loaded spring means to retract said plug relative to said sleeve, and break said circuit through said element, audible signal means and means controlled by said plug, to actuate said signal means to produce an audible signal upon said plug being retracted, said audible signal means comprising a bell, a trigger pivoted relative to said bell, a hammer on said trigger adapted to strike said bell, spring means connecting said trigger to said bell to bias the trigger for rotation in one direction, and means on said plug adapted to rotate said trigger in an opposite direction to load the trigger spring means, upon moving said plug relative to said sleeve in said direction.

4,008,386 METHOD AND MEANS FOR PRODUCING A CONTROL SIGNAL FOR PROCESS CONTROL INCLUDING REMOVABLE MEANS FOR INCREASING GAIN AS A TIME INTEGRAL OF ERROR

Charles Warren Ross, Hathboro, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.
Filed Jan. 13, 1976, Ser. No. 648,708
Int. Cl.² G05B 11/40

U.S. Cl. 235-150.1

19 Claims



1. The method for automatically producing a control signal for controlling a variable of a process to minimize a control error calculated as the deviation of the measured value of that process variable from its desired set point value comprising the steps of;

producing a signal which varies in accordance with the product of a gain factor and the control error, changing said gain factor in accordance with the integral of the magnitude by which the control error exceeds a predetermined value, and resetting said gain factor to zero whenever the magnitude of said control error goes through zero so that said signal acts as a control signal which goes to zero when said error goes through zero.

4,008,387 AUTOMATICALLY CONTROLLED CRYSTAL GROWTH

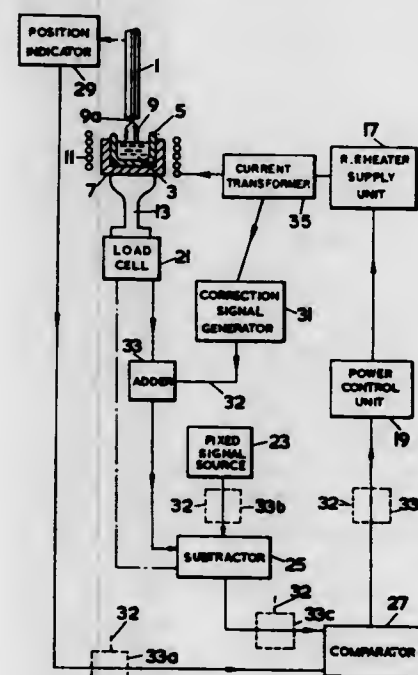
Geoffrey William Green, Malvern; Donald Thomas James Hurle, Welland, and Gordon Charles Joyce, Malvern, all of England, assignors to National Research Development Corporation, London, England

Filed Mar. 31, 1975, Ser. No. 563,441
Claims priority, application United Kingdom, Mar. 29, 1974, 14162/74

Int. Cl.² B01J 17/18; G06G 7/66

U.S. Cl. 235-151.1

8 Claims



1. Apparatus for the controlled growth of a crystal comprising a container for containing a charge of material from which said crystal is grown; an electrical heater arranged adjacent to said charge to form a melt of said charge; means for pulling a

crystal from said melt; a feedback loop for controlling the growth of said crystal by controlling energization of said heater, said feedback loop including: a weight function signal generator arranged so as to measure the weight of said melt and to provide an output signal representative of a function of said weight, a comparator, and means for supplying electrical current to said heater; means for providing a reference signal representative of the expected value of said generator output signal to said comparator for comparing said generator output signal with said reference signal and for providing for any difference between said signals a control signal for controlling the current supplied to said heater by said means for supplying current; and wherein the improvement comprises an error correction loop for cancelling an error in the weight measured by said weight function signal generator, said error correction loop including: means for monitoring the output of said means for supplying electrical current, means for deriving from said monitored current a correction signal proportional to said current and equal in magnitude to said error, and means for applying said correction signal to said feedback loop at a point in said feedback loop before said means for supplying current, in order to cancel said error.

4,008,388 MASS SPECTROMETRIC SYSTEM FOR RAPID, AUTOMATIC AND SPECIFIC IDENTIFICATION AND QUANTITATION OF COMPOUNDS

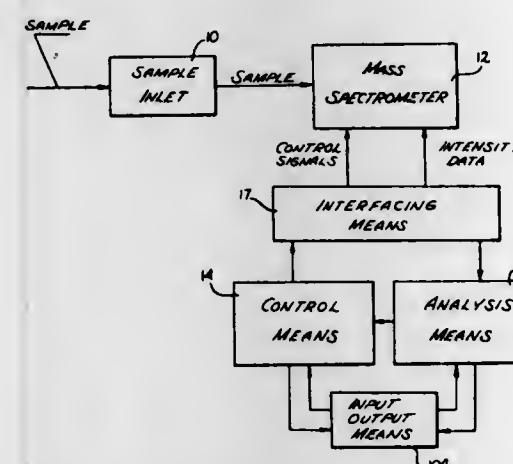
Fred W. McLafferty, Ithaca, N.Y.; Robert H. Hertel, Pasadena, and Robert D. Villwock, Glendora, both of Calif., assignors to Universal Monitor Corporation, Pasadena, Calif.

Continuation of Ser. No. 470,642, May 16, 1974, abandoned.
This application Aug. 4, 1975, Ser. No. 601,825

Int. Cl.² G06F 15/52; G06G 7/74

U.S. Cl. 235-151.35

46 Claims



1. In a mass spectrometric system comprised of (i) means for measuring the mass spectra of sample compounds; (ii) means for introducing a sample of a pure compound or a mixture of compounds into said measuring means so as to measure the intensities of one or more mass peaks of said sample; and (iv) means for data input and output electrically coupled to said control means and to means for analyzing said mass peaks, said analysis means comprising:

- first means for storing the mass spectrum of at least one target compound or a contracted mass spectrum thereof;
- second means for storing at least one spectral matching criterion;
- means for matching said measured mass peaks to corresponding mass peaks of said stored spectrum of said target compound on a probabilistic basis, the degree of said matching being determined with respect to said spectral matching criterion, said matching means being electrically coupled to said first and second storage means and to said measuring means,

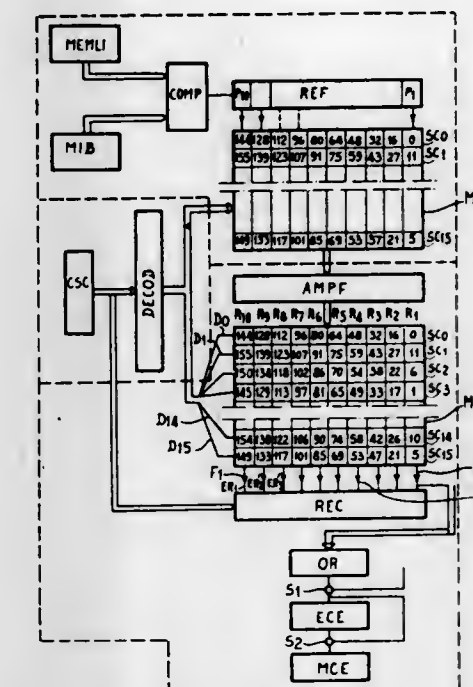
whereby, said target compound is identified as being present in said sample or as not being present therein in accordance with said spectral matching criterion.

4,008,389 APPARATUS FOR CHECKING THE OPERATION OF CONTROL CIRCUITS

Jean-Pierre Brunin, Belfort, and Jean-Marc Thomas, Valdoie, both of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France
Continuation-in-part of Ser. No. 503,114, Sept. 4, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,251
Claims priority, application France, Sept. 5, 1973, 73.32061
Int. Cl.² G06F 11/00

U.S. Cl. 235-153 AS

8 Claims



1. Apparatus for checking the operation of N control circuits, each including detector means for generating an error signal in response to erroneous operation, the control circuits being divided into m groups with k control circuits in each group, said apparatus comprising:

N gate means for transmitting an error signal when enabled; first conductor means for operatively connecting each detector means to a different gate means so that the gate means are divided into m groups with k gates in each group; first selection means for individually enabling a different one of the m groups of control circuits and the gates connected to the detector means of the enabled control circuits during m sub-cycles of operation; second selection means for selecting for operation during each sub-cycle not more than k control circuits; and error indicator means for receiving error signals transmitted by the gate means when enabled by the first selection means and for indicating the erroneous operation of one or more of the control circuits.

4,008,390 OPTICAL PULSE TRANSMISSION SYSTEM

Peter Klaus Runge, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

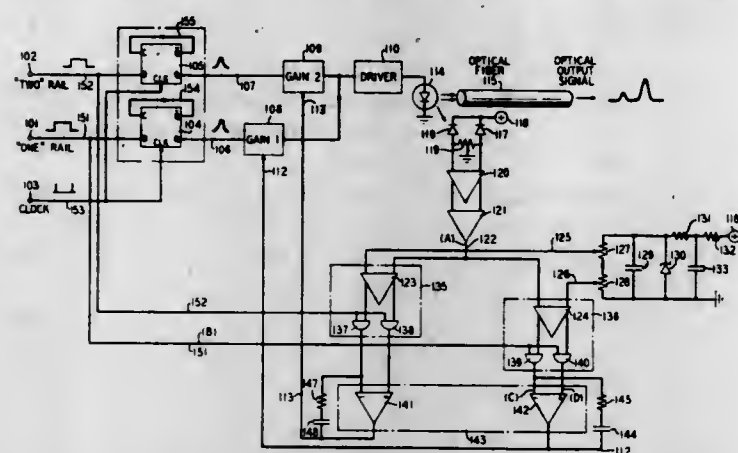
Filed Mar. 15, 1976, Ser. No. 666,579
Int. Cl.² H04B 9/00; G01J 1/32; G05D 25/02

U.S. Cl. 250-199

10 Claims

1. An optical system for transmitting input voltage pulses comprising an optical source for producing a light signal in response to an electrical signal applied thereto, an optical transmission medium having one end disposed adjacent to said optical source for receiving the produced light signal, a light detector in close proximity to said optical source for collecting

light emitting from said optical source and for converting the collected light to a first developed signal, means for developing a second signal in response to the electrical signal applied to said optical source, means for subtracting the developed second signal from said first developed signal to produce a



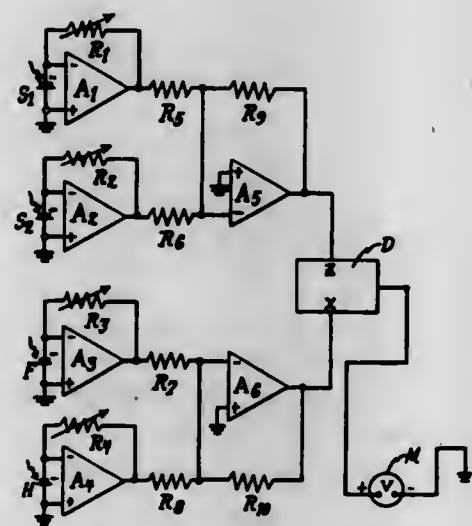
control voltage, means responsive to said control voltage for coupling said input voltage pulses to said optical source, whereby a negative feedback arrangement is provided for control of the intensity of said light signal from said optical source.

4,008,391

DEVICE FOR MEASURING LIGHTING EFFECTIVENESS
Alfred J. Henderson, Jr., Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.
Filed Nov. 12, 1975, Ser. No. 631,096
Int. Cl.² H01J 39/12

U.S. Cl. 250-208

9 Claims



1. A device for measuring quality of illumination comprising, in combination, first and second light sensing means, first and second circuit means respectively associated with said first and second light sensing means for producing respective outputs proportional to the arithmetic sum of illumination levels on the respective first and second light sensing means, electronic means connected to the outputs of said first and second circuit means for performing an arithmetic division on the same, and indicating means connected to said electronic means for displaying the resultant output of said electronic means.

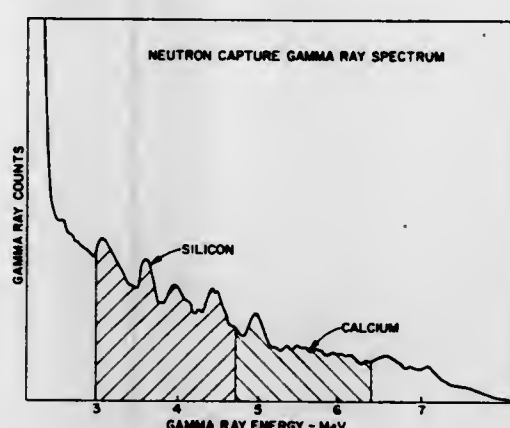
4,008,392

METHOD FOR DETERMINING FLUID TYPE AND LITHOLOGY OF SUBTERRANEAN FORMATIONS
George A. Lock, and Wilmer A. Hoyer, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 398,623, Sept. 19, 1973, abandoned.
This application Dec. 26, 1974, Ser. No. 536,525
Int. Cl.² G01V 5/00

U.S. Cl. 250-270

1 Claim



1. A method of determining the presence of natural gas in a subterranean formation which comprises placing a source of high energy neutrons within the borehole at the level of a subterranean formation having a fluid content with known salinity, generating a pulse of high energy neutrons, detecting gamma rays resulting from inelastic scattering reactions during said neutron pulse, terminating said neutron pulse, detecting gamma rays resulting from neutron capture reactions subsequent to termination of said neutron pulse, determining the relative amounts of inelastic gamma rays at energy levels indicative of carbon and oxygen, determining the relative amounts of neutron capture gamma rays at energy levels indicative of silicon and chlorine, comparing the relative amounts of carbon and oxygen gamma rays to the amounts which would be present in said formation when saturated with oil, comparing the silicon-chlorine neutron capture gamma rays to the amounts of silicon-chlorine neutron capture gamma rays which would be present when the formation is fully saturated with water of a known salinity, and correlating the comparisons to determine the presence of natural gas in the formation.

4,008,393

SYSTEM AND METHOD OF LIQUID SCINTILLATION COUNTING

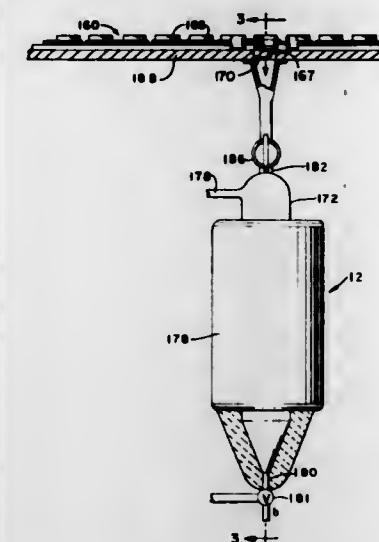
Edward Rapkin, Short Hills, N.J., assignor to Intertechnique S.A., Plaisir, France
Filed Sept. 11, 1970, Ser. No. 71,613
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² G01T 1/00

U.S. Cl. 250-328

37 Claims

1. A liquid scintillation counting system comprising (a) a combustion chamber for combusting radioactive samples; (b) conveying means for retaining a multiplicity of said radioactive samples in storage and for conveying said radioactive samples from said storage into said combustion chamber in sequence so that each sample enters said chamber when said chamber is ready for a new sample; (c) means for collecting from said combustion chamber combustion product resulting from the combustion of each sample and retaining said product in a liquid scintillator to provide at least one test sample corresponding to each radioactive sample combusted; and (d) a detecting means communicating with said collecting means, receiving and counting said test samples, said conveying means comprising a horizontally oriented link chain posi-

tioned directly above a horizontally oriented flat plate containing a single aperture, said link chain defining a series of



compartments, each compartment being open at the top and bottom and being sized to hold a sample.

4,008,394

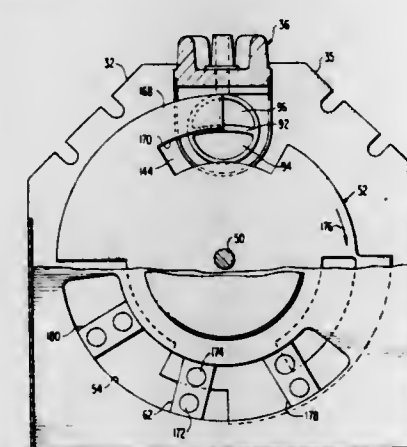
GAS ANALYZING

Ojars Risgin, Grass Lake, and Charles B. Arnold, Saline, both of Mich., assignors to Sensors, Inc., Ann Arbor, Mich.
Filed June 28, 1973, Ser. No. 374,553

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Int. Cl.² G01N 21/00

U.S. Cl. 250-345

18 Claims



1. Gas analyzing structure for use in simultaneously performing multiple gas analyses comprising frame means supporting a plurality of individual optical gas analysis assemblies located to dispose portions of each such assembly along an arcuate path, each such assembly of said plurality of assemblies including a single source of radiant energy, a single radiant energy detector having an electrical output, means for directing the radiant energy from the single source for passage along a sample gas and a reference gas path, and means for directing such radiant energy after passage along the reference gas and sample gas paths to the single detector for such radiant energy, means for predetermined cyclic interruption of radiant energy in the sample and reference gas paths of each such assembly including a single chopper disc rotatable about a fixed central axis located in predetermined positional relationship to the arcuate path disposition of gas analysis assemblies, the chopper disc including a plurality of windows predeterminedly spaced radially from the fixed central axis with a portion of the windows being spaced from the central axis a predetermined distance to permit passage of radiant energy in the sample gas path and a portion of the win-

dows being spaced radially from the central axis to permit passage of radiant energy in the reference gas path of each optical gas analyzer assembly upon rotation of the chopper disc about the fixed central axis, and said radiant energy detector of each of said assemblies being adapted to be connected to circuitry for processing the electrical output of a detector.

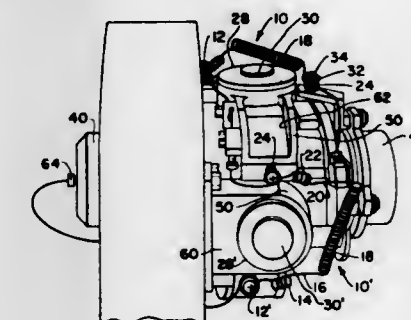
4,008,395

FLEXIBLE TUBE SECTION FOR GIMBALLED IR DETECTORS

Herbert B. Ellis, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 2, 1974, Ser. No. 494,101
Int. Cl.² G01J 1/00

U.S. Cl. 250-352

4 Claims



1. An infrared missile seeker assembly comprising:
a. a telescope mounted on a gimbal having inner and outer gimbal axes;
b. an infrared detector rigidly mounted on said telescope; and
c. means for supply coolant to said detector comprising two flexible tube sections each having a plurality of individual coils configured to circumvent said inner and outer gimbal axes, each said individual coil having a low spring constant, thus minimizing any resultant torque on said gimbal.

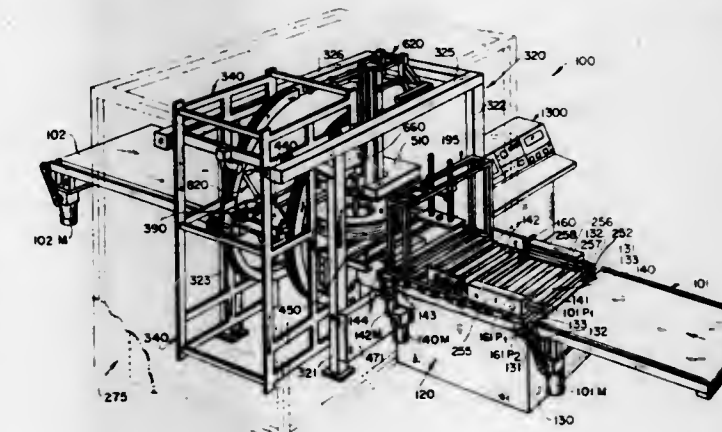
4,008,396

TIRE INSPECTION SYSTEM

Phillip K. Loyer, Waynesville, N.C., assignor to Picker Corporation, Cleveland, Ohio
Division of Ser. No. 495,493, Aug. 7, 1974. This application Aug. 13, 1975, Ser. No. 604,331
Int. Cl.² G01N 23/00

U.S. Cl. 250-358 T

24 Claims



1. In an apparatus for inspecting tires through the use of penetrative emanation, of the type including a penetrative emanation shielded enclosure which houses a penetrative emanation tire inspection system, an inlet opening for admitting tires to be inspected to said enclosure, and an outlet opening for discharging inspected tires, the improvement of a pair of closure systems for closing each of said openings, each of said closure systems comprising:

- a. a pair of doors formed from penetrative emanation impervious material;
- b. means mounting said doors for movement toward each other from positions on opposite sides of their associated opening to close said opening, and for movement from each other to open said opening;
- c. drive means operably connected to said doors to concurrently move said doors toward and away from each other to close and open said opening;
- d. one of said doors having a penetrative emanation impervious lip which overlaps the juncture between said doors when said doors are closed to prevent the passage of penetrative emanation through said juncture.

4,008,397

FLUOROMETER FLOW CELL

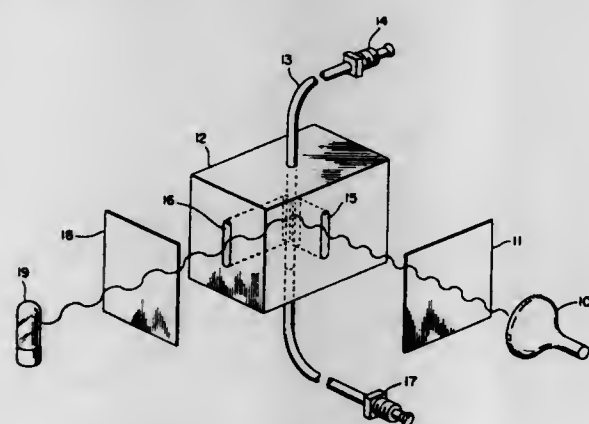
Joseph John Zdrodowski, Bricktown, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 24, 1975, Ser. No. 571,147

Int. Cl.² G01J 1/42; G01N 21/38

U.S. Cl. 250—373

4 Claims



1. In a fluorometer consisting of
 - A. light source means;
 - B. excitation filter means;
 - C. cell holder means;
 - D. emission filter means; and,
 - E. photo detector means,

the improvement which comprises providing said cell holder means with a flow cell consisting of polyfluoroethylene tubing which is in operative optical relationship with said light source, said excitation filter means, said emission filter means and said detector means.

4,008,398

TRANSDUCER SIGNAL CONDITIONING CIRCUIT

Benjamin B. Schramm, 426 Dallas Drive, Campbell, Calif. 95008, and Alan M. Paul, 3031 Bryant St., Palo Alto, Calif. 94306

Division of Ser. No. 449,842, March 11, 1974, abandoned.

This application Nov. 19, 1975, Ser. No. 633,438

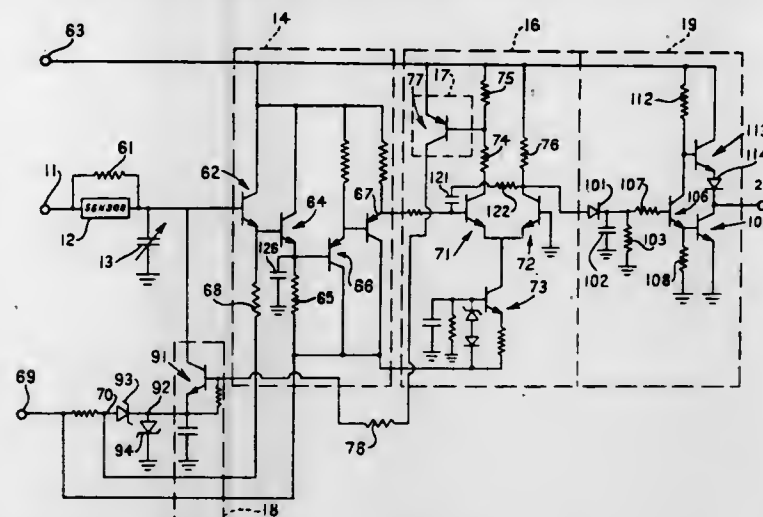
Int. Cl.² G01J 1/42

U.S. Cl. 250—372

5 Claims

1. A transducer measurement circuit for an ultraviolet light sensor having high resistance which varies inversely with the intensity of ultraviolet light incident thereon comprising
 - a capacitor connected to a first end of said sensor,
 - a source of electrical power connected to a second end of said sensor whereby said capacitor is adapted to be discharged through the variable resistance of said sensor,
 - a comparator circuit biased to conduct at a predetermined input voltage threshold and having an input connected to the juncture of said sensor and capacitor for initiating conduction of said comparator circuit at a capacitor voltage equal to said predetermined threshold voltage,
 - a transistor switch connected across said capacitor and connected to said comparator circuit for conduction

upon conduction of said comparator circuit to recharge said capacitor and thus turn off said comparator circuit and complete a feedback loop, whereby the output of said differential comparator circuit is a series of pulses, and



processing means connected to the output of said comparator circuit for processing the pulses as a measure of sensor resistance.

4,008,399

GAMMA COMPENSATED, SELF POWERED NEUTRON DETECTOR

Donald P. Brown, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

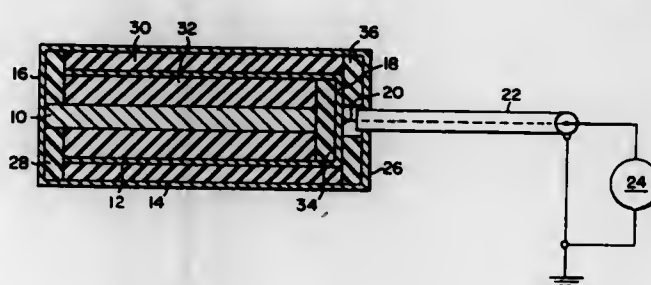
Continuation of Ser. No. 440,232, Feb. 6, 1974, abandoned.

This application June 13, 1975, Ser. No. 586,698

Int. Cl.² G01T 3/00

U.S. Cl. 250—390

11 Claims



1. An improved, self-powered, gamma compensated, neutron detector comprising:
 - an emitter constructed from a material which is responsive to neutron bombardment to provide a beta emission with a representative intensity corresponding to the intensity of the neutron bombardment;
 - an electrically conductive sheath positioned concentrically around said emitter;
 - means for maintaining said emitter and sheath at a common potential;
 - an electrically conductive collector positioned concentrically around said emitter, arranged between said sheath and emitter and electrically insulated therefrom, said sheath is constructed to provide an intensity of Compton scattered electron emissions as a result from gamma interaction with the sheath materials that will impart in the collector a current substantially equal and opposite in magnitude to the net gamma induced current imparted in the collector as a result of Compton scattered electron emissions from the collector materials; and
 - an electrical connector having a first electrical conductor coupled to said collector and insulated from said sheath and emitter, and a second electrical conductor communicating with said emitter and sheath.

4,008,400

TRANSVERSE TOMOGRAPHY SYSTEM HAVING MULTIBEAM ORBITAL SCANNING WITH ALL BEAMS OFFSET FROM THE CENTER OF ORBIT

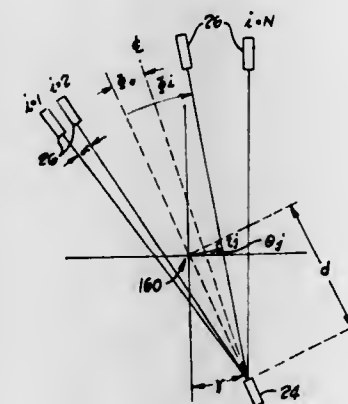
Carl J. Brunnett, Mayfield Heights, Ohio; Jerome R. Cox, Jr., St. Louis; Donald L. Snyder, Clayton, both of Mo., and Rodney A. Mattson, Mentor, Ohio, assignors to Picker Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 559,411, March 18, 1975, Pat. No. 3,976,885. This application Nov. 28, 1975, Ser. No. 635,952

Int. Cl.² G01M 23/00

U.S. Cl. 250—445 T

41 Claims



1. Transverse section scanning apparatus for scanning coplanar points of a body with a set of beams of X-radiation, having axes substantially in a plane containing the points, comprising:
 - a. a support structure including means to rotate one section of the structure about a system axis;
 - b. radiation source means carried by the one section and including a source axis positioned at a distance d from the system axis, the source means being for providing a plurality of N beams of radiation directed substantially radially of the source axis in the plane, the outermost beams subtending a radiation field of $N-1/2 \alpha^\circ$ on either side of a radiation field center line, where α is the angular separation between axes of adjacent beams;
 - c. radiation detector means carried by the one section and adapted to measure the intensity values of said beams;
 - d. said one section maintaining said radiation source means and said radiation detector means in spaced alignment about the system axis as a study is conducted, said support structure further including:
 - i. offsetting means for relatively positioning said radiation source means and said radiation detector means such that said field line center is displaced a predetermined distance D from said source axis to offset all beams of radiation from said system axis;
 - ii. the support structure including orbiting means for rotating the one section, the radiation source means and the radiation detector means through substantially a one revolution orbital path about the system axis during the study, and for maintaining the distance D substantially constant during an orbit of the source means and the detector means; and,
 - e. data collection means, including said radiation detector means, for collecting values of intensities of said beams at predetermined orbital positions of said radiation source means and radiation detector means as about said orbital center, wherein said displacing said field line center by said predetermined distance D allows the collection of nonduplicate data throughout the substantial orbit of one revolution.

4,008,401

U. V. CURING SYSTEM

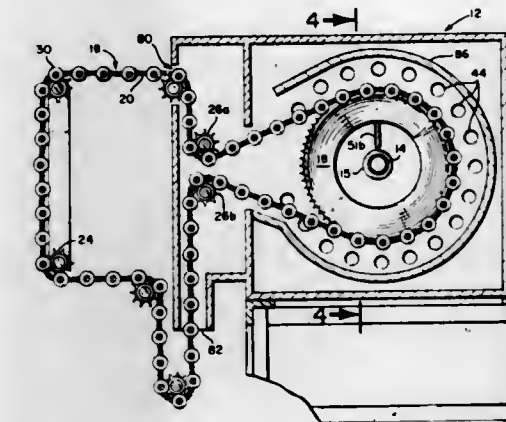
George H. Holoubek, and Henry A. Burzlaff, both of Muscatine, Iowa, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Oct. 1, 1975, Ser. No. 618,702

Int. Cl.² G01M 21/00

U.S. Cl. 250—453

9 Claims



8. A method for curing resin coated articles comprising:
 - successively positioning resin coated articles upon stationary mounting means on an endless conveyor outside of a housing;
 - aligning said articles so that the longitudinal axis thereof is parallel and coextensive with the longitudinal axis of an elongated radiation source;
 - conveying said articles into the housing; and,
 - revolving said articles about a curved pathway located concentric with the longitudinal axis of said radiation source and in a plane perpendicular to said axis;
 - simultaneously maintaining said articles stationary on said mounting means thereby exposing substantially the entire exterior surfaces of said articles to direct radiation from said radiation source;
 - curing said resin; and,
 - conveying said articles outside the housing for removal from said mounting means.

4,008,402

METHOD AND APPARATUS FOR ELECTRON BEAM ALIGNMENT WITH A MEMBER BY DETECTING X-RAYS

Terrence W. O'Keefe, and Alan J. Simon, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

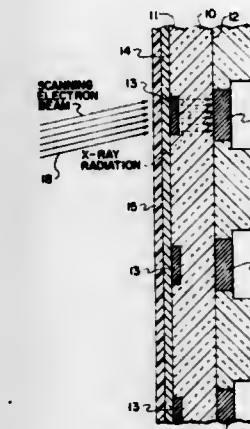
Filed July 18, 1974, Ser. No. 489,638

The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

Int. Cl.² H01J 29/50, 31/49

U.S. Cl. 250—492 A

16 Claims



1. A method of precision aligning an electron beam with selected areas of a major surface of a member comprising the steps of:

- A. forming adjacent a major surface of a member a plurality of marks of predetermined shape capable of generating x-ray radiation on irradiation by an electron beam corresponding to the area of the mark irradiated;
- B. irradiating at least one of the marks with a corresponding alignment beam portion of an electron beam to be aligned, said alignment beam portion having a predetermined cross-sectional shape;
- C. detecting x-ray radiation emissions from said irradiated mark; and
- D. moving the electron beam relative to the member until the x-ray radiation emissions detected in accord with step C indicate alignment of the alignment beam portion with the corresponding mark.

4,008,403

SAFETY CIRCUIT AND SOCKET CONSTRUCTION

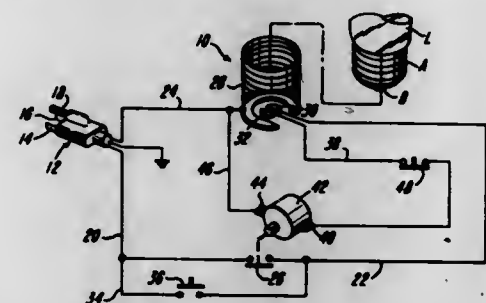
Manning I. Rose, 2301 Glenheath, Dayton, Ohio 45440

Filed Sept. 30, 1974, Ser. No. 510,215

Int. Cl.² H01H 47/00

U.S. Cl. 307-113

11 Claims



1. In apparatus for connecting electrical load devices having two terminals to an electrical energy source of the type having a socket having first contact means for engaging one of said terminals and second contact means for engaging the other of said terminals, circuit means including a make switch which, when said make switch is closed, is adapted to operatively connect said socket to an electrical energy source, and electrically operable means adapted to be energized upon closure of said make switch, the improvement wherein said make switch is a normally open momentary switch, said circuit means includes a holding switch closed when said electrically operable means is energized so that said socket is operatively connected to the source, and wherein one of said socket contact means comprises two contact parts that are electrically interconnected when a load device is in said socket and electrically unconnected when no load device is in said socket, said two contact parts being electrically connected to said electrically operable means and the source so that said electrically operable means will be in an energized state when said momentary make switch is opened only if said two contact parts are electrically interconnected when said make switch is closed and only so long as said two contact parts remain electrically interconnected.

4,008,404

INTERVAL TIMER

Donald S. Foreman, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 29, 1975, Ser. No. 644,669

Int. Cl.² G08G 1/07

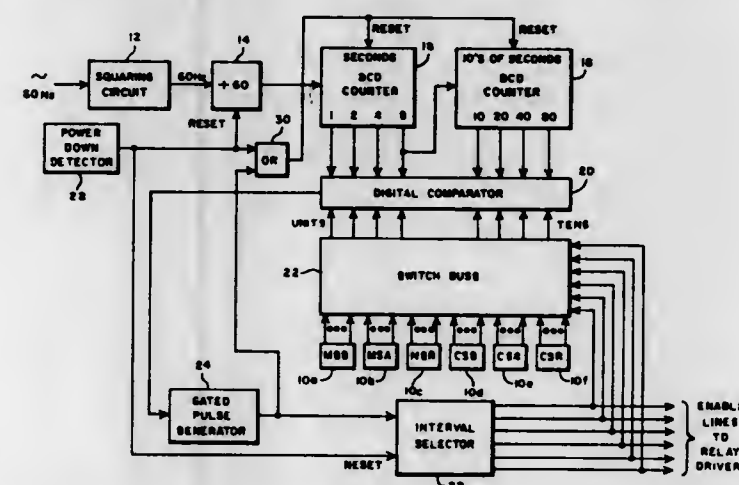
U.S. Cl. 307-149

13 Claims

1. A traffic controller for providing a set of traffic control output signals for each interval of a sequence of timed intervals, the traffic controller comprising:
 - interval select means for selecting a particular interval, the selected interval having an associated set of traffic control output signals;
 - clock means for producing clock signals;
 - counter means for counting in response to the clock signals;

interval timing means for providing for each selected interval, a number indicative of a desired time duration of the selected interval;

comparator means for switching from a first to a second state when the count of the counter equals the number provided by the interval timing means; and



gated pulse generator means for generating a control pulse to cause the interval select means to select another one of the intervals, the gated pulse generator means providing the control pulse when the comparator means remains in the second state for greater than a predetermined time.

4,008,405

MOTION DETECTION CIRCUIT FOR ELECTRONIC WEIGHING SYSTEM

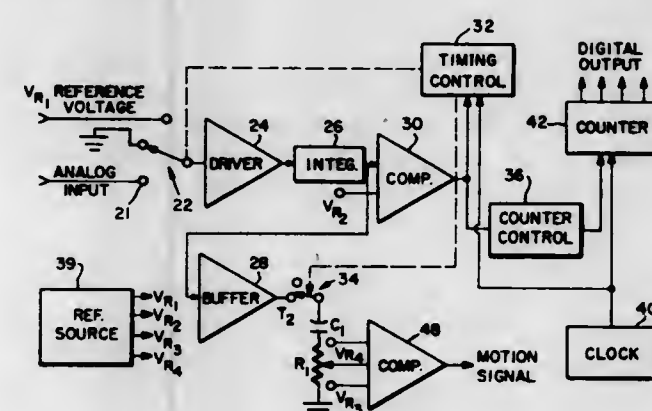
Leopold Neumann, Lexington, and Bernard M. Gordon, Magnolia, both of Mass., assignors to Analogic Corporation, Wakefield, Mass.

Filed June 5, 1975, Ser. No. 584,052

Int. Cl.² H03K 5/20, 5/153

U.S. Cl. 307-231

6 Claims



1. For use in an electronic digitizer, circuitry for detecting the rate of change of an analog input signal and providing a digital logic signal representation thereof, comprising:

a dual-slope analog-to-digital converter operative in successive conversion cycles and having an integrator which integrates the analog input signal during a fixed-length sampling interval and which integrates a reference signal during a variable-length second interval, the ratio of the two intervals being digitally determined to provide a digital representation of the magnitude of the analog input signal;

means for storing an analog representation of the output signal from the integrator of the dual-slope converter between the sampling and second intervals of a first conversion cycle;

means operative in response to the stored analog representation and to the integrator output between the sampling and second intervals of a second conversion cycle succeeding said first conversion cycle for producing a signal representative of the difference therebetween;

means for providing a predetermined reference threshold; and

means for comparing said reference threshold with said difference signal to provide a digital output signal indicative of whether the rate of change of the analog input signal falls within preselected limits as determined by the reference threshold.

4,008,406

ELECTRONIC CIRCUIT USING FIELD EFFECT TRANSISTOR WITH COMPENSATION MEANS

Hiroto Kawagoe, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

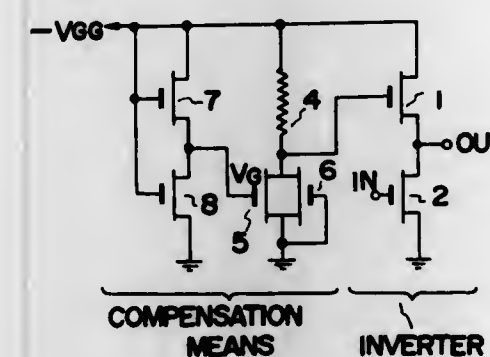
Filed Sept. 11, 1975, Ser. No. 612,354

Claims priority, application United Kingdom, Nov. 7, 1974, 48264/74

Int. Cl.² H03K 3/353, 17/14, 19/08, 19/40

U.S. Cl. 307-304

18 Claims



1. In an electronic circuit having first and second field effect transistors connected in series between a terminal for connecting a source of reference potential and a terminal for connecting a power supply source thereto,
 - a third field effect transistor, the source electrode of which is connected to said reference potential terminal, the gate electrode of which is connected to a bias voltage terminal, and the drain electrode of which is connected to the gate electrode of said second field effect transistor,
 - a resistor connected between the drain electrode of said third field effect transistor and said power supply source terminal,
- the improvement comprising:
- first resistance means connected between said power supply source terminal and the gate electrode of said third field effect transistor for supplying said bias voltage to the gate of said third field effect transistor for improving the third transistor's response to unfavorable voltage fluctuations of said power supply.

4,008,407

NUCLEAR THERMIONIC CONVERTER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention by; Wayne M. Phillips, La Crescenta, and Jack F. Mondt, La Canada, both of Calif.

Filed Oct. 3, 1972, Ser. No. 294,727

Int. Cl.² H01J 45/00

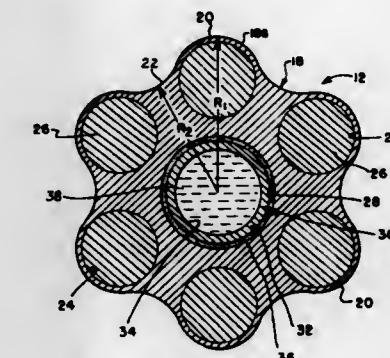
U.S. Cl. 310-4 R

5 Claims

1. Thermionic reactor apparatus comprising:

a rod having a central passage with the walls thereof emitting material, and having a plurality of fuel passages located between the central passage and the periphery of the rod, the periphery of said rod undulating in radius and having maximum radii along imaginary radial lines pass-

ing through the fuel passages and minimum radii along imaginary radial lines passing between adjacent fuel passages;



nuclear fuel disposed in said fuel passages; and

a collector disposed in said central passage.

4,008,408

PIEZOELECTRIC ELECTRO-ACOUSTIC TRANSDUCER

Akihiko Kodama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

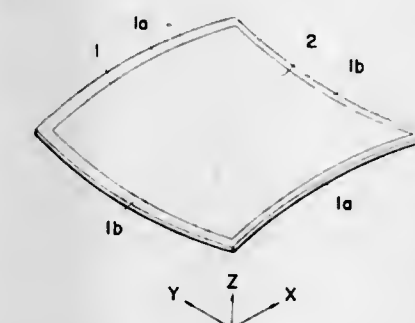
Filed Feb. 24, 1975, Ser. No. 552,140

Claims priority, application Japan, Feb. 28, 1974, 49-22866

Int. Cl.² H01L 41/08

U.S. Cl. 310-9.1

2 Claims



1. A piezoelectric electro-acoustic transducer, comprising:
 - a piezoelectric diaphragm;
 - a rigid endless framelike support member surrounding an opening therethrough spanned by said diaphragm, said endless framelike support member being nonplanar and including a portion along its length which is curved generally in the direction of the axis of said opening, the peripheral edge of said diaphragm being attached to said endless framelike support member and following the curvature of said portion thereof, the surface of said diaphragm being correspondingly curved to a nonplanar condition by its edge attachment to said rigid nonplanar framelike support member so as to impart at least one of tension and resiliency to said diaphragm, said nonplanar frameline support member including opposed first side portions curved in one direction and opposed second side portions curved in the opposite direction, said diaphragm being held in a saddle-shape by such curvature of said first and second support member portions.

4,008,409

DYNAMOELECTRIC MACHINE CORE AND COIL ASSEMBLY

Ralph G. Rhudy, and Hans H. Casanova, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 9, 1975, Ser. No. 566,454

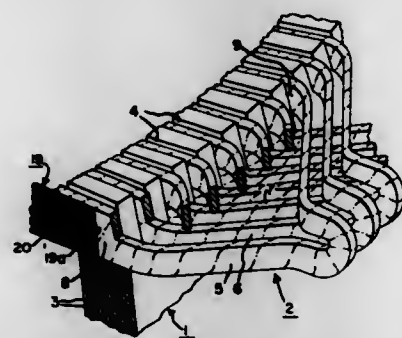
Int. Cl.² H02K 15/12

U.S. Cl. 310-45

7 Claims

1. A dynamoelectric machine core and coil winding assembly comprising a core stack of magnetic metal laminations formed with coil-receiving slots therein, an electrical winding of interconnected coils having their sides disposed, respectively, in said slots and having their end turns extending beyond the ends of the core stack, a rigid coating of insulating material disposed around each coil side to insulate the coils from the core stack, in combination with generally flat mats of semi-conducting material each having a plurality of ridges of

electrically semi-conductive, pressure-deformable room temperature vulcanizing silicone rubber bonded to one side thereof, said rubber bonded to the mats comprising 50 to 80 percent by weight silicone rubber loaded with 20 to 30 per-



cent carbon powdered material, said mats being positioned respectively, one in each of said slots with the rubber coated side of each mat compressed against the side of a slot by the coil side mounted therein.

4,008,410

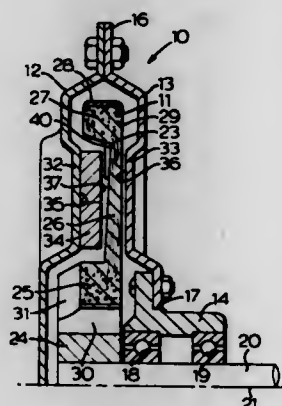
COMMUTATOR FOR DISCOIDAL ARMATURE

Eric Whiteley, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada
Filed Mar. 6, 1975, Ser. No. 556,117

Claims priority, application Canada, Mar. 13, 1974, 194870
Int. Cl.² H02K 13/04

U.S. Cl. 310-237

6 Claims



1. A discoidal armature for a dynamoelectric machine comprising a plurality of stranded coils disposed overlapping in a flat, circular array and bonded together by means of a strong, adherent, non-conductive bonding medium to provide a rigid discoidal structure having an annular disc portion containing the coil sides and integral with coaxial inner and outer ring portions containing the coil end-heads, each one of said coils having sides disposed radially at approximately one pole pitch and having the strands of the sides diverge in the plane of said disc portion from said inner ring portion to said outer ring portion so as to provide an annular disc portion having flat outer surfaces that converge from said inner ring portion to said outer ring portion; commutating means for said structure characterized by at least one annular array of commutator segments on said disc portion adjacent said outer ring portion and connected in circuit with said coils; and a strong, adherent, non-conductive bonding medium bonding said segments to said discoidal structure.

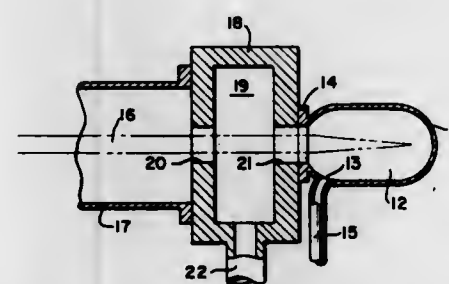
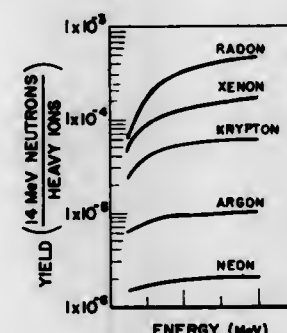
4,008,411
PRODUCTION OF 14 MEV NEUTRONS BY HEAVY IONS
Robert M. Brugger, Columbia, Mo.; Lowell G. Miller, and Robert C. Young, both of Idaho Falls, Idaho, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 8, 1975, Ser. No. 594,166

Int. Cl.² H01J 39/22

U.S. Cl. 313-61 R

9 Claims



7. A neutron generator for the production of approximately 14 MeV neutrons comprising:

- a target housing enclosing a target chamber and having therein an access port and a beam port;
- means for introducing a deuterium-tritium mixture target into said target chamber through said access port;
- means for accelerating heavy ions; and
- means for introducing said accelerated heavy ions into said target chamber through said beam port so as to impinge upon said mixture to produce recoil deuterons and tritons which interact with atoms of tritium and deuterium in said mixture to produce approximately 14 MeV neutrons.

4,008,412

THIN-FILM FIELD-EMISSION ELECTRON SOURCE AND A METHOD FOR MANUFACTURING THE SAME

Isamu Yuito, Hachioji; Kikuiji Sato, Kokubunji, and Mikio Hirano, Ohme, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Aug. 18, 1975, Ser. No. 605,603

Claims priority, application Japan, Aug. 16, 1974, 49-93297

Int. Cl.² H01J 1/02

U.S. Cl. 313-309

19 Claims



1. A thin-film field-emission electron source comprising a conductive substrate having a minute cavity, a needlelike emitter within said cavity, an insulating layer on the surface of said substrate except for the portion of said cavity, and a first anode layer on said insulating layer, wherein said emitter and said substrate are formed as a single body, and said insulating layer and said first anode layer overhang said cavity around the projection of said emitter except over said emitter.

4,008,413
COMPACT HIGH VOLTAGE FEEDTHROUGH FOR GAS DISCHARGE DEVICES

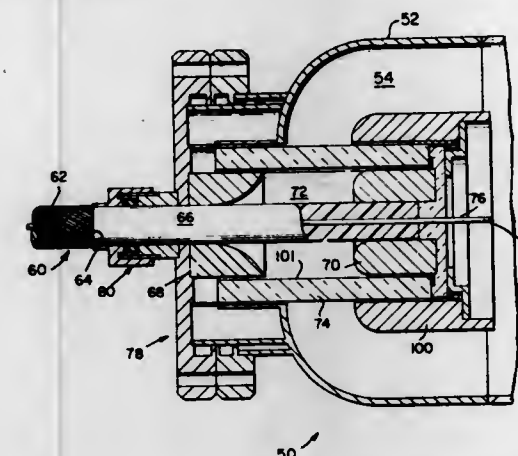
John R. Bayless, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 3, 1975, Ser. No. 553,875

Int. Cl.² H01J 19/62

U.S. Cl. 313-331

4 Claims



1. A high voltage feedthrough for a gas discharge device, comprising:
 - a gas discharge device having a hole in which a coaxial cable, with at least one center conductor, is inserted;
 - a plurality of electric field shaping electrodes with an inter-electrode space therebetween, a gas in said interelectrode space;
 - said device having a horizontal axis extending through it;
 - said shaping electrodes being substantially cylindrically shaped and positioned around said axis;
 - said shaping electrodes having a hole through their centers, said cable extending through said holes; said cable being secured in place by said shaping electrodes;
 - ends on said shaping electrodes, which are perpendicular to said axis and face each other, having curved edges to prevent breakdown between said electrodes;
 - a high voltage electrode;
 - a tubular insulator between said high voltage electrode and said shaping electrodes, said insulator having an inner and an outer surface; said inner surface facing said shaping electrodes and said outer surface facing said high voltage electrode;
 - said insulator having a space between its inner surface and said shaping electrodes, gas being in said space to prevent breakdown between said shaping electrodes.

4,008,414

CIRCUIT FOR POWERING FLUORESCENT LAMPS
Donald L. Agnew, Long Beach, Calif., assignor to Power Saver Corporation, Bellflower, Calif.

Filed July 28, 1975, Ser. No. 599,378

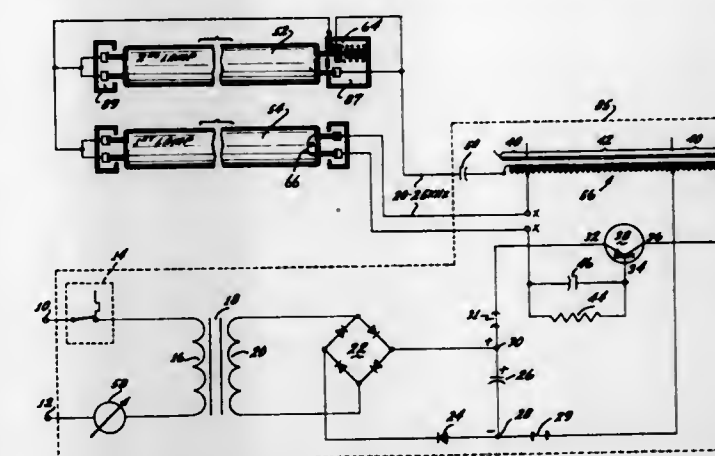
Int. Cl.² H05B 41/24, 41/29

U.S. Cl. 315-97

14 Claims

1. Apparatus for powering first and second fluorescent lamps connected in series, said lamps each having a starter heater filament, comprising:
 - a pair of sockets associated with each lamp, each socket having a terminal for making electrical connection to a lamp, with one of the terminals associated with each lamp connected in common;
 - an oscillator including two output terminals each of which is connected to the terminal of a socket associated with a different lamp but not to the terminals connected in common, and further including a feedback circuit including means for connecting a starter heater filament of the first lamp in series within the feedback circuit, whereby removal of the first lamp from its sockets disables said oscillator; and
 - switching means for establishing a short circuit between the socket terminals of the second lamp when the lamp is

removed from its sockets, whereby the socket terminals of the socket lamp are bypassed permitting power to



continue to be applied to the socket terminals of the first lamp after the second lamp has been removed from its sockets.

4,008,415

PHOTOCONTROL FOR ELECTRIC LAMPS

Antonio De Avila-Serafin, and Francisco Javier Diaz-Romo, both of Guadalajara, Mexico, assignors to Electrotec de Occidente, S.A., Guadalajara, Mexico

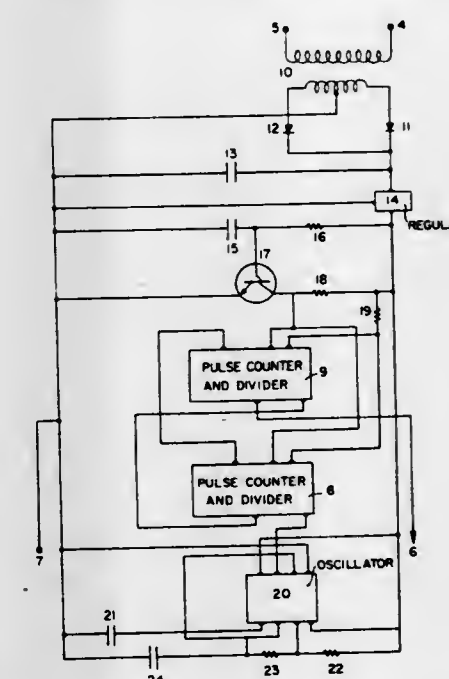
Filed Dec. 11, 1974, Ser. No. 531,835

Claims priority, application Mexico, Dec. 14, 1973, 148214

Int. Cl.² H05B 39/02

U.S. Cl. 315-156

5 Claims



1. A photocontrol system, comprising:
 - a circuit means having power supply terminals for connection with a source of electrical energy and load terminals for connection with an electrical load;
 - switch means connected in the circuit means to control supply of current to the load terminals;
 - electrical means controlling operation of said switch means;
 - solid state electronic timer means connected between the load terminals and comprising a pulse generator which generates pulses at a predetermined frequency, beginning when current is supplied to the load terminals, and counting means which count the pulses generated by the pulse generator and provide an output signal when a preset count has been reached after beginning counting;
 - control means connected to respond to said output signal by causing said electrical means to bring about opening of the switch means; and

f. photoelectric means respective to the intensity of ambient light to cause the electrical means to maintain the switch means open independently of said control means until the level of ambient light falls below a predetermined level, whereby when said power supply terminals are connected with a source of electrical energy and the intensity of ambient light falls below said predetermined level, said photoelectric means automatically cause said switch means to close and remain closed until said preset count is reached or the intensity of ambient light once more reaches said predetermined level, which ever is sooner, whereupon said switch means are automatically opened and remain open until the intensity of ambient light falls once more below said predetermined level.

4,008,416

CIRCUIT FOR PRODUCING A GRADUAL CHANGE IN CONDUCTION ANGLE

Heary H. Nakasone, 1672 Camrose Way, Anaheim, Calif. 92802

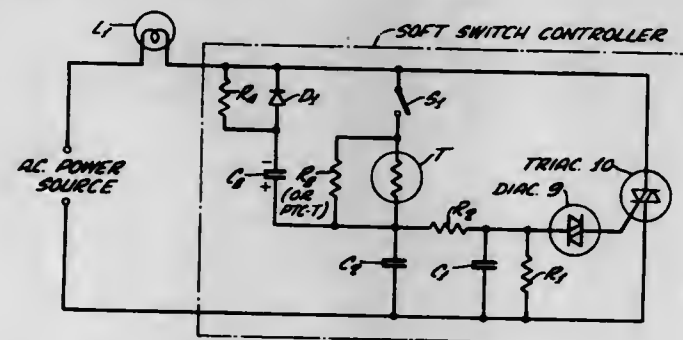
Continuation-in-part of Ser. No. 364,693, May 29, 1973, Pat. No. 3,898,516. This application July 14, 1975, Ser. No. 595,585

The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.² H05B 39/02

U.S. Cl. 315-194

7 Claims



1. A soft switch comprising:
a solid state switching device having gate terminal means for altering the impedance between a pair of main terminals from a high impedance state to a low impedance state;
means for connecting said solid state switching device in series with a load and an A-C power source;
a switch having an ON position and an OFF position said switching having one terminal operatively connected to the junction connecting the load with said solid state switch device;
means operatively connected to said switch and the gate terminal of said solid state switching device for actuating said solid state switching device so as to cause said solid state switching device to delay conduction beyond the peak of the first complete A-C half cycle following the closure of said switch to the ON position, and
for causing said solid state switching device to smoothly and progressively increase its conduction duration with each half cycle of the A-C source following the initial conduction.

4,008,417

PHASE LOSS DETECTOR

James P. Donovan, Louisville, Ky., assignor to General Equipment and Manufacturing Company, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 492,542, July 29, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 616,911

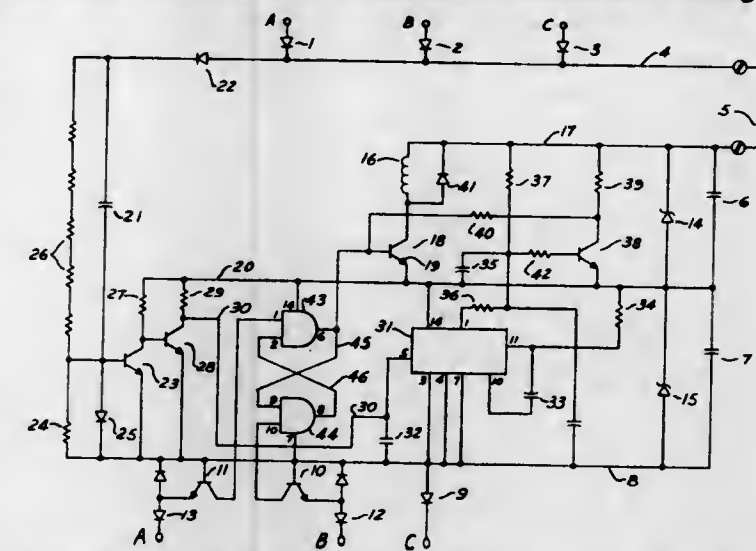
Int. Cl.² H02H 3/24

U.S. Cl. 361-53

5 Claims

1. In a circuit to detect improper voltages on a multiphase A.C. power line, in combination, a multiphase full wave diode bridge rectifier having its input arranged to be connected to the power lines to be monitored and having output terminals,

a resistance load connected across the output terminals of the bridge rectifier whereby current flows continuously there-through, a condenser and a first resistor connected in series across said output terminals, a discharge resistor connected across the condenser, a monostable multivibrator having a



timing interval less than the time interval of one cycle of the ripple voltage of the bridge rectifier, means for triggering the multivibrator in response to current flow in said first resistor, a relay, and switching means connected to the multivibrator arranged to energize the relay according to the time the multivibrator is in its unbalanced state.

4,008,418

HIGH VOLTAGE TRANSIENT PROTECTION CIRCUIT FOR VOLTAGE REGULATORS

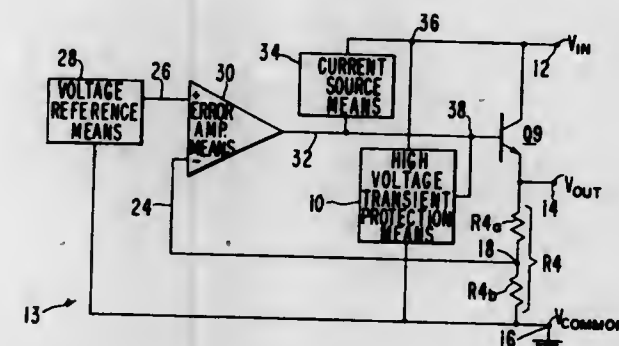
Howard E. Murphy, Redwood City, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 2, 1976, Ser. No. 663,017

Int. Cl.² H02H 3/28

U.S. Cl. 361-18

9 Claims



7. An improved series pass voltage regulator of the type possessing an input terminal, an output terminal, a common terminal and a series pass transistor having an emitter, a collector and a base, said emitter and said collector operatively connected across said input and said output terminals, a voltage divider having an intermediate voltage tap connected across said output and said common terminals, a current source connected between said input terminal and said base, an error amplifier having an output connected to said base, one input connected to said intermediate voltage tap and another input connected to a voltage reference, wherein the improvement comprises:

a first NPN transistor having an emitter, a collector and a base, said emitter and said collector of said first transistor operatively connected between said base of said series pass transistor and said common terminal; and
means connected between said input terminal and said base of said first transistor for biasing said first transistor into conduction in response to a voltage transient applied at said input terminal whose magnitude exceeds a selected

value, whereby said base of said series pass transistor is protectively coupled to said common terminal during said voltage transient, said means including

a second NPN type transistor having an emitter, a collector and a base, said second emitter connected to said first base;

a third PNP type transistor having an emitter, a collector and a base, said third collector connected to said second base forming a first control node, said third base connected to said second collector;

a first resistor connected between said first control node and said second emitter;

a second resistor connected between said third emitter forming a second control node thereat and said third base; and

a plurality of zener diodes connected in series, anode to cathode, possessing an end anode terminal, an end cathode terminal and at least one intermediate diode connection terminal, said end anode terminal connected to said input terminal of said series pass voltage regulator, said end cathode connected to said first control node and a selected said at least one intermediate diode connection terminal connected to said second control node.

4,008,420

SWITCHABLE HIGH-FREQUENCY MAGNETIC ROTARY FIELDS

Franz Navratil, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

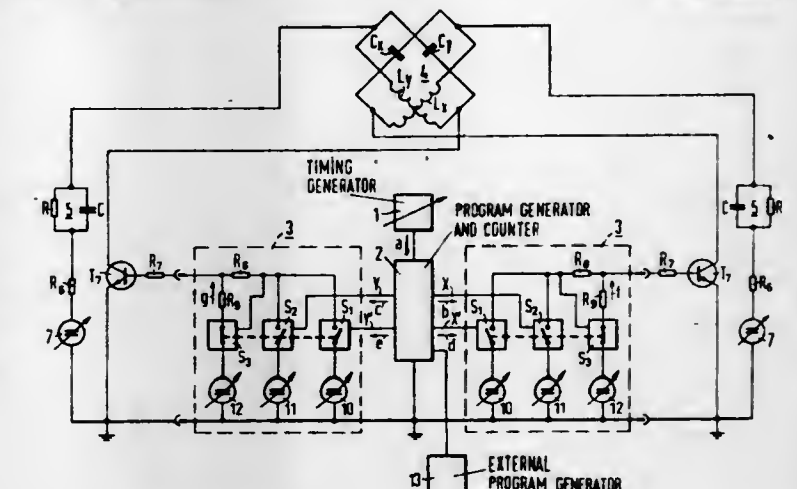
Filed July 21, 1975, Ser. No. 597,664

Claims priority, application Germany, July 22, 1974, 2435245

Int. Cl.² H01H 47/00

U.S. Cl. 361-153

4 Claims



1. An arrangement for producing a switchable high frequency magnetic rotary field, comprising:
a pair of crossed coils; a separate capacitance connected across each of said coils to form respective parallel resonant circuits,
each resonant circuit having in series therewith a timing device, a controllable voltage source and a resonant circuit switch,
said resonant circuit switches being triggerable by fixed phase pulses and pulse successions which are displaced by 90° therewith, respectively, a program generator,
means for feeding a timing pulse succession to said program generator, said program generator supplying starting and stopping pulses and operational pulse successions,
each resonant circuit switch including first and second switching stages coupled in parallel with each other, the first switch stage being responsive to the starting and stopping pulses from the program generator,
the second switch stage being responsive to the operation pulse succession from the program generator,
controllable voltage sources of like polarity being connected in series with each of said first and second switching stages, and means for superimposing a direct voltage of opposite polarity onto the starting, stopping and operation pulses.

4,008,421

METHODS AND APPARATUS FOR SPEED-CONTROL OF INDUCTION MOTORS

Brian Michael Bird, Bristol, England, assignor to National Research Development Corporation, England

Filed Jan. 31, 1975, Ser. No. 546,113

Claims priority, application United Kingdom, Feb. 1, 1974, 4768/74

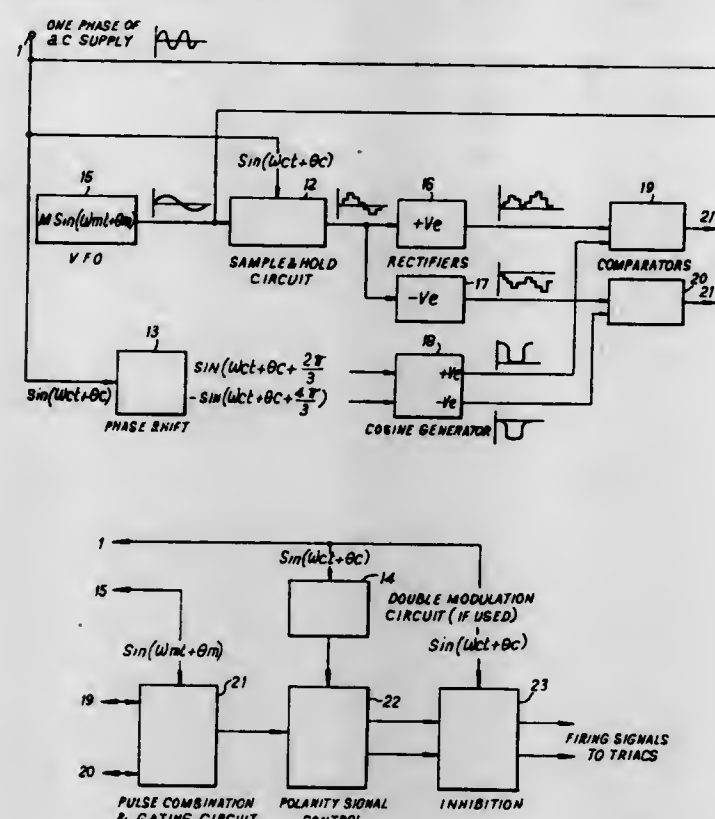
Int. Cl.² H02P 5/34

U.S. Cl. 318-171

10 Claims

1. A substantially flat protective shield for a control device having a housing provided with a selector knob and dial arrangement adjacent said knob as well as electrical terminal means adjacent said knob and dial arrangement, said protective shield being adapted to be secured to said control device and cover said terminal means, said shield having opening means therethrough adapted to expose said dial arrangement and have said selector knob project therethrough so that a tongue portion of said knob can overlap said shield to hold said shield to said control device, said opening means being substantially rectangular to define two pair of opposed side edges bordering said opening means, one of said opposed side edges of one pair of side edges having a concave portion thereof adapted to face said knob and complement the telescoping portion of said knob, said shield comprising a flat blank of electrical insulating material having opposed flat parallel sides without any projections therefrom.

modulating wave, comparing the instantaneous amplitudes of said rectified, stepwise varying modulating wave and a cosine wave of supply frequency and of equal maximum amplitude as



said modulating wave and switching said energising current to flow solely during those intervals between equality of the two said waves and the next following zero amplitude time of the said cosine wave.

4,008,422

FRACTIONAL HORSEPOWER BRUSHLESS DIRECT CURRENT MOTOR

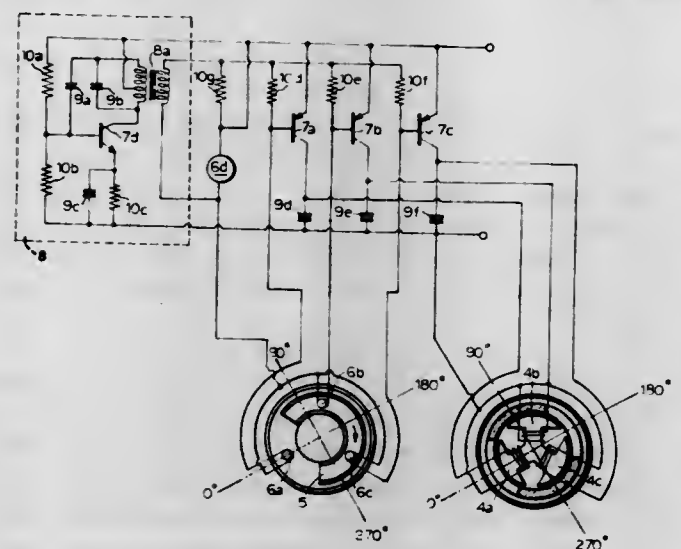
Kinzo Sodekoda, Omiya, and Norikazu Taguchi, Shobumachi, both of Japan, assignors to Tanaka Instrument Co., Ltd., Yono, Japan

Filed Oct. 18, 1974, Ser. No. 516,197

Claims priority, application Japan, Mar. 18, 1974, 49-18500; Feb. 18, 1974, 49-18501; Feb. 18, 1974, 49-18551[U]

Int. Cl.² H02K 29/00

U.S. Cl. 318-138



1. A brushless direct current fractional horsepower motor, comprising in combination:
a housing and a cover therefor;
a stator within the housing having three stationary windings arranged around the periphery of the motor;

a permanently magnetized rotor rotatable therebetween; detector means around said rotor for detecting the position of said rotor relative to said stator windings, said detector means comprising three detecting coils fixed on said stator and a rotational sector-shaped transducer rotatable with said rotor past said coils;
a resistor in series with each detecting coil;
a dummy coil spaced from said rotor and a further resistor in series therewith;
a source of high frequency alternating current connected in parallel to the respective series connected coils and resistors;
three switching transistors having the collectors coupled to the stationary windings, having the bases connected to the junctions between the detecting coils and associated resistors and having the emitters connected in common to the junction between the dummy coil and further resistor; and
a source of power across which the emitters of the switching transistors and the three stationary windings are coupled in parallel.

4,008,423

ELECTRICALLY PROPELLED VEHICLE

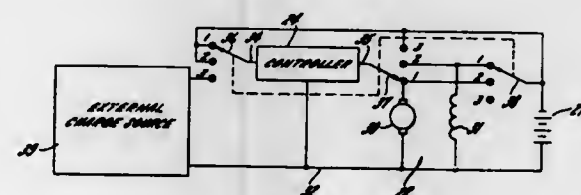
Clinton C. Christianson, Minnetonka, Minn., and Robert F. Bourke, Wilson, Wis., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 11, 1975, Ser. No. 548,911

Int. Cl.² H02P 5/06

U.S. Cl. 318-139

26 Claims



1. A propulsion system for an electrical vehicle comprising in combination, a propulsion battery, a separately excited d.c. motor for propelling the vehicle, said motor having an armature winding and a field winding, a proportional controller, control signal producing means responsive to a command signal and a signal indicative of a motor operating condition for increasing or decreasing the operating level of the controller to drive the motor in accordance with the command signal, switching means for establishing a motor circuit including an armature control mode and a field control mode, said switching means including means for interposing the controller between the battery and the armature and means for coupling the field to the battery in said armature control mode, said switching means further including means for interposing the controller between the battery and the field and means for coupling the armature to the battery in said field control mode, means for detecting the maximum operating level of the controller, and means responsive to said detecting means and said control signal producing means and operative upon said switching means for causing said switching means to switch from one of said modes to the other of said modes when said controller is at maximum operating level and said control signal producing means requires a further increase in said operating level, whereby said controller is safely switched between modes to control the motor in respective armature and field control modes.

4,008,424

BIDIRECTIONAL SPEED CONTROL SYSTEM

Gian Battista Bompani, Montale Rangone (Modena), Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

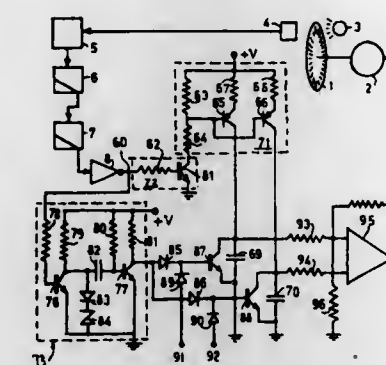
Filed Jan. 2, 1974, Ser. No. 430,249

Claims priority, application Italy, Dec. 28, 1972, 3377/72

Int. Cl.² H02P 5/06

U.S. Cl. 318-293

13 Claims



1. A bidirectional speed regulation system for a d.c. motor, comprising:
a transducer device for supplying pulses having a frequency related to the motor speed;
circuit means for comparing the period of said pulses with a reference period and for supplying periodic pulses whose duration is equal to the difference between said reference period and said period related to the motor speed;
a constant current generator fed by a voltage source, said generator having two independent output leads for providing a current of the same polarity on each lead;
circuit means for supplying a short control pulse in coincidence with each of said periodic pulses;
a pair of capacitors, each connected to one of said independent output leads;
a switching device controlled by said periodic pulses, for controlling the charge on said pair of capacitors, during the duration of said periodic pulses;
a pair of switching devices for short circuiting said pair of capacitors for the whole duration of said control pulses;
a conditioning logic circuit, controlled by external signals for selectively controlling said pair of switching devices and for selectively short circuiting, for the whole duration of said external signals, either one of said pair of capacitors; and
an operational amplifier for driving said motor, said amplifier including an inverting and a non-inverting input lead, an output lead connected to said motor and coupled through a feedback path to said inverting input lead, each of said input leads being connected to one of said pair of capacitors through a separate resistor so as to be coupled to ground through its resistor whenever the corresponding capacitor is short circuited.

4,008,425

MOTOR SERVO SYSTEM WITH MULTIPLIER MEANS TO DRIVE AND SERVO THE MOTOR

Baron Christian Dickey, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 9, 1975, Ser. No. 539,781

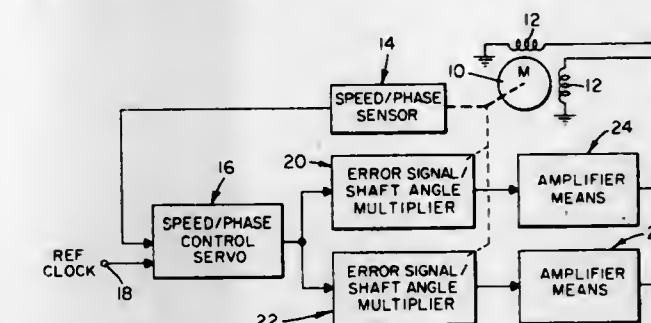
Int. Cl.² H02P 5/06

U.S. Cl. 318-314

6 Claims

1. A servo/drive system for introducing sinusoidal drive signals to the windings of a motor having at least two windings, comprising the combination of;
tachometer means coupled to the motor for generating a tachometer signal indicative of the speed/phase characteristics and thus of the rotational error of the motor;
speed/phase control servo means coupled to the tachometer means;

means for providing a reference clock to the speed/phase control servo means, wherein the speed/phase control servo means generates the error signal by a comparison of the signal from the tachometer means and the reference clock;
error signal/shaft angle multiplier means including at least two Hall element means integral with the motor and coupled to the speed/phase control servo means and to respective windings of the motor with no switching therebetween, the multiplier means being responsive to the angular position of the rotor to inherently generate within the multiplier means sinusoidal drive signals for each



respective winding which are the product of the instantaneous rotational error of the motor times the instantaneous angular position of the motor shaft;
means for continuously introducing the sinusoidal drive signals to each of respective motor windings simultaneously, and including amplifier means continuously coupled between the error signal/shaft angle multiplier means and each of the motor windings; and
said sinusoidal drive signals having amplitudes proportional to the signals indicative of the rotational error, and phase proportional to the motor angular position, which drive signals provide both motor drive and servo control for the motor.

4,008,426

ELECTRONIC SPEED CONTROL SYSTEMS FOR MINIATURE DIRECT CURRENT MOTORS

Makoto Ogura, Kawasaki, Japan, assignor to Jeco Co., Ltd., Kawasaki, Japan

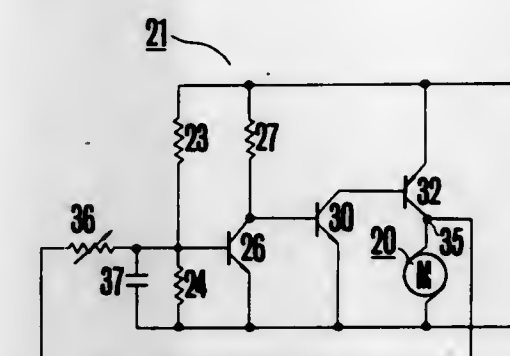
Filed Nov. 20, 1975, Ser. No. 633,869

Claims priority, application Japan, Nov. 28, 1974, 49-143050[U]; Jan. 14, 1975, 50-7201[U]; Feb. 18, 1975, 50-21499[U]; Feb. 20, 1975, 50-22493[U]; June 3, 1975, 50-74293[U]; Nov. 5, 1975, 50-133437

Int. Cl.² H02P 7/00

U.S. Cl. 318-331

29 Claims



1. An electronic speed control system for a miniature direct current motor comprising a first bipolar transistor of the first type, second and third bipolar transistors of the second type, a source of supply having first and second terminals, means for connecting the emitter electrode of the first transistor to the first terminal of the source, means to connect the collector electrode of the first transistor to the second terminal of said source through the brush and commutator of said motor, means to connect the base electrode of said first transistor to the base electrode of said second transistor, and means to connect the base electrode of said third transistor to the base electrode of said second transistor.

the collector electrode of said second transistor, means to connect the emitter electrode of the second transistor to the second terminal of the source, means to connect the base electrode of the second transistor to the collector electrode of the third transistor, means to connect the collector electrode of the third transistor to the first terminal of the source through a first resistor, means to connect the emitter electrode of the third transistor to the second terminal of the source, means to connect the base electrode of the third transistor to the juncture between second and third resistors which are connected in series across the first and second terminals of the source, and means to connect the base electrode of the third transistor to the juncture between the collector electrode of the first transistor and said motor through a fourth resistor.

4,008,427

VARIABLE INPUT POWER SUPPLY

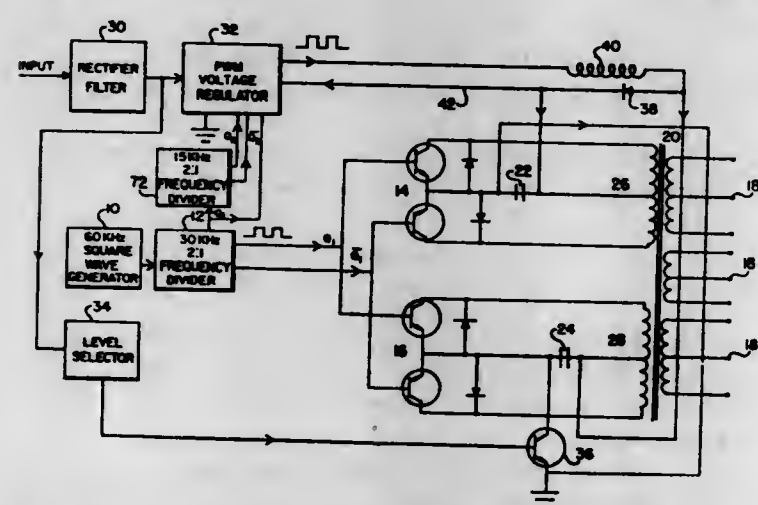
Leopold J. Johnson, Escondido, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 29, 1975, Ser. No. 617,924

Int. Cl.² H02M 7/537

U.S. Cl. 321-18

7 Claims



1. A power supply providing a regulated output voltage over a range of input voltages, said power supply comprising:
a rectifier circuit means having input terminals for receiving AC and DC input voltages and producing a DC output voltage of constant polarity;
a voltage regulator means connected to the output of said rectifier circuit means having a feedback input means for generating a series of voltage pulses wherein for a given voltage applied to said feedback input means, the time duration of each pulse is inversely proportional to said voltage regulator means input voltage;
a plurality of filter means connected to the output of said voltage regulator means, each of said filter means having an output;
sensing means connected to the input of said voltage regulator means for sensing variations in the input voltage to said voltage regulator means;
control means connected to said sensing means and to each of said filter means for selectively coupling said series of voltage pulses to a given one of said filter means;
feedback means connected from each of said outputs of said filter means to said feedback input means of said voltage regulator means;
coupling means connected to each of said outputs of said filter means and to the output of said power supply for transferring power from each of said outputs of said filter means to said output of said power supply.

4,008,428 CIRCUIT ARRANGEMENT WITH A NUMBER OF FREQUENCY CONVERTERS, PARTICULARLY Y-CONNECTED DIRECT FREQUENCY CONVERTERS

Hermann Waldmann, and Manfred Weibelzahl, both of Weiber, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

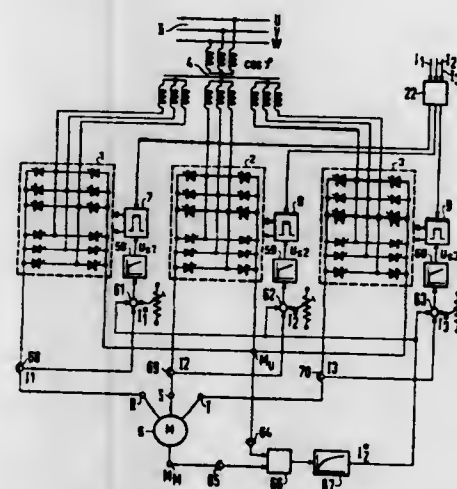
Filed Jan. 7, 1976; Ser. No. 647,110

Claims priority, application Germany, Jan. 22, 1975, 2502513

Int. Cl.² H02P 13/30

U.S. Cl. 321-69 R

1 Claim



1. A circuit arrangement for use with an m-phase symmetrical load whose conductor voltages have a predetermined periodic waveform and together form a symmetrical system, said circuit arrangement comprising:

an odd number m of direct frequency converters connected in a Y-connection and to said load without a direct connection between the neutral point of said converters and the neutral point of said load;

control units for feeding control voltages to said converters such that the output voltages of said converters have a substantially trapezoidal waveform;

current regulators each associated with one of said control units and each being responsive to the load side current generated by one of said converters, to a current reference value associated with that one converter and to a common current reference value common to all said regulators;

and means for forming said common current reference value including means for developing a difference signal corresponding to the voltage difference between the voltages at the neutral point of said converters and the neutral point of said load and a delay member responsive to said difference signal and having a time constant corresponding to the time constant of said load.

4,008,429

VOLTAGE TRANSLATOR FOR SOLID STATE WATCH

James M. Phalan, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 390,776, Aug. 23, 1973, abandoned.

This application Mar. 31, 1975, Ser. No. 563,311

Int. Cl.² G05F 1/56

U.S. Cl. 323-17

10 Claims

9. A regulated timepiece power supply comprising:

a. a series circuit comprising a battery, an inductor and a switch;

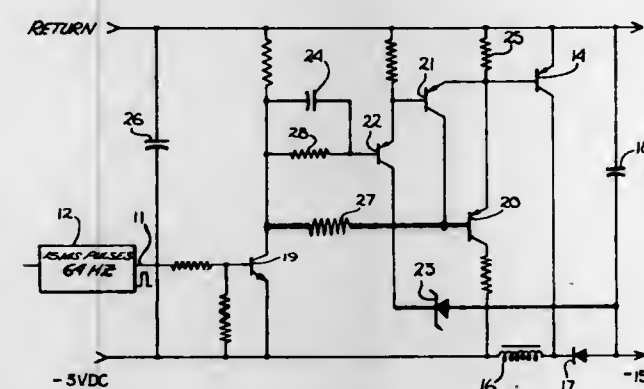
b. a capacitor coupled to said series circuit; and

c. means for maintaining the charge on said capacitor at a predetermined value, said means including a source of repetitive electrical signals coupled to said switch to cause said switch to open and close repetitively during a single charging period as long as the charge on said capacitor remains below said predetermined value, whereby

a voltage larger than the voltage of said battery will appear across said inductor each time said switch opens to provide a series of charges to said capacitor;

d. means responsive to the charge on said capacitor for generating an inhibiting signal when the charge on said capacitor exceeds a predetermined value; and

e. means responsive to said inhibiting signal for preventing said repetitive signals from closing said switch, said means including a first transistor adapted to couple said repeti-



tive pulses to said switch and a second transistor having its emitter and collector coupled to the emitter and base respectively of said first transistor, said inhibiting signal being coupled to the base of said second transistor when the charge on said capacitor exceeds a predetermined value whereby said second transistor will present a low impedance across the emitter and base of said first transistor preventing said first transistor from coupling said repetitive signal to said switch.

4,008,430

AUTOMOTIVE TEST APPARATUS FOR COUPLING TO THE IGNITION SYSTEM OF AUTOMOTIVE INTERNAL COMBUSTION ENGINES

Rudolf Blum, Wendlingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

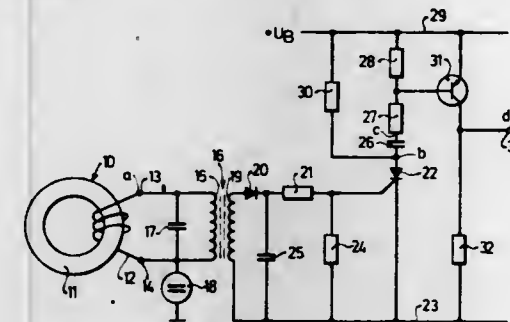
Filed Oct. 9, 1975, Ser. No. 620,927

Claims priority, application Germany, Dec. 19, 1974, 2460046

Int. Cl.² F02P 17/00

U.S. Cl. 324-15

10 Claims



1. Test apparatus for coupling to the ignition system of internal combustion engines having
coupling means (10, 11, 12) adapted to be coupled to the ignition system of an internal combustion engine, and a pulse-shaping circuit connected to the output of the coupling means and providing an output signal having a predetermined relation to the ignition pulses regardless of additional spurious pulses being applied to the coupling means, said circuit comprising
a semiconductor switch (22, 35) providing said output signal upon change of state thereof;
and a charge storage circuit (26, 34) connected to the coupling means (10, 11, 12) and to the semiconductor switch (22, 35), said charge storage circuit having a short loading time and a re-loading or discharge time which is

long with respect to said loading time to rapidly transfer a pulse applied thereto to the switch and cause rapid change of state of said switch while slowly unloading the pulse stored therein and prevent further change of state of operation of said switch during said unloading or discharge time.

4,008,431

AUTOMOBILE ENGINE TUNING SCOPE

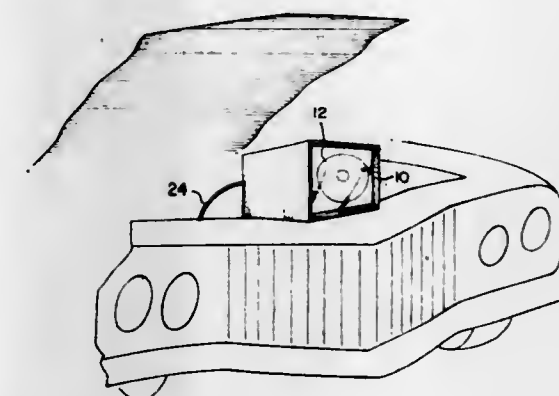
Ronald Lee Samp, Appleton, Wis., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 9, 1975, Ser. No. 611,830

Int. Cl.² F02P 17/00

U.S. Cl. 324-16 T

3 Claims



1. A timing strobe, the viewing section of which may be remotely located from an internal combustion engine to which it is attached for timing purposes, comprising
a housing enclosing a shaft rotatably mounted in said housing
a first gas discharge light bulb mounted to a member fastened to the shaft
a second gas discharge light bulb mounted to a fixed member fastened to the housing, said second light bulb mounted so as to be visible from a viewing position in which the first light bulb is also visible,
said housing formed with a window opening located to permit an observer to view both light bulbs simultaneously,
a flexible rotatable cable linking the said shaft with socket means for fastening to a shaft of an internal combustion engine, and
electric circuitry means joining both lamp bulbs in parallel to a flexible wire extending from the shaft and to a ground connection of the engine.

4,008,432

APPARATUS FOR DETECTING AN EXTERNAL MAGNETIC FIELD

Takao Sugisaki; Tatsushiro Ochial; Kyoichi Nishikawa, and Minoru Higurashi, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Japan

Division of Ser. No. 330,264, Feb. 7, 1973. This application Dec. 26, 1973, Ser. No. 427,508

Claims priority, application Japan, Mar. 2, 1972, 47-21787; Mar. 2, 1972, 47-21788; Mar. 17, 1972, 49-27242

Int. Cl.² G01R 33/02

U.S. Cl. 324-43 R

4 Claims

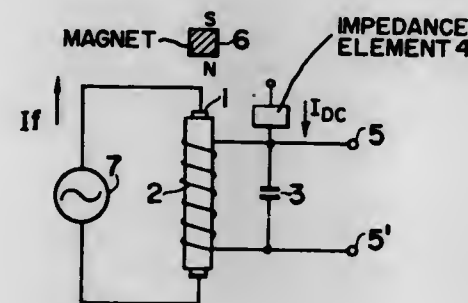
1. An apparatus for detecting an external magnetic field, comprising:

a magnetic sensor comprising an elongated member of an electrically conductive material and a thin magnetic film disposed thereabout and formed of an uniaxial magnetic anisotropic material having a magnetic hard axis disposed essentially parallel to the axis of said elongated member and a magnetic easy axis disposed about the circumference of said elongated member, and a detection coil wound about said elongated member, said magnetic sen-

sor producing parametric oscillations and having first and second oscillation states of respectively opposite phase and a non-oscillation state, in accordance with selective magnetization of said thin film in corresponding ones of first and second oscillation domains and a non-oscillation domain,

first means for producing an alternating magnetic field along said easy axis of an intensity to establish magnetization of said thin film in an oscillation domain, said first means includes further means for producing a magnetic field along said hard axis for establishing magnetization of said thin film in a desired one of said first and second oscillation states,

second means for producing an external magnetic field, and third means for moving said second means relatively to said sensor to provide adjacent positions thereof wherein the external magnetic field of said second means is coupled to the direction of said hard axis of said sensor and produces magnetization of said thin film in a different one of said domains, and a displaced position wherein the external magnetic field of said second means is not coupled to said sensor and said thin film thereof is magnetized in said given domain, whereby said magnetic sensor changes its



state from that corresponding to magnetization of said thin film in said given domain to a state corresponding to magnetization of said thin film in said different domain, said second means produces an external magnetic field of an intensity and polarity such that in said adjacent position thereof to said sensor, said external magnetic field switches the magnetization of said thin film to the other of said first and second oscillation domains, whereby said sensor changes from said one to said other of said first and second oscillation states of respectively opposite phases when said magnetization switches from said one to said other of said oscillation domains,

said detecting coil producing an oscillating voltage output in accordance with said sensor being in either of said first and second oscillation states and producing a zero voltage output when the sensor switches from one to the other of said first and second oscillation states of respectively opposite phase, and

means receiving the output of said detecting coil and responding to the zero voltage output of said detecting coil when the oscillation state of said sensor changes from one to the other of said first and second oscillation states of respectively opposite phase to provide an indication of the detection by said sensor of an external magnetic field.

4,008,433

CAPACITANCE DISPLACEMENT TYPE MEASURING PROBE

Stuart S. Fasser; John D. Suito, Jr., both of Schenectady, N.Y., and William R. Marklein, San Jose, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 14, 1976, Ser. No. 649,083

Int. Cl.² G01R 27/26

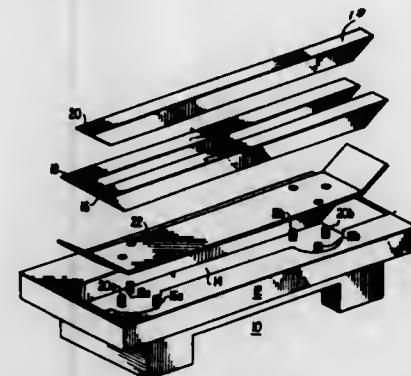
U.S. Cl. 324-61 P

2 Claims

1. A capacitance displacement probe for measuring the vibrations of a rotating member, wherein the probe forms one element of a capacitor and wherein the rotating member

forms a second element of the capacitor and is provided with a plurality of equally spaced apart grooves having a predetermined pitch and higher surface elements intermediate the grooves, said probe comprising:

- a shield electrode, including a window,
- a pair of guard electrodes and
- a sensing electrode having a sensing surface, said sensing surface having a length equal to an integer multiple of equal grooves and higher surface elements of the rotating member with which said probe is to be used,



first means for securing said guard electrodes within said shield electrode and each having a surface thereof substantially co-extensive with the outer plane of said window,

second means for mounting said sensing electrode between and electrically insulated from said guard electrodes, with the sensing surface of said sensing electrode being substantially co-extensive with the outer plane of said window, and

means for electrically connecting said sensing electrode surface to an electrical circuit.

4,008,434

ENGINE DIAGNOSTIC APPARATUS

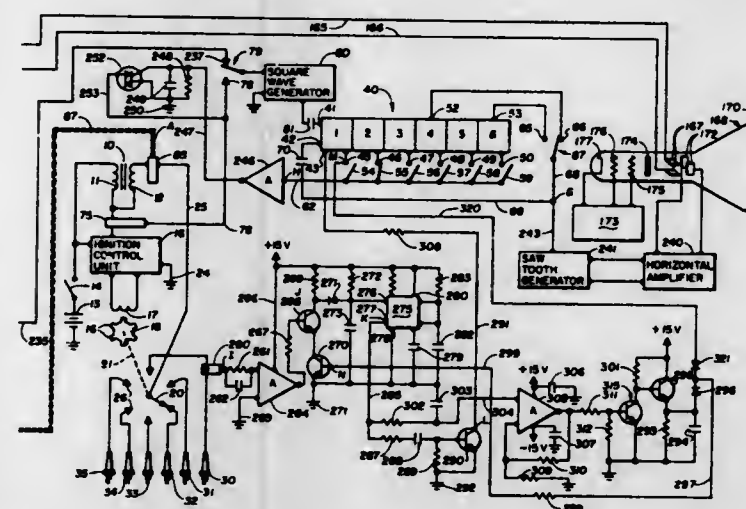
Joseph H. Schaefer, Minnetonka, Minn., assignor to Applied Power Inc., Milwaukee, Wis.

Filed July 30, 1975, Ser. No. 600,228

Int. Cl.² G01R 29/00

U.S. Cl. 324-16 S

11 Claims



1. An analyzer for multiple cylinder internal combustion engines of the type having an electrical igniter for each cylinder, electrical ignition pulse generating means, and means for sequentially applying the voltage pulses generated by said pulse generating means to said igniters, said analyzer comprising:

a connector for connection to said generating means for deriving therefrom a series of voltage pulses each substantially coincident with the application of a voltage pulse to each of said igniters,

first means connected to said connector for producing a first cyclically varying voltage of a frequency one-half of that of the frequency of occurrence of said pulses with each half cycle of the voltage beginning substantially at

the time of occurrence of one of said pulses and terminating substantially at the time of the next of said pulses, second means connected to the output of said previously named means for producing from said first cyclically varying voltage, a second cyclically varying voltage of a frequency twice that of said first voltage so that a complete cycle of said second voltage occurs between two such voltage pulses and such that the end of the first half cycle occurs approximately midway between two such voltage pulses,

testing apparatus connected to said connector for determining the operation of the engine while the engine is at various points in its cycle at which voltage pulses are normally applied to said igniters,

and circuit means connected to said second means for initiating a cycle of said testing apparatus near the end of a first half cycle of said second cyclically varying voltage so that said testing operation is initiated at a time intermediate the times at which successive voltage pulses occur.

4,008,435

DELTA MODULATION ENCODER

Toshio Oshima, and Tatsuo Ishiguro, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 365,327, May 30, 1973, abandoned.

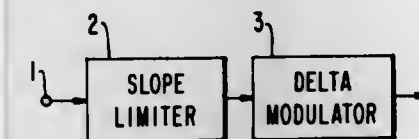
This application Feb. 25, 1975, Ser. No. 552,894

Claims priority, application Japan, May 30, 1972, 47-54104

Int. Cl.² G01R 33/12

U.S. Cl. 325-38 B

2 Claims



1. In combination, a slope limiting means for limiting the slope of input video signals to a predetermined slope and a delta modulator for performing delta modulation of the slope-limited video signals delivered from said slope limiting means; wherein said slope limiting means includes a subtraction circuit for providing a signal representative of the difference between said input video signals and a subtracting input, an amplitude-limited amplifier, having saturation levels, for amplifying the output of said subtraction circuit, an integrating circuit for time-integrating the output of said amplifier and feeding it back to said subtracting circuit as said subtracting input said slope-limited video signals being provided at the output of said integrating circuit and having a slope less than or equal to said predetermined slope which is lower than 0.9 times the maximum slope which said delta modulator can follow.

4,008,436

CHANNEL SELECTING APPARATUS

Yoshitoshi Fujita, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed May 23, 1975, Ser. No. 580,359

Claims priority, application Japan, May 27, 1974, 49-59697

Int. Cl.² H04B 1/36

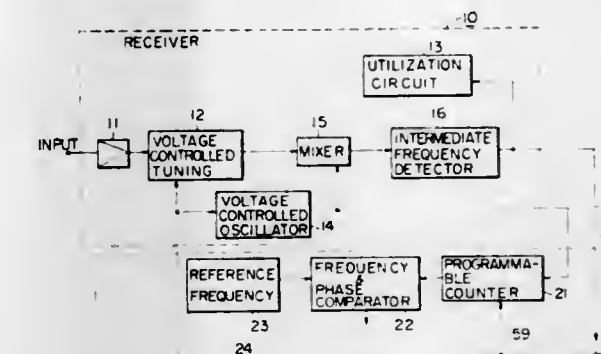
U.S. Cl. 325-335

3 Claims

1. In a receiver having a voltage-controlled local oscillator means for generating different frequency oscillations to tune the receiver to different tunable frequencies, mixer means responsive to received signals and said oscillations to produce an output signal, and utilization means coupled to said mixer means for utilizing in said receiver said output signal, channel selecting apparatus comprising:

means for generating a variable binary number and including means for generating first and second trains of pulses at different repetition frequencies, an up-down binary counter having count-up and count-down modes of operation for counting said trains of pulses to produce a binary number;

manual means including a grounded metal support, first, second and third metal contact plates insulatively supported on said metal support and arranged side by side in close proximity to each other, first, second and third amplifier means respectively coupled to said first, second and third contact plates, means coupling said first amplifier means to said binary counter to operate the same in said count-up mode, means coupling said third amplifier means to said binary counter to operate the same in said count-down mode, and gate circuit means for gating said first train of pulses to said counter under the control of the signal from said first and third amplifier means, means



coupling said second amplifier means to said gating means for gating said second train of pulses to said binary counter while inhibiting said first train of pulses;

a phase-locked loop including said voltage-controlled means, means coupled to said oscillator for demultiplying the oscillation frequency thereof by a factor of said variable binary number, and means for comparing said demultiplied frequency with a reference frequency to produce a control voltage, said control voltage being supplied to said voltage-controlled means; and means responsive to said output signal to cause said up-down binary counter to stop counting when said system is tuned to a selected channel.

4,008,437

AUTOMATIC TUNING APPARATUS

Yoshiaki Sakauchi, Tenri; Kazufumi Ushijima, Hirakati; Hajime Suzuki, Higashiosaka, and Shigeru Wakamoto, Daito, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

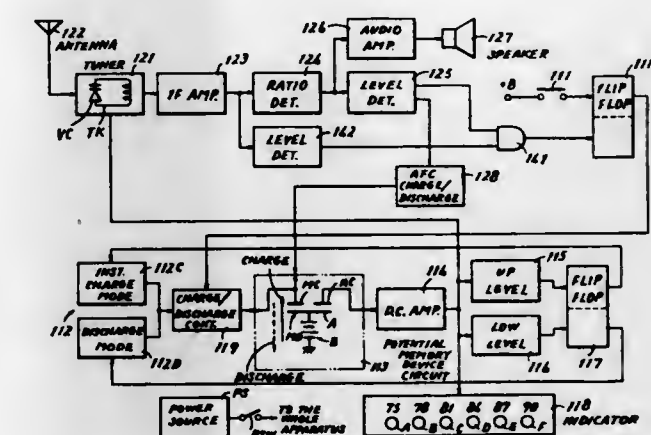
Filed Aug. 4, 1975, Ser. No. 601,283

Claims priority, application Japan, Dec. 17, 1974, 49-147047

Int. Cl.² H04B 1/34

U.S. Cl. 325-422

7 Claims



1. An automatic tuning apparatus comprising: tuning means comprising a voltage controlled variable reactance device, means for supplying a control voltage to said voltage controlled variable reactance device, said control voltage

determining a reactance value of said voltage controlled variable reactance device and thus determining a tuning frequency of said tuning means,
 means for changing said control voltage supplied from said control voltage supplying means to said voltage controlled variable reactance device for causing a change in reactance of said voltage controlled reactance device and thus a change in a tuning frequency of said tuning means, manually operable means for instructing said change in a tuning frequency of said tuning means,
 means for level detecting the amplitude of the output from said tuning means,
 means for providing a signal associated with the frequency of the output from said tuning means,
 means responsive to simultaneous outputs of said amplitude level detecting means and said frequency associated signal providing means for providing a logical product of said amplitude level detected signal and said frequency associated signal,
 means responsive to the instructing signal of said manually operable means and responsive to said logical product signal for enabling said means for changing said control voltage supplied from said control voltage supplying means,
 means responsive to said frequency associated signal of said frequency associated signal providing means for changing said control voltage supplied from said control voltage supplying means for compensating deviation of the tuning frequency,
 means responsive to absence of said amplitude level detected signal of said amplitude level detecting means for disabling said frequency compensating means, and
 means responsive to turning on of a power supply for providing for a predetermined period of time a pseudo amplitude level detected signal for forcibly enabling said frequency compensating means for said predetermined period of time.

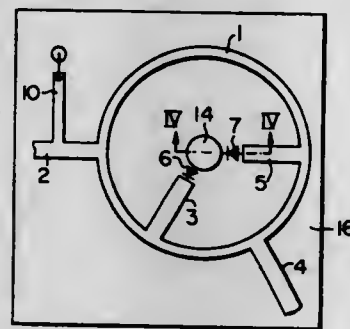
4,008,438

RAT-RACE MIXER CIRCUIT

Keiro Shinkawa, Chiuchi Sodeyama, and Hirozi Shoyama, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan
 Filed Oct. 28, 1975, Ser. No. 626,278
 Claims priority, application Japan, Oct. 28, 1974, 49-123351

Int. Cl.² H04B 1/26

U.S. Cl. 325-446



1. A mixer circuit for converting a high frequency signal into an intermediate frequency signal comprising:
 a substrate of electrical insulator having a predetermined thickness and a predetermined dielectric constant and formed with a conductor layer over the entire area of one of the surfaces thereof, said substrate being provided with a single opening extending therethrough;
 a rat-race circuit constituted by disposing microstrip lines in a desired circuit pattern on the other surface of said substrate to provide a first transmission line forming a circular closed loop having the center registering substantially with said opening and having an overall circumferential length corresponding to three half the wavelength

of the high frequency signal to be converted into the intermediate frequency signal, a second transmission line connected at one end thereof to said first transmission line and having an impedance which is $1/2$ times the impedance of said first transmission line, and a third, a fourth and a fifth transmission line connected at one end thereof to said first transmission line in such a relationship that they are successively spaced apart from the connection point of said second transmission line in the above order along said first transmission line by an arcuate distance corresponding to one quarter the wavelength of the high frequency signal, said third, fourth and fifth transmission lines having an impedance equal to that of said second transmission line, the other end of said second and fourth transmission lines extending toward the exterior of said circular closed loop while the other end of said third and fifth transmission lines extending radially inward toward the center of said circular closed loop formed by said first transmission line;

means for supplying the high frequency signal to be subject to frequency conversion to one of said second and fourth transmission lines in said rat-race circuit and supplying a local oscillation signal to the other said transmission line in said rat-race circuit;

conductive means including a bar conductor inserted into said opening bored in said substrate at substantially the center of said circular closed loop formed by said first transmission line on said substrate; and

a pair of diodes connected respectively between the portion of said bar conductor exposed from said opening and the inner end of said third and fifth transmission lines, one of said diodes being connected at the cathode thereof to said bar conductor while the other said diode being connected at the anode thereof to said bar conductor;

whereby the intermediate frequency signal obtained by subjecting said high frequency signal to frequency conversion can be derived from said bar conductor at said one surface side of said substrate.

4,008,439

PROCESSING OF TWO NOISE CONTAMINATED, SUBSTANTIALLY IDENTICAL SIGNALS TO IMPROVE SIGNAL-TO-NOISE RATIO

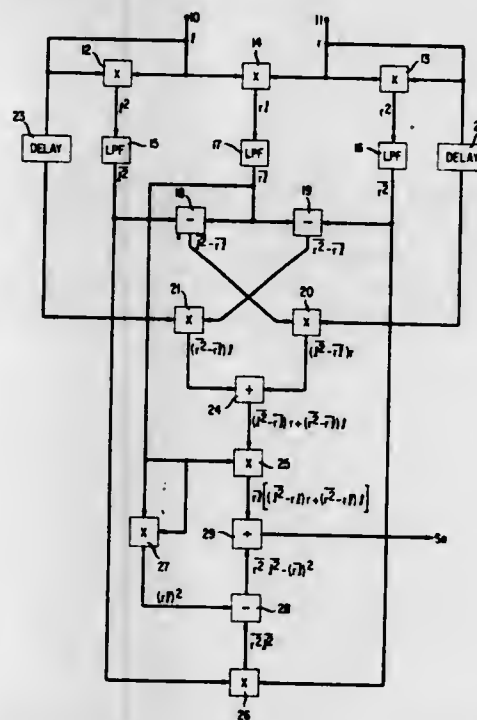
Manfred Robert Schroeder, Gottingen, Germany, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 20, 1976, Ser. No. 659,700

Int. Cl.² H03B 1/04

U.S. Cl. 328-163

6 Claims



1. A combination of processing two substantially identical signals contaminated by uncorrelated noise to produce an

output having a greater signal-to-noise ratio than either of said signals contaminated by noise, said combination comprising:
 first means for receiving said signals contaminated by noise to produce the quantities I^2 , I^2 and I , where the symbols I and r represent the instantaneous amplitudes of said two signals contaminated by noise, respectively, and the bars over said symbols indicate moving averages of the quantities represented by said symbols, and
 second means connected to said first means for combining said instantaneous amplitudes represented by said symbols r and I and said quantities I^2 , I^2 and I in the following manner

$$\frac{rI((I^2 - rI)r + (I^2 - rI)I)}{I^2 - (rI)^2}$$

4,008,440

AMPLITUDE-LIMITER

Shigeyuki Mizukoshi, Tokyo, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

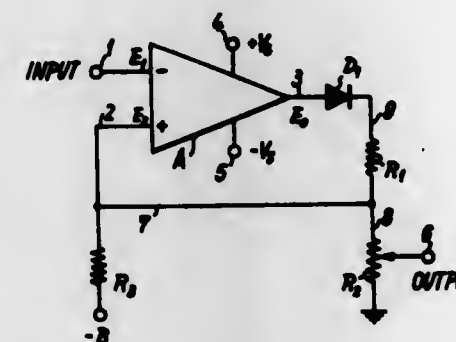
Filed May 22, 1975, Ser. No. 579,936

Claims priority, application Japan, May 25, 1974, 49-58955

Int. Cl.² H03K 5/08; H03B 3/02

U.S. Cl. 328-171

3 Claims



1. A limiter comprising:

A differential amplifier having at least a first input terminal receptive of an input AC signal, a second input terminal, an output terminal for providing an output signal proportional to a difference between voltages respectively applied to said first input terminal and said second input terminal, a positive power source terminal receptive in use of a positive source voltage having a level which determines the positive level limit of the differential amplifier output signal, and a negative power source terminal;

a feedback circuit connected between said output terminal of said differential amplifier and said second input terminal so that the output voltage derived from the output terminal of said differential amplifier is positively fed back to said second input terminal;

an output circuit connected to said feedback circuit for deriving therefrom an amplitude-limited output signal;

said feedback circuit including a rectifier element connected between said output terminal and said output circuit and having a polarity effective to pass positive portions of the differential amplifier output signal to said output circuit; and

a bias voltage set circuit connected to said second input terminal for applying a negative bias voltage to said second input terminal and to limit conduction of said diode

when the differential amplifier output signal is less than a certain value determined by the negative bias voltage, thereby to limit the negative level of the output signal.

4,008,441

CURRENT AMPLIFIER

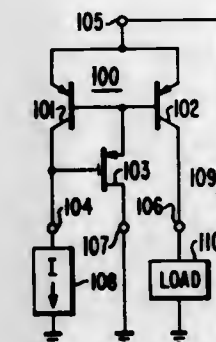
Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 16, 1974, Ser. No. 498,108

Int. Cl.² H03F 3/16

U.S. Cl. 330-35

38 Claims



1. A current mirror amplifier comprising:

an input terminal, an output terminal and a common terminal;

first and second transistors, being bipolar junction transistors having respective emitter electrodes and respective base electrodes and respective collector electrodes;

first current conductive means connecting said common terminal to said first transistor emitter electrode;

second current conductive means connecting said common terminal to said second transistor emitter electrode;

third current conductive means connecting said first transistor collector electrode to said input terminal;

fourth current conductive means connecting said second transistor collector electrode to said output terminal;

a third transistor, being a field-effect transistor having a gate electrode connected to said input terminal, and having a source electrode and a drain electrode;

means for applying a potential between said common terminal and the drain electrode of said third transistor to condition said third transistor for source-follower operation;

first direct coupling means for direct coupling said third transistor source electrode to said first transistor base electrode; and

second direct coupling means for direct coupling said third transistor source electrode to said second transistor base electrode, said first and said second direct coupling means each having substantially similar potential translating characteristics to each other.

4,008,442

SIGNAL AMPLIFIER CIRCUIT WITH A FIELD EFFECT TRANSISTOR HAVING CURRENT UNSATURATED TRIODE VACUUM TUBE CHARACTERISTICS

Shigeru Todokoro, Fujisawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed June 10, 1975, Ser. No. 585,595

Claims priority, application Japan, June 19, 1974, 49-70675[U]

Int. Cl.² H03F 3/16, 1/30

U.S. Cl. 330-35

2 Claims

1. A signal amplifier comprising:

first and second different potential points;

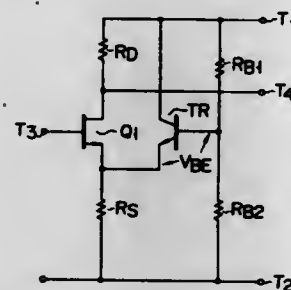
a field effect transistor having gate, drain and source electrodes and displaying current unsaturated triode vacuum tube characteristics;

a bipolar transistor having collector, emitter and base electrodes, the collector and emitter electrodes of said tran-

sistor being coupled to said first potential point and said source electrode of said field effect transistor, respectively;

first resistive impedance means coupled between said first potential point and said drain electrode of said field effect transistor;

second resistive impedance means coupled between said second potential point and said source electrode of said field effect transistor;



third resistive impedance means coupled between said first potential point and said base electrode of said bipolar transistor; and

fourth resistive impedance means coupled between said second potential point and said base electrode of said bipolar transistor,

said third resistive impedance means having a resistive value which substantially equals that of said fourth resistive impedance means multiplied by the voltage amplification factor of said field effect transistor.

4,008,443

QUATERNARY FREQUENCY SYNTHESIZER

Joël Rémy, Paris, France, assignor to Adret Electronic, Trappes, France

Continuation of Ser. No. 483,910, June 27, 1974, abandoned.

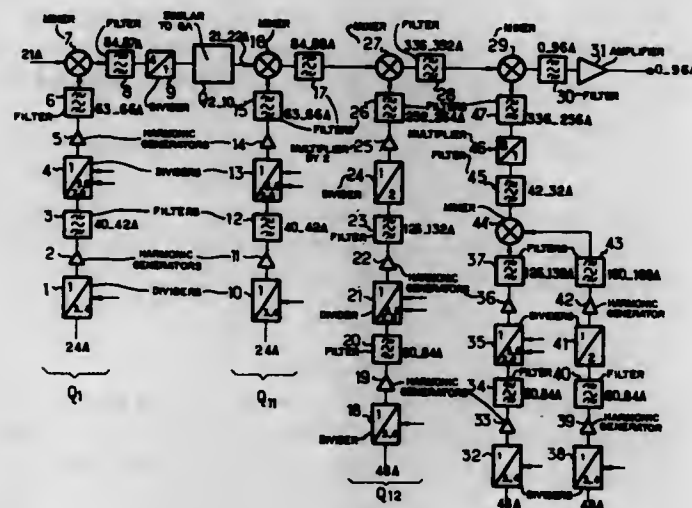
This application Nov. 14, 1975, Ser. No. 632,002

Claims priority, application France, Mar. 15, 1974, 74.08948

Int. Cl.² H03B 21/02

U.S. Cl. 331-38

14 Claims



1. A frequency synthesizer generating a resultant frequency of precise value expressed in a number of base 4, comprising:

n selective mixing means respectively numbered 1 to n , where n is an integer greater than 1, having respective first and second inputs and respective outputs, the first input of the first mixer being fed with a fixed reference frequency signal, the first input of the i th mixer (with $i = 2, 3 \dots n$) being coupled to the output of the $(i-1)$ th mixer, said synthesizer further comprising:

a plurality of signal-translating channels numbered 1 to n for selecting in each channel a digit to appear in said resultant frequency,

each channel comprising means for producing from a single given frequency an individual frequency having an accurately controlled value equal to one among only four frequency values in arithmetical progression which is fed to the said respective second inputs, and

each said channel comprising at least one variable factor dividing means coupled in series with fixed passband filtering means, said single frequency being applied to said dividing means.

4,008,444

FEEDBACK CONTROL OF A LASER OUTPUT

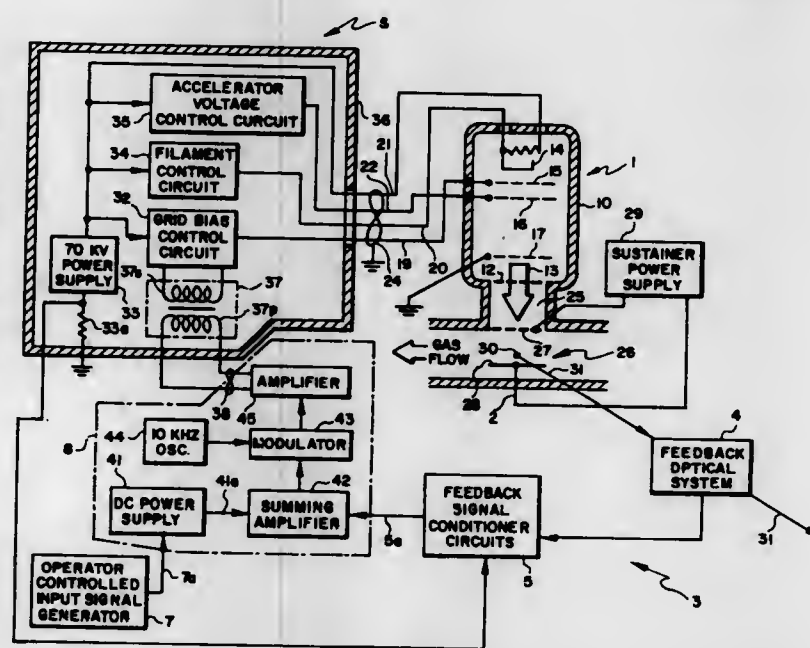
Jacob L. Zar, North Andover, and Robert E. Serris, Burlington, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Jan. 19, 1976, Ser. No. 650,309

Int. Cl.² H01S 3/13

U.S. Cl. 331-94.5 S

21 Claims



1. In a method of producing a coherent beam of radiation from a gaseous medium in an enclosure, the steps comprising:

a. providing said gaseous medium at a predetermined pressure in a working region in the enclosure;

b. generating external of said enclosure a substantially broad area electron beam having a cross section area conforming substantially to said working region;

c. introducing said electron beam to said enclosure to produce in the working region a substantially spacially uniform predetermined density of secondary electrons in the medium;

d. providing an electric field in the working region which increases the average energy of said secondary electrons therein without substantially increasing the electron density therein;

e. the energy of said secondary electrons being sufficient to stimulate the emission of said coherent beam of radiation;

f. causing said beam of coherent beam of radiation to emanate from the enclosure;

g. intercepting the emanating beam of coherent radiation;

h. converting said intercepted radiation into an electrical feedback signal representative of the power thereof; and

i. employing said electrical feedback signal to control the electron beam, thereby providing a feedback system for controlling the coherent beam of radiation.

4,008,445

ULTRA-VIOLET GAS LASER

Karl Gerhard Hernqvist, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,182

Int. Cl.² H01S 3/03

U.S. Cl. 331-94.5 D

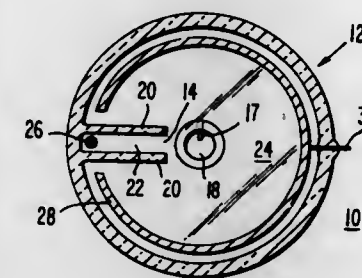
9 Claims

1. A gas laser comprising:

a tube having two regions opening into one another;

a laser gas within the tube;

means for establishing a space charge double sheath between the regions to provide a high electron temperature in one region and a low electron temperature in the other region; and



a mirror located at each end of the region of low electron temperature.

4,008,446

MICROWAVE OSCILLATION DEVICE WHOSE OSCILLATION FREQUENCY IS CONTROLLED AT THE RESONANCE FREQUENCY OF A DIELECTRIC RESONATOR

Kenji Hirai, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

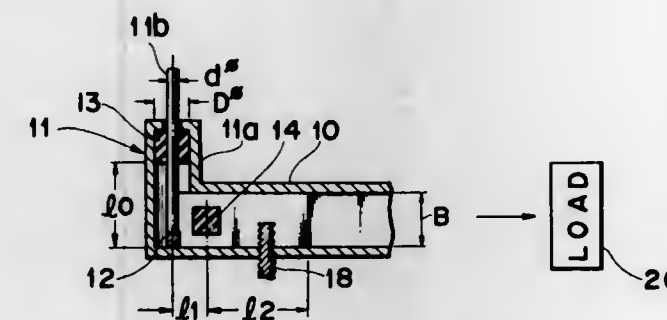
Filed July 30, 1975, Ser. No. 600,527

Claims priority, application Japan, Aug. 1, 1974, 49-87513

Int. Cl.² H03B 9/12

U.S. Cl. 331-96

14 Claims



1. A microwave oscillation device comprising a cut-off waveguide having a cut-off characteristic with respect to a frequency used, a coaxial line section provided at one end of said cut-off waveguide, a resistor provided at one end of said coaxial line portion, an oscillation element provided at the other end of said coaxial line section, a dielectric resonance element resonating at said frequency used, disposed within said cut-off waveguide so as to be electromagnetically coupled to said oscillation element in terms of lumped constant, and an output waveguide connected to the other end of said cut-off waveguide so as to be electromagnetically coupled to said dielectric resonance element in terms of distributed constant.

9. A microwave oscillation device comprising a waveguide short-circuited at one end and connected at the other end to a load, a metal-shielding plate for forming cut-off regions each having a cut-off characteristic with respect to a frequency used, disposed spaced by a prescribed distance from an E plane of said waveguide and substantially in parallel with said E plane, and in contact with H planes of said waveguide and substantially perpendicularly to said H plane and connected at one end to a short-circuiting end of said waveguide, a coaxial line section provided in one of said cut-off regions closely to said short-circuiting end of said waveguide, a resistor provided at one end of said coaxial line section, an oscillation element provided at the other end of said coaxial line section, and a dielectric resonance element provided within said one cut-off region so as to be electromagnetically coupled to said oscillation element in terms of lumped constant and to said load in terms of distributed constant.

4,008,447

MINIATURE ELECTRICAL RELAY

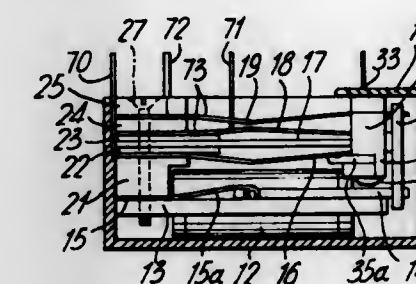
Joseph Anderson, Joseph Louis Lagasse, Satinder Singh, all of Montreal, and Victor Milaluskas, St. Laurent, all of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Nov. 14, 1975, Ser. No. 631,939

Int. Cl.² H01H 67/02

U.S. Cl. 335-128

6 Claims



1. A miniature electrical relay including a hollow housing, a base plate closing the housing and a relay mechanism in said housing, said relay mechanism comprising:

a core and coil assembly, said core including a bottom portion and a central leg extending from said bottom portion, said coil positioned on said central leg, and further including two side legs, one on each side of said central leg extending parallel thereto and spaced therefrom;

an armature adjacent said core and actuated thereby; means pivotally mounting said armature for movement toward and away from said core;

a series of contact springs positioned in stacked sequence on the side of said armature remote from said core;

an insulating member positioned between each adjacent pair of contact springs;

an operating card mounted at one end on said armature and including formations engaging with said series of contact springs for actuation thereof on movement of said armature towards and away from said core;

said armature of U shape and including two parallel spaced apart legs extending towards said bottom part of said core;

said means pivotally mounting said armature comprising a hinge spring attached to a bottom part of said core, said spring of U shape and including two parallel spaced apart legs extending towards an upper part of said core, said legs of said hinge spring and of said armature in overlapping relationships at their ends, and interengaging formations on said ends releasably attaching said armature to said hinge spring.

4,008,448

SOLENOID WITH SELECTIVELY ARRESTIBLE PLUNGER MOVEMENT

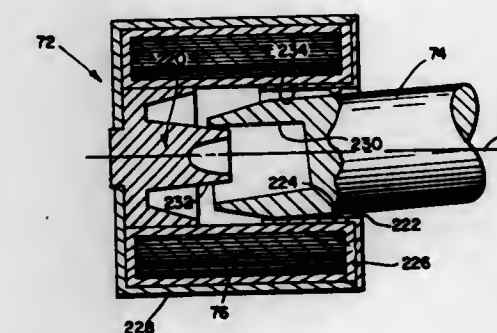
Juerg Muggli, Woburn, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1975, Ser. No. 619,361

Int. Cl.² H01F 7/13

U.S. Cl. 335-258

11 Claims



1. Solenoid apparatus comprising:

an elongated excitation winding defining a longitudinal axis around which said excitation winding is disposed, along which said excitation winding extends, and with respect to which said excitation winding is radially spaced; means for cooperating with said excitation winding, when said excitation winding is energized, for establishing a substantially low reluctance flux path for the electromagnetic field of said excitation winding, said flux path establishing means including a stationary armature positioned adjacent one end of said excitation winding and extending intermediate portions of said excitation winding disposed on opposite sides of said longitudinal axis to define a first surface positioned within said excitation winding intermediate said excitation winding and said axis and an elongated plunger disposed generally along said axis and having an end portion extending between radially disposed portions of said excitation winding, said end portion of said plunger defining a second surface disposed in facing relationship with respect to said first surface of said armature, at least one of said surfaces constituting a guide surface extending generally lengthwise of said axis and against which said other surface is adapted to be slidably seated;

means, spaced from said first surface lengthwise of said axis and extending radially inwardly from said excitation winding into contact with the longitudinal extending peripheral surface of said plunger, for establishing a fulcrum upon which said plunger, can pivot to selectively effect engagement between said first and second surfaces; and

means for urging said plunger outwardly of said excitation winding in the direction away from its said one end, when said excitation winding is unenergized, said surfaces further being configured and arranged such that, when said excitation winding is energized at a first predetermined level, contact is effected between said guide surfaces under a force sufficient to establish frictional forces therebetween precluding further displacement of said plunger in either direction along said axis and, when said excitation winding is subsequently energized at a second predetermined level greater than said first predetermined level, the frictional forces thereby established between said first and second surfaces and the force exerted on said plunger by said plunger urging means are insufficient to preclude further displacement of said plunger inwardly of said excitation winding towards its said one end under the influence of said electromagnetic field.

4,008,449

ELECTRICAL CONTROL DEVICE AND METHODS OF ADJUSTING AND OPERATING

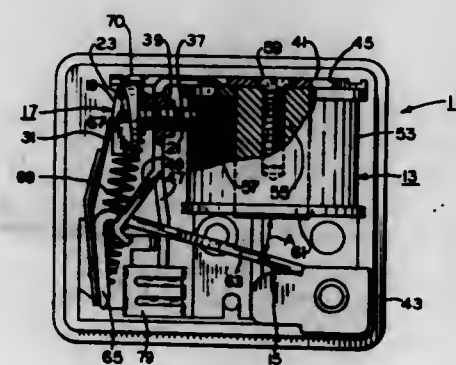
George E. Morris, Sterling, and Ronald W. Poling, Morrison, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed May 27, 1975, Ser. No. 581,272

Int. Cl.² H01H 69/01

U.S. Cl. 335-273

26 Claims



1. An electrical control device comprising an electromag-

net, means adapted for attraction from a generally at-rest position through an air gap into magnetic holding engagement with said electromagnet upon its energization, means rotatable in response to an applied adjusting force thereon for adjusting said attraction means toward a selected at-rest position thereof, said adjusting means including means engaged with said attraction means and operable generally upon the applied adjusting force rotation of said adjusting means for camming said attraction means in one direction toward the selected at-rest position thereof, and means for mounting said adjusting means so that it is rotatable and also conjointly linearly movable in another direction generally opposite the one direction away from the engagement of said camming means with said attraction means in following engagement therewith so that the resultant of the movements in the one and another directions of said attraction means is a function of the conjoint rotatable and linear movements of said adjusting means in response to the applied adjusting force thereon to adjustably alter the air gap.

4,008,450

TUNABLE COIL ASSEMBLY

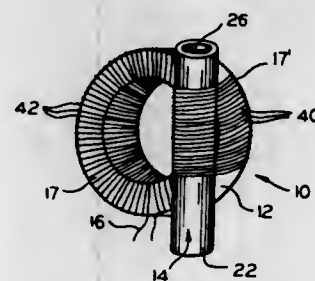
Evangelos Argoudellis, Northbrook, Ill., assignor to Filtech Corporation, Elk Grove, Ill.

Filed May 30, 1975, Ser. No. 582,273

Int. Cl.² H01F 21/06

U.S. Cl. 336-132

18 Claims



1. A tunable core assembly on which an electrically conductive wire is wound, comprising:

- a primary toroidal, magnetic, continuous core having an opening therethrough;
- an adjustable magnetic core means including a hollow holder attached to the outside of the primary core and a tuning slug movable inside said holder, said wire including at least one turn extending through said opening and being wound around and in contact with said primary core and the outside of the holder, said adjustable core means not extending into or through said opening.

4,008,451

HIGH-VOLTAGE FUSE AND PROCESS OF MANUFACTURING THE SAME

Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Sept. 22, 1975, Ser. No. 615,810

Int. Cl.² H01H 85/08, 85/12

U.S. Cl. 337-161

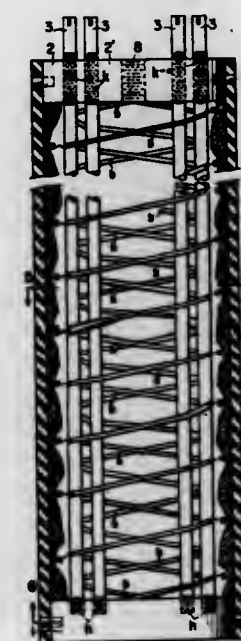
8 Claims

1. A process for manufacturing electric fuses including the steps of

- a. forming a first squirrel-cage-like structure out of a first pair of spaced, substantially semi-cylindrical co-axially arranged metal blocks and a first plurality of metal rods arranged parallel to the axes of said first pair of blocks, of winding a first fusible element means substantially helically around said first plurality of rods and conductively connecting the ends of said first fusible element means to said first pair of blocks;
- b. forming a second squirrel-cage-like structure of a second pair of spaced substantially semi-cylindrical co-axially arranged metal blocks and a second plurality of metal

rods arranged parallel to the axes of said second pair of blocks, winding a second fusible element means substantially helically around said second plurality of rods and conductively connecting the ends of said second fusible element means to said second pair of blocks;

c. juxtaposing the planar surfaces of said first pair of blocks and the planar surfaces of said second pair of blocks, inserting said first squirrel-cage-like structure and said second squirrel-cage-like structure into a common tubu-



lar casing, affixing said first pair and said second pair of blocks to the ends of said casing, and filling said casing with a pulverulent arc-quenching filler; and

- d. separating said first plurality of rods from said first fusible element means and separating said second plurality of rods from said second fusible element means after said first fusible element means and said second fusible element means are embedded in and supported by said arc-quenching filler, and withdrawing said first plurality of rods and said second plurality of rods from said casing.

4,008,452

CURRENT LIMITING FUSE DEVICE FOR RELATIVELY HIGH CURRENT

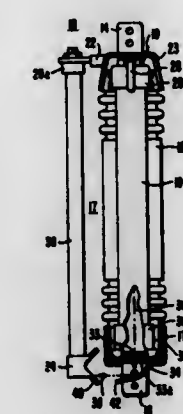
Frank L. Cameron, North Huntingdon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 1, 1975, Ser. No. 601,580

Int. Cl.² H01H 85/12, 85/04

U.S. Cl. 337-284

10 Claims



1. Fuse apparatus which is capable of conducting a relatively high value of rated current and of providing significant current limitation during a fusing operation, comprising:

- a. support means;
- b. first fuse means disposed upon said support means, comprising:

- 1. a first pair of spaced ferrule means which are interconnectable in circuit relationship with a source of electrical current;
- 2. non-current limiting fuse element means one end of which is connected in circuit relationship with one ferrule of said pair of spaced ferrule means;
- 3. separator means one end of which is connected in circuit relationship with the other ferrule of said pair of spaced ferrule means and the other end of which is connected in circuit relationship with the other end of said first non-current limiting fuse element means for providing a first insulating gap between said spaced ferrules when said non-current limiting fuse element fuses said first gap enlarging in size during a predetermined time;

- 4. gas evolving means disposed relative to said first fuse element means to evolve electrically conducting gas when said non-current limiting fuse element means fuses;
- 5. director means for directing said evolved gas;

- c. second fuse means disposed on said support means, comprising:

- 1. a second pair of spaced ferrule means; and
- 2. current limiting fuse element means one end of which is connected in circuit relationship with one ferrule of said second pair of spaced ferrules and the other end of which is connected in circuit relationship with the other ferrule of said second pair of spaced ferrules, one ferrule of said first pair of spaced ferrule means and one ferrule of said second pair of spaced ferrule means being connected in circuit relationship, the other ferrule of said first pair of spaced ferrule means and the other ferrule of said second pair of spaced ferrule means being spaced from one another to provide a second insulating gap of predetermined size, said director means being oriented to direct said evolved gas into said second gap to provide a current conducting path across said second gap, fusing current in said non-current limiting fuse element means thusly being commutated to said second fuse element means to be limited thereby, said current being prevented from returning to said non-current limiting fuse element means thereafter by an increased enlargement of said first insulating gap.

4,008,453

THERMAL CHANGE-OVER SWITCH

Dieter Hacker, Leingarten I; Rolf Jäger, Heilbronn-Horkheim, and Dieter Lettau, Heilbronn, all of Germany, assignors to Grossag Gesellschaft Mit Beschränkter Haftung, Germany, a part interest

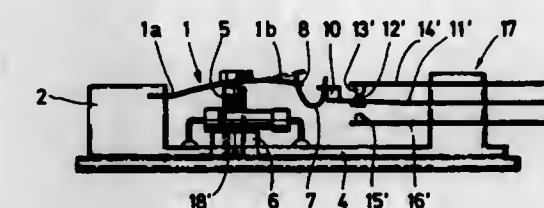
Filed Mar. 25, 1975, Ser. No. 561,893

Claims priority, application Germany, Mar. 27, 1974, 2414884

Int. Cl.² H01H 37/54, 37/60

U.S. Cl. 337-345

26 Claims



1. A change-over switch comprising a plurality of switch arms disposed parallel to each other and movable between first and second limit positions, a transverse member non-torsionally interconnecting said switch arms, a plurality of fixed contacts for engagement respectively by said switch arms in each said position, a thermally deformable bimetal actuating element for moving said switch arms to one or the other limit position in response to changes in temperature, and a pre-stressed resilient element coupling said bimetal element with

said transverse member, said resilient element having two stable positions corresponding respectively to the said limit positions and an intervening dead center position, and is arranged to be moved between the said stable positions by deformation of the bimetal element, whereby on such deformation the switch arms will be moved from one limit position to the other with a snap-action.

4,008,454

DIFFERENTIAL EXPANSION ROD AND TUBE THERMOSTAT

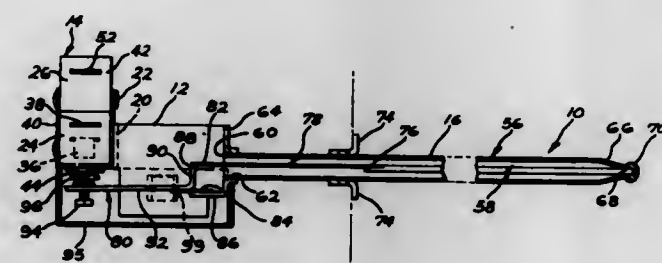
Teamus Bowling, Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 4, 1975, Ser. No. 628,814

Int. Cl.² H01H 37/46

U.S. Cl. 337-386

7 Claims



1. A thermally-responsive switch assembly comprising:
 - a base;
 - a housing attached to said base;
 - switch means attached to said housing;
 - a differential expansion thermostat having an outer tube secured to said base and an inner rod secured to the tube adjacent the free end thereof, the rod being formed of a material having a much lower coefficient of thermal expansion than that of the material of the outer tube, the thermostat being adapted to project into an oven cooking cavity to sense the oven interior temperature, a mounting means for supporting the thermostat through a wall forming the oven cooking cavity so as to leave a predetermined length of the tube on the outside of the oven to be free of exposure to the oven ambient temperature;
 - the inner rod of the thermostat being mostly exposed to the oven ambient temperature;
 - an extension strap joined to the end of the inner rod and being of a material with a high coefficient of thermal expansion that is substantially the same as that of the outer tube;
 - an amplifier lever joined to the extension strap; and
 - a hinge means provided between the amplifier lever and the base so that movement of the combined inner rod and extension strap causes movement of the free end of the amplifier lever for operating the said switch means.

4,008,455

METHOD OF MAKING SELF-CALIBRATED DISPLACEMENT MEASUREMENTS

Herbert N. Pedersen, Richland, Wash., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1975, Ser. No. 552,582

Int. Cl.² G01S 9/68

U.S. Cl. 340-1 R

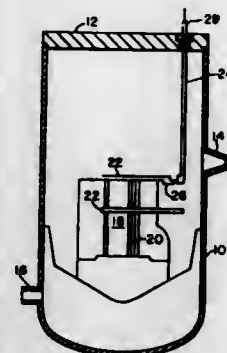
3 Claims

1. An on-line method of measuring the displacement of a core of a nuclear reactor designed to be substantially stationarily supported within the reactor during reactor operation and cooled by an acoustically conductive medium wherein an acoustically reflective surface formed with a step discontinuity of known height between parallel legs of the step, is fixedly coupled to the core and submerged within the coolant, comprising the steps of:

directing at least one acoustic pulse to impinge upon the step discontinuity on the reflective surface in a manner

that will provide first and second discrete reflected acoustic signals respectively reflecting off of the respective legs of the step;

detecting the first and second discrete reflected signals at a corresponding first and second distance from the reflecting surface where the first and second distances differ in length by the known height;



determining a measure of the time of travel of the first and second signals; and
cross-correlating the time of travel of the respective signals with the known height to provide a calibrated measure of displacement.

4,008,456

TACTILE TARGET ALERTING SYSTEM

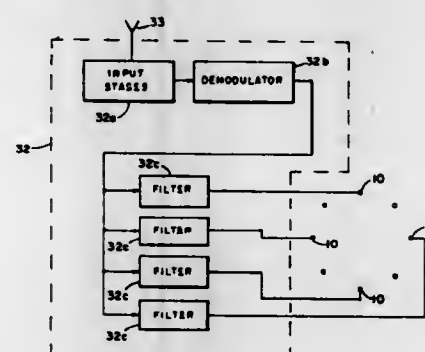
Wade H. Ewart, Guntersville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 30, 1975, Ser. No. 591,801

Int. Cl.² G01V 1/00; H04B 13/00; H04R 15/00

U.S. Cl. 340-6 R

1 Claim



1. A tactile target alerting system for a person; including a close-fitting garment for the person; a circle pattern of sensation producing means in the surface of said garment; a plurality of filter means each passing a different frequency individually connected to said pattern of sensation producing means for selectively energizing said sensation producing means; a plurality of oscillator means equal in number to said filter means; switching means connected to said oscillator means so as to selectively energize desired ones of said oscillator means; connecting means connecting said oscillators to said filter means; control means connected to each oscillator so as to variably control the power output of said oscillator; and power means connected to said switching means to provide power for said oscillators.

4,008,457

PRESSURE TRANSDUCING APPARATUS FOR USE IN A SIGNATURE IDENTIFICATION SYSTEM

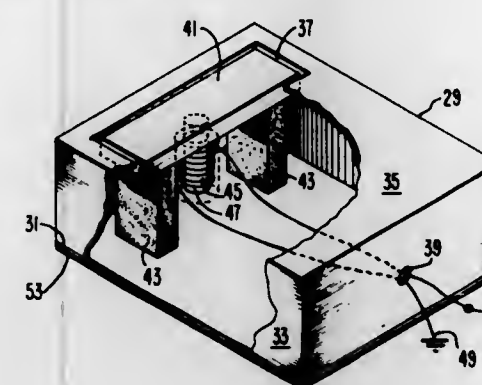
Arthur J. Radcliffe, Jr., Ann Arbor, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 525,863, Nov. 21, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 645,271

Int. Cl.² G06K 9/00

U.S. Cl. 340-146.3 SY

10 Claims



1. A pressure transducing apparatus for converting the pressure variations produced on a writing surface when an individual signs his signature to electrical waveforms representative thereof comprising:
 - writing surface means for receiving the pressure exerted when an individual signs his signature;
 - resilient means for supporting said writing surface means and being responsive to the pressure applied thereto for yielding so as to allow said writing surface means to be vertically displaced in proportion to the variations in pressure exerted on said writing surface means when an individual signs his signature;
 - means for rigidly attaching a core of magnetic material to said writing surface means for vertical displacement therewith; and
 - sensing means co-axially positioned about said core of magnetic material for generating an electrical waveform in response to the vertical displacement of said core of magnetic material, said electrical waveform being representative of the pressure variations produced on said writing surface means when an individual signs his signature thereon.

4,008,458

REMOTE AUTOMATIC READING SYSTEM

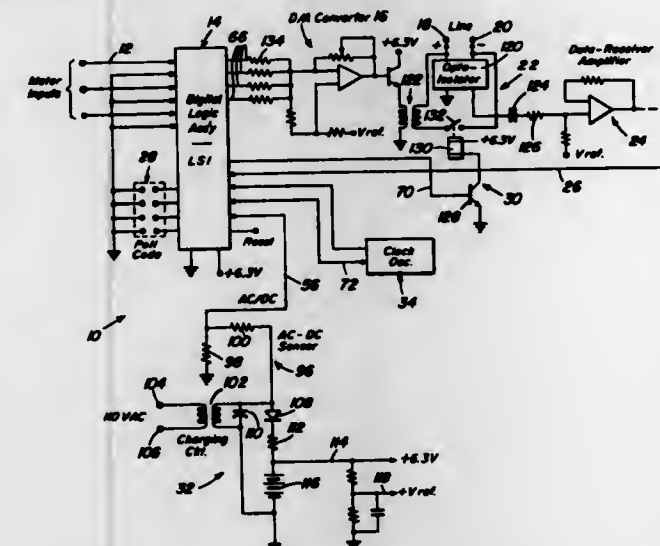
Gerald J. Wensley, Omaha, Nebr., assignor to Darco Telemetering Systems, Omaha, Nebr.

Filed Sept. 5, 1975, Ser. No. 610,895

Int. Cl.² H04Q 9/00

U.S. Cl. 340-151

13 Claims



1. In combination with a sensor at a data reading station

detecting a sequence of events to produce corresponding switch closures, and a telephone communication system having message lines, through which polling signals are transmitted to said data reading station for interrogation thereof and data signals from the data reading station are transmitted to a data collecting station, an automatic reading unit comprising digital logic means connected to the sensor for storing digital input data in response to said switch closures interrogation input means coupling the message lines to the digital logic means for transforming said stored digital input data into a frequency shifted, step simulated sinusoidal waveform in response to a coded analog polling signal, digital-to-analog converter means coupling said digital logic means to the message lines for converting said transformed digital input data into an analog data signal transmitted by the message lines to the data collecting station, a source of AC power connected to the automatic reading unit for operation thereof independently of the telephone communication system and an auxiliary source of DC power for operating the automatic reading unit in response to loss of power from the AC power source, said digital input data having a format including data bits corresponding to said switch closures and a power sensing bit representing the state of the AC power source.

4,008,459

METHOD OF SEISMIC SURVEYING FOR STRATIGRAPHIC TRAPS

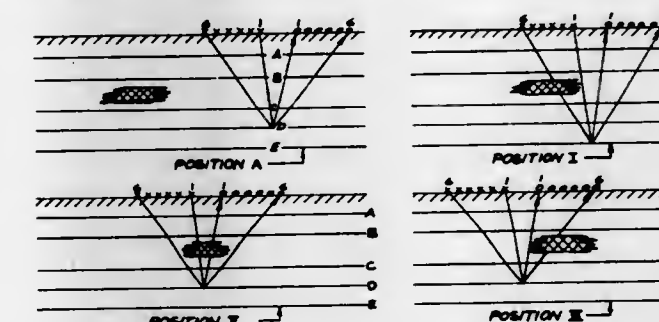
Hugh O. Walker, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed July 18, 1975, Ser. No. 597,067

Int. Cl.² G01V 1/20, 1/28

U.S. Cl. 340-15.5 CP

7 Claims



1. A method of seismic prospecting for stratigraphic traps of expected horizontal extent in subterranean earth formations comprising the steps of:
 - a. arranging a seismic source detector spread comprising a plurality of seismic energy sources and a plurality of seismic detectors having a horizontal extent approximately at least twice the expected horizontal extent of any subsurface feature being prospected for at a first source detector spread location along a line traversing a subterranean region to be prospected;
 - b. imparting from seismic energy sources at said first spread location, acoustic energy which travels generally downwardly and outwardly from said source into the subterranean region to be prospected;
 - c. recording as a function of time signals representative of the amplitudes of reflected seismic energy at said detector locations in the spread;
 - d. determining the apparent stacking velocity of seismic energy from a plurality of selected subsurface reflectors at each such impartation of seismic energy by said seismic energy sources;
 - e. moving said source detector spread location a predetermined horizontal distance approximately 1/10 the expected horizontal extent of any subsurface feature being prospected for along said traversing line and repeating steps (b), (c) and (d) at each such new location; and
 - f. comparing said apparent stacking velocities at each such source detector spread location, by graphically plotting the apparent stacking velocity at each source detector

spread location to each selected subsurface reflector as a function of horizontal distance along said traversing line, to observe any differential present in said stacking velocities to each of said selected reflectors as a function of horizontal distance, thereby obtaining the approximately horizontal distance location along said traversing line of any stratigraphic traps in said subterranean region being prospected.

4,008,460

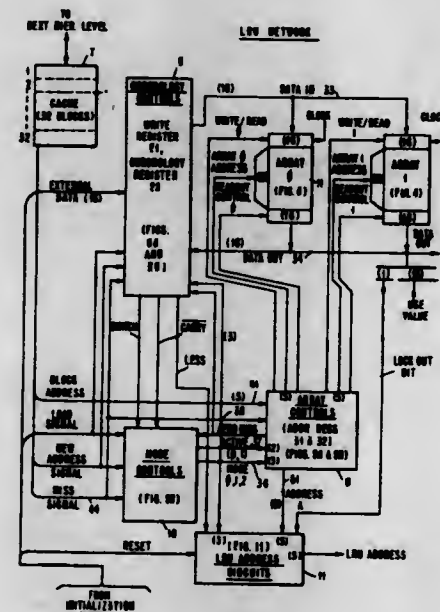
CIRCUIT FOR IMPLEMENTING A MODIFIED LRU REPLACEMENT ALGORITHM FOR A CACHE

Louis R. Bryant, Poughkeepsie; Raymond J. Pedersen, Staatsburg, and Arnold Weinberger, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,006
Int. Cl.² G06F 7/10; G11C 9/06

U.S. Cl. 340—172.5

16 Claims



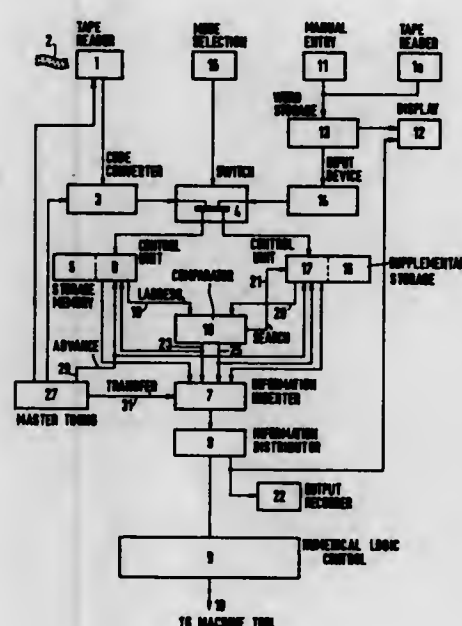
1. An LRU control system for generating replacement addresses for a buffer level in a storage hierarchy, comprising at least one memory array having array words at positions corresponding to addresses of replaceable units in the buffer level;
- chronology means for generating a chronology use value which is digitally increased by a partial amount for each access to a different replaceable unit in the buffer level;
- means for inserting the chronology use value into an array word corresponding to the different replaceable unit for which an access is made;
- an LRU address circuit for storing the address of a selected replaceable unit which is to be replaced on a next miss signal of the buffer level indicating an access cannot be made because required data is not in the buffer level;
- array controls for searching the array words in the memory array on each miss signal for the word having the lowest use value, and storing the address for that word in the LRU address circuit as the replacement address for the next miss; and
- mode controls receiving each miss signal and actuating the array controls to search the memory array for the word having the lowest use value.

4,008,461
APPARATUS FOR CORRECTING AND ADDING DATA TO THAT TAKEN FROM A MECHANICAL DATA CARRIER
Manfred V. Raven, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Sept. 17, 1975, Ser. No. 614,181
Claims priority, application Germany, Sept. 25, 1974, 2445814

Int. Cl.² G05B 19/00

U.S. Cl. 340—172.5

4 Claims

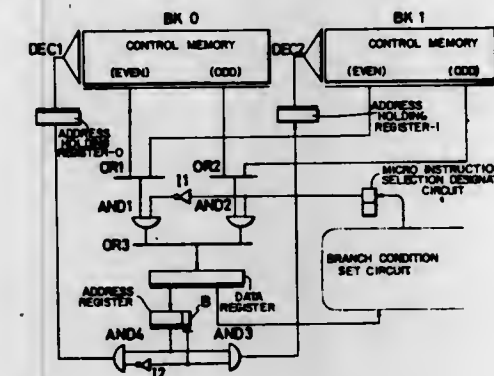


1. In a numerical machine tool control system comprising:
 - a. a program buffer storage memory;
 - b. means coupled to the input of said program buffer storage memory for reading control information in the form of records of data each containing an address and an instruction from a mechanical data carrier such as a perforated tape into said buffer storage memory;
 - c. a numerical logic control having its output coupled to control the machine tool; and
 - d. means for sequentially calling up the information in said buffer storage memory record by record in the order of addresses associated therewith and providing said records to said numerical logic control, the improvement comprising apparatus for correcting and supplementing information contained on the mechanical data carrier comprising:
 - e. a supplementary storage memory;
 - f. means coupled to the input of said supplementary storage memory to enter information in the form of additional records, having addresses the same as at least some of the records entered into said buffer storage memory, into said supplementary storage memory;
 - g. means for inserting information interposed between said numerical logic control and said buffer storage memory, said means also having an input from said supplementary storage memory, for selectively providing to said numerical logic control one of its inputs; and
 - h. means coupled to control said means for inserting information including means to compare the address of the information being called up from said buffer storage memory for output to said numerical logic control with the addresses stored in said supplementary storage memory and upon finding the same address in said supplementary storage memory to enable said means for inserting information to provide the information stored in said supplementary storage memory to said numerical logic control and otherwise to provide the output of said buffer storage memory to said numerical logic control.

4,008,462
PLURAL CONTROL MEMORY SYSTEM WITH MULTIPLE MICRO INSTRUCTION READOUT
Yasunori Kanda, Kawasaki, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan
Filed Dec. 6, 1974, Ser. No. 530,301
Claims priority, application Japan, Dec. 7, 1973, 48-139211
Int. Cl.² G06F 7/28, 13/00; G11C 7/00

U.S. Cl. 340—172.5

5 Claims

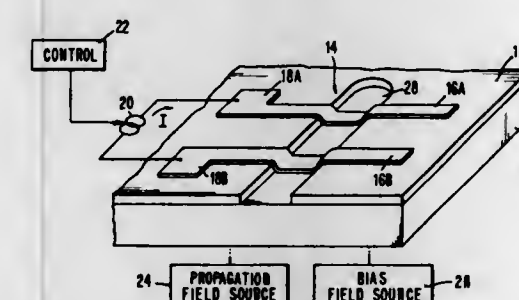


1. A microprogramming control system comprising:
 - a plurality of control memory means for storing micro instructions, said plurality of control memory means being sequentially addressed with address designations and each addressed control memory means reading out, in turn, a set of plural micro instructions in response to each respective address designation supplied thereto;
 - means for sequentially addressing said plurality of control memory means with said address designations;
 - selection gate means connected to said plurality of control memory means operating in time-shared fashion for selecting one of said plural micro instructions in said set as read out from a given one of said sequentially addressed control memory means; and
 - data register means, connected to said selection gate means and said addressing means, for storing said selected micro instruction, wherein said selected micro instruction contains a bank designating portion for identifying said given one of said plurality of control memory means and a next address designation portion for obtaining the next set of plural micro instructions from said given one of said sequentially addressed control memory means.

4,008,463
INTEGRATED BUBBLE NUCLEATOR
Mark Howard Kryder, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 30, 1975, Ser. No. 591,999
Int. Cl.² G11C 11/14

U.S. Cl. 340—174 TF

15 Claims



1. A current carrying magnetic domain nucleator for nucleating magnetic domains in an amorphous magnetic medium, comprising:
 - a conductor for carrying said current therethrough, said conductor having a portion thereof which is not continuous and does not provide a continuous electrical path for said current, and

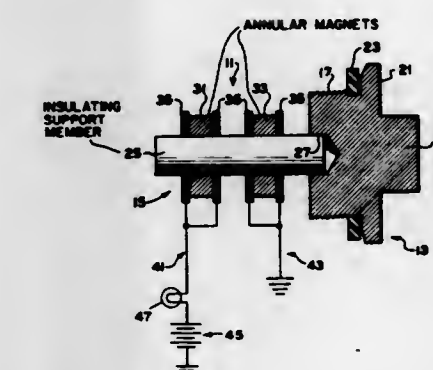
955 O.G.—39

an electrically conducting amorphous magnetic medium capable of supporting said domains therein, said medium electrically contacting said conductor and providing a path therethrough for the flow of said current, said current having a magnitude sufficient to nucleate a magnetic domain in said amorphous magnetic medium.

4,008,464
LUBRICANT CONTAMINATION WARNING DEVICE
James R. Hobbie, Mentor, Ohio, assignor to Eaton Corporation, Cleveland, Ohio
Filed Oct. 7, 1975, Ser. No. 620,453
Int. Cl.² G08B 21/00

U.S. Cl. 340—239 R

7 Claims



1. Apparatus for providing an electrical warning signal representative of a buildup of ferrous contamination in the lubricant of a mechanism including a housing and rotating gearing, and apparatus being adapted for connection to a source of electrical potential comprising:
 - a. first and second magnetic members, each of said magnetic members being generally annular in configuration and having an aperture therein;
 - b. means received in said aperture in each of said magnetic members for fixedly positioning said magnetic members within the housing so as to be exposed to the normal lubricant flow, said magnetic members being spaced apart to define a gap;
 - c. said positioning means electrically insulating said first magnetic member from said second magnetic member; and
 - d. normally-open electrical circuit means including a first circuit portion connected to one of said magnetic members and adapted for connection to said source of electrical potential, and a second circuit portion connected to the other of said magnetic members, said magnetic members being operably disposed to close said normally-open circuit when ferrous contamination on said first magnetic member comes into contact with ferrous contamination on said second magnetic member.

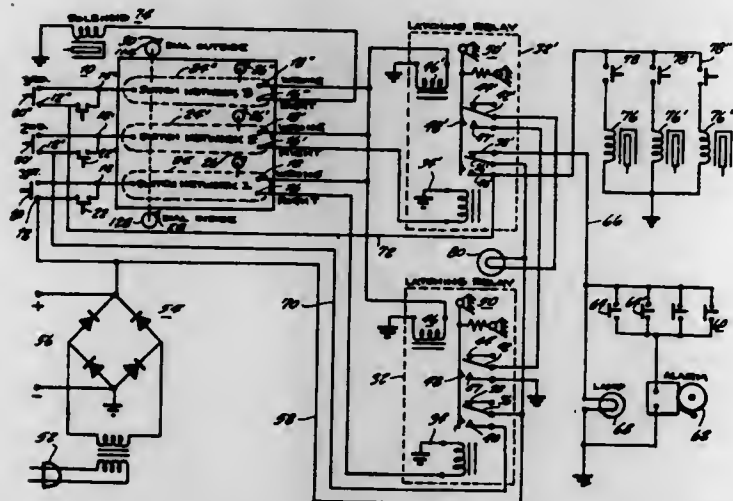
4,008,465
KEYLESS ANTI-THEFT ENTRY SYSTEM
Herbert C. Le Doux, 136 Seaman Ave., New York, N.Y. 10034
Filed Mar. 29, 1976, Ser. No. 671,386
Int. Cl.² G08B 13/08

U.S. Cl. 340—274 C

10 Claims

1. An anti-theft entry system for guarding a premises comprising:
 - a. selector switch means having a plurality of sections, each section including: an input terminal, an output terminal, and an intermediate terminal, a rotary dial means coupled between the intermediate terminal and the output terminal, said rotary dial means having a plurality of positions and capable of being preset to interconnect said last two mentioned terminals when dialed to a particular position, button switch means coupled between the input terminal and the intermediate terminal;
 - b. a plurality of latching means each respectively associated

with a section of said selector switch means, each of said latching means including: a relay coil coupled to the output terminal of its respective section and energized when the respective button switch means is closed and the preset position is dialed on its respective rotary dial means, a relay switch activated by said relay coil to close from a normal position to an active position, reset means coupled to the output terminal of its respective section and energized when its respective button switch means is closed and its respective rotary dial means is set to any position other than its preset position, said reset means returning its respective relay switch back to its normal position, the active position of the relay switches of each latching means, with the exclusion of one, being interconnected to the input terminal of a different section of the selector switch means in a predetermined sequence,



wherein the excluded relay switch is the last in the sequence;

- c. energy supply means coupled to each of said relay switches and also coupled to the input terminal of the remaining section of the selector switch means not interconnected to any active position;
- d. alarm circuit means coupled to the normal position of the excluded relay switch; and
- e. entry means coupled to the active position of the excluded relay switch for releasing a window, door, or the like,

whereby when the button switch means are depressed in the predetermined sequence, and for each button being depressed its respective dial means is positioned to its corresponding present position, said alarm circuit will be disengaged and only authorized entry can be obtained into the premises into the premises by entry means.

4,008,466

DEVICE FOR INDICATING ANGULAR POSITION AND DEPTH OF A TOWED VEHICLE

William V. Smith, 1617 Duke St., Memphis, Tenn. 38108

Filed Nov. 7, 1975, Ser. No. 629,966

Int. Cl.² G08B 21/00; B60Q 9/00

U.S. Cl. 340—282

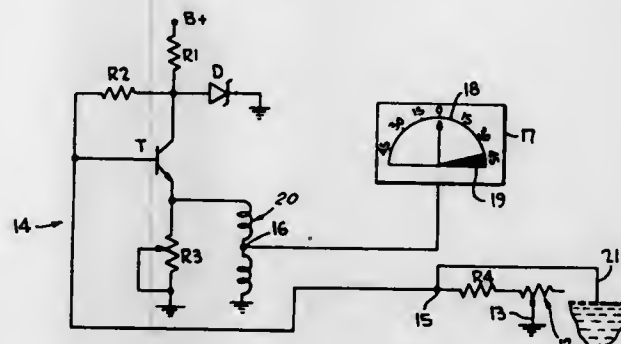
6 Claims

1. An indicator for indicating the relative angular relationship between a towed vehicle and a towing vehicle to which the towed vehicle is coupled, the indicator comprising:

- a housing to be mounted on one of the vehicles and said housing having a laterally extending slot therein;
- a movable arm having one end to be coupled to the other of the vehicles, said movable arm having its other end coupled to said housing mounted on one of the vehicles and being slidable along said slot;
- a variable slide resistor arranged within said housing and being coupled to said other end of said movable arm, said variable slide resistor providing a resistance varying in dependence upon the relative angular movement between the coupled towed vehicle and towing vehicle;

electrical measuring means having an input terminal electrically coupled to said variable slide resistor and providing an output signal varying in dependence upon variations in the resistance of said variable slide resistor;

a volt meter coupled to receive the output signal from said electrical measuring means and providing an indication of the relative angular relationship between the coupled towed vehicle and towing vehicle and,



a water sensor indicator having a water sensing member to be mounted on a towed vehicle and serving to effectively couple said input terminal of said electrical measuring means to the towed vehicle's frame when said water sensing member comes into contact with water for causing said electrical measuring means to provide a maximum output signal thereby causing a maximum indication on said volt meter.

4,008,467

POWER LINE CARRIER COMMUNICATION SYSTEM HAVING EFFICIENT CARRIER SIGNAL COUPLING OF DISTRIBUTION SECONDARY LINES

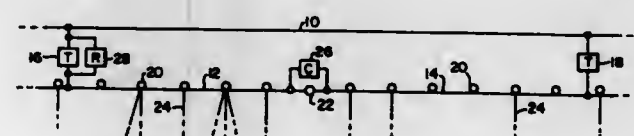
Tamas I. Pattantyus-Abraham, Wilkins Township, and Ian A. Whyte, Churchill Borough, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 16, 1975, Ser. No. 613,835

Int. Cl.² H04M 11/04

U.S. Cl. 340—310 A

6 Claims



1. A power line carrier communication system for communicating with first and second electric power customer locations separately served by first and second distribution transformers, respectively, of a distribution line system, said communication system comprising:

- a primary distribution line transmitting carrier signals having a substantially greater frequency than the frequency of electric power also conducted therein;
- means commonly connecting said first and second distribution transformers to said primary distribution line;
- first and second independent secondary distribution lines each including grounded and ungrounded conductors supported adjacent the conductors of the other line at at least one location, and being connected to said first and second distribution transformers, respectively;
- means for transferring said carrier signals only around said first distribution transformer;
- means for connecting a first electrical load at said first customer location to said first secondary distribution line and a second electrical load at said second customer location to said second secondary distribution line;
- first and second communications terminals respectively coupled to first and second secondary distribution lines near the electrical loads at said first and second customer

locations, said terminals operating at the carrier signal frequency; and

means for interconnecting said first and second secondary distribution lines at the adjacently supported location, said interconnecting means providing a substantially low-attenuation path between the secondary distribution lines for signals at the carrier frequency, and providing a substantially high-attenuation path between the secondary distribution lines for signals at the power frequency thereby being effective to transfer the carrier signals between said primary distribution line and said second communication terminal while the associated second electrical load is maintained in a separately connected relationship to said second distribution transformer.

4,008,468

ANALOGUE-TO-DIGITAL CONVERTER WITH CONTROLLED ANALOGUE SETTING

Claude Imhoff, and Jean Marie Aure, both of Paris, France, assignors to Thomson-CSF, Paris, France

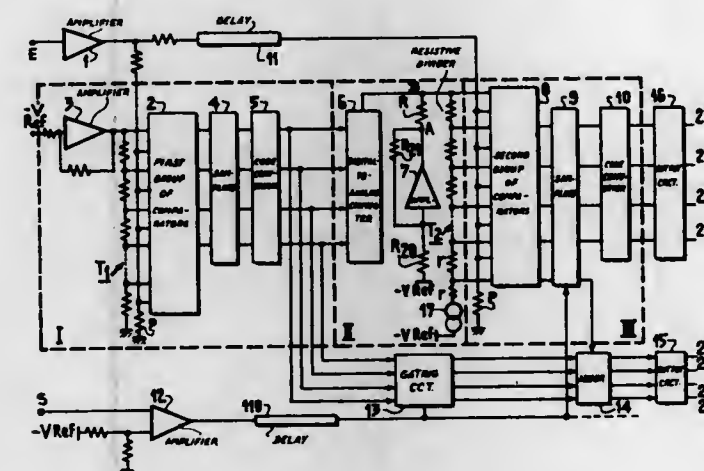
Filed Mar. 12, 1975, Ser. No. 557,478

Claims priority, application France, Mar. 15, 1974, 74.08883

Int. Cl.² H03K 13/02

U.S. Cl. 340—347 AD

10 Claims



1. A high-speed encoder of the series-parallel type for converting analogue input voltages into combinations of bits, comprising:

- a first and a second encoder section respectively including a first group of comparators and a second group of comparators each having a test input and a reference input;
- a source of first threshold voltages, separated by relatively large increments ΔV_1 , respectively applied to the reference inputs of said first group of comparators;
- a source of second threshold voltages, separated by relatively small increments ΔV_2 , respectively applied to the reference inputs of said second group of comparators;
- first circuit means for feeding an analogue input voltage in parallel to the test inputs of all the comparators of said first group with resulting generation of a set of higher-order bits in an output of said first encoder section;
- second circuit means for feeding said analogue input voltage in parallel and with a predetermined delay to the test inputs of all the comparators of said second group with resulting generation of a set of lower-order bits in an output of said second encoder section, each comparator of said second group responding to a predetermined relationship between the voltages on its test and reference inputs by changing from an unswitched state with flow of biasing current in its reference input to a switched state with flow of biasing current in its test input; and
- a control network including digital-to-analogue conversion means connected to the output of said first encoder section for concurrently shifting said second threshold voltages in response to said higher-order bits to hold said

analogue input voltage within the operating ranges of said second group of comparators, said source of second threshold voltages including a resistive voltage divider connected in series with a fixed resistor R across a constant-current generator and consisting of p segments of resistance r forming p junctions with one another and with said fixed resistor, p being the number of comparators in said second group, said junctions being respectively connected to the reference inputs of the comparators of said second group, said control network being in series with said fixed resistor only for modifying the voltage drop thereacross by multiples of ΔV_1 , the current I delivered by said generator being less than a current I_0 required to make the total voltage drop prI across said voltage divider equal to ΔV_1 , the difference $I_0 - I$ substantially compensating for threshold errors due to said biasing currents.

4,008,469

SIGNAL PROCESSING IN SHORT-PULSE GEOPHYSICAL RADAR SYSTEM

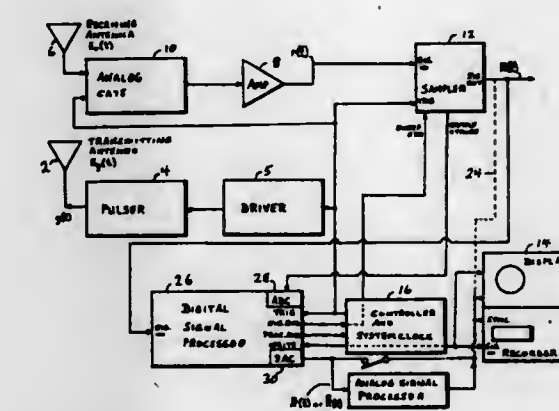
Jamie C. Chapman, Lexington, Mass., assignor to Terrestrial Systems, Incorporated, Lexington, Mass.

Filed Aug. 6, 1974, Ser. No. 495,259

Int. Cl.² G01S 9/02

U.S. Cl. 343—5 NA

6 Claims



1. In a geophysical radar system comprising:

- A. transmitting means for transmitting repetitive short radar pulses into the earth,
 - B. receiving means for detecting reflected radar energy returned as the repetitive pulses are reflected from various discontinuities at various depths within the earth, and
 - C. output means for providing an indication of the reflected radar energy in a form which is intelligible to a human observer,
- the improvement comprising:
- D. deriving means responsive to the detected radar energy for deriving a sequence of digital representations of the amplitude of the reflected energy as said reflected energy is detected by the receiving means at another corresponding sequence of instants in time, each of said instants occurring at individually selected amounts of time after each corresponding transmitted pulse is transmitted into substantially the same part of the earth, whereby the digital representations represent whatever discontinuities are present at corresponding depths into the earth,
 - E. selecting means for selecting said individually selected amounts of time according to the attenuation suffered by reflected radar energy as received at the receiving means from said selected depths such that a greater plurality of said digital representations are derived for selected depths suffering greater attenuation than are derived for selected depths suffering lesser attenuation, and
 - F. combining means for combining all of the sequence of digital representations formed at one depth at substantially one part of the earth to form a combined representation with improved signal-to-noise ratio.

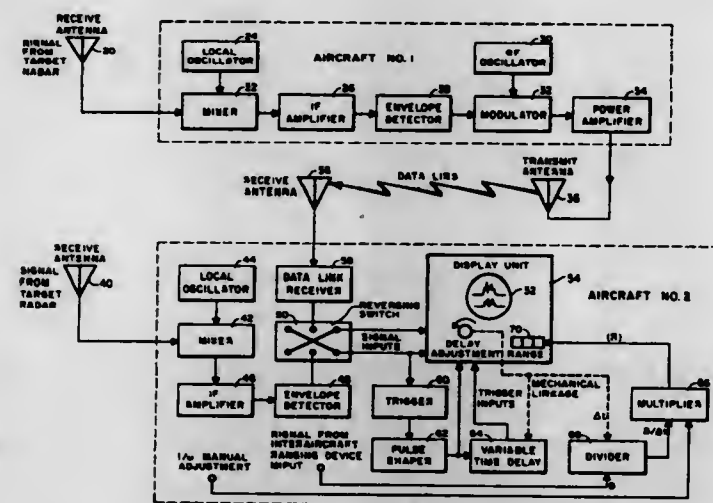
4,008,470

PASSIVE RANGING SYSTEM

George R. Lanning, Corona, and John Y. K. Chang, Riverside, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 27, 1968, Ser. No. 710,703
Int. Cl. 2 G01S 9/04

U.S. Cl. 343-6 A

4 Claims



1. In a passive airborne ranging system for determining the range of target radars located on the surface of the earth, the combination comprising:

- a first and second aircraft flying in a predetermined formation, each having radar receivers mounted therein for receiving energy signals radiated by a target radar of interest;
- said first aircraft having an envelope detector circuit means coupled to its radar receiver for detecting the envelope of the received radar signal;
- said first aircraft having a data link transmitter coupled to said first aircraft envelope detector for transmitting a signal modulated by the detected radar signal received by said first aircraft;
- said second aircraft having an envelope detector circuit means coupled to its radar receiver for detecting the envelope of the received radar signal;
- said second aircraft having data links receiving means for receiving and detecting the transmitted signal from said first aircraft;
- signal comparison means coupled to the envelope detector of said second aircraft and to said data link receiving means for producing an output signal proportional to the approximate range of the target radar to said second aircraft.

4,008,471

CORRELATOR TO REDUCE BIN STRADDLE IN A COLLISION AVOIDANCE SYSTEM

James Robert Hall, Canoga Park, and John Jeffrey Lyon, Chatsworth, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,026

Claims priority, application United Kingdom, Apr. 14, 1975, 15219/75

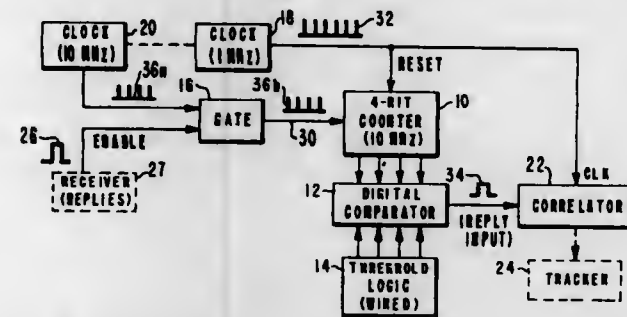
Int. Cl. 2 G01S 9/56

U.S. Cl. 343-6.5 LC

2 Claims

1. A circuit for correlating pulse reply signals generated by remote stations in response to probe signals from interrogation stations, said circuit including a correlator of the type having sequenced storage means for storing and sequencing at a given rate into bins signals applied to an input of said correlator corresponding to said reply signals, a significant portion of said reply signals having a width greater than a predetermined portion of the width of said bins, said correlator including counting means for counting said reply signals, the improvement comprising:

means for sampling said received pulse reply signals at a rate significantly greater than the rate of sequencing said storage bins;
means for counting said sampled signals at said given rate to provide a count of sampled signals;
means for comparing said sample count to a threshold value to generate thereby a thresholded output signal to incre-



ment said correlator counting means for samples producing a count greater than said threshold; and
means for coupling said thresholded output signal to said correlator counting means whereby only those reply signals exceeding a predetermined portion of a correlator range bin will increment the count of reply signals in said correlator.

4,008,472

MARINE RADAR TRANSMISSION AND RECEPTION SYSTEM

Tomiji Nirasawa, Yokohama, and Hiroshi Ota, Tokyo, both of Japan, assignors to Kabushiki Kaisha Tokyo Keikoku, Tokyo, Japan

Division of Ser. No. 358,456, May 8, 1973, Pat. No. 3,893,117.

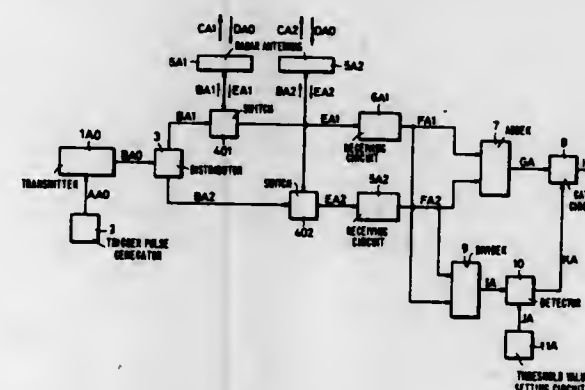
This application Feb. 21, 1975, Ser. No. 551,917

Claims priority, application Japan, May 10, 1972, 47-46033

Int. Cl. 2 G01S 7/28

U.S. Cl. 343-7 A

4 Claims



2. A marine radar transmission and reception system comprising:

- means for generating first and second transmission pulse radar waves of first and second carrier wave lengths, respectively;
- first and second antennae for emitting the first and second transmission pulse waves in the same direction as first and second pulse radar waves respectively and receiving first and second reflected pulse waves of the first and second emitted pulse radar waves respectively;
- first and second receiving circuits supplied with the outputs of the first and second antennae respectively;
- a gate circuit for gating the output of the first or second receiving circuit or the sum of the outputs of the first and second receiving circuits; and
- control means having a quotient circuit for producing the quotient of the outputs of the first and second receiving circuits, a setting circuit for deriving a predetermined threshold value output and a detector for detecting

whether or not the quotient is in excess of the threshold value output;
f. in which the gate circuit is controlled with the output of the detector of the control means, whereby sea clutter eliminated received pulse radar waves are obtained from the gate circuit.

4,008,474

DOPPLER RADAR FOR DISTINGUISHING BETWEEN APPROACHING AND RECEDING TARGETS AND HAVING INCREASED FREQUENCY RESPONSE

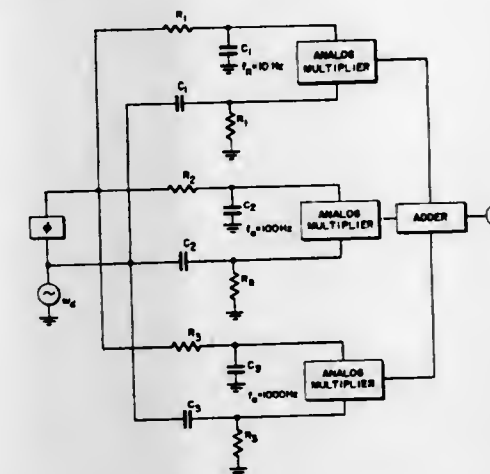
Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1975, Ser. No. 588,087

Int. Cl. 2 G01S 9/42

U.S. Cl. 343-7.7

2 Claims



4,008,473

COLLISION PREDICTING OPERATION SYSTEM

Matatoyo Hinachi, Nagoya; Kazuo Oishi, Oobu; Toshiaki Kato, Nishio; Takeshi Matsui, Kariya, and Takashi Yamada, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

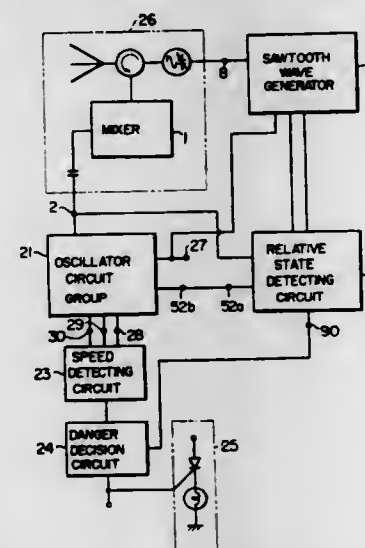
Filed Jan. 14, 1974, Ser. No. 433,405

Claims priority, application Japan, Jan. 20, 1973, 48-8810

Int. Cl. 2 G01S 9/44

U.S. Cl. 343-7.5

4 Claims



1. A collision predicting operation system comprising:
electromagnetic wave generating means whose oscillation frequency is varied in accordance with an input voltage thereto;
antenna means for radiating said electromagnetic wave and for receiving a reflected wave reflected from a target due to the encounter of said electromagnetic wave with said target;
means for causing said reflected wave to interfere with a part of said electromagnetic wave to generate a doppler signal;
periodic wave generating means connected to said doppler signal generating means and including circuitry responsive only to a doppler signal having an amplitude higher than a predetermined value and a frequency within a predetermined range to produce a periodic wave synchronized with said doppler signal and having a rise portion occurring when the phase angle of the doppler signal is zero;
frequency modulating means connected to said electromagnetic wave generating means and said periodic wave generating means, said frequency modulating means including circuit means responsive to the rise of said periodic wave for changing the input voltage to said electromagnetic wave generating means in synchronization with the occurrence of said zero phase angle of said doppler signal thereby changing the oscillation frequency of said electromagnetic wave generating means; and
means for detecting the polarity and phase of the modulated portion of said doppler signal.

4,008,475

STABILIZING AND CALIBRATION CIRCUIT FOR FM-CW RADAR RANGING SYSTEMS

Henry Charles Johnson, Neshanic, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,325

Int. Cl. 2 G01S 9/23, 9/02

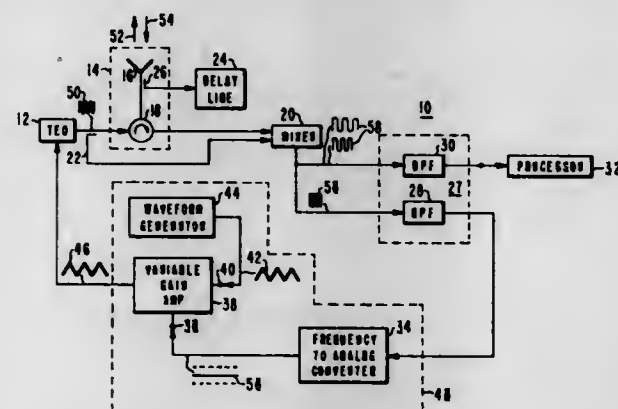
U.S. Cl. 343-14

4 Claims

1. In a frequency-modulated continuous wave ranging system of the type including: first means for generating a continu-

ous wave interrogation signal, said interrogation signal being frequency modulated in accordance with the amplitude of a predetermined waveform, the amplitude of said predetermined waveform being periodic at a predetermined rate and having a predetermined maximum amplitude; second means for transmitting said interrogation signal to targets and receiving reflected signals from said targets in response thereto; third means for deriving difference signals indicative of the frequency differences of said reflected signals from the instantaneous frequency of said interrogation signal; and fourth means for determining from said difference signals the range between said ranging system and targets within a predetermined domain of ranges, the improvement wherein:

said ranging system further comprises fifth means, responsive to said interrogation signal, for delaying a portion of said interrogation signal by a predetermined time interval and applying said delayed signal to said third means;



said delayed signal corresponding to a reflected signal from a target at a predetermined range outside of said predetermined range domain;

sixth means, responsive to said difference signals, for generating first and second output signals, said first output signal consisting substantially of difference signals corresponding to said predetermined range and said second output signal consisting substantially of said difference signals corresponding to ranges within said predetermined range domain,

said second output signal being applied to said fourth means; and

seventh means, responsive to said sixth means first output signal, for changing the product of said periodic rate and said maximum amplitude of said predetermined waveform in accordance with the difference corresponding to said predetermined range.

4,008,476

DIGITAL ANTENNA PATTERN GENERATOR FOR RADAR SIMULATION

Albert B. Evans, Jr., Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,533

Int. Cl.² G01S 7/40

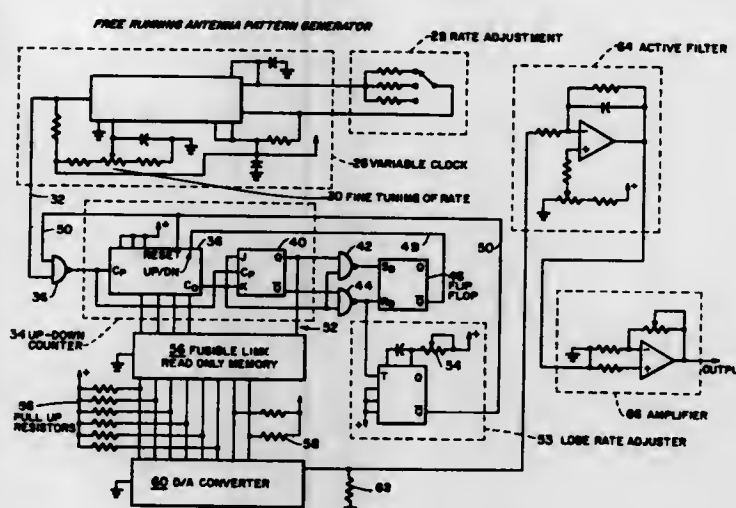
U.S. Cl. 343-17.7

11 Claims

1. An antenna pattern generator for producing an output signal representative of an antenna beam pattern comprising:

- means for converting an analog waveform into a digital signal having a magnitude proportional to angular displacement across said antenna beam pattern;
- read only memory means addressed in accordance with said magnitude of said digital signal to produce a digital pattern signal having a preselected magnitude proportional to said antenna beam pattern;
- means for converting said digital pattern signal into an analog antenna beam pattern signal; and

d. means for filtering said analog antenna beam pattern



signal to produce said output signal representative of said antenna beam pattern.

4,008,477

ANTENNA WITH INHERENT FILTERING ACTION

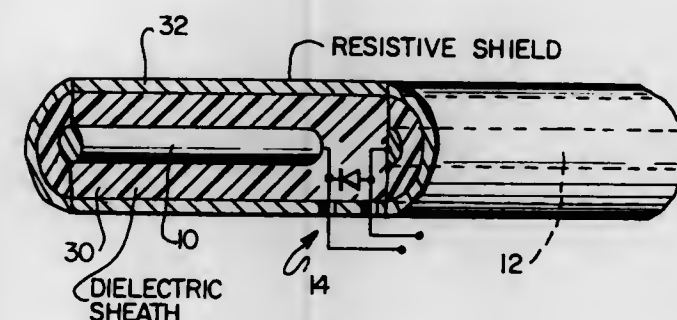
Tadeusz M. Babij, Wroclaw, Poland; Ronald R. Bowman, and Paul F. Wacker, both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed June 25, 1975, Ser. No. 590,355

Int. Cl.² H01Q 1/42, 3/16

U.S. Cl. 343-701

1 Claim



1. An antenna with inherent filtering action for shaping the frequency response curve thereof, said antenna comprising, in combination, at least one elongated receiving element constructed of an electrically-conductive material; a dielectric sheath surrounding said receiving element; a resistive shield surrounding said dielectric sheath, and a detector directly coupled to said receiving element; whereby a distributed parameter RC filter is formed decreasing the low-frequency response of said antenna.

4,008,478

RIFLE BARREL SERVING AS RADIO ANTENNA

Kurt Ikrath, Elberon; William Kennebeck, Sea Bright, and Jack Wills, Ocean Grove, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 31, 1975, Ser. No. 645,722

Int. Cl.² H01Q 1/00, 1/36

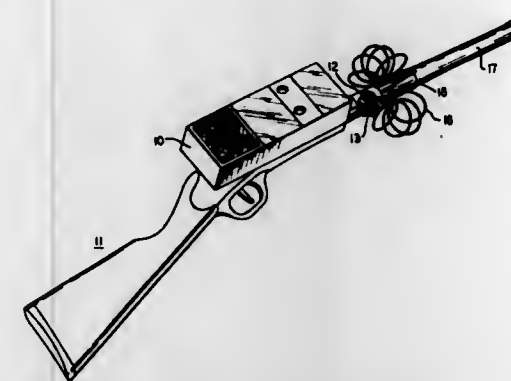
U.S. Cl. 343-720

4 Claims

1. In combination:

- a weapon having an elongated, electrically-conductive barrel;
- a radio-frequency transceiver providing an r.f. output and being mounted to said weapon;
- a helical toroidal r.f. transformer coil co-axially mounted about said barrel and coupling said r.f. output to said barrel, said barrel acting as the antenna for said transceiver and as a low-impedance secondary load for said toroidal transformer; and

d. means for insulating said toroidal transformer coil from said conductive barrel, said toroidal transformer coil



extending transversely around said insulating means and barrel.

4,008,479

DUAL-FREQUENCY CIRCULARLY POLARIZED SPIRAL ANTENNA FOR SATELLITE NAVIGATION

Valor Clark Smith, LeMesa, Calif., assignor to CHU Associates, Inc., Littleton, Mass.

Filed Nov. 3, 1975, Ser. No. 628,047

Int. Cl.² H01Q 1/36

U.S. Cl. 343-895

9 Claims



1. An omnidirectional circularly polarized antenna for satellite communication and the like having, in combination, a longitudinal insulating member; transmission-line means extending longitudinally within said member and connected near the ends of said member and at an intermediate position thereof to transversely extending conductive feed connector means; first and second interleaved sets of substantially parallel conductive strips extending longitudinally along the member; means for connecting adjacent strips of the first and second sets together at one of their ends near one end of said member and to the said connector means near said one end of the member; means for connecting the other ends of the first set of strips to the said connector means near said other end of said member; and means for connecting the other ends of the second set of strips to said connector means at the said intermediate position in order to produce substantially the same omnidirectional pattern of radiation coverage directed upward of said member and over a band of wavelengths including those corresponding to the dimensions of the strips of said first and second sets of strips.

4,008,480

PHOTOCOMPOSITION ESCAPEMENT DRIVE SYSTEM

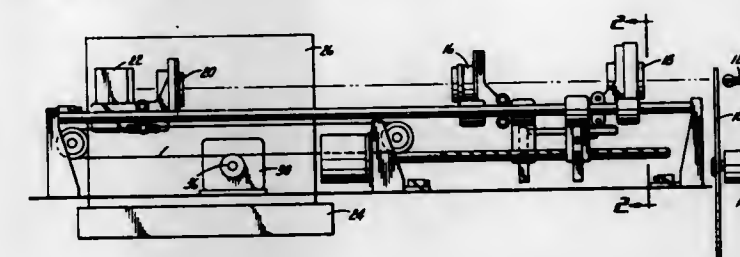
Francis S. Szabo, Morristown, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 16, 1975, Ser. No. 586,922

Int. Cl.² B41B 13/10

U.S. Cl. 354-5

4 Claims



1. A photographic type composing apparatus having a collimating lens, means for putting in the focal plane of the collimating lens an image of the character to be projected, an illuminating device to project the images of selected characters forming a line successively through the collimating lens, each character having a predetermined width value and being projected while it is in the projection position, a translating lens combination including a converging lens and a reflector arranged one behind the other to focus the projected light and reflect it through a predetermined angle, a support to hold a sensitized surface in substantial coincidence with the focal plane of the light leaving the lens combination, characterized by an improved means for displacing the lens combination relative to the collimating lens and longitudinally of the surface after each projection by variable distances proportional to the widths of the corresponding characters, comprising, a stepper motor primary drive means, and a mechanical motion reducer system means for dividing a step of said motor into a reduced output motion, wherein the stepper motor has a step movement at least twice the required step size to position the lens combination at all possible required distances and wherein the mechanical motion reducer system is a flexible line driven by a line spool carried by the motor, and the line is reeved around a stationary position turning surface, a similar turning surface carried by the carriage, and extends back toward the stationary turning surface to an anchor point in a block and tackle configuration to reduce the motor output at least by half the length of line taken up in one motor step.

4,008,481

EXPOSURE CONTROL SYSTEM WITH SEPARATE FLASH AND AMBIENT TRIGGER LEVELS

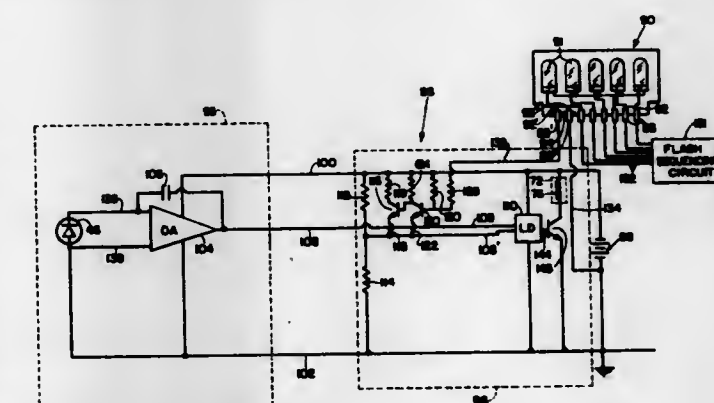
George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1975, Ser. No. 619,383

Int. Cl.² G03B 7/14

U.S. Cl. 354-27

17 Claims



1. A photographic camera for alternate use in ambient and artificial scene lighted conditions comprising: a housing; means within said housing for receiving a source of electrical energy;

means within said housing for defining a film exposure plane;

a pair of aperture shutter blades;

means for mounting said blades for selective simultaneous displacement from an initial closed arrangement wherein said blades preclude scene light from impinging on said exposure plane to an open arrangement wherein said blades permit scene light to impinge on said exposure plane and then to a final closed arrangement wherein said blades again preclude scene light from impinging on said exposure plane, such a displacement of said blades serving to define an exposure interval during which scene light impinges on said exposure plane through changing aperture sizes defined by said blades;

scene light detecting means responsive to scene light for providing an output signal in correspondence to detected scene light;

means for actuating said mounting means to initiate displacement of said blades from their said initial closed arrangement towards their said open arrangement thereby commencing said exposure interval and for subsequently actuating said mounting means in correspondence with said output signal to initiate the displacement of said blades into their said final closed arrangement; and

means inoperative during exposure operations involving only ambient scene lighted conditions for selectively increasing the correspondence relationship between said output signal and scene light detected by said detecting means to facilitate exposure operations involving artificial scene lighted conditions, the rendering of said correspondence increasing means operative resulting in an increase of detected scene light in order for said detecting means to provide the same output signal under artificial scene lighted conditions as otherwise provided by said detecting means under ambient scene lighted conditions.

4,008,482

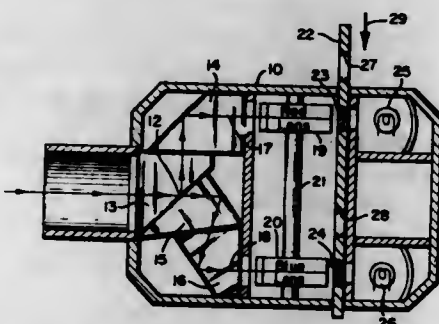
COLOR CODING AND DECODING SYSTEM FOR USE IN MICROGRAPHICS

Paul Wentworth Lang, P.O. Box 1000, Orange, Calif. 92668
Filed Nov. 24, 1975, Ser. No. 634,522

Int. Cl.² G03B 33/10

U.S. Cl. 354-104

3 Claims



1. A color coding and decoding device for use in micrographics including, in combination:

a. a camera body;

b. a light spectrum dividing means secured in said camera body for splitting the light spectrum from a scene of which a picture is to be taken into first and second different spectral portions;

c. first and second lens in said camera receiving said first and second spectral portions;

d. a slide member in said camera having negative film holding means for holding first and second black and white film negatives in said camera in positions behind said first and second lens respectively for exposure to spectral bands within said first and second spectral portions, when the slide member is in a first position; and

e. projection light means behind said holding means, said holding means also including transparency holders for

holding transparencies behind said lens and permitting light to pass from said projection light means through the transparencies when said slide member is moved to a second position, whereby first and second black and white negatives are provided from which positive prints may be made in the form of slide transparencies and subsequently received in said transparency holders for projection back through said lens and said spectrum dividing means onto a screen such that the spectral portions are recombined to produce the original scene.

4,008,483

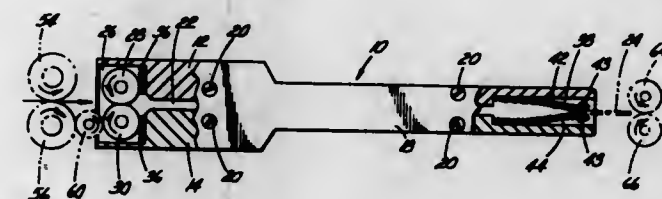
FILM CASSETTE

William R. Swift, Placentia; James Michael Marsh, Yorba Linda, and Clyde E. LeFevre, Orange, all of Calif., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio
Filed Sept. 22, 1975, Ser. No. 615,474

Int. Cl.² G03B 17/26

U.S. Cl. 354-277

10 Claims



1. A cassette for transporting a film sheet from one station to another without exposing the film sheet to ambient light comprising:

an enclosure having film sheet ingress and egress ends including top and bottom walls secured to a pair of side walls;

a pair of rollers mounted at the ingress end of the enclosure affording a light seal and adapted for receiving and advancing a film sheet into the enclosure;

resilient means mounted at the egress end of the enclosure providing a light seal for exiting of a film sheet from the enclosure;

said rollers adapted to advance a film sheet into the enclosure in response to rotation of at least one of the rollers.

4,008,484

SEMICONDUCTOR DEVICE HAVING MULTILAYERED ELECTRODE STRUCTURE

Shunichi Maekawa, Itami, and Hitoshi Kikaki, Kobe, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 373,082, June 25, 1973, abandoned, which is a continuation of Ser. No. 218,553, Jan. 17, 1972, abandoned, which is a continuation of Ser. No. 813,648, April 4, 1969, abandoned. This application June 23, 1975, Ser. No. 589,576

Claims priority, application Japan, Apr. 4, 1968, 43-22262

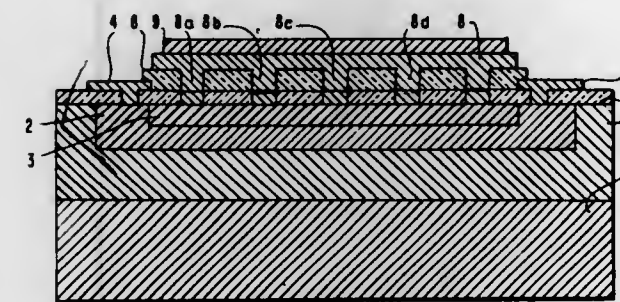
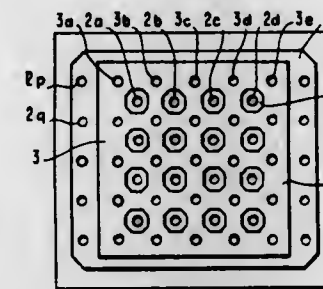
Int. Cl.² H01L 29/72

U.S. Cl. 357-36

3 Claims

1. A semiconductor high frequency high power device having a multilayered electrode structure comprising a semiconductor substrate of one conductivity type, a first base region of the opposite conductivity type formed on one surface of said substrate, a second single area emitter region of the same conductivity type as the substrate formed on said first region, a first insulating film for covering and protecting parts of pn junctions formed between said first region and said substrate that are exposed on the surface of said substrate, a first conductive layer formed on said first insulating film and having ohmic contact with said first region through holes opened in said first insulating film, a second insulating film covering the upper surface of said first conductive layer leaving at least a part of the peripheral parts of said first conductive layer uncovered, and a second conductive layer of high resistivity penetrating through said first insulating film and said second insulating film at a plurality of spaced points and

having ohmic contact with said second single area region emitter forming resistors separately contacting said single area of the second region at multiple points, without any said resistor extending across said single area region to the borders thereof, and a metal layer on nearly the entire outer surface of said second conductive layer and constituting an electrode sufficiently thick and low in resistivity that the entire outer



surface of the second conductive layer parallel to the surface of the substrate is of substantially the same potential during operation, whereby the voltage drop in the second conductive layer during operation is perpendicular to the substrate to prevent local crowding of current, and whereby when current flows in the semiconductor device a uniform potential distribution is produced on the emitter semiconductor region as a result of the currents flowing in said resistors.

4,008,485

GALLIUM ARSENIDE INFRARED LIGHT EMITTING DIODE

Tadahiko Miyoshi, Hitachi; Yasutoshi Kurihara, Katsuta, and Mitsuru Ura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

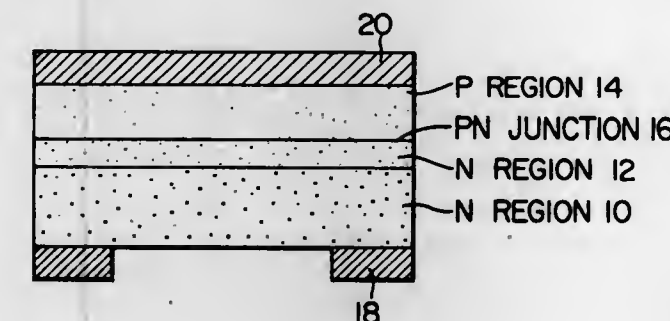
Filed June 20, 1975, Ser. No. 588,833

Claims priority, application Japan, June 24, 1974, 49-71341

Int. Cl.² H01L 33/00

U.S. Cl. 357-17

14 Claims



1. A gallium arsenide light emitting diode comprising a semiconductor body with a pair of principal surfaces, said semiconductor body including (i) a first region of GaAs doped with at least one selected from the group consisting of Sn, Se, Te and S and having an n conductivity type, a first electrode being provided in ohmic contact with that surface of said first region which forms one of said principal surfaces of said semiconductor body, (ii) a second region of GaAs doped with

Si and having an n conductivity type, said second region being disposed adjacent to said first region, and (iii) a third region of GaAs doped with Si and having a p conductivity type, said third region being disposed adjacent to said second region, a second electrode being provided in ohmic contact with that surface of said third region which forms the other principal surface of said semiconductor body.

4,008,486

COMPRESSION-ASSEMBLED SEMICONDUCTOR DEVICE WITH NESTING CIRCULAR FLANGES AND FLEXIBLE LOCATING RING

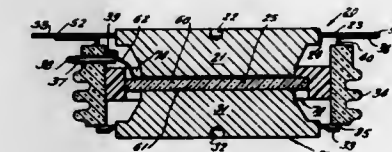
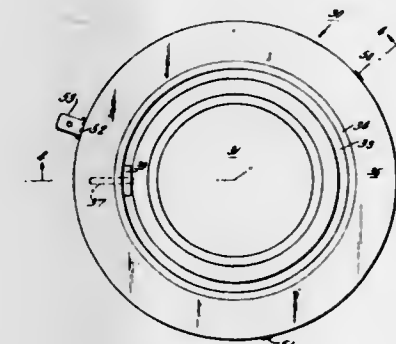
Mieczyslaw W. Byczkowski, Rancho Palos Verdes, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed June 2, 1975, Ser. No. 582,610

Int. Cl.² H01L 23/02, 23/12, 23/42, 23/44

U.S. Cl. 357-74

8 Claims



1. A compression bonded assembly for a semiconductor device comprising, in combination:

first and second spaced pole pieces; said first and second pole pieces having respective facing surfaces which are flat and parallel and which are adapted to engage corresponding surfaces of a semiconductor wafer;

a semiconductor wafer having flat parallel opposing surfaces disposed between and engaging said respective surfaces of said first and second pole pieces;

an insulation housing ring radially spaced from and concentrically surrounding said first and second pole pieces and enclosing at least the volume between said spaced pole pieces; said insulation housing ring having first and second ends;

first circular flange ring means extending from said first pole piece and connected to said first end of said insulation housing;

second circular flange ring means extending from said second pole piece;

third circular flange ring means extending outwardly from said second end of said insulation housing ring;

said third flange ring means having substantially the same diameter as said second flange ring means;

said third flange ring means engaging said second flange ring means in surface-to-surface contact;

at least three discrete bent tabs extending across the outer circumferential peripheries of said second and third flange ring means for centering said second and third flange ring means relative to one another; said at least three bent tabs being circumferentially spaced from one another; each of said at least three bent tabs extending

from the same one of said second or third flange ring means, the other of said second or third flange ring means defining a circular disc without extensions thereon.

4,008,487

SEMICONDUCTOR COMPONENT WITH PRESSURE CONTACT

Herbert Vogt, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

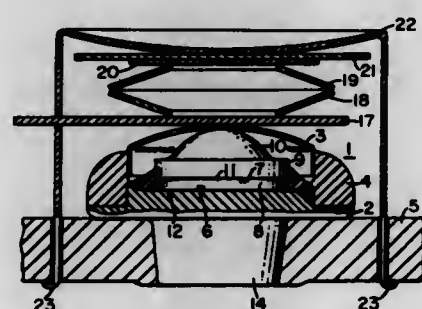
Filed July 15, 1975, Ser. No. 596,139

Claims priority, application Germany, July 24, 1974, 2435637

Int. Cl.² H01L 23/02, 23/48, 23/42

U.S. Cl. 357-81

6 Claims



1. A semiconductor apparatus comprising a semiconductor element having top and bottom opposed, substantially parallel major surfaces; a top electrode electrically and mechanically connected to said top major surface of said semiconductor element; a base member electrically and mechanically connected to said bottom major surface of said semiconductor element; a cooling body for removing heat from said semiconductor element through said base member, said cooling body having a surface inclined at an angle to a line normal to said major surfaces of said semiconductor element, said angle being greater than 0° and less than 45° said inclined surface mating with a corresponding inclined surface of said base member; and, means retained in said apparatus for exerting and maintaining a force normal to said major surfaces of said semiconductor element, said means applying downward pressure on said top electrode and upward pressure on said cooling body, whereby said semiconductor element is held in compression between said top electrode and said base member, and said cooling is held in compression against said base member at said inclined mating surfaces.

4,008,488

MAGNETIC RECORDING DATA DECODING SYSTEM

George T. Osborne, Rush City, Minn., assignor to Braemar Computer Devices, Inc., Burnsville, Minn.

Filed Aug. 25, 1975, Ser. No. 607,351

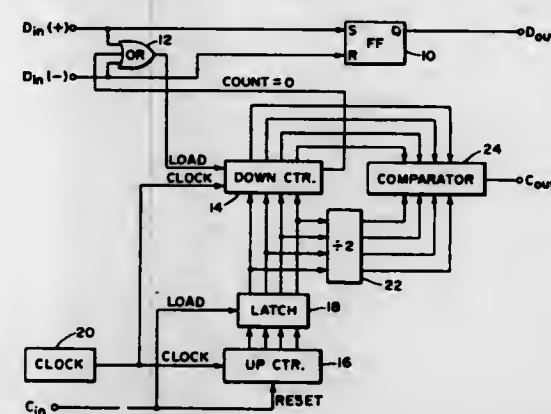
Int. Cl.² G11B 5/02

U.S. Cl. 360-51

12 Claims

1. For use in a data recording system having at least one data track and a clock track recorded on a magnetic recording medium, a decoding system comprising: first means for providing a representation of the clock period derived from said clock track; second means for providing a representation of said clock period in phase relationship with data derived from said data track; third means for providing decoded output data from such data track; and

fourth means operative in response to said second means for



4,008,489

PORTABLE VIDEO TAPE RECORDER

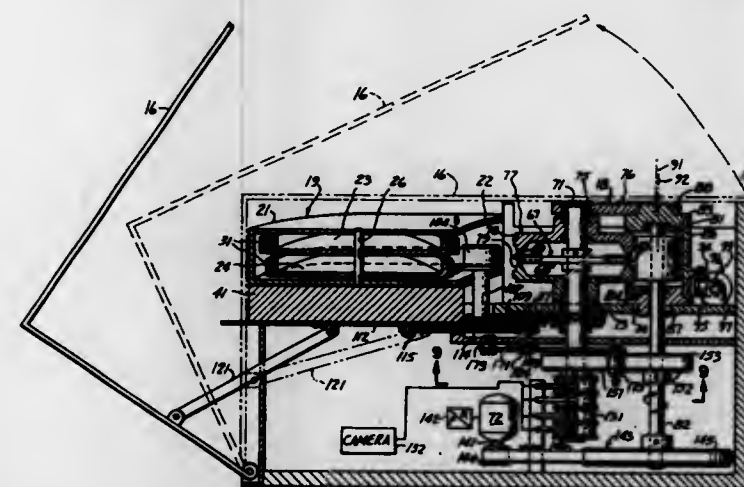
Richard C. Gilsdorf, Duarte, and Lewis B. Browder, Altadena, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 9, 1975, Ser. No. 539,758

Int. Cl.² H04N 5/78; G11B 15/28, 15/43

U.S. Cl. 360-85

31 Claims



1. Apparatus for recording video information, comprising in combination:

a portable unit; means including a video camera in said unit for generating composite electric video signals; a cartridge including a casing having an opening, a pair of cylindrical tape drums located in said casing, each tape drum having a cylindrical tape retaining surface and all portions of each tape drum being located within an imaginary cylindrical surface extending through the tape retaining surface of the particular tape drum, a magnetic recording tape having opposite ends attached to said tape drums and being wound on said cylindrical tape retaining surfaces on said tape drums, means for mounting said tape drums for rotation inside said casing, mechanical means contained within said casing and coupled to said tape drums for continuously maintaining said magnetic tape in tensioned condition on and between said tape drums, and means in said casing for guiding said magnetic tape to and from said tape drums relative to said opening; means for releasably mounting said cartridge on said unit; a magnetic tape drive and recording assembly supported by said unit in spaced relationship to said cartridge, said tape drive and recording assembly including rotatable magnetic recording head means for magnetically recording said composite electric video signals on said magnetic recording tape, rotatable tape drive capstan means at said magnetic recording head means, and for rotating said recording head means and said tape drive capstan means; and

means for extracting magnetic tape from said cartridge via said opening and for placing said extracted tape about at least part of said tape drive capstan means and recording head means.

4,008,490

MULTIPLE MAGAZINE TRANSDUCING APPARATUS

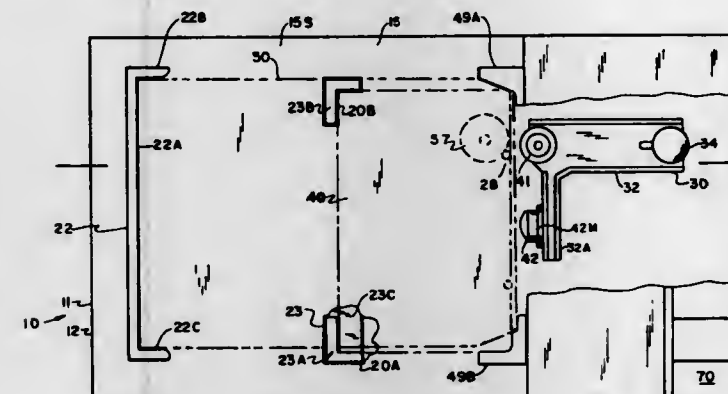
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Nov. 14, 1974, Ser. No. 523,864

Int. Cl.² G11B 23/04, 15/68

U.S. Cl. 360-94

8 Claims



1. An apparatus for transducing information with respect to magnetic tape contained within a plurality of magazines defined by respective substantially rectangular containers of different configurations including a first container the dimensions of which are smaller than those of a second container and wherein each container has openings along an edge wall thereof to permit access to the tape therein, comprising:

a support including a housing, magnetic transducing means movably supported by said support, said support having an upwardly facing wall portion and first means supported by said wall portion for retaining when abutted thereagainst each magnetic tape magazine with its wall containing said openings positioned at an operative location on said housing, second retaining means movably supported by said support and means for moving said second retaining means from a retracted position whereby it is below the upper surface of said upwardly facing wall portion of said housing and out of the way of a magazine disposed on said upwardly facing wall portion to a position whereby a portion of said second retaining means protrudes beyond said upper surface and serves to engage and cooperate with said first retaining means in predeterminedly locating and retaining said first magazine in its operative location on said upwardly facing wall portion during a transducing operation, third retaining means supported by said support for abutting and retaining a portion of the wall of the larger of said magazines so as to cooperate with said first retaining means in predeterminedly locating said larger magazine on said support, and means for moving said transducing means from a first position wherein it is out of contact with the magnetic tape of a magazine disposed at said operative location to a second positioned wherein said transducing means engages said magnetic tape through an opening along said edge wall thereof.

4,008,491

FIXED HEAD, DIRECT ACCESS STORAGE DEVICE

John J. Lynott, Los Gatos, and Elwood H. Storm, Aptos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,090

Int. Cl.² G11B 5/82, 19/00, 25/04

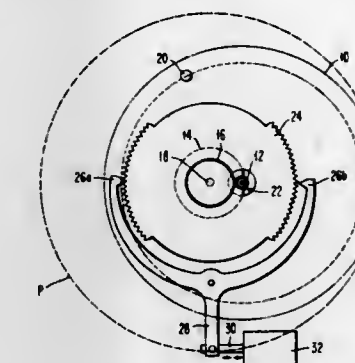
U.S. Cl. 360-97

13 Claims

1. A disk drive comprising at least one stationary magnetic

transducer for transducing signals between external circuitry and any of a plurality of concentric tracks on a magnetic record disk;

a rotary spindle on which such a magnetic record disk may be seated for rotation; a drive motor having a drive shaft parallel to but offset from said spindle; coupling means for coupling said drive shaft to rotate said spindle;



1. An enclosure in a magnetic memory storage device of the type using magnetic disks as the storage element comprising: a shroud having a generally circular outer wall for enclosing the magnetic disk pack and having a spindle for mounting said pack on a bottom surface of said shroud and having a clean air inlet port an exhaust air port and an opening for head arm assemblies associated with said storage device, the air inlet port being located just downwind of said opening and the exhaust port just upwind of said opening, where upwind and downwind refer to the air circulation caused by the rotating disk pack when in operation

4,008,492

THERMALLY STABILIZED ENCLOSURE FOR MAGNETIC DISK

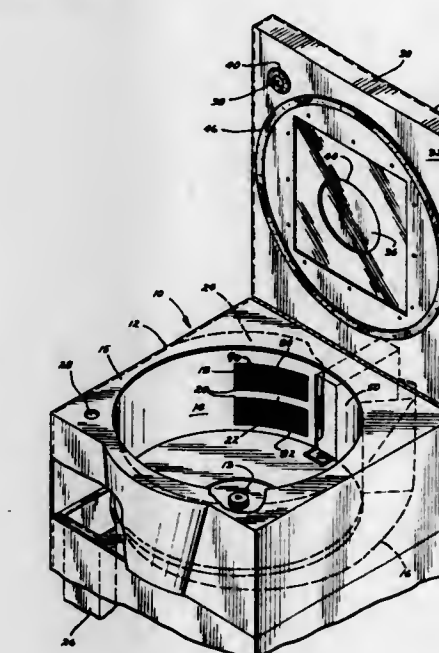
John W. Elsing, Edina, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed July 23, 1975, Ser. No. 598,517

Int. Cl.² G11B 17/00, 23/02

U.S. Cl. 360-98

6 Claims



a clean air plenum having a clean air inlet duct and an upper surface having a small air outlet port of a predetermined size therewithin and means communicating with said air inlet port for allowing air to flow there through
air inlet means for supplying fresh air around said spindle at the bottom surface of said shroud
a top cover for said enclosure for sealing said shroud when in operation and having a circulating air plenum therewithin having an inlet port to said plenum positioned to meet in the closed position with said small air outlet port in said clean air plenum and an exhaust port from said circulating air plenum positioned centrally over said disk pack spindle within said shroud when said cover is in a closed position.

4,008,493

MAGNETIC HEAD STRUCTURE WITH MINIMUM FEEDTHROUGH

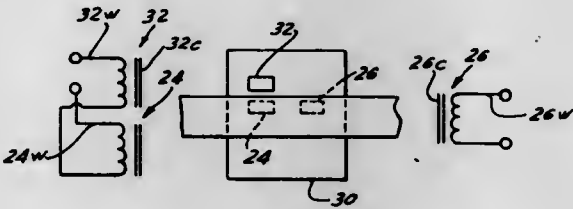
John N. Pizzuto, 52 Verleye Ave., East Northport, N.Y. 11731

Filed July 11, 1975, Ser. No. 595,293

Int. Cl.² G11B 5/20, 5/44

U.S. Cl. 360-124

5 Claims



1. A magnetic head structure comprising first and second

magnetic transducers each having a core with a winding disposed about the core, said first and second magnetic transducers being positioned for cooperation with a first channel of a magnetic medium and displaced from each other along said first channel, said first magnetic transducer being adapted to record signals on the first channel of the magnetic medium, said second magnetic transducer being adapted to reproduce signals previously recorded on the first channel of the magnetic medium by said first magnetic transducer, a third magnetic transducer similar to said first magnetic transducer, a fourth magnetic transducer similar to said second magnetic transducer, said third and fourth magnetic transducers being adjacent and laterally disposed to said first and second magnetic transducers, respectively, and positioned to cooperate with a second channel of the magnetic medium and displaced from each other along said second channel, said third magnetic transducer being adapted to record signals on the second channel of the magnetic medium, said fourth magnetic transducer being adapted to reproduce signals previously recorded on the second channel of the magnetic medium by said third magnetic transducer, a neutralizing magnetic transducer having first and second windings, said neutralizing magnetic transducer being laterally disposed with respect to said first or second magnetic transducer on the side thereof remote from the second channel, means for connecting said first winding of said neutralizing magnetic transducer in a common circuit but in phase opposition with the winding of said one of said first and second magnetic transducers and means for connecting said second winding of said neutralizing magnetic transducer in a common circuit but in phase opposition with the winding of the one of said third and fourth magnetic transducers which is adjacent the one of said first and second magnetic transducers laterally disposed to said neutralizing magnetic transducer.

DESIGN PATENTS

GRANTED FEBRUARY 15, 1977

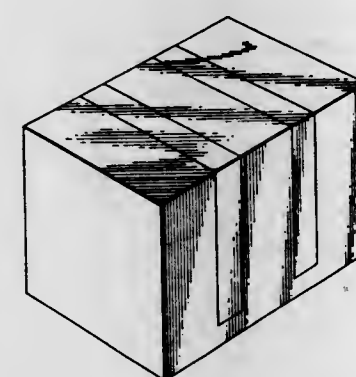
ERRATA

For CLASS	See PATENT NO.
013-029	243,403
013-013	243,404
013-013	243,405
013-013	243,406
013-013	243,407
013-003	243,408
014-070	243,409
024-008	243,412
028-013	243,418
028-048	243,419
028-047	243,420

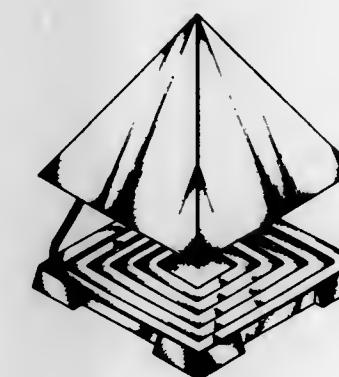
DESIGNS

FEBRUARY 15, 1977

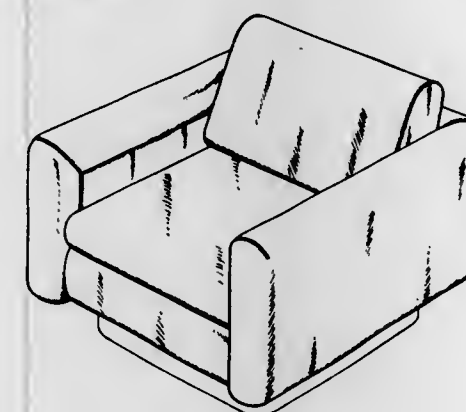
243,371
INVERTIBLE TABLE UNIT
 Marilyn M. Abrams, 3440 Beret Lane, Silver Spring, Md. 20906
 Filed July 7, 1975, Ser. No. 593,254
 Term of patent 14 years
 Int. Cl. D6-06
 U.S. Cl. D6-3



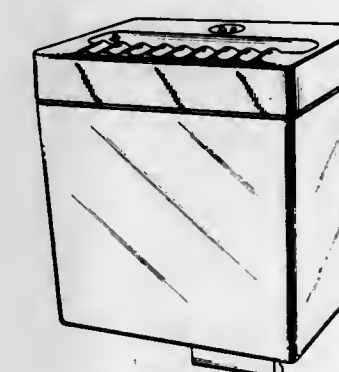
243,373
DISPLAY STAND
 Marian E. Garsen, 14646 Dickens St., Sherman Oaks, Calif. 91403
 Filed Feb. 3, 1976, Ser. No. 655,008
 Term of patent 3½ years
 Int. Cl. D20-02
 U.S. Cl. D6-85



243,372
CHAIR
 Robert J. Denny, 56 High St., Gardner, Mass. 01440, and
 Richard D. Horowitz, 180 Beacon St., Boston, Mass. 02116
 Filed June 2, 1975, Ser. No. 582,581
 Term of patent 14 years
 Int. Cl. D6-01
 U.S. Cl. D6-26



243,374
SOAP DISPENSER
 Antonio Macchi Cassia, Milan, Italy, assignor to Steiner American Corporation
 Filed Dec. 22, 1975, Ser. No. 642,653
 Claims priority, application Italy, Aug. 8, 1975, 22091/75
 Term of patent 14 years
 Int. Cl. D23-02
 U.S. Cl. D6-95



243,375

JEWELRY DISPLAY CABINET

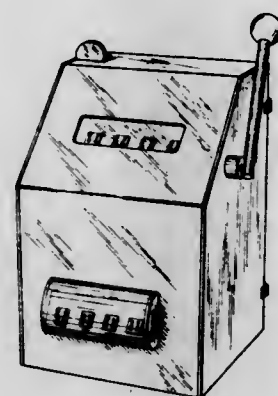
Russell A. DiOrio, Cranston, R.I., assignor to DiOrio Enterprises, Inc.

Filed May 10, 1976, Ser. No. 685,090

Term of patent 14 years

Int. Cl. D20-02; D6-04

U.S. Cl. D6-151



243,377

COMBINED SHELF AND MULTIPLE CABINET UNIT

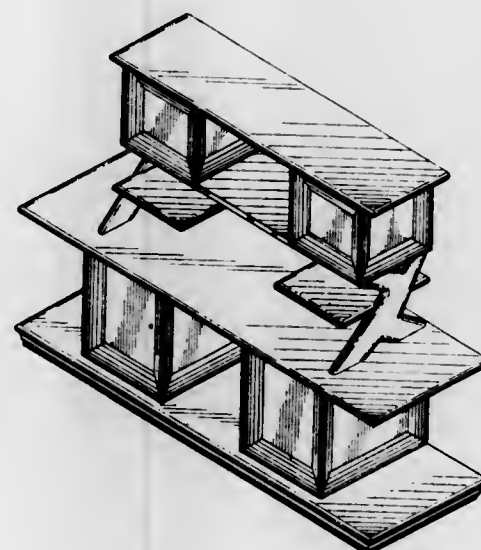
Ronald M. Moore, 16500 Quarry Road, Bldg. 12, Apt. 428, Southgate, Mich. 48195

Filed June 2, 1975, Ser. No. 582,847

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-186



243,376

TABLE

Rupert A. Scott, Van Nuys, Calif., assignor to Rowe Furniture Corporation

Filed July 11, 1975, Ser. No. 594,941

Term of patent 14 years

Int. Cl. D6-03

U.S. Cl. D6-175



243,378

PICTURE FRAME

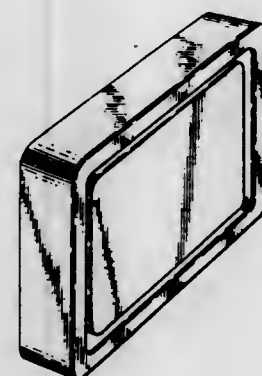
Gary Lee Tharp, 20851 Assiniboine Trail, Los Gatos, Calif. 95030

Filed Oct. 3, 1974, Ser. No. 511,805

Term of patent 14 years

Int. Cl. D6-07

U.S. Cl. D6-242



243,379

HOT CUP COASTER AND LID

Emett O. Meeks, P.O. Box 10493, Midwest City, Okla. 73110

Filed Mar. 17, 1975, Ser. No. 559,344

Term of patent 14 years

Int. Cl. D7-06

U.S. Cl. D7-45



243,380

COOKING AND UTILITY PAN

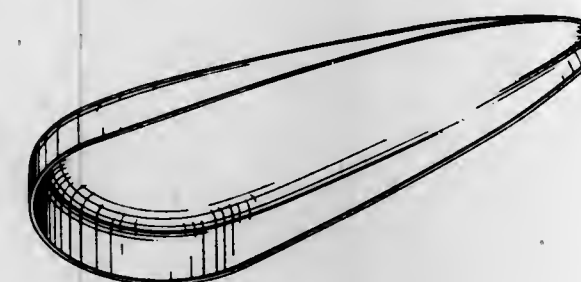
Leon H. Berger, P.O. Box 1505, Flagstaff, Ariz. 86001

Filed June 19, 1975, Ser. No. 588,335

Term of patent 14 years

Int. Cl. D7-02

U.S. Cl. D7-85



243,381

SPATULA

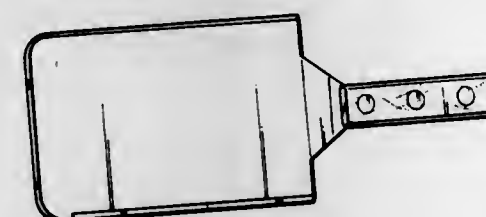
Thomas A. Kridos, 1821 N. Dixie Highway, Fort Lauderdale, Fla. 33305

Filed July 7, 1975, Ser. No. 593,676

Term of patent 14 years

Int. Cl. D7-02

U.S. Cl. D7-102



243,382

RECORD WASHER OR SIMILAR ARTICLE

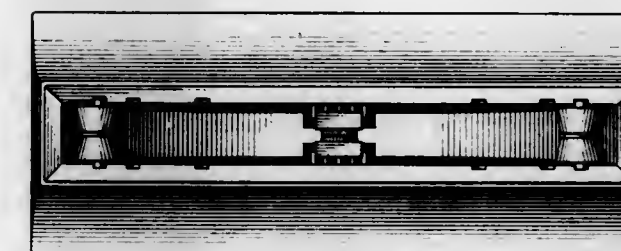
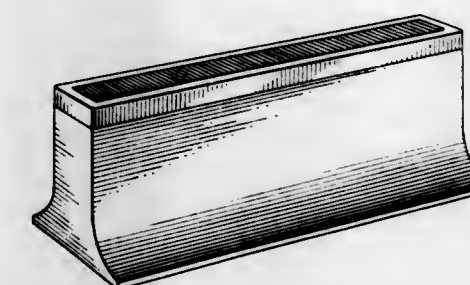
Dana W. Mox, Glenview; Charles M. Smith, Palatine, and Craig J. Hudson, Crystal Lake, all of Ill., assignors to Fidelitone, Inc.

Filed Aug. 18, 1975, Ser. No. 605,622

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D7-161



243,383

BOTTLE SCRAPER

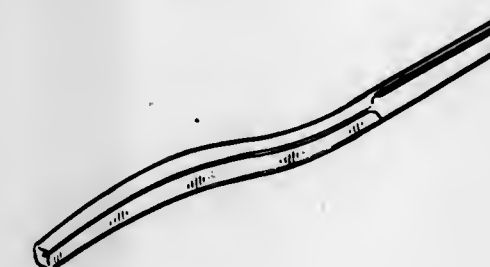
Norman J. Ploszaj, 2066 Andover Lane, Erie, Pa. 16509

Filed May 4, 1976, Ser. No. 682,953

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D7-181



243,384

COMBINED DRAW BOLT AND LOCK FOR LUGGAGE OR THE LIKE

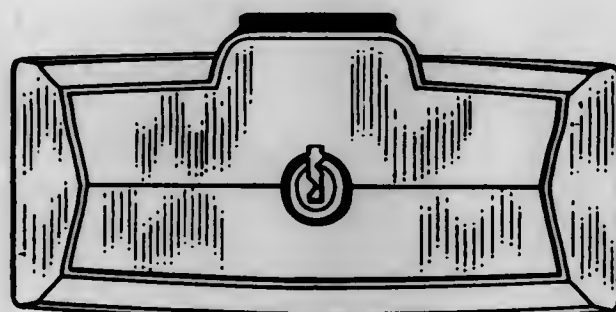
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.

Filed Jan. 7, 1975, Ser. No. 539,077

Term of patent 14 years

Int. Cl. D8-07

U.S. Cl. D8-338



243,385

WALL PLATE

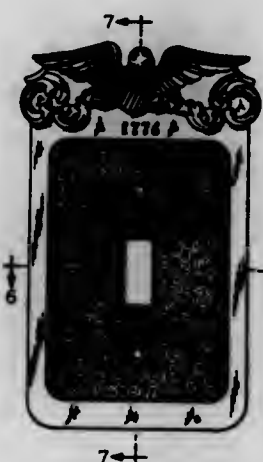
Joan Grieb, New York, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,033

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-351



243,386

DISPENSING CONTAINER

Earl Hoyt, Ramsey, N.J., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 11, 1975, Ser. No. 585,846

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-71



243,387

CARAFE

Roger de Jouennes, Rue du Bourg Bassot, 71560 - Mercurey, France

Filed June 10, 1974, Ser. No. 477,856

Claims priority, application France, Apr. 18, 1974, 74.66

Term of patent 7 years

Int. Cl. D9-01

U.S. Cl. D9-148



243,388

CONTAINER FOR NEWSPAPERS OR THE LIKE

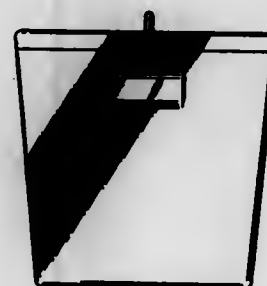
Sarah J. Dumas, 300 Brentwood Drive, N.E., Atlanta, Ga. 30305

Filed Mar. 12, 1974, Ser. No. 450,326

Term of patent 14 years

Int. Cl. D9-03

U.S. Cl. D9-240



243,389

PLASTIC BINDING SIZE SELECTOR

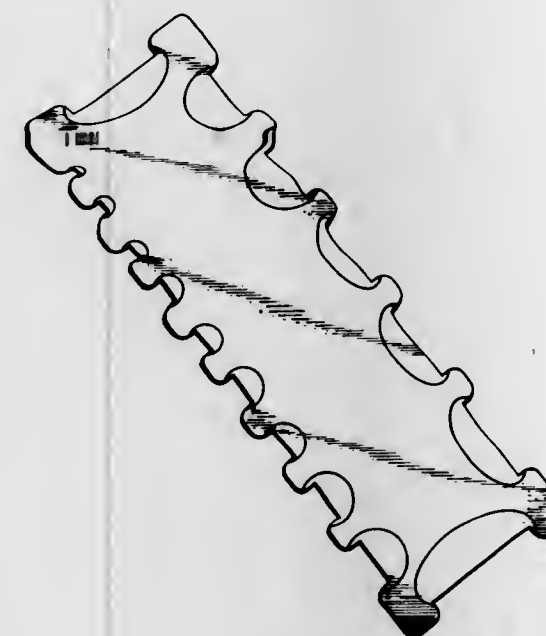
John W. Lyon, 309 Chapel Hill Road, Hot Springs, Ark. 71901

Filed Aug. 28, 1975, Ser. No. 608,589

Term of patent 7 years

Int. Cl. D10-04

U.S. Cl. D10-64



243,390

PLANTER

Lena Mastrianni, 86 Cornell Drive, Smithtown, N.Y. 11787

Filed Apr. 12, 1976, Ser. No. 675,901

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-149



243,391

TIRE VALVE EXTENDER

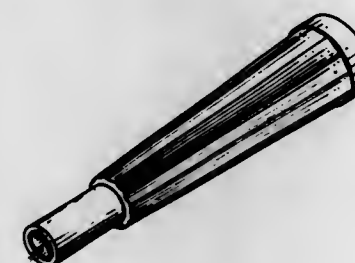
Harald Schmidt, Kings Park, N.Y., assignor to Hansa Plastics, Inc., Kings Park, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,446

Term of patent 14 years

Int. Cl. D12-15

U.S. Cl. D12-153



243,392

CAR TOP CARRIER

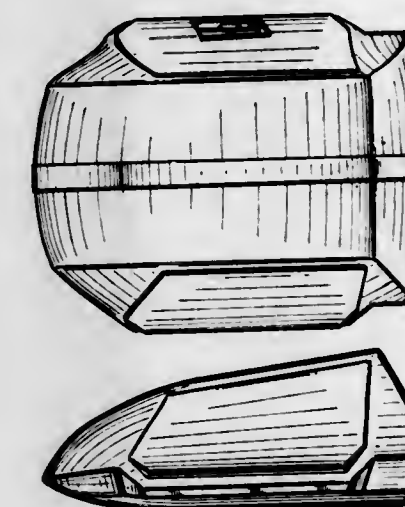
Victor Fairthorne, Toronto, Canada, assignor to Land Ranger Manufacturing Inc.

Filed Oct. 3, 1975, Ser. No. 619,375

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-157



243,393

TRUCK BED REMOVABLY MOUNTABLE UTILITY STORAGE CARRYALL

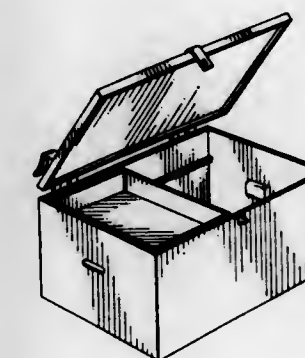
Freddie L. Wynn, 927 J S. 9th Ave., Apt. 96, Phoenix, Ariz. 85007

Filed Dec. 1, 1975, Ser. No. 636,690

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-157



243,394

OVAL LENTICULAR LENS

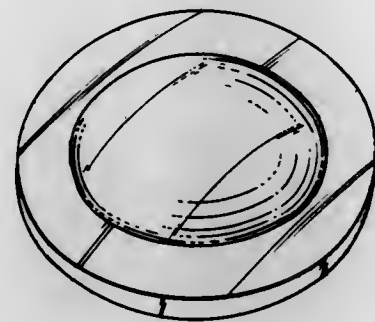
Frank O. Nerad, Burbank, and Forbes C. Robertson, Woodland Hills, both of Calif., assignors to Armortite Inc., San Marcos, Calif.

Filed May 12, 1975, Ser. No. 576,867

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-51



243,397

SPECTACLE FRAME FRONT

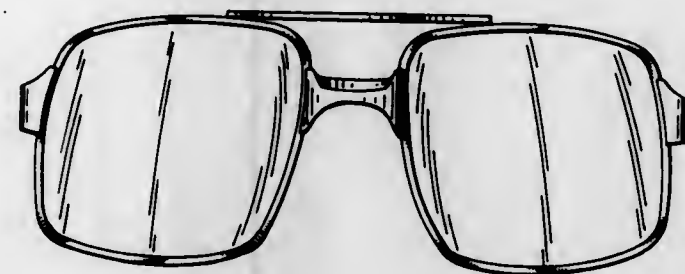
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 601,853, Aug. 4, 1975. This application Jan. 8, 1976, Ser. No. 647,531

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,398

PAIR OF SPECTACLES

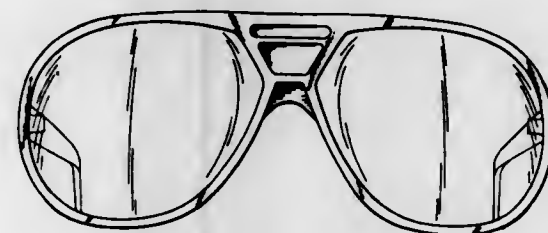
Larry G. Loughner, Andover, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 9, 1976, Ser. No. 656,562

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,395

PAIR OF SPECTACLES

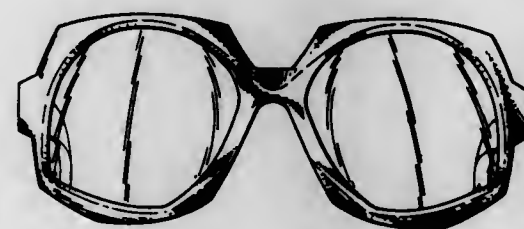
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Oct. 28, 1975, Ser. No. 625,982

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,399

COMBINED FILTER, AERATOR AND SPRAY COOLING UNIT FOR SWIMMING POOLS

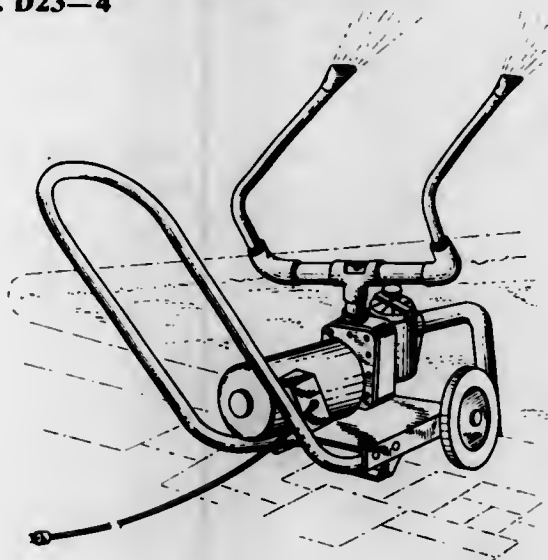
William G. Lupton, 311 Forest Drive, South, Short Hills, N.J. 07078

Filed Jan. 7, 1975, Ser. No. 539,108

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-4



243,396

PAIR OF SPECTACLES

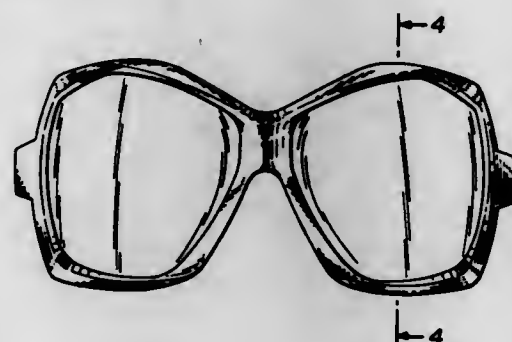
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 8, 1975, Ser. No. 638,485

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,400

WATER FILLER FITTING

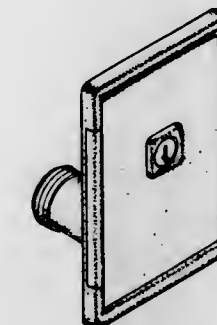
Martin O. Riley, 1330 Hillcrest Ave., Pasadena, Calif. 91106

Filed Oct. 16, 1975, Ser. No. 622,987

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-40



243,403

ELECTRICAL OUTLET ADAPTER

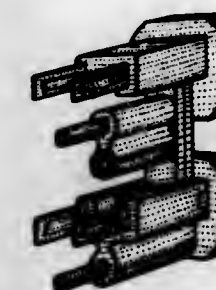
Lawrence Bernard Rellis, 2209 W. Villa Maria Drive, Phoenix, Ariz. 85023

Filed June 2, 1975, Ser. No. 582,907

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-29



243,401

HEATING PANEL ELEMENT

Rune G. Almén, Halmstad, Sweden, assignor to Sensotherm Aktiebolag, Sandviken, Sweden

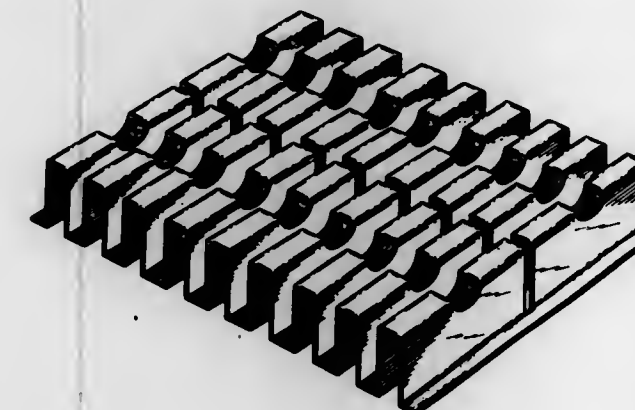
Filed Aug. 1, 1975, Ser. No. 601,163

Claims priority, application Sweden, Feb. 4, 1975, 75258

Term of patent 14 years

Int. Cl. D23-03

U.S. Cl. D23-127



243,404

GROUND CLAMP

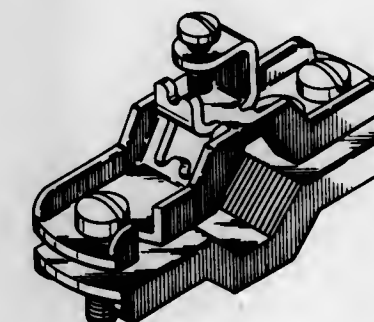
Thomas Mooney, Mount Sinai; Stephen Veselaski, Shirley, both of N.Y., and Richard A. Bauer, Etters, Pa., assignors to ITE Imperial Corporation, East Farmingdale, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,200

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-13



243,402

AIR FRESHENER HOUSING

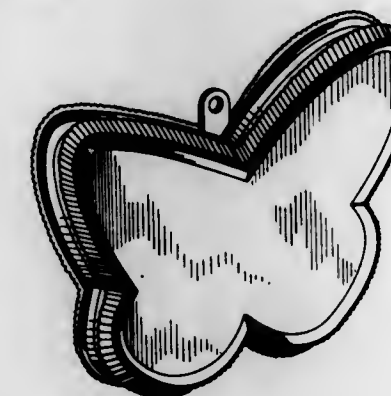
Leonard A. Irving, 1801 Byrd St., Baltimore, Md. 21230

Filed Mar. 23, 1976, Ser. No. 669,482

Term of patent 3.5 years

Int. Cl. D23-04

U.S. Cl. D23-150



243,405

SADDLE TYPE CONNECTOR

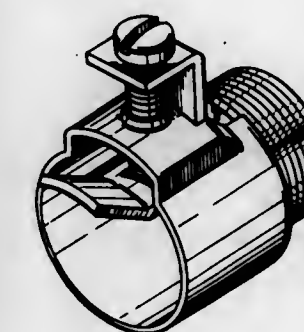
Thomas Mooney, Mount Sinai, and Stephen Veselaski, Shirley, both of N.Y., assignors to ITE Imperial Corporation, East Farmingdale, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,201

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-13



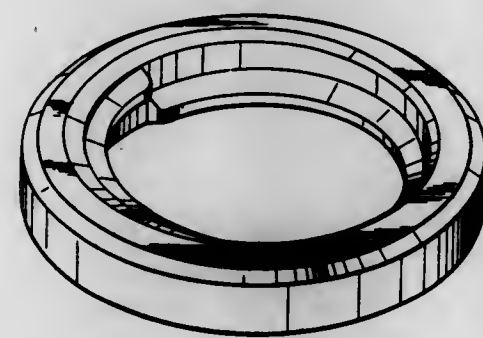
243,406

THREADED SEALING RING FOR ELECTRICAL CONNECTORS

Thomas Mooney, Mount Sinai, N.Y., and Richard A. Bauer, Etters, Pa., assignors to ITE Imperial Corporation, East Farmingdale, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,233
Term of patent 14 years
Int. Cl. D13-03

U.S. Cl. D13-13



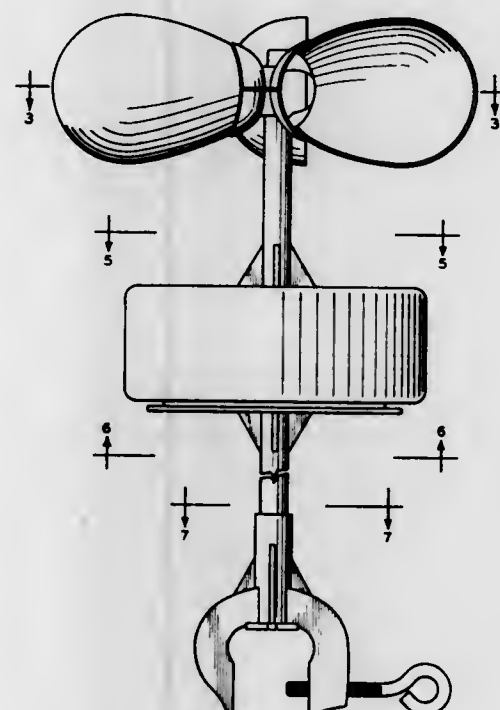
243,408

WIND DRIVEN ELECTRIC GENERATOR

Jack G. McAllister, 2701 N. Douglas Drive, Minneapolis, Minn. 55422

Filed July 2, 1975, Ser. No. 592,617
Term of patent 14 years
Int. Cl. D13-01

U.S. Cl. D13-3



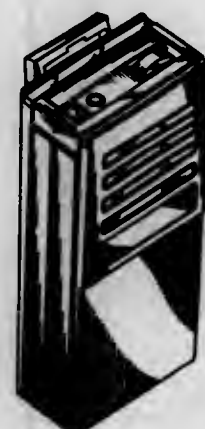
243,409

RADIO PAGER APPARATUS OR SIMILAR ARTICLE

John Allie Eckmann, Pompano Beach, and Arnold Sherwin Goldman, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 8, 1976, Ser. No. 665,021
Term of patent 14 years
Int. Cl. D14-03

U.S. Cl. D14-70



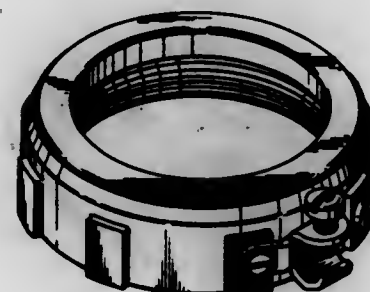
243,407

CRADLE TYPE GROUND LUG FOR CONDUIT

Thomas Mooney, Mount Sinai, N.Y., and Richard A. Bauer, Etters, Pa., assignors to ITE Imperial Corporation, East Farmingdale, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,307
Term of patent 14 years
Int. Cl. D13-03

U.S. Cl. D13-13



243,410

MATCH HOLDER

Linda C. Brown, 1940 Cameo, Clovis, N. Mex. 88101

Filed Aug. 15, 1975, Ser. No. 606,406
Term of patent 14 years
Int. Cl. D27-99

U.S. Cl. D27-32



243,412

PRESSURE RELIEF VALVE FOR A LOW PRESSURE CUFFED TRACHEOSTOMY TUBE

Kenneth K. Krueger, Tustin, and Todor Pavlov, Laguna Niguel, both of Calif., assignors to Shiley Laboratories, Inc., Santa Ana, Calif.

Filed Aug. 25, 1975, Ser. No. 607,264
Term of patent 14 years
Int. Cl. D24-02

U.S. Cl. D32-1 R



243,411

ANIMAL COLLAR OR SIMILAR ARTICLE

Betty Lee Johnson, 7820 N. Van Ness, Fresno, Calif. 93705

Filed Sept. 10, 1974, Ser. No. 504,811
Term of patent 14 years
Int. Cl. D30-04

U.S. Cl. D30-38



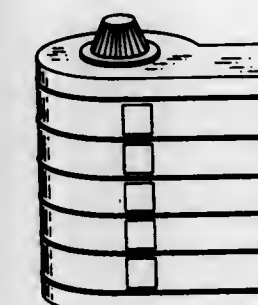
243,413

HORSE RACE GAME INDICATOR

Woody Savage, 114 S. 7th St., Richmond, Calif. 94801

Filed May 22, 1975, Ser. No. 579,794
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-5 MM

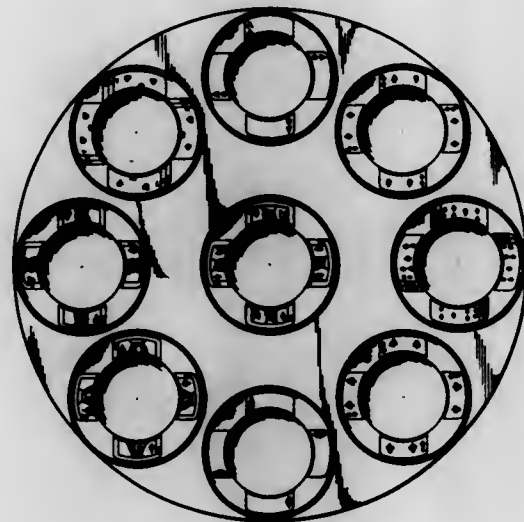


243,414

GAME TURNTABLE FOR SEGREGATING AND IDENTIFYING BY CATEGORY POKER CHIPS
 Ralph G. Vyskocil, 23701 Colbourne Road, Euclid, Ohio 44123

Filed July 14, 1975, Ser. No. 595,614
 Term of patent 14 years
 Int. Cl. D21-01

U.S. Cl. D34-13 A



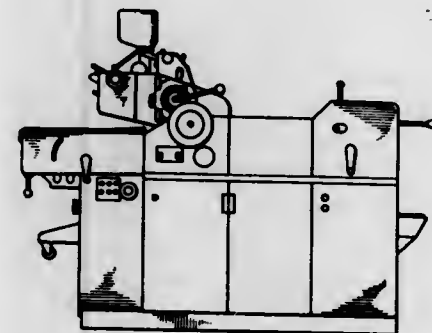
243,416

OFFSET PRINTING PRESS MACHINE

Shigeru Shimizu, Takarazuka; Kazuyuki Hatsuda, Takatsuki, and Sadao Murata, Kyoto, all of Japan, assignors to K.K. Hamada Insatsuki Seizosho

Filed Dec. 4, 1974, Ser. No. 529,482
 Claims priority, application Japan, June 8, 1974, 49-19079
 Term of patent 7 years
 Int. Cl. D18-02

U.S. Cl. D64-11 R



243,415

FLOOR LAMP

William A. Larson, El Cerrito, Calif., assignor to Harbor Universal, Inc.

Filed Jan. 16, 1976, Ser. No. 649,772
 Term of patent 14 years
 Int. Cl. D26-03

U.S. Cl. D48-20 A

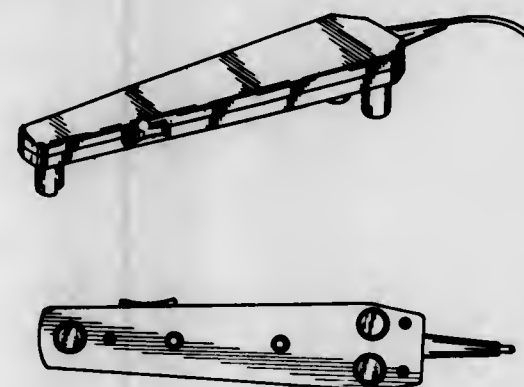


243,417

PHYSIOLOGICAL SENSOR

Howard Martin Allen, Beaverton, and Ronald Charles Barber, Portland, both of Oreg., assignors to Tektronix, Inc.

Filed Feb. 18, 1975, Ser. No. 550,233
 Term of patent 14 years
 Int. Cl. D24-02; D10-99
 U.S. Cl. D83-1 F



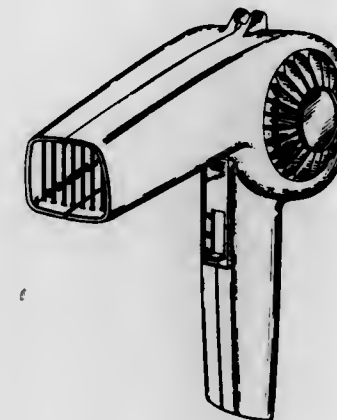
243,418

HAND HELD ELECTRIC HAIR DRYER

Martin J. Wolff, West Haven, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed June 4, 1975, Ser. No. 583,609
 Term of patent 14 years
 Int. Cl. D28-03

U.S. Cl. D28-13



243,419

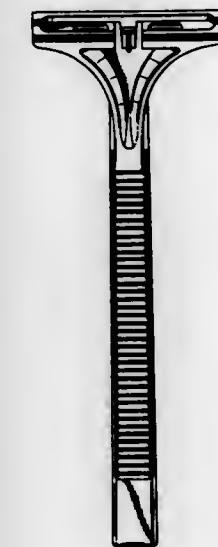
RAZOR HANDLE

William Hedley, Gateshead, England, assignor to Wilkinson Sword Limited

Filed Mar. 27, 1975, Ser. No. 562,751
 Claims priority, application United Kingdom, Oct. 8, 1974, 968237/74

Term of patent 14 years
 Int. Cl. D28-03

U.S. Cl. D28-48



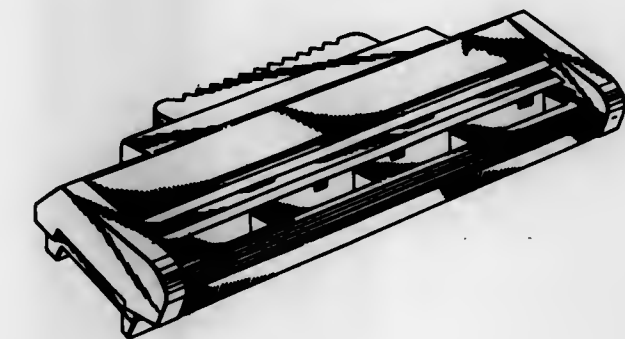
243,420

COMBINED RAZOR BLADE AND MOUNT

Graham R. Jones, Northumberland, England, assignor to Wilkinson Sword Limited

Filed Apr. 15, 1975, Ser. No. 568,247
 Term of patent 14 years
 Int. Cl. D28-03

U.S. Cl. D28-47



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF FEBRUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. Monforts: *See—*
Houben, Heinz; and Pabst, Manfred, 4,007,625.
- A & P Products Incorporated: *See—*
Ponn, Timothy R., 4,008,300.
- A/S Akers Mek. Verksted: *See—*
Nybo, Reidar Oivind; and Eik, Geir, 4,007,782.
- Aarhus Oliefabrik A/S: *See—*
Hansen, Ole Kaae, 4,008,334.
- AB Kabi: *See—*
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- AB Metalform: *See—*
Falk, Curt Gunnar; Strandell, Per-Olof; Albrecht, Per Erik; and Wallner, Goran Anders, 4,007,617.
- Abbott Laboratories: *See—*
Perun, Thomas John; Rasmussen, Ronald Robert; and Horrom, Bruce Wayne, 4,008,236.
- ABC Extrusion Company: *See—*
Brooks, Jackson R., 4,007,552.
- Abe, Toshizo; Sakamoto, Seiho; Nishihara, Yasuhiro; and Saruwatari, Hidetoshi, to Mitsubishi Chemical Industries Ltd. Process for polymerizing olefin. 4,008,358, Cl. 526-116.000.
- Abex Corporation: *See—*
Shaw, Edwin L., 4,008,004.
- Achelpohl, Fritz, to Windmoller & Holscher. Apparatus for reversing the running direction of tube sections in sack machines. 4,007,669, Cl. 93-8.00R.
- Acheson, Richard M.; Stubbs, John K.; Baxter, Charles A. R.; and Kuhla, Donald E., to Pfizer Inc. Imidazo[2,1-b]thiazole and thiazolo[3,2-a]-benzimidazole quaternary salts as hypoglycemic agents and growth promotants. 4,008,245, Cl. 260-306.70T.
- Acre, Leon R., to Midland-Ross Corporation. Releasable lock for brakes. 4,007,815, Cl. 188-265.000.
- ACTA Limited: *See—*
Stancati, Nicholas F., 4,007,941.
- Acuity Systems, Incorporated: *See—*
McDevitt, Howard I., Jr.; Bax, Ronald F.; and Body, Richard H., 4,007,990.
- Addressograph Multigraph Corporation: *See—*
DeRyke, Thomas Vernon; and Holman, Willard James, 4,007,925.
- Swift, William R.; Marsh, James Michael; and LeFevre, Clyde E., 4,008,483.
- Szabo, Francis S., 4,008,480.
- Adret Electronic: *See—*
Remy, Joel, 4,008,443.
- Aeroquip Corporation: *See—*
Buseth, Richard A.; and Rogers, Russell L., 4,007,909.
- Aetna-Standard Engineering Company: *See—*
Schuetz, James W.; and Martin, William A., 4,007,655.
- Agency of Industrial Science & Technology: *See—*
Torikai, Eiichi; and Kawami, Yoji, 4,008,144.
- AGFA-GEVAERT N.V.: *See—*
Hellemans, Ludovicus Maria; De Saedeleer, Roger Isidoor; and Verheyen, Johannes Maria, 4,008,048.
- Lemahieu, Raymond Gerard; and Laridon, Urbain Leopold, 4,008,085.
- Pattyn, Herman Alberik; Vanassche, Willy Joseph; and De brabandere, Luc Achiel, 4,008,089.
- Van Paesschen, August Jean, 4,008,088.
- Verlinden, Victor Clement; and De Beul, Victor Franciscus, 4,008,036.
- Agnelli, Joseph F., to Raymond Lee Organization, Inc., The. Garment fastener. 4,007,515, Cl. 24-103.000.
- Agnew, Donald L., to Power Saver Corporation. Circuit for powering fluorescent lamps. 4,008,414, Cl. 315-97.000.
- Agrotechnika, narodny podnik: *See—*
Mackrle, Svatopluk; Mackrle, Vladimir; and Dracka, Oldrich, 4,008,153.
- Agui, Hideo; Nakatsuka, Iwao; Mitani, Toru; Nakashita, Mitsuo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; and Eda, Yasuko, to Sumitomo Chemical Company, Limited. 2,3,5,8-Tetrahydro-5-alkoxy-8-oxofuro[2,3-g]quinoline-7-carboxylic acid derivatives. 4,008,237, Cl. 260-287.0AN.
- Ahle, James L., to Gulf Research & Development Company. Synergistic weed control composition. 4,008,069, Cl. 71-90.000.
- Aikoh Co., Ltd.: *See—*
Boron, Joseph J., 4,007,640.
- Airhart, Tom Patterson, to Atlantic Richfield Company. Expanding detonation chamber multi-shot gas exploder. 4,007,803, Cl. 181-117.000.
- Aisin Seiki Kabushiki Kaisha: *See—*
Kagata, Tooru, 4,007,820.
- Ajax Machine and Welding Company: *See—*
Casad, Edward F.; and Jones, Richard E., 4,007,945.
- Ajinomoto Co., Inc.: *See—*
Yamashita, Takashi; and Takeshiro, Tadashi, 4,008,306.
- Akashi, Hiroyuki: *See—*
Sawatari, Kenichi; Mukai, Toshihiko; Oda, Satoshi; Akashi, Hiroyuki; and Kohara, Masanori, 4,008,274.
- Akerman, Emanuel; and Pomper, Seymour, to Standard Brands Incorporated. Method of treating baker's yeast. 4,008,335, Cl. 426-62.000.
- Aki, Osami: *See—*
Ochiai, Michihiko; Aki, Osami; Morimoto, Akira; and Okada, Taiiti, 4,008,227.
- Akita, Eiichi; Tsuchiya, Tsutomu; Kondo, Shinichi; Yasuda, Shuntaro; Umezawa, Sumio; and Umezawa, Hamao, to Meiji Seiki Kaisha, Ltd. 1-N-(S)- α -substituted- ω -aminoacyl)-neamine or -ribostamycin and the production thereof. 4,008,218, Cl. 536-17.000.
- Akita, Eiichi; Tsuchiya, Tsutomu; Kondo, Shinichi; Yasuda, Shuntaro; Umezawa, Sumio; and Umezawa, Hamao, to Meiji Seika Kaisha, Ltd. 1-N-(S)- α -substituted- ω -aminoacyl)-neamine or -ribostamycin and the production thereof. 4,008,362, Cl. 536-17.000.
- Aktiebolaget Electrolux: *See—*
Gustavsson, John Kenneth Crister; and Sjogren, Bjorn Christer, 4,007,678.
- Aktiebolaget Tudor: *See—*
Sundberg, Erik G.; and Westberg, Erik, 4,008,100.
- Akzo N.V.: *See—*
Mijs, Willem Jacobus; and Reesink, Johan Bernard, 4,008,192.
- Akzona Incorporated: *See—*
Hewett, Colin Leslie; and Savage, David Samuel, 4,008,277.
- Rice, Charles M., 4,007,519.
- Alban, William R. Fuel rate monitor apparatus for vehicles. 4,007,634, Cl. 73-114.000.
- Albano, John V.; and Smith, Donald F., to St. Regis Paper Company. Insulated container. 4,007,670, Cl. 93-36.010.
- Albee, William H.: *See—*
Vincent, Charles R.; and Albee, William H., 4,007,801.
- Albertsen, Norman D.: *See—*
Haynes, Harvey H.; Albertsen, Norman D.; and Kahn, Lawrence F., 4,007,700.
- Albrecht, Charles Walter: *See—*
Murphy, William V.; and Albrecht, Charles Walter, 4,007,856.
- Albrecht, Per Erik: *See—*
Falk, Curt Gunnar; Strandell, Per-Olof; Albrecht, Per Erik; and Wallner, Goran Anders, 4,007,617.
- Alcorn, Ward C., III: *See—*
Clemmer, Clyde C.; and Alcorn, Ward C., III, 4,008,049.
- Aldrich, Ward. Nail puller. 4,007,913, Cl. 254-18.000.
- Aleck, Benjamin J., to Grumman Aerospace Corporation. Cylindrical containers by hour glass formation of metal tubes. 4,007,616, Cl. 72-38.000.
- Alexander, Roy P., to Olin Corporation. On-site generation of polyurethane foam. 4,008,188, Cl. 260-2.5AP.
- Alkasab, Kalil A., to Universal Oil Products Company. Heating and cooling system utilizing solar energy. 4,007,776, Cl. 165-18.000.
- Allan, Barry D., to United States of America, Army. Dry water. 4,008,170, Cl. 252-194.000.
- Allen, Joseph C.; Woodward, Charles D.; Brown, Alfred; and Wu, Ching H., to Texaco Inc. Heated multiple solvent method for recovering viscous petroleum. 4,007,785, Cl. 166-263.000.
- Allied Chemical Corporation: *See—*
Stephenson, Robert Larry; Loomba, Yogendra Singh; and Fox, William Robert, 4,007,948.
- Allis-Chalmers Corporation: *See—*
Jones, Kenneth R., 4,007,716.
- Marco, George P., 4,007,847.
- Shaver, J. Lyle, 4,007,744.
- Allison, Robert E.: *See—*
Dixon, Robert L.; and Allison, Robert E., 4,007,799.
- Allpack Industrielle Lohnverpackung GmbH & Co. KG, Firma: *See—*
Hoffiger, Harro, 4,007,942.
- Amana Refrigeration, Inc.: *See—*
Maxwell, Richard D.; Pink, John J.; Fitzharris, Michael J.; and Marz, Louis R., 4,007,602.
- Amancharla, Amareswar; and Young, Carter R., to Otis Engineering Corporation. Well plug with anchor means. 4,007,783, Cl. 166-135.000.
- Amax Inc.: *See—*
Timmons, George A., 4,007,770.
- Amberg, Stephen W.; and Landers, Frank S., to Owens-Illinois, Inc. Receptacle of foamed plastic lined with unoriented polyolefin film. 4,008,347, Cl. 428-35.000.

Ambitex Corporation: See—
Lichowsky, Abraham, 4,007,674.

American Color & Chemical Corporation: See—
Renfrew, Edgar E., 4,008,212.
Renfrew, Edgar Earl; and Genta, Guido Ruggiero Lorenzo, 4,008,262.

American Cyanamid Company: See—
Conrow, Ransom Brown; Bernstein, Seymour; and Lenhard, Robert Herman, 4,008,320.
Glick, Arthur; and Chirgwin, Lester Daniel, Jr., 4,008,303.

American Filtrona Corporation: See—
Holden, Herbert K.; and Mansfield, Peter W., 4,007,668.

American Home Products Corporation: See—
Sellestedt, John H., 4,008,226.

American Hospital Supply Corporation: See—
Blake, Larry W., 4,007,743.

Ames, Adolf; and Wagner, Alfred, to Swiss Aluminium Ltd. Container for an extrusion press. 4,007,619, Cl. 72-272.000.

AMP Incorporated: See—
Tucci, John James, 4,007,534.

Ampex Corporation: See—
Dickey, Baron Christian, 4,008,425.
Monforte, Frank R.; and Argentina, Giltan M., 4,007,541.

Ampler, Leif Carl Gustaf, to Gullfiber AB. Device for manufacturing blocks of porous thermoplastic in a continuous process. 4,008,030, Cl. 425-224.000.

Anaconda Company, The: See—
Kuhn, Martin C.; Stephens, John A.; Noakes, Michael J.; and Rovig, Allen D., 4,008,072.

Analogic Corporation: See—
Neumann, Leopold; and Gordon, Bernard M., 4,008,405.

Anchor/Darling Valve Company: See—
Karpenko, Anatole N., 4,007,906.

Anderson Development Company: See—
Meyer, Jeffrey G.; and Phipps, Glennis L., 4,008,359.

Anderson, Earl L. Dual denture model surveyor. 4,007,531, Cl. 32-67.000.

Anderson, James R., to Central Sprinkler Corporation. Adjustable dry pendant sprinkler head assembly. 4,007,878, Cl. 239-209.000.

Anderson, Joseph; Lagasse, Joseph Louis; Singh, Satinder; and Milauskas, Victor, to Northern Electric Company Limited. Miniature electrical relay. 4,008,447, Cl. 335-128.000.

Anderson, Robert F.: See—
Zabransky, Robert F.; and Anderson, Robert F., 4,008,291.

Andre, Leopold Guy Pierre: See—
Cailliot, Serge Leon Louis; and Andre, Leopold Guy Pierre, 4,007,675.

Andrae, Erhard Charles. Gas filter. 4,008,060, Cl. 55-446.000.

Annen, Klaus; Hofmeister, Helmut; Laurent, Henry; Kieslich, Klaus; Wendt, Hans; and Mengel, Peter Klaus, to Schering Aktiengesellschaft. Pregnane-21-oiic acid derivatives. 4,008,312, Cl. 424-241.000.

Aono, Masazumi; Shindo, Shuichi; and Miyazaki, Takushi, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. 4,008,087, Cl. 96-69.000.

Aono, Shunji: See—
Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, 4,008,265.

Apotheloz, Robert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Blocking mechanism for an impact fuze. 4,007,689, Cl. 102-78.000.

Applied Power Inc.: See—
Schaefer, Joseph H., 4,008,434.

Arazi, Amatzia: See—
Bron, Dan; and Arazi, Amatzia, 4,007,739.

Argentina, Giltan M.: See—
Monforte, Frank R.; and Argentina, Giltan M., 4,007,541.

Argoudelis, Evangelos, to Filtech Corporation. Tunable coil assembly. 4,008,450, Cl. 336-132.000.

Arisaka, Katsuharu; Sawada, Hideo; and Shimoguchi, Kozo, to Daicel, Ltd. Process for the production of nonwoven cellulose acetate laminate cured with phenolic resin. 4,008,301, Cl. 264-137.000.

Armco Steel Corporation: See—
Galloway, John W., 4,007,750.

Arnold, Charles B.: See—
Risign, Ojars; and Arnold, Charles B., 4,008,394.

Arthur, Jett C., Jr.: See—
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Mene; and Novak, Arthur F., 4,008,137.

Arvidsson, Karl Ewald. Apparatus for treating work pieces. 4,007,706, Cl. 118-50.000.

AS-Motor GmbH KG: See—
Perkams, Wilhelm, 4,008,355.

Asahi Glass Co., Ltd.: See—
Nishikori, Tunesaru; Mori, Tetsu; Kobayashi, Yasuo; and Hiyama, Kenjiro, 4,008,062.

Asahi Kasei Kogyo Kabushiki Kaisha: See—
Matsuda, Shogo; Kuriki, Tomio; Ohue, Kazuto; and Okajima, Kunihiko, 4,008,339.

Asai, Harumi: See—
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Asai, Yasuhiro: See—
Miyoshi, Eiji; Fukuda, Minoru; Hagiwara, Yasuhiko; and Asai, Yasuhiro, 4,008,103.

Asano, Seizi, to Fuji Photo Optical Co., Ltd. Cell retaining casing for photographic cameras. 4,008,356, Cl. 429-98.000.

Ateliers des Charmilles S.A.: See—
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Atlantic Richfield Company: See—
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Atlas Pacific Engineering Company: See—
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Aubin, Gerard; Braguier, Michel Arsene; Naturel, Christian; Poulin, Etienne M.; and Wattre, Joseph A., to Letat Francais represente par le Ministre des Postes et Telecommunications; and Desmarquest et C.E.C. S.A. Device for fluidizing and distributing powder. 4,007,969, Cl. 302-25.000.

Auer, John H., Jr., to General Signal Corporation. Control system for monitoring vehicle passage at predetermined locations. 4,007,897, Cl. 246-187.008.

Aure, Jean Marie: See—
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Aurich, Christoph W.: See—
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Austines, Leif N.: See—
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Auvil, Harvey S.; and Davis, Rufus F., Jr., to Coaltek Associates. Coal heating temperature control. 4,008,042, Cl. 432-26.000.

Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, to Sandoz Ltd. Method of stabilizing organic materials employing pyrazole compounds and stabilized compositions thereof. 4,008,200, Cl. 260-45.75N.

Avco Corporation: See—
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Avco Everett Research Laboratory, Inc.: See—
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Avery, Leslie Ronald, to RCA Corporation. Automatic noise gate for a synchronizing signal amplifier. 4,008,370, Cl. 358-155.000.

Awad, Nagi M. Flexible sealed liquid containing packet. 4,007,838, Cl. 206-484.000.

Awe, William Chester: See—
Kvavle, Robert Carl; and Awe, William Chester, 4,007,732.

Aya, Toshihiko: See—
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Ayres, James L.: See—
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B/W Metals Company, Inc.: See—
Weddendorf, Elmer R., 4,007,810.

Babji, Tadeusz M.; Bowman, Ronald R.; and Wacker, Paul F., to United States of America, Commerce. Antenna with inherent filtering action. 4,008,477, Cl. 343-701.000.

Bag System AB: See—
Goransson, Pehr-Gunnar Heine, 4,007,809.

Bahnehan, Vern A., to Hofmann, Marvin, a part interest. Anti-theft dispensing rack. 4,007,853, Cl. 221-3.000.

Bain, Frederick A.; and Roberts, John O. L., to Great Canadian Oil Sands Limited. Method of sludge disposal related to the hot water extraction of tar sands. 4,008,146, Cl. 208-11.0LE.

Baisch, J. Carroll: See—
Johnson, Charles M., 4,007,791.

Baker, Don R.: See—
Mihailovski, Alexander; and Baker, Don R., 4,008,318.

Baker, James P., to Weatherhead Company, The. Motor vehicle open center series hydraulic circuit. 4,007,593, Cl. 60-548.000.

Ballarin, Jurgen, to Bosch-Siemens Hausgerate GmbH. Refrigerator unit, particularly dual temperature refrigerator. 4,007,604, Cl. 62-174.000.

Bambury, Ronald E.; Edwards, Michael L.; and Miller, Laird F., to Richardson-Merrell Inc. 6-[(2,4-Dioxo-1-pyrimidinyl)acetyl]amino]penicillin derivatives. 4,008,221, Cl. 260-239.100.

Bandemor, Royal F., to Outboard Marine Corporation. Automatic fluid filling device for batteries. 4,007,764, Cl. 141-35.000.

Banko, Anton, to Surgical Design Corporation. Surgical system for controlling the infusion of fluid to and the evacuation of fluid and material from an operating field. 4,007,742, Cl. 128-230.000.

Banthin, Clifford R.; Decko, Gary W.; and Hurley, John F., to Avco Corporation. Apparatus for and method of suppressing infrared radiation emitted from gas turbine engine. 4,007,587, Cl. 60-204.000.

Barbieri, Thomas: See—
Getz, Edward J.; Barbieri, Thomas; and Stauffer, Robert J., 4,007,836.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: See—
Schippers, Heinz; and Lenk, Erich, 4,007,884.

Barouh, Victor; and Glenn, Robert. Typewriter correction materials employing adhesives. 4,007,823, Cl. 197-181.000.

Barr, Douglas R.: See—
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., 4,008,210.

Barron, Donald Robert, to EMI Limited. Imaging systems. 4,008,371, Cl. 358-206.000.

Barter, James A., to PPG Industries, Inc. Organic acid anhydride-peroxydicarbonate composition. 4,008,175, Cl. 252-426.000.

Barton, John Edward Duncan, to Imperial Chemical Industries Limited. Esters of N-phosphonomethylglycinonitrile. 4,008,296, Cl. 260-940.000.

BASF Aktiengesellschaft: See—
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Basiulis, Algerd: See—
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Bass, Robert J.; Koch, Richard C.; Richards, Hugh C.; and Thorpe, John E., to Pfizer Inc. Control of rice blast disease employing certain pyrido compounds. 4,008,325, Cl. 424-258.000.

Bassett, Gordon H.: See—
Marchello, Maurice J.; and Bassett, Gordon H., 4,007,571.

Bauer, Dan O.; and Salemlka, Robert M., to Pneumo Corporation. Servoactuator. 4,007,666, Cl. 91-446.000.

Bauerle, Gerhard, to Bunker Ramo Corporation. Electrical connector. 4,007,977, Cl. 339-217.00S.

Bax, Ronald F.: See—
McDevitt, Howard I., Jr.; Bax, Ronald F.; and Body, Richard H., 4,007,990.

Baxter, Charles A. R.: See—
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Baxter Laboratories, Inc.: See—
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Bayer Aktiengesellschaft: See—
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Bayles, John H.; and Roster, Theodore J., to United States of America, Navy. Portable salvage lift apparatus. 4,007,816, Cl. 188-290.000.

Bayless, John R., to Hughes Aircraft Company. Compact high voltage feedthrough for gas discharge devices. 4,008,413, Cl. 313-331.000.

Baylor, John M., to J. I. Case Company. Sealed track joint. 4,007,972, Cl. 305-11.000.

Bea, Karl J. Wind powered fluid compressor. 4,008,006, Cl. 417-271.000.

Beall, George H.; and Rittler, Hermann L., to Corning Glass Works. High durability, reinforcing fibers for cementitious materials. 4,008,094, Cl. 106-99.000.

Beaucamp, Klaus: See—
Gruber, Wolfgang; Bergmeyer, Hans Ulrich; Nelboeck-Hochstetter, Michael; Beaucamp, Klaus; Holz, Gunter; Gramsall, Johanna; and Lang, Gunter, 4,008,127.

Beaugrand, Eugene L. Safety closure for medicine bottles and the like. 4,007,850, Cl. 215-216.000.

Beck, Christian A.; and Hubbard, David W., to Pitney-Bowes, Inc. Method and apparatus for handling a belt of photoconductive material. 4,007,984, Cl. 355-16.000.

Beck, Maurice Sidney; and Henry, Robert Malcolm, to National Research Development Corporation. Flow control system. 4,007,754, Cl. 137-2.000.

Beckman, John Heller, to Union Carbide Corporation. Prepackaged shirred tubular casing article. 4,007,761, Cl. 138-103.000.

Beffa, Fabio: See—
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Behrenz, Wolfgang: See—
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Gilsdorf, Richard C.; and Browder, Lewis B., 4,008,489.

Bell, Malcolm R.; and Oesterlin, Rudolf, to Sterling Drug Inc. Cyclopenta[c]pyrrole derivatives. 4,008,250, Cl. 260-326.270.

Bell Telephone Laboratories, Incorporated: See—
Cohen, Richard Lewis; and Meek, Ronald Lee, 4,008,343.
Dybwad, Gay Leon, 4,008,117.
Flanagan, James Loton; MacLean, Donald John, Jr.; and West, James Edward, 4,008,376.
Runge, Peter Klaus, 4,008,390.
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Bellows, Paul M. Shut off and venting system for a conduit transfer line. 4,007,765, Cl. 141-59.000.

Berge, Louis J.: See—
Carles, Jacques E.; and Berge, Louis J., 4,008,120.

Bergendorff, Fred R. Straightedge. 4,007,542, Cl. 33-77.000.

Berger, Robert E., to Goodyear Aerospace Corporation. Carbon brake disk with cast keyslot reinforcement members. 4,007,814, Cl. 188-218.0XL.

Bergmeyer, Hans Ulrich: See—
Gruber, Wolfgang; Bergmeyer, Hans Ulrich; Nelboeck-Hochstetter, Michael; Beaucamp, Klaus; Holz, Gunter; Gramsall, Johanna; and Lang, Gunter, 4,008,127.

Bernhardt, Frederick William. Cartridges containing self-setting mixes. 4,007,831, Cl. 206-219.000.

Bernstein, Seymour: See—
Conrow, Ransom Brown; Bernstein, Seymour; and Lenhard, Robert Herman, 4,008,320.

Berthiaume, Camille J., to Columbia Technical Corporation. Fuel conditioning apparatus and method. 4,008,038, Cl. 431-11.000.

Berthold, Erich: See—
Kurth, Harald; Laube, Dieter; and Berthold, Erich, 4,007,608.

Beschoner, Hans-Hermann; Dulken, Hartmut; Guder, Gottfried; and Kassel, Karl-Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Method for producing an electrophotographic recording material. 4,008,082, Cl. 96-1.500.

Besik, Ferdinand, to Ontario Research Foundation. Renovation of waste water. 4,008,159, Cl. 210-7.000.

Betz, Erwin C. Apparatus for combining oxygen and hydrogen. 4,008,050, Cl. 23-288.00R.

Bianco, Archangel J. B-X cable pliers. 4,007,523, Cl. 30-90.200.

Bickar, Raymond E.: See—
Nordia, John A.; and Bickar, Raymond E., 4,007,949.

Bigelow, Floyd E., Jr. Building system. 4,007,833, Cl. 206-321.000.

Birchall, James Derek; and Cassidy, John Edward. Method of making a fibre of aluminium phosphate. 4,008,299, Cl. 264-63.000.

Bird, Brian Michael, to National Research Development Corporation. Methods and apparatus for speed-control of induction motors. 4,008,421, Cl. 318-171.000.

Bitterli, Peter; and Kehrler, Fritz, to Sandoz Ltd. Co-condensate mixtures of iminoisodolones. 4,008,097, Cl. 106-288.00Q.

Black Clawson Company, The: See—
Erdody, Robert G.; Harmon, Paul E.; and Tetro, Richard S., 4,007,656.

Bladow, Arnold A.; and Ramsey, Francis E., to Swift and Company Limited. Method of injecting poultry in the thigh and leg portions without penetrating the skin. 4,007,837, Cl. 426-281.000.

Blake, Larry W., to American Hospital Supply Corporation. Opening mechanism for umbrella-like intravascular shunt defect closure device. 4,007,743, Cl. 128-334.00R.

Blasiole, George A.; and Carroll, Alexander A., to Carrier Corporation. Blade assembly. 4,007,998, Cl. 416-135.000.

Blay, Jorge A., to Celanese Corporation. Process for dehalogenation and/or prevention of halogenation. 4,008,279, Cl. 260-601.00R.

Bleazard, Robert C., to Smithfield Fibers, Inc. Yarn and method knitting same. 4,007,611, Cl. 66-195.000.

Blum, Rudolf, to Robert Bosch G.m.b.H. Automotive test apparatus for coupling to the ignition system of automotive internal combustion engines. 4,008,430, Cl. 324-15.000.

Bockrath, Ronald E.: See—
Chipman, Gary R.; and Bockrath, Ronald E., 4,008,206.

Body, Richard H.: See—
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Boehringer Mannheim G.m.b.H.: See—
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Boeing Company, The: See—
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Hartel, Erwin H., 4,007,894.

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Boldrini, Walter: See—
Tomati, Umberto; and Boldrini, Walter, 4,007,857.

Bolger, John G., Jr. Roadway for supplying power to vehicles and method of using the same. 4,007,817, Cl. 191-10.000.

Boliden Aktiebolag: See—
Petersson, Stig Arvid, 4,008,075.

Bompani, Gian Battista, to Honeywell Information Systems Italia. Bidirectional speed control system. 4,008,424, Cl. 318-293.000.

Bonnell, Robert Peter; and Northey, Arthur Douglas, to Fairley Norbon Pty. Ltd. Rotary engines, compressors and vacuum pumps. 4,007,715, Cl. 123-8.430.

Bookout, Charles C., to Ford Motor Company. Five-speed automatic transmission. 4,007,648, Cl. 74-763.000.

Boone, Henry S. Turbine engine and pump. 4,007,996, Cl. 415-120.000.

Boop, Gene T. Explosively actuated well tool having improved disarmed configuration. 4,007,796, Cl. 175-4.550.

Boord, Leslie F.: See—
Gray, Robert E.; and Boord, Leslie F., 4,007,758.

Borgersen, Egil, to Nordisk Kartro Aktiebolag. Fastener package. 4,007,834, Cl. 206-338.000.

Boron, Joseph J., to Aikoh Co., Ltd. Sampling apparatus. 4,007,640, Cl. 73-425.40R.

Borriani, Bartolomeo: See—
Fedrigo, Renzo; Borriani, Bartolomeo; Garattini, Vittorio; and Pino, Giovanni, 4,008,021.

Borstel, Eugene C., Jr., to Omark Industries, Inc. Mower. 4,007,578, Cl. 56-295.000.

Bosch-Siemens Hausgerate GmbH: See—
Ballarin, Jurgen, 4,007,604.

Boudakian, Max M., to Olin Corporation. Preparation of 2-amino-5-halobenzotrifluoride. 4,008,278, Cl. 260-578.000.

Bourke, Robert F.: See—
Christianson, Clinton C.; and Bourke, Robert F., 4,008,423.

Bowers, John Edwin, to International Lead Zinc Research Organization, Inc. Superconducting alloys. 4,008,079, Cl. 75-134.00T.

Bowling, Teamus, to General Electric Company. Differential expansion rod and tube thermostat. 4,008,454, Cl. 337-386.000.

Bowman, Ronald R.: See—
Babji, Tadeusz M.; Bowman, Ronald R.; and Wacker, Paul F., 4,008,477.

BP Chemicals International Limited: See—
Gasson, Edward James; Krosnar, Thomas Charles, deceased; and
Marian, Stanley Frederic, 4,008,179.
Bracher, Daniel; and Lotmar, Walter. Device for the measurement of
the size of an eye pupil. 4,007,980, Cl. 351-6.000.
Braemar Computer Devices, Inc.: See—
Osborne, George T., 4,008,488.
Braguer, Michel Arsene: See—
Aubin, Gerard; Braguer, Michel Arsene; Naturel, Christian; Pou-
lin, Etienne M.; and Wattré, Joseph A., 4,007,969.
Brandon, Ross H.; and Zeffer, Peter P., to Jervis B. Webb Company.
Apparatus for stripping an anode block from an anode assembly.
4,007,533, Cl. 29-762.000.
Brandt, Paul W.; and Somerville, Dean S. Locking puller device.
4,007,535, Cl. 29-261.000.
Branson, Charles D.; and Demi, Roy C., to Robertshaw Controls
Company. Fuel control system and control device therefor or the
like. 4,007,760, Cl. 137-614.130.
Branson, Charles D.; and Demi, Roy C., to Robertshaw Controls
Company. Fuel control system and control device therefor or the
like. 4,007,872, Cl. 236-15.00A.
Branson, Charles D.; and Demi, Roy C., to Robertshaw Controls
Company. Fuel control system and control device therefor or the
like. 4,007,907, Cl. 251-85.000.
Brantley, Richard G.: See—
Waldrop, Rayburn C.; and Brantley, Richard G., 4,007,741.
Brauer, Melvin; and Kropinski, Thaddeus Frank, to N. L. Industries,
Inc. Mineral oil extended polyurethane system containing a coupling
agent for decontaminating and sealing the interior spaces of an
insulated electrical device. 4,008,197, Cl. 260-31.600.
Braukman, Eugene H.: See—
Vice, Lester J., 4,007,887.
Braunschweigische Maschinenbauanstalt: See—
Dietzel, Walter; Matusch, Siegfried; Schaper, Helmut; and
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Braytenbah, Andrew S.; and Jaegtnes, Karl O., to Westinghouse Elec-
tric Corporation. Dual turbine power plant and a reheat steam
bypass flow control system for use therein. 4,007,595, Cl.
60-644.000.
Braytenbah, Andrew S.; and Jaegtnes, Karl O., to Westinghouse Elec-
tric Corporation. Dual turbine power plant and method of operating
such plant, especially one having an HTGR steam supply. 4,007,596,
Cl. 60-652.000.
Braytenbah, Andrew S.: See—
Jaegtnes, Karl O.; and Braytenbah, Andrew S., 4,007,597.
Bremer, Allen Robert; and De Vlieg, Garrett Howard, to Boeing
Company. The Aircraft towing braking system. 4,007,890, Cl.
244-50.000.
Bremer, Klaus: See—
Brown, Scott L., Jr.; and Bremer, Klaus, 4,007,826.
Brenneman, Richard S.; and Clancy, John J., to Combustion Equip-
ment Associates, Inc. Process for treating organic wastes. 4,008,053,
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Brenner, Gordon M.: See—
Brenner, Michael G.; and Brenner, Gordon M., 4,007,898.
Brenner, Michael G.; and Brenner, Gordon M., to M.G.B., Inc. Torque
collar for high torque motors. 4,007,898, Cl. 248-26.000.
Bretschneider, Johannes; Bundesen, Lorenz; and Knapp, Heinrich, to
Robert Bosch G.m.b.H. Apparatus for the detoxification of exhaust
gases. 4,007,719, Cl. 123-119.00D.
Bretschneider, Johannes; Bundesen, Lorenz; and Knapp, Heinrich, to
Robert Bosch G.m.b.H. Fuel metering system for internal combus-
tion engines. 4,007,720, Cl. 123-122.00R.
Briar, Jack E.: See—
Scoggin, Baxter I., Jr.; Vaughan, Woodrow E.; Reed, Gerald D.;
Cartner, Don W.; Hill, David E.; and Briar, Jack E., 4,007,510.
Bricker, Daniel W.: See—
Murray, Donald E.; and Bricker, Daniel W., 4,008,040.
Brico Engineering Limited: See—
Cadle, Terence M., 4,008,051.
Briggs, George Oliver, to International Basic Economy Corporation.
Method for adjusting temperature and pressure of a fluid. 4,007,545,
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Brimer, Claude Morris, to Linear International Corporation. Washing
machine balance and suspension system. 4,007,612, Cl. 68-23.200.
British Petroleum Company Limited, The: See—
Park, Anthony John; and Weeks, Brian, 4,008,361.
Broadhill Development Corporation: See—
Carlson, Elmer T., 4,008,365.
Brockington, James W., to Texaco Inc. Alkylation catalyst for produc-
tion of motor fuels. 4,008,178, Cl. 252-434.000.
Broll, Arno: See—
Wagner, Hans B.; and Broll, Arno, 4,008,091.
Bromfield, Ian Derek; and Seddon, Peter, to Nippon Kogaku K.K.
Manufacture of multi-layer structures. 4,007,988, Cl. 355-133.000.
Broon, Dan; and Arazi, Amatzia. Fluid-operated hypodermic syringe.
4,007,739, Cl. 128-218.00R.
Brooks, Jackson R., to ABC Extrusion Company. Extruded aluminum
sign frame system. 4,007,552, Cl. 40-130.00R.
Brouard, Claude Marie Henri Emile; Leroy, Jean Marie Louis; and
Stiot, Jean-Pierre Henri, to Ugine Kuhlmann. Azo dyestuffs contain-
ing a cinnamonnitrile residue. 4,008,213, Cl. 260-160.000.
Browder, Lewis B.: See—
Gilsdorf, Richard C.; and Browder, Lewis B., 4,008,489.
Brown, Alfred: See—
Allen, Joseph C.; Woodward, Charles D.; Brown, Alfred; and Wu,
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Brown, Delmont D., to D. S. Brown Company. The. Expansion joint
with elastomer seal. 4,007,994, Cl. 404-69.000.
Brown, Donald P., to United States of America, Energy Research and
Development Administration. Gamma compensated, self powered
neutron detector. 4,008,399, Cl. 250-390.000.
Brown, Eric D.; and Chaffee, Roger G., to Dow Corning Corporation.
Method of preparing phosphonium siloxanes and products thereof.
4,008,261, Cl. 260-448.20E.
Brown, Robert L. Marine platform. 4,007,599, Cl. 61-104.000.
Brown, Scott L., Jr.; and Bremer, Klaus, to Stephens-Adamson, Inc.
Dual pressure take-up apparatus and system for dual belt conveyor-
elevator. 4,007,826, Cl. 198-813.000.
Brubaker, Burton D., to Dow Chemical Company. The. Structures for
absorbing impact energy. 4,007,917, Cl. 256-13.100.
Brugger, Robert M.; Miller, Lowell G.; and Young, Robert C., to
United States of America, Energy Research and Development Ad-
ministration. Production of 14 MeV neutrons by heavy ions.
4,008,411, Cl. 313-61.00R.
Brunin, Jean-Pierre; and Thomas, Jean-Marc, to Compagnie Honey-
well Bull (Societe Anonyme). Apparatus for checking the operation
of control circuits. 4,008,389, Cl. 235-153.0AS.
Brunner, Carl J.; Cox, Jerome R., Jr.; Snyder, Donald L.; and Mattson,
Rodney A., to Picker Corporation. Transverse tomography system
having multibeam orbital scanning with all beams offset from the
center of orbit. 4,008,400, Cl. 250-445.00T.
Bryant, Louis R.; Pedersen, Raymond J.; and Weinberger, Arnold, to
International Business Machines Corporation. Circuit for imple-
menting a modified LRU replacement algorithm for a cache.
4,008,460, Cl. 340-172.500.
Buchan, W. Raymond; and Mayer, Edward F., to Ittek Corporation.
Xerographic development apparatus having a large reservoir for
controlled flow through a narrow development zone. 4,007,707, Cl.
118-647.000.
Buerger, Herbert, to Del-Met Corporation. Lockring, trim ring and
molded plastic wheel cover assembly. 4,007,967, Cl. 301-37.00P.
Bugaut, Andre: See—
Kalopissis, Gregoire; Bugaut, Andre; and Estradier, Francoise,
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Kalopissis, Gregoire; Bugaut, Andre; and Estradier, Francoise,
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Kalopissis, Gregoire; Gascon, Jean; Bugaut, Andre; Gallien,
Jacqueline; and Gaston-Breton, Hubert, 4,008,272.
Bundesen, Lorenz: See—
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Bunker Ramo Corporation: See—
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Burch, Andrew E. Saw tables. 4,007,657, Cl. 83-471.300.
Burkhardt, Jurgen: See—
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Burzlaff, Henry A.: See—
Holoubek, George H.; and Burzlaff, Henry A., 4,008,401.
Busch, Norbert: See—
Mauvernay, Roland-Yves; Busch, Norbert; Moleyre, Jacques;
Simons, Jacques; and Montell, Andre, 4,008,329.
Buseth, Richard A.; and Rogers, Russell L., to Aeroquip Corporation.
Full flow valved fitting. 4,007,909, Cl. 251-149.200.
Butler, Glenn A.; and McKinley, George, to Bell & Howell Company.
Card handling teaching machine with instantaneous feedback sys-
tem. 4,007,547, Cl. 35-35.00C.
Byczkowski, Mieczyslaw W., to International Rectifier Corporation.
Compression-assembled semiconductor device with nesting circular
flanges and flexible locating ring. 4,008,486, Cl. 357-74.000.
Cabasso, Israel: See—
Jagur-Grodzinski, Joseph; Vofsi, David; and Cabasso, Israel,
4,008,191.
Cadle, Terence M., to Brico Engineering Limited. Composite metal
articles. 4,008,051, Cl. 29-182.300.
Cady, Percy L., to Houdaille Industries, Inc. Punching device with
punch retainer. 4,007,653, Cl. 83-140.000.
Cailliot, Serge Leon Louis; and Andre, Leopold Guy Pierre. Coffee
mill. 4,007,675, Cl. 99-286.000.
Caldwell, Bessie L.: See—
Hinchman, Leslie R.; and Hinchman, Robert B., 4,007,591.
Caldwell, Edward N., to Robertshaw Controls Company. Heat ex-
change system and method and control device therefor having
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- Gordon, Bernard M.: See—
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- Gorin, Everett, to Continental Oil Company. Regenerative sulfur dioxide scrubbing system. 4,008,310, Cl. 423-242.000.
- Gorin, Everett: See—
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- Goto, Kuniaki; Asai, Harumi; and Natsuume, Tadao, to Nippon Zeon Co., Ltd. Novel phenol derivatives. 4,008,284, Cl. 260-619.00D.
- Gould Inc.: See—
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- Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbri, Riccardo, to Montedison Fibre S.p.A. Adducts of carbamoyl sulphoxides. 4,008,071, Cl. 71-99.000.
- Gradi, Otmar; Loebel, Wolf; Rossmann, Axel; Zech, Herbert; and Zahring, Gerhard, to Motoren-und Turbinen-Union Munich GmbH. Axial-flow rotor wheel for high-speed turbomachines. 4,008,000, Cl. 416-214.00A.
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- Gramsall, Johanna: See—
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- Gross, James R.; and McFadden, Russell T., to Dow Chemical Company. The Water swellable articles. 4,008,353, Cl. 428-522.000.
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- Groupeement Europeen De La Cellulose: See—
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- Gustavsson, John Kenneth Crister; and Sjogren, Bjorn Christer, to Aktiebolaget Electrolux. Compactor press assembly. 4,007,678, Cl. 100-52.000.
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Pioneer Electronic Corporation: See—
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Popoff, Ivan Christoff; and Haines, Paul Gordon, to Pennwalt Corporation. Oxazolidine and thiazolidine carbodithioates. 4,008,244, Cl. 260-306,70R.

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- Sawaki, Mikio: See—
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- Sax, Alan M.: See—
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- Sayigh, Adnan A. R.; Sun, Kwok K.; and Ulrich, Henri, to Upjohn Company, The. Process for isolating 4,4'-diaminodiphenylmethane. 4,008,275, Cl. 260-570.00D.
- Scaggs, Anthony L., to Dow Chemical Company, The. Novel fire-retardant polymer. 4,008,186, Cl. 260-2.5FP.
- Scaglia, Enzo, to M. Scaglia S.p.A. Yarn bobbin and method for manufacturing the same. 4,007,888, Cl. 242-118.600.
- Schade, Otto Heinrich, Jr., to RCA Corporation. Current amplifier. 4,008,441, Cl. 330-35.000.
- Schaefer, Joseph H., to Applied Power Inc. Engine diagnostic apparatus. 4,008,434, Cl. 324-16.00S.
- Schaper, Helmut: See—
Dietzel, Walter; Matusch, Siegfried; Schaper, Helmut; and Zeichner, Erwin, 4,008,098.
- Scharfen, Hans; and Steinberger, Josef, to Paul Forkardt Kommanditgesellschaft. Power operable jaw chuck. 4,007,943, Cl. 279-121.000.
- Scheffler, Ulrich: See—
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- Scheidt, Franz; and Nies, Herbert, to Hoechst Aktiengesellschaft. Stabilizer combination for halogen-containing polymers. 4,008,193, Cl. 260-23.0XA.
- Scherbakov, Vsevolod Sergeevich; Gruzintsev, Igor Andreevich; and Zolotukhin, Viktor Mikhailovich. Piston compressor. 4,008,011, Cl. 417-446.000.
- Schering Aktiengesellschaft: See—
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- Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Jürgen; Eder, Ulrich; and Wiechert, Rudolf, 4,008,253.
- Scheurecker, Werner, to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Strand guiding means to be used in a continuous casting plant. 4,007,822, Cl. 193-35.00R.
- Schiffelbein, Richard A. Concrete delivery apparatus. 4,007,821, Cl. 193-4.000.
- Schiffman, Stanley P.: See—
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- Schippers, Heinz; and Lenk, Erich, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Winding apparatus. 4,007,884, Cl. 242-41.000.
- Schlenger, Warren G., to Texaco Inc. Secondary recovery of oil by steam stimulation plus the production of electrical energy and mechanical power. 4,007,786, Cl. 166-266.000.
- Schmidt, Peter Jürgen: See—
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- Schneider, Abraham: See—
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- Schneider, William P., to Upjohn Company, The. Racemic fluoro-substituted PGF₂ analogs. 4,008,263, Cl. 260-468.00D.
- Schnell, William J.: See—
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- Schoeck, Peter A.: See—
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- Scholtus, Christiaan Gustaaf Adolf: See—
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- Schott, Lawrence A.: See—
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- Schramm, Benjamin B.; and Paul, Alan M. Transducer signal conditioning circuit. 4,008,398, Cl. 250-372.000.
- Schreiber, Peter J., to N.A.D., Inc. Fluidic controlled ventilator. 4,007,736, Cl. 128-145.800.
- Schriber, Gene Arnold: See—
Nash, Harold Garth; Schriber, Gene Arnold; and Linford, John Robert, 4,008,373.
- Schroeder, Manfred Robert, to Bell Telephone Laboratories, Incorporated.

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- Schuetz, James W.; and Martin, William A., to Aetna-Standard Engineering Company. Flying cutter with continuous work piece support. 4,007,655, Cl. 83-155.000.
- Schutz, Karl-Heinz; and Peter, Heinz, to SKF Industrial Trading and Development Company, B.V. Articulated bearing. 4,007,975, Cl. 308-238.000.
- Schwartz, Edward J. Pipe coupler. 4,007,993, Cl. 403-3.000.
- Schwelmer Eisenwerk Muller & Co. GmbH: See—
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- SCM Corporation: See—
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- Scoggins, Baxter L., Jr.; Vaughan, Woodrow E.; Reed, Gerald D.; Carter, Don W.; Hill, David E.; and Briar, Jack E., to Modern Plastic Sales. Brush head. 4,007,510, Cl. 15-176.000.
- Scott, Douglas J. Device for increasing the torque applied to a hand tool. 4,007,651, Cl. 81-180.00R.
- Scott, Douglas R.: See—
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- Scott, William A., to Walbro Corporation. Governor for two-cycle engines. 4,007,717, Cl. 123-103.00R.
- Scottish Agricultural Industries Limited: See—
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- Sebel, Hans-Georg, to Henkel & Cie G.m.b.H. Adhesives based upon polyvinyl alcohol and starch. 4,008,116, Cl. 156-328.000.
- Seddon, Peter: See—
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- Segars, Ronald A., to United States of America, Army. Apparatus for determining the textural qualities of food. 4,007,632, Cl. 73-78.000.
- Seikagaku Kogyo Co., Ltd.: See—
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- Seiler, Hans: See—
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- Seipel, Thomas E., to Oscar Mayer & Co. Inc. Article display rack. 4,007,841, Cl. 211-59.100.
- Sellers, John; Griffiths, Mary; and Dyer, Thomas Harry, to Thomas French & Sons Limited. Narrow fabrics. 4,007,763, Cl. 139-116.000.
- Sellstedt, John H., to American Home Products Corporation. Intermediates for preparing semi-synthetic cephalosporins and processes relating thereto. 4,008,226, Cl. 260-243.00C.
- Semperit Aktiengesellschaft: See—
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- Sensors, Inc.: See—
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- Serizawa, Masakazu, to Rokugo Mfg. & Co., Ltd. Fan rotor for cross-flow fan. 4,007,999, Cl. 416-178.000.
- Serris, Robert E.: See—
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- Shacklett, Robert L.: See—
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- Sharp Kabushiki Kaisha: See—
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- Ueno, Atsushi; Sakai, Kiyoharu; and Fujimoto, Showhey, 4,008,372.
- Shatterproof Glass Corporation: See—
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- Shaver, J. Lyle, to Allis-Chalmers Corporation. Grain accelerator precleaner. 4,007,744, Cl. 130-27.00Q.
- Shaw, Edwin L., to Abex Corporation. Control system for variable displacement pumps. 4,008,004, Cl. 417-216.000.
- Shay, Joseph John, to Summit Packaging Systems, Inc. Squeeze-bottle-type powder dispenser. 4,007,858, Cl. 222-193.000.
- Shea, John J.; and Phillips, Harry. High speed bone drill. 4,007,528, Cl. 32-26.000.
- Sheets, Ronald E., to Tamarack Scientific Co. Inc. Vacuum contact printing system and process for electronic circuit photomask replication. 4,007,987, Cl. 355-91.000.
- Shekleton, Jack R.: See—
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- Shell Oil Company: See—
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- Verbrugghe, Pieter A.; and Uurbanus, Elisabeth W., 4,008,287.
- Sheppard, Chester Stephen: See—
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- Shibata, Masaru: See—
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- Shillinger, George L., Jr., to United States of America, National Aeronautics and Space Administration. Spring operated accelerator and constant force spring mechanism therefor. 4,007,623, Cl. 73-12.000.
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- Shimoguchi, Koza: See—
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- Shinagawa, Susumu: See—
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- Shindo, Shuichi: See—
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- Shintani, Tsuneo, to Kurosaki Refractories Co., Ltd. Compositions for plugs of refractory material. 4,008,194, Cl. 260-28.00R.
- Shipes, Kelly V., to Hudson Products Corporation. Axial flow fan assembly. 4,008,007, Cl. 417-363.000.
- Shokite, Richard J., to Warnaco, Inc. Molding apparatus. 4,008,029, Cl. 425-157.000.
- Shoup, Jerry F.: See—
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- Shoyama, Hirozi: See—
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- Shulke, David D.: See—
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- Shuttle, Anthony J., Jr. Method of recovering useful minerals from subterranean deposits thereof. 4,007,965, Cl. 299-11.000.
- Siber, Erwin-Walter C. Spinning top bowling game. 4,007,935, Cl. 273-108.000.
- Siegl, Herbert: See—
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- Siegle, Peter; Kühle, Engelbert; Hamann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. N-methyl-N-(3-trifluoromethylphenylsulfonyl)-carbonyloxime-carbamates. 4,008,328, Cl. 424-298.000.
- Siegrist, Adolf Emil; and Coviello, Vincenzo, to Ciba-Geigy Corporation. Process for the manufacture of cyano-substituted stilbene compounds. 4,008,224, Cl. 260-240.0CA.
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- Silverbush, Herbert M.; and Jensen, Philip B., to Rau Fastener, a division of U.S. Industries, Inc. Method of registering logo carrying fastener prior to emplacement on garment. 4,007,537, Cl. 29-432.100.
- Simms, Larry L. Icebox conversion unit. 4,007,600, Cl. 62-3.000.
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- Simons, Jacques: See—
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- SKF Industrial Trading and Development Company, B.V.: See—
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- Skil Corporation: See—
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- Slater Electric Inc.: See—
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Smani, Smael Mohammed, to Office Cherifien des Phosphates. Process for enrichment, by flotation, of phosphate ores with gangues containing carbonates. 4,008,151, Cl. 209-9.000.

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Smith, William V. Device for indicating angular position and depth of a towed vehicle. 4,008,466, Cl. 340-282.000.

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- Yoshida Kogyo Kabushiki Kaisha: See—
Matsubara, Isamu, 4,007,918.
- Yoshino, Motohiro, to Terumo Corporation. Mechanism for allowing blood bags to communicate with each other. 4,007,738, Cl. 128-214.00D.
- Yoshio, Fujita, to Mitsubishi Jukogyo Kabushiki Kaisha. Hydrogen gas extractor. 4,007,606, Cl. 62-475.000.
- Yoshitomi Pharmaceutical Industries, Ltd.: See—
Sawatari, Kenichi; Mukai, Toshihiko; Oda, Satoshi; Akashi, Hiroyuki; and Kohara, Masanori, 4,008,274.
- Young, Carter R.: See—
Amancharla, Amarewar; and Young, Carter R., 4,007,783.
- Young, Robert C.: See—
Brugger, Robert M.; Miller, Lowell G.; and Young, Robert C., 4,008,411.
- Yuda, Sumio; Sawada, Tohru; and Moriya, Kohji, to Warabi Special Steel Co., Ltd. Magnetic materials. 4,008,105, Cl. 148-101.000.
- Yuito, Isamu; Sato, Kikui; and Hirano, Mikio, to Hitachi, Ltd. Thin-film field-emission electron source and a method for manufacturing the same. 4,008,412, Cl. 313-309.000.

Yuugen Kaisha Matsushima Seisakusho: See—
Matsushima, Ryuzo, 4,007,768.
Zabransky, Robert F.; and Anderson, Robert F., to Universal Oil
Products Company. Simulated moving bed alkylation process.
4,008,291, Cl. 260-683.430.
Zahring, Gerhard: See—
Gradi, Ottmar; Loebel, Wolf; Rossmann, Axel; Zech, Herbert; and
Zahring, Gerhard, 4,008,000.
Zaloga, Peter P. Register with air-driven oscillating louvers. 4,007,673,
Cl. 98-40.00V.
Zapata Industries, Inc.: See—
Snyder, William Joseph, 4,007,848.
Walker, Rocco David, 4,007,851.
Zappelli, Piergiorgio: See—
Re, Luciano; and Zappelli, Piergiorgio, 4,008,363.
Zar, Jacob L.; and Serris, Robert E., to Avco Everett Research Labora-
tory, Inc. Feedback control of a laser output. 4,008,444, Cl. 331-
94.50S.
Zdrodowski, Joseph John, to Hoffmann-La Roche Inc. Fluorometer
flow cell. 4,008,397, Cl. 250-373.000.
Zech, Herbert: See—
Gradi, Ottmar; Loebel, Wolf; Rossmann, Axel; Zech, Herbert; and
Zahring, Gerhard, 4,008,000.

Zeffer, Peter P.: See—
Brandon, Ross H.; and Zeffer, Peter P., 4,007,533.
Zeichner, Erwin: See—
Dietzel, Walter; Matusch, Siegfried; Schaper, Helmut; and
Zeichner, Erwin, 4,008,098.
Zenitz, Bernard L., to Sterling Drug Inc. Phenyl-lower-alkylamines.
4,008,276, Cl. 260-570.50P.
Zernig, Ernst. Single-pivot hinge. 4,007,513, Cl. 16-128.00R.
Zin, Gary K.: See—
Korostoff, Edward; and Zin, Gary K., 4,008,035.
Zingg, Warren M., to Dow Chemical Company, The. Apparatus for
mixing dry particles with a liquid. 4,007,921, Cl. 259-151.000.
Zoecon Corporation: See—
Henrick, Clive A.; and Staal, Gerardus B., 4,008,258.
Zollinger, Howard A.: See—
Lubbers, LeRoy; Stubbs, William K.; and Zollinger, Howard A.,
4,007,843.
Zolotukhin, Viktor Mikhailovich: See—
Scherbakov, Vsevolod Sergeevich; Gruzintsev, Igor Andreevich;
and Zolotukhin, Viktor Mikhailovich, 4,008,011.
Zorini, Luigi Omodeo, to Comez, S.p.A. Twisted beard needle.
4,007,609, Cl. 66-116.000.
Zoya, Walter J., to Sperry Rand Corporation. Power transmission.
4,007,592, Cl. 60-391.000.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 416,589	3,990,363	Mar. 27, 1976	Nov. 9, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977	B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 426,227	3,999,078	Mar. 2, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976	B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976	B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976	B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976	B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976

PI 34 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 456,153	3,997,992	Mar. 9, 1976	Oct. 5, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976	B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977	B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976	B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976	B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976	B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977	B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976	B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976	B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976	B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977	B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976	B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976	B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976	B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976	B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976	B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976	B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976	B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976	B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977	B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977	B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977	B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976	B 470,900	4,001,213	Mar. 2, 1976	Dec. 7, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977	B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976	B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976	B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976	B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976	B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976	B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977	B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976	B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977	B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976	B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976	B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976	B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976	B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976	B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976	B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976	B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976	B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976	B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976	B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976	B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976	B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976	B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976	B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976	B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977	B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977	B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977	B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976	B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976	B 492,120	3,995,992	Feb. 24, 1976	Dec. 7, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976	B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976	B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976	B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976	B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976	B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976	B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976	B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976	B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977	B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976	B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976	B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976	B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977	B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976	B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977	B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977	B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976	B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976	B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976	B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977	B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976	B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976	B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976	B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976	B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976	B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976	B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976	B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976	B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976	B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976	B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976	B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976	B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976	B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977	B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976	B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976	B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976	B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976	B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976	B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977	B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976	B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976	B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977	B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976	B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976	B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976	Γ 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976	B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,474	3,997,260	Feb. 17, 1976	Nov. 4, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 509,586	4,006,645	Feb. 3, 1976	Nov. 8, 1977
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,458	4,007,702	Mar. 23, 1976	Feb. 15, 1977	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,648	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 504,877	3,997,564	Feb. 24, 1976	Nov. 9, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 504,899	3,991,273	Mar. 9, 1976	Dec. 14, 1976	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976

PI 37 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976	B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976	B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977	B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977	B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976	B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976	B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976	B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976	B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976	B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976	B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977	B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976	B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976	B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976	B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976	B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976	B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976	B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976	B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976	B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976	B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976	B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976	B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 534,449	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 534,901	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 536,511	3,995,989	Mar. 9, 1976	Oct. 12, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 528,756	3,990,476	Feb. 10, 1976	Nov. 9, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976

**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
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AND NOW ISSUED AS PATENTS—CONTINUED**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976	B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977	B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976	B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976	B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976	B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976	B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976	B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976	B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976	B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976	B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976	B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977	B 560,765	3,983,389	Feb. 10, 1976	Sep. 28, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976	B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976

**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 197

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF FEBRUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Dill, Frederick H.; and Konnerth, Karl L., Jr., to International Business Machines Corporation: System for performing spectral analyses under computer control. Re. 29,138, Cl. 235-151.320.
International Business Machines Corporation: See—
Dill, Frederick H.; and Konnerth, Karl L., Jr., Re. 29,138.
Konnerth, Karl L., Jr.: See—
Dill, Frederick H.; and Konnerth, Karl L., Jr., Re. 29,138.
Lee, Chin K.; and Long, Margaret E., to R. J. Reynolds Tobacco Company. Enzymatic process using immobilized microbial cells. Re. 29,136, Cl. 195-116.000.
Long, Margaret E.: See—
Lee, Chin K.; and Long, Margaret E., Re. 29,136.
Mohwinkel, Franz, to Washington Nu Process, Inc. Process of preserving potatoes in closed packages. Re. 29,137, Cl. 426-412.000.
R. J. Reynolds Tobacco Company: See—
Lee, Chin K.; and Long, Margaret E., Re. 29,136.
Washington Nu Process, Inc.: See—
Mohwinkel, Franz, Re. 29,137.

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- Abrams, Marilyn M. Invertible table unit. 243,371, 2-15-77, Cl. D6-3.000.
Allen, Howard Martin; and Barber, Ronald Charles, to Tektronix, Inc. Physiological sensor. 243,417, 2-15-77, Cl. D83-1.00F.
Almen, Rune G., to Sensotherm Aktiebolag. Heating panel element. 243,401, 2-15-77, Cl. D23-127.000.
American Optical Corporation: See—
Johnsen, David W., 243,395.
Johnsen, David W., 243,396.
Johnsen, David W., 243,397.
Loughner, Larry G., 243,398.
Armorlite Inc.: See—
Nerad, Frank O.; and Robertson, Forbes C., 243,394.
Barber, Ronald Charles: See—
Allen, Howard Martin; and Barber, Ronald Charles, 243,417.
Bauer, Richard A.: See—
Mooney, Thomas; Veselaski, Stephen; and Bauer, Richard A., 243,404.
Mooney, Thomas; and Bauer, Richard A., 243,406.
Mooney, Thomas; and Bauer, Richard A., 243,407.
Berger, Leon H. Cooking and utility pan. 243,380, 2-15-77, Cl. D7-85.000.
Brown, Linda C. Match holder. 243,410, 2-15-77, Cl. D27-32.000.
Cassia, Antonio Macchi, to Steiner American Corporation. Soap dispenser. 243,374, 2-15-77, Cl. D6-95.000.
de Jouennes, Roger. Carafe. 243,387, 2-15-77, Cl. D9-148.000.
Denny, Robert J.; and Horowitz, Richard D. Chair. 243,372, 2-15-77, Cl. D6-26.000.
DiOrio Enterprises, Inc.: See—
DiOrio, Russell A., 243,375.
DiOrio, Russell A., to DiOrio Enterprises, Inc. Jewelry display cabinet. 243,375, 2-15-77, Cl. D6-151.000.
Dumas, Sarah J. Container for newspapers or the like. 243,388, 2-15-77, Cl. D9-240.000.
Eckmann, John Allie; and Goldman, Arnold Sherwin, to Motorola, Inc. Radio pager apparatus or similar article. 243,409, 2-15-77, Cl. D14-70.000.
Fairthorne, Victor, to Land Ranger Manufacturing Inc. Car top carrier. 243,392, 2-15-77, Cl. D12-157.000.
Fidelitone, Inc.: See—
Mox, Dana W.; Smith, Charles M.; and Hudson, Craig J., 243,382.
Garsen, Marian E. Display stand. 243,373, 2-15-77, Cl. D6-85.000.
General Electric Company: See—
Grieb, Joan, 243,385.
Goldman, Arnold Sherwin: See—
Eckmann, John Allie; and Goldman, Arnold Sherwin, 243,409.
Grieb, Joan, to General Electric Company. Wall plate. 243,385, 2-15-77, Cl. D8-351.000.
Hansa Plastics, Inc.: See—
Schmidt, Harald, 243,391.
Harbor Universal, Inc.: See—
Larson, William A., 243,415.
Hatsuda, Kazuyuki: See—
Shimizu, Shigeru; Hatsuda, Kazuyuki; and Murata, Sadao, 243,416.
Hedley, William, to Wilkinson Sword Limited. Razor handle. 243,419, 2-15-77, Cl. D28-48.000.
Horowitz, Richard D.: See—
Denny, Robert J.; and Horowitz, Richard D., 243,372.
Hoyt, Earl, to Morton-Norwich Products, Inc. Dispensing container. 243,386, 2-15-77, Cl. D9-71.000.
Hudson, Craig J.: See—
Mox, Dana W.; Smith, Charles M.; and Hudson, Craig J., 243,382.
Irving, Leonard A. Air freshener housing. 243,402, 2-15-77, Cl. D23-150.000.
ITE Imperial Corporation: See—
Mooney, Thomas; Veselaski, Stephen; and Bauer, Richard A., 243,404.
Mooney, Thomas; and Veselaski, Stephen, 243,405.
Mooney, Thomas; and Bauer, Richard A., 243,406.
Mooney, Thomas; and Bauer, Richard A., 243,407.
Johnsen, David W., to American Optical Corporation. Pair of spectacles. 243,395, 2-15-77, Cl. D16-65.000.
Johnsen, David W., to American Optical Corporation. Pair of spectacles. 243,396, 2-15-77, Cl. D16-65.000.
Johnsen, David W., to American Optical Corporation. Spectacle frame front. 243,397, 2-15-77, Cl. D16-65.000.
Johnson, Betty Lee. Animal collar or similar article. 243,411, 2-15-77, Cl. D30-38.000.
Jones, Graham R., to Wilkinson Sword Limited. Combined razor blade and mount. 243,420, 2-15-77, Cl. D28-47.000.
K.K. Hamada Insatsuki Seizosho: See—
Shimizu, Shigeru; Hatsuda, Kazuyuki; and Murata, Sadao, 243,416.
Kridos, Thomas A. Spatula. 243,381, 2-15-77, Cl. D7-102.000.
Krueger, Kenneth K.; and Pavlov, Todor, to Shiley Laboratories, Inc. Pressure relief valve for a low pressure cuffed tracheostomy tube. 243,412, 2-15-77, Cl. D32-1.00R.
Land Ranger Manufacturing Inc.: See—
Fairthorne, Victor, 243,392.
Larson, William A., to Harbor Universal, Inc. Floor lamp. 243,415, 2-15-77, Cl. D48-20.00A.
Loughner, Larry G., to American Optical Corporation. Pair of spectacles. 243,398, 2-15-77, Cl. D16-65.000.
Lupton, William G. Combined filter, aerator and spray cooling unit for swimming pools. 243,399, 2-15-77, Cl. D23-4.000.
Lyon, John W. Plastic binding size selector. 243,389, 2-15-77, Cl. D10-64.000.
Mastrianni, Lena. Planter. 243,390, 2-15-77, Cl. D11-149.000.
McAllister, Jack G. Wind driven electric generator. 243,408, 2-15-77, Cl. D13-3.000.
Meeks, Emmett O. Hot cup coaster and lid. 243,379, 2-15-77, Cl. D7-45.000.
Mooney, Thomas; Veselaski, Stephen; and Bauer, Richard A., to ITE Imperial Corporation. Ground clamp. 243,404, 2-15-77, Cl. D13-13.000.
Mooney, Thomas; and Veselaski, Stephen, to ITE Imperial Corporation. Saddle type connector. 243,405, 2-15-77, Cl. D13-13.000.
Mooney, Thomas; and Bauer, Richard A., to ITE Imperial Corporation. Threaded sealing ring for electrical connectors. 243,406, 2-15-77, Cl. D13-13.000.
Mooney, Thomas; and Bauer, Richard A., to ITE Imperial Corporation. Cradle type ground lug for conduit. 243,407, 2-15-77, Cl. D13-13.000.
Moore, Ronald M. Combined shelf and multiple cabinet unit. 243,377, 2-15-77, Cl. D6-186.000.
Morton-Norwich Products, Inc.: See—
Hoyt, Earl, 243,386.
Motorola, Inc.: See—
Eckmann, John Allie; and Goldman, Arnold Sherwin, 243,409.
Mox, Dana W.; Smith, Charles M.; and Hudson, Craig J., to Fidelitone, Inc. Record washer or similar article. 243,382, 2-15-77, Cl. D7-161.000.
Murata, Sadao: See—
Shimizu, Shigeru; Hatsuda, Kazuyuki; and Murata, Sadao, 243,416.
Nerad, Frank O.; and Robertson, Forbes C., to Armorlite Inc. Oval lenticular lens. 243,394, 2-15-77, Cl. D16-51.000.
Pavlov, Todor: See—
Krueger, Kenneth K.; and Pavlov, Todor, 243,412.

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- Ploszaj, Norman J. Bottle scraper. 243,383, 2-15-77, Cl. D7-181.000.
Presto Lock Company, Division of Walter Kidde & Company, Inc.: See—
Stolarz, Edward M., 243,384.
Rellis, Lawrence Bernard. Electrical outlet adapter. 243,403, 2-15-77, Cl. D13-29.000.
Riley, Martin O. Water filler fitting. 243,400, 2-15-77, Cl. D23-40.000.
Robertson, Forbes C.: See—
Nerad, Frank O.; and Robertson, Forbes C., 243,394.
Rowe Furniture Corporation: See—
Scott, Rupert A., 243,376.
Savage, Woody. Horse race game indicator. 243,413, 2-15-77, Cl. D34-5.0MM.
Schmidt, Harald, to Hansa Plastics, Inc. Tire valve extender. 243,391, 2-15-77, Cl. D12-153.000.
Scott, Rupert A., to Rowe Furniture Corporation. Table. 243,376, 2-15-77, Cl. D6-175.000.
Sensotherm Aktiebolag: See—
Almen, Rune G., 243,401.
Shiley Laboratories, Inc.: See—
Krueger, Kenneth K.; and Pavlov, Todor, 243,412.
Shimizu, Shigeru; Hatsuda, Kazuyuki; and Murata, Sadao, to K.K. Hamada Insatsuki Seizosho. Offset printing press machine. 243,416, 2-15-77, Cl. D64-11.00R.
Smith, Charles M.: See—
Mox, Dana W.; Smith, Charles M.; and Hudson, Craig J., 243,382.
Sperry Rand Corporation: See—
Wolff, Martin J., 243,418.
Steiner American Corporation: See—
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Stolarz, Edward M., to Presto Lock Company, Division of Walter Kidde & Company, Inc. Combined draw bolt and lock for luggage or the like. 243,384, 2-15-77, Cl. D8-338.000.
Tektronix, Inc.: See—
Allen, Howard Martin; and Barber, Ronald Charles, 243,417.
Tharp, Gary Lee. Picture frame. 243,378, 2-15-77, Cl. D6-242.000.
Veselaski, Stephen: See—
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Mooney, Thomas; and Veselaski, Stephen, 243,405.
Vyskocil, Ralph G. Game turntable for segregating and identifying by category poker chips. 243,414, 2-15-77, Cl. D34-13.00A.
Wilkinson Sword Limited: See—
Hedley, William, 243,419.
Jones, Graham R., 243,420.
Wolff, Martin J., to Sperry Rand Corporation. Hand held electric hair dryer. 243,418, 2-15-77, Cl. D28-13.000.
Wynn, Freddie L. Truck bed removably mountable utility storage carryall. 243,393, 2-15-77, Cl. D12-157.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 15, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

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1.9	4,007,494	CLASS 33	284	4,007,590	1 R	4,008,072	CLASS 105	CLASS 132			
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2	4,007,496	137 R	4,007,543	391	4,008,074	43	4,008,074	73	4,007,748		
33	4,007,497	174 R	4,007,544	548	4,008,075	77	4,008,075	CLASS 134			
CLASS 4		CLASS 34	644	4,007,594	101 R	4,008,076	43	4,008,090	56 R	4,007,749	
213	4,007,498	14	4,007,545	652	4,008,077	77	4,008,091	48	4,008,092	83	4,007,750
249	4,007,499	133	4,007,546	707	4,008,078	118 P	4,008,077	59	4,008,093	140	4,007,751
295	4,007,500	CLASS 35		CLASS 61		124	4,008,079	99	4,008,094	CLASS 135	
CLASS 5		35 C	4,007,547	90	4,007,598	134 N	4,008,080	235	4,008,095	25 R	4,007,752
90	4,007,501	35 R	4,007,548	104	4,007,599	134 T	4,008,079	277	4,008,096	25 R	4,007,753
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4 R	4,007,504	141 T	4,007,550	137	4,007,602	CLASS 83		13	4,007,695	115	4,007,756
CLASS 8		CLASS 40		151	4,007,603	106	4,007,652	31	4,007,696	315	4,007,757
10.2	4,008,043	124.2	4,007,551	174	4,007,604	140	4,007,653	45	4,007,697	472	4,007,758
115.5	4,008,044	130 R	4,007,552	184	4,007,605	155	4,007,654	80	4,007,698	550	4,007,759
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CLASS 13		CLASS 44		158	4,008,062	312	4,007,658	CLASS 114		CLASS 139	
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CLASS 14		10 R	4,008,054	CLASS 66		CLASS 85		222	4,007,701	116	4,007,763
17	4,007,507	CLASS 46		9 B	4,007,607	CLASS 89		230	4,007,702	CLASS 141	
CLASS 15		25	4,007,555	40	4,007,608	1.807	4,007,660	CLASS 116		35	4,007,764
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CLASS 16		252	4,007,558	CLASS 68		49	4,007,664	50	4,007,706	CLASS 145	
19	4,007,512	CLASS 51		23.2	4,007,612	391 R	4,007,665	647	4,007,707	50 D	4,007,768
128 R	4,007,513	101 LG	4,007,559	58	4,007,613	446	4,007,666	CLASS 119		CLASS 148	
129	4,007,514	111 R	4,007,560	234	4,007,614	CLASS 92		1	4,007,708	6.11	4,008,102
CLASS 21		241 VS	4,007,561	387	4,007,615	60	4,007,667	14.03	4,007,710	6.15 R	4,008,101
102 R	4,008,045	244	4,007,562	CLASS 71		CLASS 93		51.5	4,007,711	12 F	4,008,103
CLASS 23		298 R	4,008,055	28	4,008,064	1 C	4,007,668	CLASS 122		13.1	4,008,104
258.5 M	4,008,047	CLASS 52		34	4,008,065	8 R	4,007,669	250 R	4,007,712	101	4,008,105
260	4,008,048	98	4,007,563	76	4,008,066	36.01	4,007,670	504	4,007,713	172	4,008,106
270.5 W	4,008,046	169.3	4,007,565	88	4,008,067	58 ST	4,007,671	CLASS 123		175	4,008,107
288 H	4,008,049	169.7	4,007,566	90	4,008,068	CLASS 96		8.09	4,007,714	CLASS 149	
288 R	4,008,050	294	4,007,568	92	4,008,069	1.5	4,008,082	8.43	4,007,715	2	4,008,108
CLASS 24		309.3	4,007,569	99	4,008,071	27 R	4,008,083	90.28	4,007,716	37	4,008,109
103	4,007,515	317	4,007,570	CLASS 72		35	4,008,084	103 R	4,007,717	46	4,008,110
221 R	4,007,516	483	4,007,571	38	4,007,616	48 R	4,008,085	119 D	4,007,718	CLASS 152	
CLASS 26		687	4,007,572	234	4,007,617	56.5	4,008,086	122 R	4,007,720	330 RF	4,007,769
18.5	4,007,517	722	4,007,574	245	4,007,618	69	4,008,087	134	4,007,721	CLASS 156	
CLASS 28		696	4,007,573	272	4,007,619	84 R	4,008,088	139 AW	4,007,722	52	4,008,113
1.6	4,007,518	351	4,007,621	345	4,007,620	108	4,008,089	148 CC	4,007,724	267	4,008,115
1.8	4,007,519	393	4,007,622	351	4,007,621	CLASS 98		148 R	4,007,723	328	4,008,116
CLASS 29		CLASS 53		CLASS 73		37	4,007,672	190 A	4,007,725	380	4,008,117
25.42	4,007,520	26	4,007,575	12	4,007,623	40 V	4,007,673	CLASS 126		392	4,008,114
38 C	4,007,521	28	4,007,576	23	4,007,624	CLASS 99		67	4,007,726	499	4,008,118
116 AD	4,007,522	180 R	4,007,577	23.1	4,007,625	281	4,007,674	200	4,007,727	541	4,008,119
159 R	4,007,532	CLASS 55		32 A	4,007,626	286	4,007,675	271	4,007,728	644	4,008,122
182.3	4,008,051	92	4,008,056	40.5 R	4,007,627	545	4,007,676	286	4,007,730	656	4,008,123
194	4,008,052	105	4,008,057	53	4,007,628	CLASS 100		CLASS 127		CLASS 162	
261	4,007,535	179	4,008,058	71.4	4,007,630	45	4,007,677	19	4,008,098	89	4,008,120
421 R	4,007,536	396	4,008,059	84	4,007,631	52	4,007,678	CLASS 128		124	4,008,121
432.1	4,007,537	446	4,008,060	114	4,007,632	53	4,007,679	2 B	4,007,732	290	4,008,122
447	4,007,538	CLASS 56		273	4,007,633	CLASS 101		2 S	4,007,733	336	4,008,123
455 R	4,007,539	295	4,007,578	290 R	4,007,635	153	4,007,680	2 Z	4,007,731	CLASS 164	
509	4,007,540	327 A	4,007,579	343.5	4,007,637	288	4,007,681	2.05 G	4,007,734	52	4,007,770
566.3	4,007,534	CLASS 57		421 A	4,007,638	348	4,007,682	37	4,007,735	56	4,007,771
600	4,007,541	140 BY	4,007,580	425.4 P	4,007,639	363	4,007,683	145.8	4,007,736	151	4,007,772
623.4	4,008,100	156	4,007,581	425.4 R	4,007,640	366	4,007,684	188	4,007,737	CLASS 165	
762	4,007,533	CLASS 58		425.6	4,007,641	CLASS 102		214 D	4,007,738	1	4,007,773
CLASS 30		23 A	4,007,582	462	4,007,642	39	4,007,685	218 R	4,007,739	18	4,007,776
90.2	4,007,523	50 R	4,007,583	CLASS 74		44	4,007,686	221	4,007,740	32	4,007,777
266	4,007,524	CLASS 59		2	4,007,643	45	4,007,687	230	4,007,742	34	4,007,778
276	4,007,525	11	4,007,584	229	4,007,644	49.5	4,007,688	292	4,007,741	39	4,007,779
CLASS 32		CLASS 60		501 R	4,007,645	78	4,007,689	334 R	4,007,743	46	4,007,780
327	4,007,527	201	4,007,586	763	4,007,647	90	4,007,691	CLASS 130		CLASS 166	
26	4,007,528	204	4,007,587	803	4,007,648	CLASS 104		27 Q	4,007,744	79	4,007,782
27	4,007,529	274	4,007,588	CLASS 75		134	4,007,692	261 R	4,007,745	135	4,007,783
36	4,007,530										

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263	4,007,785	268	4,008,129	CLASS 228	429 B	4,008,176	475 R	4,008,266	28 C	4,007,958
266	4,007,786	CLASS 203	179	4,007,867	434	4,008,177	509	4,008,267	CLASS 297	
267	4,007,787	6	4,008,130	CLASS 229	437	4,008,178	514 H	4,008,268	42	4,007,959
272	4,007,788	82	4,008,131	20	4,007,868	439	4,008,180	515 A	71	4,007,960
281	4,007,789	CLASS 204	41 B	4,007,869	465	4,008,181	545 R	4,008,271	111	4,007,961
299	4,007,790	79	4,008,132	CLASS 232	512	4,008,182	552 R	4,008,272	306	4,007,962
300	4,007,791	80	4,008,133	34	4,007,870	522	4,008,184	554	CLASS 299	
308	4,007,792	108	4,008,134	CLASS 233	18	4,007,913	570 D	4,008,273	2	4,007,963
25	4,007,793	149	4,008,135	27	4,007,871	108	4,007,914	570.5 P	4	4,007,964
CLASS 169	158 HE	159.14	4,008,136	CLASS 235	132	4,007,915	571	4,008,274	11	4,007,965
1	4,007,794	162 R	4,008,137	150.1	4,008,386	132	4,007,916	578	4,007,966	
CLASS 171	181	195 G	4,008,138	151.1	4,008,387	13.1	4,007,917	601 R	CLASS 301	
50	4,007,795	225	4,008,141	151.32	Re.29,138	59	4,007,918	604 R	42	4,007,959
CLASS 173	68 B	257	4,008,142	151.35	4,008,388	108	4,007,920	606.5 P	71	4,007,960
CLASS 174	88 B	290 R	4,008,143	153 AS	4,008,389	151	4,007,921	615 A	111	4,007,961
68 B	4,008,365	1.5	4,008,144	CLASS 236	15 A	4,007,872	191	4,007,922	306	4,007,962
88 B	4,008,366	108	4,008,145	49	4,007,873	2 B	4,007,874	619 D	CLASS 299	
107	4,008,367	175	4,008,146	CLASS 237	12.3 A	4,007,875	10	4,007,876	37 P	4,007,967
120 R	4,008,368	219	4,008,147	10	4,007,878	209	4,007,877	635 C	38 R	4,007,968
CLASS 175	4.55	306	4,008,148	CLASS 239	214	4,007,879	585	4,007,880	25	4,007,969
26	4,007,797	321	4,008,149	10	4,007,878	CLASS 242	4 B	4,007,881	93	4,007,970
297	4,007,798	338	4,008,150	209	4,007,877	4 B	4,007,881	18 R	109	4,007,971
340	4,007,799	411	4,008,151	CLASS 244	4,007,878	18 R	4,007,882	23 XA	11	4,007,972
CLASS 177	209	448	4,008,152	42 D	4,007,896	35.5 R	4,007,883	28 R	113	4,008,403
209	4,007,800	484	4,008,153	50	4,007,890	43 R	4,007,885	29.2 TN	149	4,008,404
CLASS 178	67	503	4,008,154	53 B	4,007,891	84.2 R	4,007,886	31.6	231	4,008,405
CLASS 179	1 CN	8	4,008,155	62	4,007,892	86.5 R	4,007,887	37 SB	304	4,008,406
1 CN	4,008,376	11 LE	4,008,145	104 FP	4,007,894	118.6	4,007,888	40 R	9	4,007,973
1 E	4,008,374	126	4,008,146	138 R	4,007,895	199	4,007,889	45.75 N	238	4,007,974
1 VC	4,008,375	211	4,008,148	187 B	4,007,897	42 D	4,007,896	45.75 S	9	4,007,975
7 R	4,008,377	216	4,008,149	CLASS 246	4,007,898	50	4,007,890	47 UA	238	4,007,975
15 A	4,008,378	352	4,008,150	187 B	4,007,897	53 B	4,007,891	49	9	4,007,973
90 B	4,008,380	9	4,008,151	CLASS 248	4,007,898	62	4,007,892	75 M	238	4,007,974
90 K	4,008,379	80.5	4,008,152	26	4,007,898	64	4,007,893	75 R	9	4,007,975
100.4 ST	4,008,381	444	4,008,152	49	4,007,899	104 FP	4,007,894	79.3 R	4 R	4,008,407
CLASS 180	74	7	4,008,159	311.1	4,007,899	138 R	4,007,895	112.5 LH	9.1	4,008,408
74	4,007,801	23 R	4,008,160	526	4,007,901	138 R	4,007,895	123.5	45	4,008,409
82 C	4,007,802	45	4,008,161	534	4,007,902	147	4,008,211	147	237	4,008,410
CLASS 181	117	208	4,008,153	CLASS 249	145	4,007,903	157	4,008,212	61 R	4,008,411
117	4,007,803	217	4,008,154	199	4,008,390	145	4,007,903	160	309	4,008,412
118	4,007,804	242 R	4,008,155	208	4,008,391	187 B	4,007,897	160	331	4,008,413
120	4,007,805	321 B	4,008,156	270	4,008,392	CLASS 250	4,008,390	160	97	4,008,414
131	4,007,806	386	4,008,158	328	4,008,393	240 CA	4,008,224	160	156	4,008,415
CLASS 182	109	59.1	4,007,841	345	4,008,394	243 C	4,008,225	160	194	4,008,416
109	4,007,807	16 R	4,007,842	352	4,008,395	243 C	4,008,225	160	194	4,008,416
142	4,007,808	16.4 B	4,007,843	358 T	4,008,396	243 C	4,008,225	160	194	4,008,416
CLASS 186	1	75 T	4,007,844	372	4,008,398	243 C	4,008,225	160	194	4,008,416
1 AC	4,007,809	138 D	4,007,845	373	4,008,397	243 C	4,008,225	160	194	4,008,416
1 R	4,007,810	152	4,007,846	390	4,008,399	243 C	4,008,225	160	194	4,008,416
CLASS 187	29 R	670	4,007,847	445 T	4,008,400	243 C	4,008,225	160	194	4,008,416
29 R	4,007,811	138 D	4,007,845	453	4,008,401	243 C	4,008,225	160	194	4,008,416
CLASS 188	76	152	4,007,846	492 A	4,008,402	243 C	4,008,225	160	194	4,008,416
218 XL	4,007,814	152	4,007,846	CLASS 251	1 B	4,007,904	305	4,008,244	61 R	4,008,411
265	4,007,815	670	4,007,847	1 B	4,007,905	1 R	4,007,906	306.7 R	309	4,008,412
290	4,007,816	31	4,007,848	1 R	4,007,906	26	4,007,907	306.7 T	331	4,008,413
CLASS 191	10	213	4,007,849	127	4,007,908	85	4,007,907	306.8 R	97	4,008,414
10	4,007,817	216	4,007,850	149.2	4,007,909	127	4,007,908	306.8 R	156	4,008,415
CLASS 192	56 R	307	4,007,851	229	4,007,910	149.2	4,007,909	306.8 R	194	4,008,416
56 R	4,007,818	26	4,007,855	307	4,007,851	229	4,007,910	306.8 R	194	4,008,416
58 B	4,007,819	67	4,007,856	CLASS 219	10.55 D	4,008,383	125 R	4,008,384	138	4,008,422
67 R	4,007,820	153	4,007,857	CLASS 220	269	4,008,385	125 R	4,008,384	139	4,008,423
CLASS 193	4	193	4,007,858	CLASS 221	3.2	4,007,852	269	4,008,385	171	4,008,424
35 R	4,007,822	443	4,007,859	CLASS 222	167	4,007,854	269	4,008,385	314	4,008,425
CLASS 195	31 F	46	4,007,860	26	4,007,855	127	4,007,908	269	331	4,008,426
31 F	4,008,124	85	4,007,861	127	4,007,908	149.2	4,007,909	269	331	4,008,426
51 R	4,008,125	182	4,008,163	149.2	4,007,909	229	4,007,910	269	331	4,008,426
63	4,008,126	191	4,008,164	229	4,007,910	229	4,007,910	269	331	4,008,426
65	4,008,127	194	4,008,165	229	4,007,910	229	4,007,910	269	331	4,008,426
116	Re.29,136	301.1 W	4,008,171	229	4,007,910	229	4,007,910	269	331	4,008,426
CLASS 196	110	301.21	4,008,172	229	4,007,910	229	4,007,910	269	331	4,008,426
110	4,008,128	358	4,008,173	229	4,007,910	229	4,007,910	269	331	4,008,426
CLASS 197	181	411 S	4,008,174	229	4,007,910	229	4,007,910	269	331	4,008,426
181	4,007,823	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426
CLASS 198	462	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426
462	4,007,824	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426
770	4,007,825	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426
813	4,007,826	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426
862	4,007,827	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426
CLASS 200	51 R	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426
51 R	4,008,382	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426
648 D	4,008,287	470	4,008,264	229	4,007,910	229	4,007,910	269	331	4,008,426

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284	4,008,452	156	4,007,979	CLASS 360	446	4,008,011	298	4,008,328	307	4,008,344	
345	4,008,453				454	4,008,012	322	4,008,330	381	4,008,345	
386	4,008,454						327	4,008,331	387	4,008,346	
CLASS 339		6	4,007,980	51	4,008,488	CLASS 418		CLASS 428			
14 RP	4,007,976			85	4,008,489	16	4,008,013		35	4,008,347	
217 S	4,007,977			94	4,008,490	51	4,008,014			4,008,348	
CLASS 340		5	4,008,480	97	4,008,491	61 A	4,008,001	CLASS 425			
1 R	4,008,455	27	4,008,481	98	4,008,492	61 B	4,008,015	3	4,008,021	161	4,008,349
6 R	4,008,456	104	4,008,482	124	4,008,493		4,008,016	72 R	4,008,022	311	4,008,350
15.5 CP	4,008,459	277	4,008,483			92	4,008,017	78	4,008,023	411	4,008,351
146.3 SY	4,008,457			18	4,008,418	129	4,008,018	85	4,008,024	474	4,008,352
151	4,008,458	4	4,007,981	53	4,008,417	171	4,008,018	96	4,008,025	522	4,008,353
172.5	4,008,460	15	4,007,982	153	4,008,420	221	4,008,019	117	4,008,026	CLASS 429	
	4,008,461			334	4,008,419	258	4,008,020	127	4,008,027	56	4,008,354
	4,008,462	16	4,007,983			CLASS 423		145	4,008,028	59	4,008,355
174 TF	4,008,463	46	4,007,985	3	4,007,993	50	4,008,306	157	4,008,029	63	4,008,356
239 R	4,008,464	57	4,007,986			120	4,008,307	224	4,008,030	98	4,008,357
274 C	4,008,465	91	4,007,987	69	4,007,994	139	4,008,308	242 R	4,008,031	142	4,008,358
282	4,008,466	133	4,007,988	77	4,007,995	167	4,008,309	246	4,008,032	CLASS 431	
310 A	4,008,467					242	4,008,310	441	4,008,034	2	4,008,037
347 AD	4,008,468					309	4,008,314	461	4,008,035	11	4,008,038
CLASS 343				120	4,007,996	319	4,008,315	466	4,008,036	90	4,008,039
5 NA	4,008,469	96	4,007,989			533	4,008,316	467	4,008,033	94	4,008,040
6 A	4,008,470	124	4,007,990	61	4,007,997	CLASS 424		CLASS 426		247	4,008,041
6.5 LC	4,008,471	141	4,007,991	135	4,007,998	89	4,008,317	44	4,008,333	CLASS 432	
7 A	4,008,472	160	4,007,992	178	4,007,999	211	4,008,318	46	4,008,334	26	4,008,042
7.5	4,008,473			214 A	4,008,000	214	4,008,319	62	4,008,335	CLASS 526	
7.7	4,008,474					226	4,008,320	270	4,008,336	116	4,008,358
14	4,008,475	17	4,008,485			240	4,008,321	281	4,008,337	129	4,008,359
17.7	4,008,476	36	4,008,484	204	4,008,002	241	4,008,312		4,008,338	237	4,008,360
701	4,008,477	74	4,008,486	216	4,008,004	242	4,008,313	330.4	4,008,339	CLASS 528	
720	4,008,478	81	4,008,487	250	4,008,003	243	4,008,321	412	Re.29,137	503	4,008,361
895	4,008,479			269	4,008,005	250	4,008,322	651	4,008,340	CLASS 536	
CLASS 350				271	4,008,006		4,008,323	CLASS 427		17	4,008,218
96 WG	4,007,978	84	4,008,369	363	4,008,007		4,008,324	44	4,008,341		4,008,362
		155	4,008,370	385	4,008,008	258	4,008,325	297	4,008,342	28	4,008,363
		206	4,008,371	387	4,008,009	263	4,008,326	305	4,008,343		
		227	4,008,372	405	4,008,010	278	4,008,327				

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1 : 4,007,577	4,007,801	4,008,486	4,007,729	20 : 4,008,401	4,007,842
4,007,586	4,007,808	4,008,489	4,007,737	4,007,843	4,007,843
4,007,594	4,007,816	4,008,491	4,007,740	4,007,845	4,007,845
4,007,726	4,007,817	4,007,552	4,007,761	4,007,849	4,007,849
4,007,996	4,007,827	4,007,566	4,007,776	4,007,853	4,007,853
4,008,170	4,007,844	4,007,896	4,007,795	4,007,861	4,007,861
4,008,456	4,007,862	4,008,307	4,007,807	4,007,870	4,007,870
3 : 4,007,855	4,007,876	4,007,522	4,007,826	4,007,909	4,007,909
4 : 4,007,612	4,007,879	4,007,557	4,007,847	4,007,913	4,007,913
4,007,859	4,007,889	4,007,587	4,007,869	4,007,917	4,007,917
4,008,072	4,007,891	4,007,681	4,007,873	4,007,948	4,007,948
4,008,373	4,007,893	4,007,704	4,007,902	4,007,952	4,007,952
6 : 4,007,495	4,007,898	4,007,854	4,007,925	4,007,993	4,007,993
4,007,505	4,007,906	4,007,954	4,007,958	4,008,002	4,008,002
4,007,506	4,007,911	4,007,984	4,008,014	4,008,130	4,008,130
4,007,525	4,007,915	4,007,997	4,008,016	4,008,186	4,008,186
4,007,540	4,007,919	4,008,029	4,008,050	4,008,202	4,008,202
4,007,541	4,007,927	4,008,187	4,008,068	4,008,208	4,008,208
4,007,542	4,007,928	4,008,188	4,008,157	4,008,217	4,008,217
4,007,548	4,007,931	4,008,189	4,008,168	4,008,261	4,008,261
4,007,565	4,007,937	4,008,275	4,008,180	4,008,263	4,008,263
4,007,573	4,007,946	4,008,303	4,008,182	4,008,270	4,008,270
4,007,582	4,007,950	4,008,365	4,008,206	4,008,298	4,008,298
4,007,584	4,007,956	4,008,332	4,008,236	4,008,326	4,008,326
4,007,592	4,007,957	4,007,576	4,008,257	4,008,394	4,008,394
4,007,600	4,007,966	4,007,656	4,008,289	4,008,457	4,008,457
4,007,601	4,007,987	4,007,920	4,008,290	4,007,615	4,007,615
4,007,613	4,008,031	4,008,083	4,008,291	4,007,677	4,007,677
4,007,623	4,008,039	4,008,251	4,008,305	4,007,710	4,007,710
4,007,628	4,008,139	4,008,331	4,008,338	4,008,015	4,008,015
4,007,633	4,008,152	4,007,805	4,008,449	4,008,018	4,008,018
4,007,637	4,008,174	4,007,728	4,008,450	4,008,047	4,008,047
4,007,642	4,008,214	4,007,936	4,008,458	4,008,059	4,008,059
4,007,646	4,008,258	4,008,009	4,007,605	4,008,337	4,008,337
4,007,659	4,008,318	4,007,830	4,007,690	4,008,350	4,008,350
4,007,674	4,008,378	4,007,877	4,007,819	4,008,380	4,008,380
4,007,676	4,008,379	4,007,923	4,007,881	4,008,404	4,008,404
4,007,688	4,008,395	4,008,025	4,008,145	4,008,423	4,008,423
4,007,691	4,008,398	4,008,210	4,008,228	4,008,434	4,008,434
4,007,700	4,008,407	4,007,499	4,008,229	4,008,488	4,008,488
4,007,711	4,008,413	4,007,502	4,008,230	4,008,492	4,008,492
4,007,723	4,008,414	4,007,516	4,008,231	4,007,510	4,007,510
4,007,725	4,008,416	4,007,547	4,008,232	4,007,694	4,007,694
4,007,731	4,008,418	4,007,550	4,008,238	4,007,701	4,007,701
4,007,734	4,008,425	4,007,569	4,008,242	4,007,744	4,007,744
4,007,743	4,008,427	4,007,571	4,008,243	4,007,779	4,007,779
4,007,748	4,008,429	4,007,610	4,008,322	4,008,254	4,008,254
4,007,749	4,008,470	4,007,626	4,008,369	4,008,266	4,008,266
4,007,767	4,008,471	4,007,650	4,007,602	4,008,281	4,008,281
4,007,777	4,008,476	4,007,673	4,007,757	4,008,411	4,008,411
4,007,786	4,008,479	4,007,683	4,007,770	4,007,860	4,007,860
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			4,007,839		

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4,008,038	4,007,585	4,008,388	4,007,695	4,008,173	4,007,914
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4,007,583	4,007,644	4,008,460	4,007,792	4,008,244	4,008,007
4,007,595	4,007,651	4,008,463	4,007,863	4,008,262	4,008,020
4,007,596	4,007,653	4,008,465	4,007,921	4,008,269	4,008,049
4,007,631	4,007,671	4,008,493	4,008,114	4,008,293	4,008,096
4,007,670	4,007,682	Re.29,136	4,008,288	4,008,310	4,008,131
4,007,680	4,007,709	4,007,517	4,007,578	4,008,319	4,008,163
4,007,714	4,007,713	4,007,519	4,007,732	4,008,349	4,008,164
4,007,812	4,007,742	4,007,534	4,007,887	4,008,386	4,008,165
4,007,836	4,007,753	4,007,745	4,008,056	4,008,402	4,008,185
4,007,886	4,007,823	4,007,793	4,008,077	4,008,419	4,008,279
4,007,916	4,007,835	4,007,829	4,007,509	4,008,452	4,008,292
4,007,937	4,007,838	4,007,865	4,007,549	4,008,467	4,008,353
4,007,941	4,007,840	4,008,391	4,007,554	4,007,537	4,008,392
4,007,985	4,007,866	4,008,396	4,007,597	4,007,597	4,008,459
4,008,027	4,007,867	38 : 4,007,535	4,007,607	4,007,494	4,007,846
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4,008,044	4,007,897	4,007,553	4,007,624	4,007,544	4,007,543
4,008,133	4,007,929	4,007,593	4,007,636	4,007,564	4,007,564
4,008,138	4,007,933	4,007,634	4,007,638	4,007,528	4,007,658
4,008,197	4,007,967	4,007,640	4,007,655	4,007,528	4,007,668
4,008,199	4,007,976	4,007,657	4,007,685	4,007,528	4,007,685
4,008,201	4,007,981	4,007,665	4,007,736	4,007,528	4,007,775
4,008,241	4,007,982	4,007,679	4,007,755	4,007,528	4,007,779
4,008,252	4,007,983	4,007,750	4,007,758	4,007,528	4,008,106
4,008,282	4,007,989	4,007,784	4,007,759	4,007,528	4,008,178
4,008,327	4,008,003	4,007,810	4,007,760	4,007,528	4,008,178
4,008,340	4,008,006	4,007,814	4,007,825	4,007,528	4,008,178
4,008,343	4,008,022	4,007,944	4,007,837	4,007,528	4,008,178
4,008,376	4,008,023	4,007,945	4,007,848	4,007,528	4,008,178
4,008,382	4,008,033	4,007,949	4,007,851	4,007,528	4,008,178
4,008,390	4,008,041	4,007,992	4,007,856	4,007,528	4,008,178
4,008,393	4,008,046	4,007,994	4,007,864	4,007,528	4,008,178
4,008,397	4,008,094	4,008,004	4,007,872	4,007,528	4,008,178
4,008,441	4,008,111	4,008,052	4,007,878	4,007,528	4,008,178
4,008,445	4,008,169	4,008,101	4,007,907	4,007,528	4,008,178
4,008,474	4,008,181	4,008,118	4,007,930	4,007,528	4,008,178
4,008,475	4,008,235	4,008,126	4,007,965	4,007,528	4,008,178
4,008,478	4,008,239	4,008,175	4,007,998	4,007,528	4,008,178
4,008,480	4,008,250	4,008,190	4,008,035	4,007,528	4,008,178
4,008,490	4,008,273	4,008,221	4,008,040	4,007,528	4,008,178
36 : Re.29,138	4,008,276	4,008,240	4,008,054	4,007,528	4,008,178
4,007,511	4,008,308	4,008,247	4,008,057	4,007,528	4,008,178
4,007,514	4,008,308	4,008,300	4,008,081	4,007,528	4,008,178
4,007,524	4,008,320	4,008,347	4,008,110	4,007,528	4,008,178
4,007,527	4,008,335	4,008,384	4,008,117	4,007,528	4,008,178
4,007,530	4,008,346	4,008,400	4,008,136	4,007,528	4,008,178

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5 : 243,389	243,413	243,409	243,377	40 : 243,379	243,379
6 : 243,373	243,415	243,388	243,408	41 : 243,417	243,417
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PATENT AND TRADEMARK OFFICE NOTICES

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter 1—Patent and Trademark Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

Patent Examining and Appeal Procedures

On October 4, 1976 notice was given in the Federal Register (41 FR 43729) of a proposal to amend sixteen sections of Title 37 of the Code of Federal Regulations relating to patent examining and appeal procedures. Interested persons were invited to comment on the proposal by December 7, 1976. One hundred seventy-five written letters and statements were submitted. A hearing was held in Arlington, Virginia on December 7, 1976 at which 21 persons testified orally. Careful consideration has been given to all comments received, and the proposal is being adopted with certain changes.

The regulations adopted involve all sections that were proposed to be revised, amended or added—namely, §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.69, 1.97, 1.98, 1.99, 1.109, 1.175, 1.194, 1.196, 1.291, 1.292, and 1.346. Amendments also are being made in two sections which were not included in the published proposal—§§ 1.51 and 1.176. Since amendments to these sections are closely related to the substance of matters which were contained in the published proposal, separate notice and public comment on these amendments are deemed unnecessary.

In addition, amendments are being adopted which were published for comment in two earlier, much less extensive proposals that concerned availability of certain files for public inspection. A notice of a proposed amendment to § 1.14(b) was published on June 4, 1974 (39 FR 19786). A notice of a proposed amendment to § 1.11(a) was published on September 17, 1974 (39 FR 33376). No negative comments were submitted with respect to either of these proposals and both are being adopted without change.

The text of the rules will be reproduced in the Patent and Trademark Office OFFICIAL GAZETTE in about a month with additions indicated by arrows and deletions indicated by brackets to help readers identify the changes. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

PURPOSE OF RULES

The purpose of the rules that are being adopted is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures. It is desirable that patents be as dependable as possible, so as to enhance the incentives provided by the patent system to make inventions, to invest in research and development, to put new or improved products on the market, and to disclose inventions that otherwise would be kept as trade secrets. It is believed that the rules being adopted will help to maintain strong patent incentives.

The rules afford patent owners an opportunity, through the filing of a reissue application, to obtain a ruling from an examiner on the pertinence of additional prior art after a patent has been issued. The rules also broaden the public's opportunity for participation in the patent examining process, consistent with the limitations of statute, the protection of trade secrets, and the need to avoid making it unduly expensive to obtain a patent.

The rules set forth the duty of candor and good faith which applicants have to the Patent and Trademark Office and encourage them to provide information about the prior art in a way that will make it more useful to examiners. A provision for foreign language oaths by individuals who do not understand English is intended to make them more aware of their representations and of their obligations.

Under the rules more Patent and Trademark Office decisions that could have important precedent value will be

available to the public, and some additional files will be available for inspection. Proceedings before the Board of Appeals are modified to help avoid the issuance of invalid patents. The rules encourage examiners to see that persons inspecting the file history of issued patents will be able to tell why the case was allowed.

REISSUE APPLICATIONS

Amended § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. It is adopted with no change from the proposal. The requirement for an oath or declaration alleging that the reissue applicant believes "the original patent to be wholly or partly inoperative or invalid. . . ." is dispensed with in § 1.175(a) (1) unless the applicant believes that to be the case. Section 1.175(a)(4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus, a patentee may file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure may be used at any time during the life of a patent. During litigation, a federal court may, if it chooses, stay proceedings to permit new art to be considered by the Office.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 USC 251 does not authorize reissue of a patent unless it is deemed wholly or partly inoperative or invalid. However, the record of prosecution of the reissue will indicate that the prior art has been considered by the examiner.

A substantial majority of the comments received favored amended § 1.175 as a means for improving the reliability of patents and avoiding unnecessary litigation costs. The negative comments generally questioned the statutory authority of the Commissioner to adopt this section. Authority for § 1.175 is believed to exist in 35 U.S.C. 6, which is the Commissioner's rulemaking authority, and in 35 U.S.C. 251. The latter section of the statute requires that the patent be deemed wholly or partly inoperative or invalid before a reissue may be granted, but does not require such a belief by the patentee before a reissue application may be filed. The case law does not suggest that the approach of new § 1.175(a)(4) is inconsistent with 35 U.S.C. 251.¹ Inasmuch as 35 U.S.C. 251 is a remedial provision,² it is believed that a liberal interpretation is justified and that adequate authority exists for the amended section.

Amended § 1.11(b) opens all reissue applications to inspection by the general public. Section 1.11(b) also provides for announcement of the filings of reissue applications in the OFFICIAL GAZETTE. This announcement will give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. The announcement will include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned. Section 1.11(b) is amended from the proposal to so indicate. Reissue applications already on file on the effective date of the section will not be automatically open to inspection and will not be announced in the OFFICIAL GAZETTE. However, a liberal policy will be followed in granting petitions for access to individual applications already on file.

In order that members of the public may have time to review the reissue application and submit pertinent information

¹ See *In re Clark*, 522 F.2d 623, 187 USPQ 209 (CCPA 1975), at footnote 4 where the court declined to decide whether it is proper to seek reissue merely to disclose unclaimed prior art. See also *In re Altenpohl*, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974).

² See *In re Oda*, 443 F.2d 1200, 170 USPQ 268 (CCPA 1971).

tion to the Office before the examiner's action. § 1.176 is amended to provide that reissue applications will not be acted on sooner than two months after the OFFICIAL GAZETTE announcement of filing.

A substantial majority of the comments received favored adoption of § 1.11(b). The only opposition was based upon a suggestion that no statutory authority exists. However, since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

The insertion of "all" as the fifth word of the first sentence of § 1.11(b) is for clarity. The word "furnished" is changed to "obtained" in § 1.11 for clarity.

PROTESTS AND PUBLIC USE PROCEEDINGS

Amended §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions in avoiding the issuance of invalid patents.

A substantial majority of the comments favored these sections and viewed them as improving the quality of issued patents. Entry of protests has been upheld in court.³

Section 1.291(a) provides that public protests against pending applications will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests must be accompanied by copies of prior art documents relied upon, although protests without copies will not necessarily be ignored. This is similar to the requirement of new § 1.98 that copies of patents and publications accompany prior art statements. Section 1.291 does not contemplate permitting a protester to participate as a party in further proceedings. In the case of applications available to the public, such as reissue applications, the protester may file papers rebutting statements made by the applicant. The examiner at his discretion may request a protester to submit additional written information or may provide extra time for comments by a protester to be filed.

To ensure consideration by the examiner, all protests must be timely submitted. Protests will generally be considered timely submitted, if they are filed before final rejection or allowance of the application by the examiner. The consideration given to protests filed after final rejection or allowance of the application by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Obviously, if the prior art documents anticipate or clearly render obvious one or more claims they will not knowingly be ignored. It must be recognized, however, that the likelihood of consideration by the examiner decreases as the patent date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

The first sentence of § 1.291(a) is deleted as unnecessary. Section 1.291(a) also is changed from the proposal to make clear that it applies to pending applications and that all protests will be referred to the examiner having charge of the subject matter involved.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted. The section is changed from the proposal by the addition of the words "any papers related thereto" to recognize that statements as to the pertinence of prior art may be submitted. Both the citations and the related papers are to be entered without comments. The material submitted is not examined by the Office but is available to members of the public inspecting Office records.

Some suggestions were received for major modifications of § 1.291. It was suggested that an advisory opinion of the examiner be placed in the patent file when protests were received after issuance of the patent. Several persons supported a suggestion for examiners to state whether a "new issue" was raised by prior art cited by a protester. Another suggestion was that a procedure similar to that used in the recent Trial Voluntary Protest Programs⁴ be adopted on a continuing basis. These suggestions were carefully considered, but are not adopted. The suggestions extend substantially

beyond § 1.291 as proposed, and their benefits do not appear sufficient to justify the added cost at this time.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. The term "patentee" is used in its ordinary sense as defined in 35 USC 100(d). If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy. The proposal is changed by adding the words "with the Office" after "filed" in §§ 1.291(c) and 1.292(b) for clarity.

In § 1.292, the requirement that petitioner bear the Office's expenses in conducting the public use proceeding is deleted. Section 1.292 is also amended to ensure that the existence of public use proceedings is recorded in the application file wrapper. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper is available.

DUTY OF DISCLOSURE

Amended § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The wording of the section is changed in several respects from the proposal, but the purpose and general scope are the same as in the proposal. The section codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the federal courts. The expanded wording of the section is intended to be helpful to individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and may afford guidance to courts as well.

A majority of comments received favored § 1.56 as proposed or with modifications. Persons opposed expressed concern over the imprecise definition of the duty of disclosure and the possibility that the proposal would substantially increase the burden on patent applicants. Some stated that there would be increased litigation as a result of the proposal. Several suggestions were received on better ways to define the individuals who should disclose information and the kinds of information that should be disclosed.

The first sentence of § 1.56(a) is changed from the proposal by adding the word "substantively," so that individuals having a duty of disclosure are limited to those who are "substantively involved in the preparation or prosecution of the application." This change is intended to make clear that the duty does not extend to typists, clerks, and similar personnel who assist with an application. This phrase, when taken with the last sentence of § 1.56(a), is believed to provide an adequate indication of the individuals who are covered by the duty of disclosure. The word "with" is inserted in the first sentence of § 1.56(a) before "the assignee" and before "anyone to whom there is an obligation to assign" to make clearer that the duty applies only to individuals, not to organizations.

Numerous comments concerned the term "relevance" that was used in the proposal. In response to the comments, language is substituted in § 1.56 and related sections which is believed to establish a clearer standard for determining whether information need be disclosed to the Office. "Relevant" is replaced by "material" because the latter term connotes something more than a trivial relationship. It appears to be more commonly used in court opinions. In addition, the third sentence of § 1.56, which defines materiality, is rewritten. The sentence now states that information is material "where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." The sentence paraphrases the definition of materiality used by the Supreme Court in its recent decision in *TSC Industries v. Northway*.⁵ Although in that case the court was concerned with rules promulgated by the Securities and Exchange Commission, the Court's articulation of materiality is believed consistent with the prevailing concept that has been applied by lower courts in recent patent cases.

³ *International Paper Co. v. Fibreboard Corp.*, 63 F.R.D. 88, 181 USPQ 740 (D. Del. 1974).

⁴ 923 O.G. 2; 930 O.G. 1454; 938 O.G. 945.

⁵ 426 U.S. —, 48 L. Ed. 2d 757, 96 S. Ct. 2126, 44 U.S.L.W. 4852, decided June 14, 1976.

The definition of materiality in § 1.56 will have to be interpreted in the context of patent law rather than securities law. Principles followed by courts in securities cases should not be translated to patent cases automatically. It is noteworthy, however, that in formulating the definition of materiality in *TSC Industries* the Supreme Court considered some of the same matters over which concern was expressed in the public comments on proposed § 1.56. The Court noted that the standard of materiality should not be so low that persons would be "subjected to liability for insignificant omissions or misstatements," or so low that the fear of liability would cause management "simply to bury the shareholder in an avalanche of trivial information—a result that is hardly conducive to informed decision making."⁶

Although the third sentence of § 1.56(a) refers to decisions of an examiner, it is intended that the duty of disclosure would apply in the same manner in the less common instances where the official making a decision on a patent application is someone other than an examiner—e.g., a member of the Board of Patent Interferences or the Board of Appeals. This is implicit in the duty "of candor and good faith" toward the Office that is specified in the first sentence of § 1.56(a).

Comments and questions were received concerning the term "information" used in the second and third sentences of § 1.56(a) and elsewhere. It means all of the kinds of information required to be disclosed under current case law. In addition to prior art patents and publications, it includes information on prior public uses, sales, and the like. It is not believed practicable to define information in the text of the rule at this time. However, the rule is not intended to require disclosure of information favorable to patentability—e.g., evidence of commercial success of the invention. Neither is it meant to require disclosure of information concerning the level of skill in the art for purposes of determining obviousness.

Several comments were received concerning the duty to disclose information the patent applicant regards as confidential, including information the applicant has received from another party under an injunction of secrecy. This problem has existed prior to amendment of § 1.56. The Patent and Trademark Office, of course, keeps information disclosed by applicants confidential until a patent is issued. It has been suggested that the Office should develop a mechanism for continuing to hold information in confidence after issuance of a patent if in the judgment of the examiner the information is not material to the examination of the application. The feasibility of offering a rule for public comment on this topic at a later date will be considered.

New § 1.56(b) is added to make clear that information may be disclosed to the Office through an attorney or agent of record or through a pro se inventor, and that other individuals may satisfy their duty of disclosure to the Office by disclosing information to such an attorney, agent or inventor. Information that is not material need not be passed along to the Office.

Proposed sections 1.56 (b) and (c) have been revised and shortened and appear as §§ 1.56 (c) and (d). The proposal was criticized for leaving it open to the Office to apply a different standard of materiality from the one set forth in § 1.56.⁷ Section 1.56(d) as adopted states that an application "shall" be stricken when the criteria set forth are met. Thus § 1.56(d) as adopted establishes a single standard for striking applications.

The term "inequitable conduct" is dropped from § 1.56(d) as covering too great a spectrum of conduct to be subject to mandatory striking. Inequitable conduct that is equivalent to fraud is intended to come within the definition of fraud. The Court of Customs and Patent Appeals already has interpreted "fraud" in existing § 1.56 to encompass conduct of this sort.⁸ Moreover, § 1.56(d) as adopted calls for striking an application either for fraud or for a violation of the duty of disclosure.

In § 1.56(d) "bad faith" is substituted for the term "deliberate" that was used in the proposal. This change is to make clear that an intent to deceive (or gross negligence

equivalent to such an intent) must be shown before an application will be stricken. Bad faith is not present if information is withheld as a result of an error in judgment or inadvertence.

Several comments concerned whether attorneys and agents could represent their clients' interests and at the same time comply with § 1.56. Similar comments were directed to §§ 1.97 to 1.99. It is of course in the interest of the client to have a valid patent and this cannot be obtained without disclosure of known material facts. It is not inconsistent for an attorney or agent to fulfill his duty of candor and good faith to the Office and to act as an advocate for his client. The submission of information under § 1.56 does not preclude the submission of arguments that such information does not render the subject matter of the application unpatentable.

In § 1.65 a new third sentence is added to require the patent applicant to acknowledge the duty of disclosure. The language is changed from the proposal to be consistent with changes made in § 1.56. To allow time for the Office and applicants to revise printed oath and declaration forms now in use, the mandatory acknowledgement of the duty of disclosure in amended § 1.65 does not become effective until January 1, 1978. Applicants at their option may include the new language in oaths and declarations filed prior to the effective date. The Office will publish a separate notice in the Federal Register adding a sentence acknowledging the duty of disclosure to appropriate forms in 37 CFR Part 3, "Forms for Patent Cases."

The word "statement" is deleted from the title of § 1.65 to avoid confusion with the prior art statement of §§ 1.97 through 1.99.

Amended § 1.346 emphasizes that there must be a reasonable basis to support every allegation of improper conduct made by a registered practitioner in any Office proceeding. The language that was proposed is clarified in the section as adopted. Although § 1.346 is limited to papers filed in Office proceedings, the amendment to § 1.346 is not intended to imply that disciplinary action never will be taken against a registered practitioner under § 1.348 for a groundless allegation of improper conduct in a court proceeding.

PRIOR ART STATEMENT

New §§ 1.97, 1.98 and 1.99 deal with prior art statements and provide a mechanism by which patent applicants may comply with the duty of disclosure provided in § 1.56. The sections have been substantially changed from the proposal. In response to comments received.

Unlike the corresponding part of the proposal, the sections as adopted are not mandatory, though applicants are strongly encouraged to follow the procedures described in them. Applications will be examined whether or not a prior art statement is filed and whether it complies with the rules or is defective. It is nevertheless believed that applicants will find that the use of prior art statements complying fully with the requirements of §§ 1.97 through 1.99 will be the best way to satisfy the duty of disclosure. The Patent and Trademark Office cannot assure that prior art disclosed in other ways will be considered by the examiner.

Sections 1.97 through 1.99 do not prescribe the content of what materials should be submitted in the prior art statement; this is for the applicant and the attorney or agent to decide in the light of the duty of disclosure expressed in § 1.56. The only criterion contained in §§ 1.97 through 1.99 as to content of the art cited is in § 1.97(b). This subsection indicates that the statement will be construed as a representation that the prior art listed includes what the submitter considers to be the closest art of which he is aware. The submitter need not decide which particular items of prior art are the closest or identify any items as such; the representation is simply that he is not withholding known prior art which he considers closer than that which is submitted. Section 1.97(h) makes clear that the prior art statement is not a representation that a search has been made or that no better art exists.

In § 1.97(a) the time for filing the prior art statement is extended from the two months of the original proposal to three months. In most cases prior art submitted within three months will be available to the examiner before he takes up the case for action, though it will be helpful if citations are made as promptly as possible.

Section 1.98 lists the elements of the prior art statement: a listing of the art, a concise explanation of the relevance of each listed item, and copies of the art or the pertinent portions thereof.

The prior art statement resembles somewhat the "patentability statement" of the proposal and the "patentability brief" proposed elsewhere.⁹ The name has been changed to reflect a change in the requirements of § 1.98(a). Unlike the proposed version of this paragraph, which called for an explanation of why the claimed invention is believed patentable over the cited art, the paragraph as adopted calls only for a concise explanation of the relevance of each listed item. This may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention. It might be a simple statement pointing to similarities between the item of prior art and the claimed invention. It is permissible but not necessary to discuss differences between the prior art and the claims. It is thought that the explanation of relevance will be essentially as useful to the examiner as the formerly proposed explanation of patentability, and should be significantly less burdensome for the applicant to prepare.

Section 1.98 requires a copy of each patent or publication cited, including U.S. patents, to accompany the prior art statement. Several comments questioned the need for burdening the applicant to supply copies of materials that are present in the Office's files. However, substantial time and effort often is needed to locate a document in the Office's files. Since the person submitting the prior art statement generally has available a copy of the item being cited, it is believed that expense and effort can be minimized by having that person supply the copy in all cases. Consideration has been given to proposals to allow the applicant to submit an order for copies of the patents along with his statement instead of actually submitting copies. This will be further studied, but to date no way has been found to assure that the copies will be available to the examiner by the first action unless the applicant submits them with the prior art statement.

Other changes to §§ 1.97 through 1.99 from the proposal eliminate unnecessary language and clarify the requirements.

A notice published in 1974¹⁰ contained guidelines for the citation of prior art by applicants. Many of those guidelines are repeated or superseded by §§ 1.97 through 1.99. In order to allow applicants, attorneys and agents time to adjust their procedures to comply with the requirements for prior art statements, the effective date of §§ 1.97 through 1.99 will be July 1, 1977. Until these new sections become effective, applicants should continue to follow the 1974 guidelines. Issuance of a revised notice, to take effect July 1, 1977, is under study.

A survey conducted by the Office in 1976 concludes that many applicants have not been citing prior art to the Office.¹¹ It is hoped that with the duty of disclosure expressly set forth in § 1.56, applicants will perceive that it is to their advantage to use the procedures of §§ 1.97 through 1.99.

Section 1.51 is amended by designating the existing rule as § 1.51(a) and adding new § 1.51(b) which contains a reference to §§ 1.97 through 1.99.

FOREIGN LANGUAGE OATHS

Amended § 1.52 and new § 1.69 are adopted as proposed.

Section 1.69 requires that oaths and declarations be in a language which is understood by the individual making the oath or declaration, i.e., a language which the individual comprehends. If the individual comprehends the English language, he must use it. If the individual cannot comprehend the English language, any oath or declaration must be in a language which the individual can comprehend. If an individual uses a language other than English for an oath or declaration, the oath or declaration must include a statement that the individual understands the content of any documents to which the oath or declaration relates. If the documents are in a language the individual cannot comprehend, the documents may be explained to him so that he is able to understand them.

⁹ E.g., Federal Register of September 9, 1968, 34 FR 14176, 566 O.G. 1402; S. 2255, 94th Congress, § 131(b).

¹⁰ Notice of August 12, 1974, 926 O.G. 2.

¹¹ BNA's Patent, Trademark and Copyright Journal, No. 301, October 28, 1976, page D-1.

The Office will provide approved translations for as many of the oath or declaration forms which appear in Part 3 of Title 37 of the Code of Federal Regulations as practicable, and in as many languages as practicable, probably using a side-by-side English/foreign language format. The availability of the foreign language forms will be announced in the OFFICIAL GAZETTE at a later date.

The change in § 1.52, providing for an exception to the requirement that oaths and declarations be in the English language, is necessitated by the adoption of § 1.69.

Although very few persons opposed §§ 1.52 and 1.69, several suggested that the philosophy behind the change be extended to the specification, requiring the specification to be in a language which the applicant understands, accompanied by an English translation. This suggestion was not considered feasible because of the obvious burdens on the applicant and the danger to the applicant and the public if the translation is not literally correct. Also, if a large number of applications were filed in a foreign language, there would be significant administrative burdens on the Office. Attention is directed to the Manual of Patent Examining Procedure, § 608.1, which permits non-English language applications to be filed in certain limited circumstances.

Other suggested modifications of the proposed rule included: (1) using an English language oath or declaration with one additional clause in a language understood by the person making the oath or declaration, the clause stating that the person understands all the documents to which the oath or declaration relates; and (2) extending the two month grace period for filing an English translation of an oath or declaration filed under § 1.65.

After due consideration, suggestion (1) was believed not to accomplish the objectives of the rule as well as the adopted rule. Suggestion (2) would cause unsatisfactory delays in the initial processing of applications.

DECISIONS AND FILES MADE PUBLIC

Section 1.14(d) makes more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public, and includes reference to decisions of the Board of Patent Interferences, in addition to decisions of the Board of Appeals and the Commissioner.

A large majority of the comments received were favorable. Several commentators felt that more decisions would be made available as a result of the proposed section and that it would assist in publicizing aspects of Office procedure which may not have been available previously.

Some negative comments were based on the view that the Freedom of Information Act¹² required all decisions of the Office to be made publicly available. A greater number of those opposing the proposed section, however, felt that applicants should have an absolute right to have their applications maintained in confidence and that no information should be made public without specific authorization from them. One commentator felt that rulemaking on this subject should be deferred until currently pending litigation¹³ under the Freedom of Information Act was finally resolved.

The section as adopted is applicable to decisions deemed by the Commissioner to involve an interpretation of patent laws or regulations that would be of significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It is applicable whether or not the decision is a final decision of the Patent and Trademark Office.

The parenthetical phrase in the first sentence of the proposed section, which cited other provisions of the rules under which decisions are open to public inspection, is deleted as unnecessary and possibly confusing. Also, in view of several comments received, the period of time during which an applicant or party in interest may object to having a decision made public is extended from one month to two months. At least twenty days is given to request reconsideration and seek court review before a decision is made public over an objection.

Section 1.14(d) is considered to place a duty on the Patent and Trademark Office to identify significant decisions

⁶ 426 U.S. at ___, 48 L. Ed. 2d at 765, 96 S. Ct. at 2132, 44 U.S.L.W. at 4355.

⁷ See discussion accompanying proposed rules in Federal Register of October 4, 1976, page 43731, first sentence.

⁸ *Norton v. Curtiss*, 433 F. 2d 779, 792, 167 USPQ 532, 543 (CCPA 1970).

¹² 5 USC 552.

¹³ *Irons v. Gottschalk*, Slip Opinion, No. 74-1365 (D.C. Cir., October 21, 1976).

and to take the steps necessary to inform the public of such decisions, by publication of such decisions, in whole or in part. It is anticipated, however, that no more than a few dozen decisions per year will be deemed of sufficient importance to warrant publication under the authority of this section.

Amended § 1.14(b) allows public inspection of abandoned applications referred to in defensive publications. The comments received on the proposed amendment on this topic in 1974 expressed no opposition and the proposal is adopted without change.

The amendment is intended to encourage use of the defensive publication program provided under § 1.139. The objective of that program is to make available to the public the technical disclosure of applications in which the owner prefers to publish an abstract in lieu of obtaining an examination. Existing §§ 1.11(b) and 1.139 open the complete defensive publication application to inspection by the general public upon publication of the abstract. With the amendment, an abandoned application referred to in a defensive publication application will likewise be open to public inspection, avoiding any need to repeat its contents in the defensive publication application. Thus, public availability of the applications involved should be of benefit both to the applicant and the public.

A suggestion was made that the section be extended still further to include abandoned applications referred to in foreign patents. This suggestion, however, goes too far beyond the proposal that was published and has too uncertain an impact to be adopted at this time.

Amended § 1.11(a) provides earlier access to the file of an interference which involved a patent or an application on which a patent has issued. All comments that were submitted on the 1974 proposal on this topic were favorable and two commentators felt the proposal should be extended further. The proposal is being adopted without change.

Under present practice, access to the file of an interference is not permitted until judicial review of the decision of the Board of Patent Interferences has been exhausted. The amended section allows access to the file after final decision of the Board of Patent Interferences if that decision is an award of priority as to all parties. It is believed that such earlier access will be of benefit to members of the public by making available information relevant to the issuance of the patent whether or not the interference decision is still being adjudicated.

PATENT APPEALS

Section 1.194 clarifies the circumstances in which oral hearings should be requested, provides for oral arguments by or on behalf of examiners in certain appeals and reduces the time permitted for oral arguments.

Comments relating to this section were favorable by a very substantial majority, although there were several reservations to the effect that § 1.194(a) tended to discourage or downgrade oral arguments. Participation by examiners was considered to be desirable not only from the standpoint of improving the overall presentation of the argument, particularly in complex cases, but also for the educational and experience benefits to the examiners themselves.

The only opposition to the section was based on the feeling that oral hearings would be discouraged. The rule is intended to discourage oral hearings only to the same extent as the Office's 1975 Official Gazette notice on the subject.¹⁴ Section 1.194(a) indicates that oral hearings should not be requested as a matter of course in every appeal, but only in those circumstances where the appellant feels that such a hearing will be of material assistance to the proper presentation of the appeal. The section expressly provides that equal consideration will be accorded in deciding all appeals, whether or not an oral hearing is held.

In appeals where the appellant has requested an oral hearing, § 1.194(b) provides for oral argument by, or on behalf of, the primary examiner, if such argument is considered to be helpful by either the primary examiner or the Board. This provision incorporates the present practice of permitting examiners to present an oral argument before the Board.¹⁵ It gives the Board additional discretionary authority to request presentation of an oral argument by, or on behalf of the ex-

aminer to ensure that all issues are fully and accurately presented.

Section 1.194(c) provides, as does existing § 1.194, that appeals will be assigned for consideration and decision without an oral hearing where none has been requested by the appellant. Where an oral hearing has been requested, a day of hearing will be set, and both appellant and the primary examiner will be notified. A provision for notice to the examiner is added to the proposed version. Additionally, § 1.194(c) reflects the present practice of limiting oral argument on behalf of the appellant to twenty minutes.¹⁶ The time permitted for argument by the examiner has been shortened from twenty minutes, as proposed, to fifteen minutes. The examiner, unlike the appellant, will not ordinarily need time to present the facts of the case or for rebuttal.

In any appeal where oral argument is to be presented by, or on behalf of, the primary examiner, the appellant will be given due notice of that fact.

Proposed § 1.196(b) would have authorized the Board of Appeals to reject allowed claims, in cases before it, whenever the Board had knowledge of grounds for so doing.

While a majority of those commenting on this section favored in principle the concept of allowing the Board to have this right, significant concern was voiced that there was no statutory authority for the Board to actually reject allowed claims. Further, the question of proper authority for judicial review of such action by the Board was a matter of concern. Other reasons advanced in opposition to the section were that applicants would be inhibited from appealing by the risk of having allowed claims rejected and that the proposal would create a higher presumption of validity in cases reviewed by the Board. A significant number commented that it would be more appropriate for the Board to remand the case to the primary examiner for consideration of the grounds raised by the Board. This would afford the applicant an opportunity to demonstrate the patentability of the claims and would remove any question as to statutory authority.

In view of the comments received, existing § 1.196(b) will not be modified, but a new § 1.196(d) is added providing express authority for the Board of Appeals to include, in its decision, a statement of any grounds for rejecting any allowed claim that it believes should be considered by the primary examiner. Section 1.196(d) provides that the Board may remand the case to the examiner for such consideration, and that the applicant shall have an opportunity to respond to the grounds set forth by the Board prior to consideration, by the examiner. If the previously allowed claims are rejected by the examiner, the rejection may be appealed to the Board.

The new section further provides that a decision of the Board which includes a remand will not be considered as a final decision in the case, but that the Board, following conclusion of the proceedings before the primary examiner, will either adopt its earlier decision as final or will render a new decision based on all appealed claims, as it considers appropriate. In either case, final action by the Board will give rise to the existing alternatives available to an appellant following a decision by the Board.

In situations where the primary examiner concludes after consideration of all the evidence and argument that the remanded claims should be allowed, the new rule dealing with reasons for allowance (§ 1.109) provides an appropriate mechanism for him to explain, on the record, his reasoning for coming to this conclusion, notwithstanding the grounds set forth by the Board in its statement.

Promulgation of new § 1.196(d) does not affect the Board's existing authority to remand a case to the primary examiner without rendering a decision in appropriate circumstances. Section 1.196(d) is not intended as an instruction to the Board to reexamine every allowed claim in every appealed application. It is, rather, intended to give the Board express authority to act when it becomes apparent, during the consideration of rejected claims, that one or more allowed claims may be subject to rejection on either the same or on different grounds from those applied against the rejected claims.

REASONS FOR ALLOWANCE

New § 1.109 is intended to emphasize and formalize the examiner's authority to state his reasoning for allowing a claim or claims. The authority is discretionary with the ex-

¹⁴ See notice of March 20, 1975, 933 O.G. 1010.
¹⁵ MPEP, § 1209.

¹⁶ See notice of March 20, 1975, 933 O.G. 1010.

aminer and is only to be used when the record does not otherwise reveal the reasons for allowance.

A majority of the comments received favored the rule as proposed because it would tend to provide courts and others who were reviewing the patent with a clearer record. Those who opposed the rule most often gave the reason that the examiner might fail to state all the reasons or the strongest reasons why a claim was allowed, which could place unnecessary limitations on the claims or create an estoppel in subsequent litigation or licensing.

To help insure that the examiner's statement of his reasoning in allowing a claim will not unnecessarily limit the claims or create an estoppel, a final sentence is added to the proposal which states that failure of the applicant to comment upon or rebut the examiner's reasoning "shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner."

Several commenters suggested that stricter enforcement of §§ 1.111 and 1.133 would eliminate the need for a new rule concerning reasons for allowance. Situations exist, however, where a statement of reasons for allowance could be helpful, for example when an examiner withdraws a rejection for reasons not suggested by the applicant; when an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive; when an examiner allows a claim on the first Office action after citing very close prior art; and when the examiner allows a claim after remand from the Board of Appeals (see new § 1.196(d)).

The first sentence of the proposed rule is changed to define more precisely the circumstances in which an examiner's statement is appropriate, as well as to define more precisely the content of the statement. The statement will include the examiner's "reasoning." The examiner may state his reasoning whenever he "believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims."

Several persons commented that the rule should provide a procedure for appeal from the examiner's statement of his reasoning. The rules does permit applicants to comment upon the examiner's reasoning. If the applicant does not wish to comment, he may reserve for a later proceeding, without prejudice, any rebuttal.

TEXT OF RULES ADOPTED

After consideration of the comments received and pursuant to the authority contained in § 6 of Title 35 of the United States Code, Part 1 of Title 37 of the Code of Federal Regulations is amended as set forth below.

1. Section 1.11 is revised to read as follows:

§ 1.11 Files open to the public.

(a) After a patent has been issued, the specification, drawings, and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be obtained [furnished] upon paying the fee therefor. After an award of priority by the Board of Patent Interferences as to all parties, the file of any interference which involved a patent, or an application on which a patent has issued, [The file of any terminated interference involving a patent, or an application on which a patent has subsequently issued,] is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

(b) All reissue applications and all applications [Applications] in which the Office has accepted a request filed under § 1.139 and related papers in the application file, are open to inspection by the general public, and copies may be obtained [furnished] upon paying the fee therefor. The filing of reissue applications will be announced in the OFFICIAL GAZETTE. The announcement shall include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned.

2. In § 1.14 paragraphs (b) and (d) are revised to read as follows:

§ 1.14 Patent applications preserved in secrecy.

(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application which is open to inspection pursuant to § 1.139, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Abandoned applications may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

(d) Any decision of the Board of Appeals or the Board of Patent Interferences, or any decision of the Commissioner on petition, [Selected decisions of the Board of Appeals, or of the Commissioner, in abandoned applications] not otherwise open to public inspection shall [paragraph (b) of this section] may be published or made available for public inspection if: (1) The Commissioner believes the decision involves an interpretation of patent laws or regulations that would be of important precedent value; and (2) the applicant, or any party involved in the interference, does not, within two months after being notified of the intention to make the decision public, object in writing on the ground that the decision discloses a trade secret or other confidential information. If a decision discloses such information, the applicant or party shall identify the deletions in the text of the decision considered necessary to protect the information. If it is considered the entire decision must be withheld from the public to protect such information, the applicant or party must explain why. Applicants or parties will be given time, not less than twenty days, to request reconsideration and seek court review before any portions of decisions are made public over their objection. [Publication at the Commissioner's discretion, unless the applicant timely presents sufficient reasons for not doing so. The applicant will be notified, through the attorney of record in the application file, when it is proposed to release such a decision and a time not less than thirty days set for presenting any such reasons. The fact that the subject matter of the application has not been made public in any manner, or that the same subject matter is being prosecuted in a pending application, will be considered sufficient reason for not releasing the decision if the applicant so requests unless the text of the decision contains no description of such subject matter. Other reasons presented will be duly considered.] See § 2.27 for trademark applications.

3. Section 1.51 is revised to read as follows:

§ 1.51 General requisites of an application.

(a) Applications for patents must be made to the Commissioner of Patents and Trademarks. A complete application comprises:

(1) [a] A specification, including a claim or claims, see §§ 1.71 to 1.77.

(2) [b] An oath or declaration, see §§ 1.65 to 1.68.

(3) [c] Drawings, when necessary, see §§ 1.81 to 1.88.

(4) [c] The prescribed filing fee. (See 35 USC section 41 for filing fees.)

(b) Applicants are encouraged to file a prior art statement at the time of filing the application or within three months thereafter. See §§ 1.97 through 1.99.

4. In § 1.52 paragraph (a) is revised to read as follows:

§ 1.52 Language, paper, writing, margins.

(a) The specification and oath or declaration must be in the English language except as provided in § 1.69. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written or printed in permanent ink or its equivalent in quality. All of the application paper must be presented in a form having sufficient clarity and contrast between the paper and the writing or printing thereon to permit the production of readily legible copies in any number by use of photographic, electrostatic, photoffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

5. Section 1.56 is revised to read as follows:

§ 1.56 *Duty of disclosure; striking of* ~~improper~~ *applications.*

►(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the inventor, on each attorney or agent who prepares or prosecutes the application, and on every other individual who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application. All such individuals have a duty to disclose to the Office information they are aware of which is material to the examination of the application. Such information is material where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent. The duty is commensurate with the degree of involvement in the preparation or prosecution of the application.

►(b) Disclosures pursuant to this section may be made to the Office through an attorney or agent having responsibility for the preparation or prosecution of the application or through an inventor who is acting in his own behalf. Disclosure to such an attorney, agent or inventor shall satisfy the duty, with respect to the information disclosed, of any other individual. Such an attorney, agent or inventor has no duty to transmit information which is not material to the examination of the application.

►(c) Any application [signed or sworn to in blank, or without actual inspection by the applicant, and any application altered or partly filled in after being signed or sworn to, and also any application fraudulently filed or in connection with which any fraud is practiced or attempted on the Patent and Trademark Office,] may be stricken from the files if:

(1) Signed or sworn to in blank, or without actual inspection by the applicant; or
(2) Altered or partly filled in after being signed or sworn to.

►(d) An application shall be stricken from the files if it is established by clear and convincing evidence that any fraud was practiced or attempted on the Office in connection with it or that there was any violation of the duty of disclosure through bad faith or gross negligence.

6. In the heading preceding § 1.65 "STATEMENT;" is deleted.

7. In § 1.65 the heading and paragraph (a) are revised to read as follows:

§ 1.65 *Oath or declaration.* ~~Statement of applicant.~~

(a) (1) The applicant, if the inventor, must state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his application. In every original application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States more than one year prior to his application or patented or described in any printed publication in any country before his invention or more than one year prior to his application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in this country. ►He must acknowledge a duty to disclose information he is aware of which is material to the examination of the application. ►He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign applica-

tion filed more than twelve months before the filing of the application in this country.

(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66, or (b) include the personal declaration of the applicant as prescribed in § 1.68. See § 1.153 for design cases and § 1.162 for plant cases.

8. Section 1.69 is added to read as follows:

§ 1.69 *Foreign language oaths and declarations.*

►(a) Whenever an individual making an oath or declaration cannot understand English, the oath or declaration must be in a language that such individual can understand and shall state that such individual understands the content of any documents to which the oath or declaration relates.

►(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under § 1.65, the translation may be filed in the Office no later than two months after the filing date.

9. The heading "PRIOR ART STATEMENT" is added following § 1.95 and preceding § 1.97.

10. Section 1.97 is added to read as follows:

§ 1.97 *Filing of prior art statement.*

►(a) As a means of complying with the duty of disclosure set forth in § 1.56, applicants are encouraged to file a prior art statement at the time of filing the application or within three months thereafter. The statement may either be separate from the specification or may be incorporated therein.

►(b) The statement shall serve as a representation that the prior art listed therein includes, in the opinion of the person filing it, the closest prior art of which that person is aware; the statement shall not be construed as a representation that a search has been made or that no better art exists.

11. Section 1.98 is added to read as follows:

§ 1.98 *Content of prior art statement.*

►(a) Any statement filed under § 1.97 or § 1.99 shall include: (1) a listing of patents, publications or other information and (2) a concise explanation of the relevance of each listed item. The statement shall be accompanied by a copy of each listed patent or publication or other item of information in written form or of at least the portions thereof considered by the person filing the statement to be pertinent.

►(b) When two or more patents or publications considered material are substantially identical, a copy of a representative one may be included in the statement and others merely listed. A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant.

12. Section 1.99 is added to read as follows:

§ 1.99 *Updating of prior art statement.*

►If prior to issuance of a patent an applicant, pursuant to his duty of disclosure under § 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements of § 1.98.

13. Section 1.109 is added to read as follows:

§ 1.109 *Reasons for allowance.*

►If the examiner believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims, the examiner may set forth such reasoning. This shall be incorporated into an Office action rejecting other claims of the application or be the subject of a sepa-

rate communication to the applicant. The applicant may file a statement commenting on the reasons for allowance within such time as may be specified by the examiner. Failure to file such a statement shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner.

14. In § 1.175 paragraph (a) is revised to read as follows:

§ 1.175 *Reissue oath or declaration.*

(a) Applicants for reissue, in addition to complying with the requirements of the first sentence of § 1.65, must also file with their applications a statement under oath or declaration as follows:

(1) When the ~~That~~ applicant verily believes the original patent to be wholly or partly inoperative or invalid, stating such belief and the reasons why.

(2) When it is claimed that such patent is so inoperative or invalid "by reason of a defective specification or drawing," particularly specifying such defect.

(3) When it is claimed that such patent is inoperative or invalid "by reason of the patentee claiming more or less than he had a right to claim in the patent," distinctly specifying the excess or insufficiency in the claims.

►(4) When the applicant is aware of prior art or other information relevant to patentability, not previously considered by the Office, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, particularly specifying such prior art or other information and requesting that if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent.

►(5) ~~That~~ Particulars specifying the errors or what might be deemed to be errors relied upon, and how they arose or occurred.

►(6) Stating that ~~That~~ said errors, if any, arose "without any deceptive intention" on the part of the applicant.

15. Section 1.176 is revised to read as follows:

§ 1.176 *Examination of reissue.*

An original claim, if re-presented in the reissue application, is subject to reexamination, and the entire application will be examined in the same manner as original applications, subject to the rules relating thereto, excepting that division will not be required. Applications for reissue will be acted on by the examiner in advance of other applications, but not sooner than two months after announcement of the filing of the reissue application has appeared in the OFFICIAL GAZETTE.

16. Section 1.194 is revised to read as follows:

§ 1.194 *Oral Hearing.*

►(a) An oral hearing should be requested only in those circumstances in which the appellant considers such a hearing necessary or desirable for a proper presentation of his appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Appeals as appeals decided after oral hearing.

►(b) If appellant requests an oral hearing, an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.

►(c) If no request for oral hearing has been made by the appellant, the appeal will be assigned for consideration and decision. If the appellant has requested an oral hearing, a day of hearing will be set, and due notice thereof given to the appellant and to the primary examiner. Hearing will be held as stated in the notice, and oral argument will be limited to [one-half hour] twenty minutes for the appellant and fifteen minutes for the primary examiner unless otherwise ordered before the hearing begins.

17. Section 1.196 is amended by adding new paragraph (d) to read as follows:

§ 1.196 *Decision by the Board of Appeals.*

►(d) Although the Board of Appeals normally will confine its decision to a review of rejections made by the pri-

mary examiner, should it have knowledge of any grounds for rejecting any allowed claim that it believes should be considered, it may include in its decision a statement to that effect and remand the case to the primary examiner for consideration thereof. In such event, the Board shall set a period, not less than one month, within which the applicant may submit to the primary examiner an appropriate amendment, or a showing of facts or reasons, or both, in order to avoid the grounds set forth in the statement of the Board of Appeals. If the primary examiner rejects the previously allowed claim or claims on the basis of such statement, the applicant may appeal to the Board of Appeals from the rejection. Whenever a decision of the Board of Appeals includes a remand, that decision shall not be considered as a final decision in the case, but the Board of Appeals shall, upon conclusion of the proceedings before the primary examiner on remand, either adopt its decision as final or render a new decision on all of the claims on appeal, as it may deem appropriate.

18. Section 1.291 is revised to read as follows:

§ 1.291 *Protests and prior art citations by public.* ~~to the grant of a patent.~~

►(a) ~~The patent statutes do not provide for opposition to the grant of a patent on the part of the public. Protests to the grant of a patent are ordinarily merely acknowledged, and filed after being~~ Protests against pending applications will be acknowledged and referred to the examiner having charge of the subject matter involved [for his information]. ►A protest specifically identifying the application to which the protest is directed will be entered in the application file and, if timely submitted and accompanied by a copy of each prior art document relied upon, will be considered by the examiner.

►(b) Citations of prior art and any papers related thereto may be entered in the patent file after a patent has been granted, at the request of a member of the public or the patentee. Such citations and papers will be entered without comment by the Patent and Trademark Office.

►(c) Protests and prior art citations by the public and any accompanying papers should either (1) reflect that a copy of the same has been served upon the applicant or patentee or upon his attorney or agent of record; or (2) be filed with the Office in duplicate in the event service is not possible.

19. In § 1.292 paragraph (b) is revised to read as follows:

§ 1.292 *Public use proceedings.*

(b) The petition and accompanying papers should be filed in duplicate, or served upon the applicant, his attorney or agent of record, and petitioner should offer to bear any expense to which the Office may be put in connection with the proceeding. ►either (1) reflect that a copy of the same has been served upon the applicant, or upon his attorney or agent of record; or (2) be filed with the Office in duplicate in the event service is not possible. The petition and accompanying papers, or a notice that such a petition has been filed, shall be entered in the application file.

20. Section 1.346 is revised to read as follows:

§ 1.346 *Signature and certificate of attorney.*

Every paper filed by an attorney or agent representing an applicant or party to a proceeding in the Patent and Trademark Office must bear the signature of such attorney or agent, except papers which are required to be signed by the applicant or party in person (such as the application itself and affidavits or declarations required of applicants). The signature of an attorney or agent to a paper filed by him, or the filing or presentation of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief, there is good ground to support it, including any allegations of improper conduct contained therein; and that it is not interposed for delay.

Effective Date. These amendments become effective on March 1, 1977, except for §§ 1.51, 1.97, 1.98, and 1.99 which

become effective on July 1, 1977, and §§ 1.65 and 1.69 which become effective on January 1, 1978.

Date: Jan. 18, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, Ph.D.

Assistant Secretary for Science and Technology.

Date: Jan. 19, 1977.

NOTE.—The above notice is identical to a notice that was published in the Federal Register of January 28, 1977 (42 F.R. 5588) except that the above notice shows the differences between the existing rules and the rules being adopted. Additions are indicated by arrows and deletions are indicated by brackets.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,777,926, M. E. Bourns, VARIABLE RESISTOR, filed May 21, 1974, D.C.N.J. (Newark) Doc. C-74-745, Bourns, Inc. and Marlan E. Bourns v. Mepco, Inc. Stipulation of dismissal of action, Apr. 30, 1976.

2,873,440, J. B. Speller, ANALOGUE-TO-DIGITAL CONVERTER, filed Oct. 4, 1976, United States Court of Claims (District of Columbia) Doc. 13-76, United Technologies Corporation v. The United States. Judgment entered for plaintiff against the United States, Oct. 8, 1976.

2,990,025, Talbert and Scarborough, BIT, filed July 1, 1974, D.C., S.D. Tex. (Houston) Doc. CA74-890, Dresser Industries, Inc. v. Smith International, Inc. The complaint in its entirety is dismissed with prejudice, Mar. 31, 1976.

3,029,109, W. P. Nail, CONTROL OF INFLATABLE ARTICLES, filed May 27, 1976, D.C., N.D. Calif. (San Francisco) Doc. C76-1084-SC, World Products Warehouse Company v. Keith W. Reid, Donald Johnson and Air Beds Inc.

3,048,581, J. Fried, ACETALS AND KETALS OF 16,17-DI-HYDROXY STEROIDS, filed Mar. 26, 1976, D.C.N.J. (Newark) Doc. C-76-560, Premo Pharmaceutical Laboratories, Inc. v. E. R. Squibb & Sons, Inc.

3,056,836, H. D. Moed, ARALKYLAMINES AND METHODS OF PREPARATION THEREOF, filed Sept. 27, 1976, D.C., W.D. Ky. (Bowling Green) Doc. C76-0072(B), Mead Johnson & Company and U.S. Philips Corporation v. Richie Pharmacal Company, Inc.

3,104,799, D. J. Steidinger, ENVELOPE ASSEMBLY, filed Apr. 21, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c1501, Uarco Inc. v. The Standard Register Company.

3,122,238, F. F. Brunette, DISPLAY ASSEMBLIES, filed Oct. 7, 1976, D.C., W.D. Mich. (Grand Rapids) Doc. K76-503 C.A. 9, Frederick F. Brunette and Brilliant Products Inc. v. Union Steel Products.

3,134,732, Kearby, Thorn and Hinlicky, REACTIVATION OF REGENERATED NOBLE METAL CATALYSTS WITH GASEOUS HALOGENS, filed June 4, 1976, D.C., S.D. Tex. (Houston) Doc. CA-76-H-934, Exxon Research & Engineering Co. v. Atlantic Richfield Co. and Engelhard Minerals & Chemical Corp.

3,146,972, E. Engel, EMERGENCY CONTROL SYSTEM FOR AIRCRAFT, filed Aug. 30, 1976, D.C., S.D.N.Y., Doc. 76-C-3869, Ervin Engel v. National Aeronautics and Space Administration.

3,173,583, E. A. Wahl, BIN ACTIVATOR, filed July 23, 1976, D.C.N.J. (Newark) Doc. 76-1412, Eugene A. Wahl and Vibra Screw Incorporated v. Solids Flow Control Corporation.

3,259,291, J. A. Maurer, MOTION PICTURE PROJECTOR WITH AUTOMATIC EDGEWISE FILM THREADING, filed May 6, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c1698, The Singer Company and McGraw-Hill, Inc. v. Bell & Howell Company.

3,265,219, A. E. Sundin, CRANE WITH FOLDING BOOM WHICH PASSES CLOSE TO BUT CLEARS ITS MAST, filed Mar. 19, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76-521A, Hiab-Foco AB v. Wm. and Harvey Rowland of Georgia, Inc. et al.

3,495,668, P. W. Schumacher, DRILL BIT, filed Oct. 18, 1976, D.C., S.D. Tex. (Houston) Doc. 76-H-1703, Reed Tool Company v. Dresser Industries, Inc.

3,650,766, Y. Smader, EXTRUDED FOOD PRODUCTS AND METHOD OF PRODUCING SAME, filed Oct. 14, 1976, D.C., N.D. Ohio (Toledo) Doc. C76-521, DCA Food Industries Inc. v. Fry Foods, Inc. Same, filed Oct. 14, 1976, D.C., N.D. Tex. (Dallas) Doc. CA3-76-1364-C, DCA Food Industries v. Rubenstein Foods, Inc. Same, filed Oct. 14, 1976, D.C. Md. (Baltimore) Doc. K-76-1543, DCA Food Industries, Inc. v. Old Salt Seafood Co., Inc.

3,669,499, Semplonius and Kolk, CHAIR, filed July 25, 1976, D.C. Del. (Wilmington) Doc. 76-278, Steelcase, Inc. v. Harvard Industries, Inc. Stipulation and order dismissing this action, Oct. 4, 1976.

3,750,187, R. D. Keefer, RECORDING AND INTEGRATOR UNIT, filed Oct. 29, 1974, D.C., E.D. Mich. (Detroit) Doc. 74-72690, Gelman Instrument Company v. Transidyne General Corporation. Consent judgment. In view of an agreement whereby plaintiff has granted defendant a non-exclusive license under said patent, the claims presented by plaintiff and the counterclaims presented by defendant in this suit are all dismissed with prejudice, Oct. 7, 1976.

3,766,460, Hentz and Burroughs, MANUAL CONTROL SYSTEM FOR NUMERICALLY CONTROLLED MACHINE, filed Oct. 18, 1976, D.C.N.J. (Newark) Doc. 76-1992, LeBlond Incorporated v. H. Ernault-Somua, S.A.

3,785,050, Whitledge and Kavick, COUPLING ATTACHMENT DEVICE; 3,858,298, same, SWAGING APPARATUS, filed Oct. 4, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76-1646A, Samuel Moore & Company v. Parker Hannifin Corporation and The Orton Company.

3,858,298. (See 3,785,050.)

3,892,427, Kraynak and Blumenfeld, PERSONALIZED COMPUTER PRINTED HARD COVERED BOOK, filed Dec. 31, 1975, D.C., C.D. Calif. (Los Angeles) Doc. CV-76-4343-R, McBooks Publishing Co., Inc. v. Spencer Gifts, Inc.

3,908,199, C. Lim, FAN HAT APPARATUS, filed Oct. 18, 1976, D. C. Hawaii (Honolulu), Doc. CV-76-0383, Chat-Kil Lim v. Kory Tyau.

3,912,696, J. I. Doughty, CURABLE PLASTIC COMPOSITION, filed Apr. 13, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76-1194-FW, Minnesota Mining and Manufacturing Company v. Products Research & Chemical Corporation.

Re. 25,570, J. H. Lemelson, EXTRUSION APPARATUS, filed Aug. 12, 1976, D.C.N.J. (Newark) Doc. 76-1583, Jerome H. Lemelson v. Kautex-Werke Reinold Hagen GmbH and Kautex Machines Inc.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 22, 1977

Re. 28,884	3,964,845	3,984,526	3,989,726
3,549,427	3,965,270	3,984,544	3,989,752
3,606,125	3,967,378	3,984,553	3,989,821
3,674,573	3,968,420	3,984,726	3,989,860
3,677,832	3,970,436	3,984,866	3,989,961
3,687,969	3,970,441	3,985,015	3,990,798
3,747,760	3,970,685	3,985,117	3,990,881
3,758,496	3,971,783	3,985,271	3,991,099
3,760,424	3,972,763	3,985,505	3,991,160
3,762,002	3,972,890	3,985,521	3,991,253
3,781,276	3,973,063	3,985,652	3,991,280
3,871,885	3,975,013	3,986,275	3,991,421
3,886,148	3,975,165	3,986,657	3,991,570
3,889,795	3,975,479	3,986,693	3,991,652
3,902,889	3,975,607	3,987,027	3,991,747
3,912,681	3,976,946	3,987,102	3,991,771
3,916,246	3,977,031	3,987,130	3,992,167
3,919,382	3,978,282	3,987,151	3,992,323
3,919,656	3,978,437	3,987,405	3,992,463
3,920,067	3,978,699	3,987,418	3,992,535
3,924,701	3,978,708	3,987,427	3,992,669
3,924,858	3,978,827	3,987,548	3,992,775
3,925,479	3,980,192	3,987,756	3,992,853
3,926,705	3,980,331	3,987,841	3,992,962
3,926,906	3,980,655	3,987,963	3,993,001
3,928,097	3,980,781	3,988,064	3,993,035
3,934,557	3,981,311	3,988,067	3,993,500
3,934,979	3,981,584	3,988,132	3,993,544
3,936,472	3,981,843	3,988,136	3,993,726
3,937,835	3,982,111	3,988,261	3,993,822
3,941,856	3,982,329	3,988,466	3,994,097
3,942,847	3,982,430	3,988,473	3,994,157
3,947,260	3,982,432	3,988,610	3,994,421
3,947,813	3,982,468	3,988,673	3,994,615
3,951,328	3,982,474	3,988,789	3,994,639
3,953,608	3,982,475	3,988,828	3,995,148
3,954,584	3,982,588	3,989,034	3,995,174
3,955,072	3,982,973	3,989,072	3,995,340
3,956,495	3,983,018	3,989,146	3,995,393
3,957,580	3,983,066	3,989,342	3,995,921
3,959,179	3,983,279	3,989,466	3,996,271
3,959,309	3,983,397	3,989,518	3,996,368
3,961,680	3,983,479	3,989,596	3,997,837
3,962,086	3,983,611	3,989,616	
3,963,498	3,983,952	3,989,617	
3,964,328	3,983,983	3,989,664	

Disclaimer and Dedication

3,677,722.—Frank Rymas, Sterling Township, Macomb County, Mich. CEMENTED CARBIDE COMPOSITION AND METHOD OF PREPARATION. Patent dated July 18, 1972. Disclaimer and dedication filed Dec. 13, 1976, by the assignee, The Walmet Corporation.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Erratum

All reference to Patent Number 4,004,623 to Russell H. Thackery of Columbus, Ohio for Power Tool, appearing in the OFFICIAL GAZETTE of January 25, 1977, should be deleted since no patent was granted.

Disclaimer

3,853,723.—Robert Mack, Lake Charles, La. MERCURY CELL ANODE SHORT DETECTION AND CURRENT BALANCING. Patent dated Dec. 10, 1974. Disclaimer filed Dec. 15, 1976, by the assignee, PPG Industries, Inc.

Hereby enters this disclaimer to claims 15, 16, 17 and 18 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 29, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-17-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-16-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-2-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-20-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-15-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-1-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director..... Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-6-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	7-23-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Trolley; Printing; Typewriters; Stationery; Information Dissemination.	5-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-1-76

Expiration of patents: The patents within the range of numbers indicated below expire during February 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 22, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

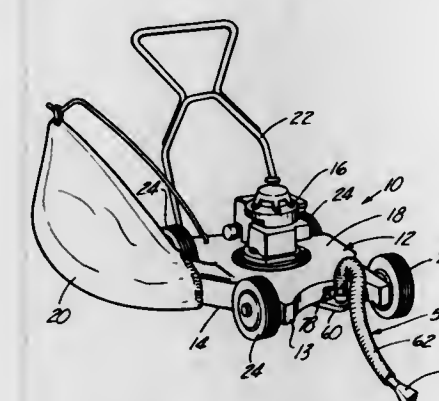
Patents..... Numbers 2,923,008 to 2,926,351, inclusive
Plant Patents..... Numbers 1,901 to 1,918, inclusive

REISSUES

FEBRUARY 22, 1977

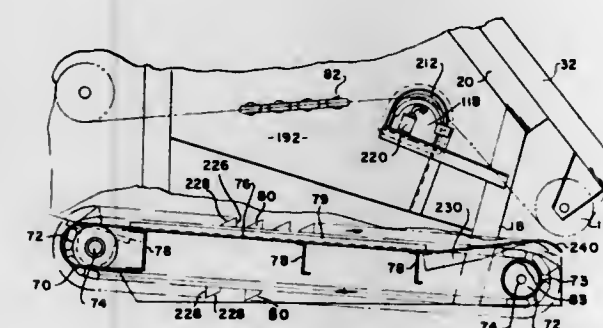
Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,139
LAWN MAINTENANCE EQUIPMENT
Carlton E. Messner, 1445 Randolph, Muskegon, Mich. 49441
Original No. 3,905,181, dated Sept. 16, 1975, Ser. No. 439,385, Feb. 4, 1974. Application for reissue Feb. 2, 1976, Ser. No. 654,031
Int. Cl.² A01D 35/262
U.S. Cl. 56—13.1



10. Lawn maintenance equipment comprising a housing having a front wall, a rear wall and a top wall, sidewalls, a bottom inlet for air and vegetation and a discharge chute disposed in the upper part of one of said walls, a power driven, generally vertically disposed shaft within said housing, a cutting blade mounted to said shaft in a horizontal plane disposed below said discharge chute, a fan blade fixed to said shaft above said cutting blade to rotate at the same speed as said cutting blade, a baffle mounted to said housing and extending from said front wall generally horizontally between said cutting blade and said fan blade, said baffle being adapted to effect an increase in the rate of air flow and to direct said air flow toroidally in said housing.

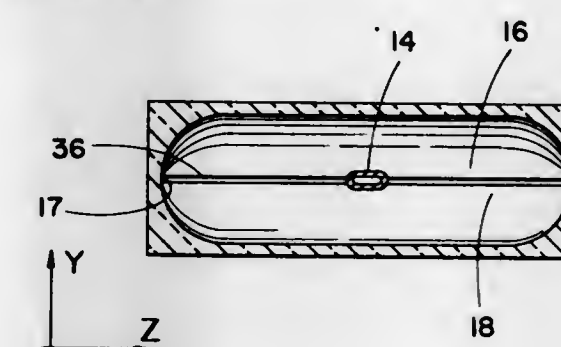
Re. 29,140
HAY ROLL FORMING MACHINE
Aquila D. Mast, Lancaster, and Edward T. Eggers, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Original No. 3,815,345, dated June 11, 1974, Ser. No. 353,947, Apr. 24, 1973. Application for reissue June 7, 1976, Ser. No. 693,826
Int. Cl.² A01D 39/00
U.S. Cl. 56—341



8. A mobile hay roll forming machine adapted to engage a swath or windrow of forage crop material lying upon a field and coil it into a compact roll of substantial length and diameter, said machine comprising a mobile frame, vertical side members on said frame spaced transversely apart to define a roll-forming cavity therebetween, an endless flexible upper apron in the upper

portion of said cavity, supporting means on said frame for said upper apron arranged and adapted to position a portion thereof as a lower course and another portion as an upper course, said lower course of said upper apron being engageable with said swath or crop material as the same is coiled into a roll, and means operable to drive said upper apron in a manner to move said lower course thereof in a direction to facilitate coiling of said roll, and yieldable means supported by said frame and engaging and supporting a portion of said upper apron initially in a contracted arrangement and operable to permit said lower course of said apron to expand toward said upper course thereof as a roll of crop material being formed within said cavity increases in diameter; in combination with auxiliary guide means supported upon said side members at a predetermined level above a field over which the machine is moving to provide a lower portion of said roll-forming cavity with a height substantially less than the diameter of a roll of crop material of ultimate maximum size to be formed in said machine and within which said formation is initiated, said auxiliary guide means comprising guide members having upper portions and said members being supported by said side members on said frame for movement of said upper portions thereof between a position in which said upper portions project into said cavity and respectively engage the opposite side edges of said lower course of said upper apron for supporting the same and to define the height of said lower portion of said cavity within which the formation of said roll is initiated and a position in which said upper portions of said guide members are retracted from said projected positions toward said side members once formation of said roll has been initiated in said lower portion of said cavity.

Re. 29,141
APPARATUS FOR ORIENTING GENERALLY FLAT PARTICLES FOR SENSING
Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.
Original No. 3,893,766, dated July 8, 1975, Ser. No. 369,910, June 14, 1973. Application for reissue Dec. 3, 1975, Ser. No. 637,232
Int. Cl.² G01N 1/28
U.S. Cl. 356—36



1. A flow chamber for orienting sample particles suspended in a sample fluid for [observation by slit-scan photometry] sensing by interaction with light said flow chamber having an entrance for receiving the sample fluid and an exit for fluid discharge, said flow chamber being configured so that the ratio of a first dimension of the flow chamber to a second dimension of the flow chamber is monotonically increasing in the direction of sample fluid flow, the first dimension being transverse to the second dimension, and the cross-sectional area of said flow chamber generally normal to the direction of fluid flow is configured to decrease gradually and monotonically in the direction of fluid flow such that fluid flow within said flow chamber is caused to accelerate gradually and mono-

tonically and [observation means for transmitting a light beam through said flow chamber located] means for producing said light in said flow chamber at a point prior to said exit.

Re. 29,142

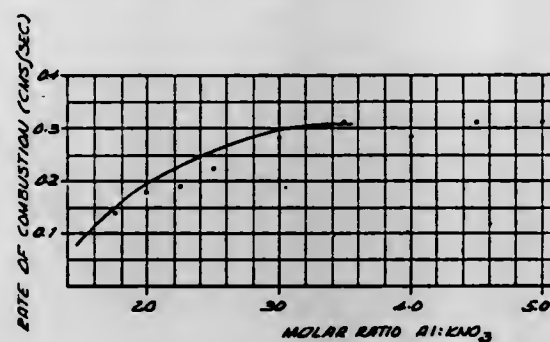
COMBUSTIBLE COMPOSITIONS FOR GENERATING AEROSOLS, PARTICULARLY SUITABLE FOR CLOUD MODIFICATION AND WEATHER CONTROL AND AEROSOLIZATION PROCESS

Henry M. Papee; Alberto C. Montefinale; Gianna L. Petriconi, all of Rome, Italy, and Tadeusz W. Zawadzky, Ottawa, Canada, assignors to Consiglio Nazionale delle Ricerche, Rome, Italy

Original No. 3,630,950, dated Dec. 28, 1971, Ser. No. 777,581, Nov. 21, 1968. Continuation-in-part of Ser. No. 742,956, June 19, 1968, abandoned, which is a continuation of Ser. No. 444,923, March 22, 1965, abandoned, which is a continuation-in-part of Ser. No. 392,809, Aug. 28, 1964, abandoned. Application for reissue May 22, 1973, Ser. No. 362,680

Int. Cl.² A01G 15/00; C09K 3/30; E01H 13/00
U.S. Cl. 252-305

11 Claims



1. A combustible composition consisting of a readily oxidizable substance selected from the group consisting of aluminum, magnesium, alkali-metals and alkaline earth metals; an oxidizing agent selected from the groups consisting of:
(a) sulphur and sulphur yielding compounds; and
(b) organic and inorganic nitrates, alkali-metal and ammonium chlorates and perchlorates;

the molar ratio of the oxidizable substance to the oxidizing agent being between 1.5:1 and 3.5:1 and a stable hygroscopic solid to be dispersed which does not directly participate in the combustion process of the combustible composition, said hygroscopic solid being present in an amount up to 40% of the total weight of the combustible composition, the oxidizable substance, the oxidizing agent and the stable hygroscopic solid having a particle size in the range of from -140 to +270 mesh, and a fused compound which burns initiating the combustion of said composition, whereby during combustion, a finely dispersed aerosol smoke consisting essentially of moderately

hygroscopic condensation giant nuclei and a non-hygroscopic gas are simultaneously evolved, said gas acting to disperse said nuclei, thereby generating aerosol smoke and a non-hygroscopic gas which control and modify weather conditions.

Re. 29,143

FAIL-SAFE APPARATUS FOR CHECKING THE PRESENCE OF FLAME IN A BURNER

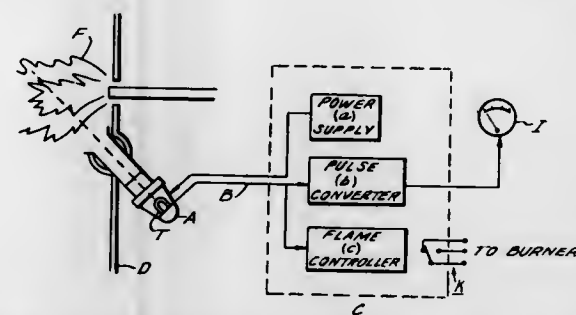
Gianni Bianchini, Reggio Emilia, Italy, assignor to Societa Italiana Eletttronica S.p.A., Milan, Italy

Original No. 3,914,662, dated Oct. 21, 1975, Ser. No. 462,190, Apr. 18, 1974. Application for reissue Dec. 4, 1975, Ser. No. 637,583

Claims priority, application Italy, May 22, 1973, 24389/73
Int. Cl.² H01H 47/24

U.S. Cl. 361-175

13 Claims



1. A flame control device usable with a detector head exposed to the radiation of a flame to be monitored, said detector head preferably comprising an ionization tube which develops an output signal in the presence of flame, said flame control device comprising:

- a chain of stages being connected in cascade fashion, each stage including at least one electrical component;
- a first stage of said chain being coupled to said detector head;
- a first one of all remaining stages including dynamic coupling means to stop the continuous components and to translate only energy given by the alternate components of the input signal;
- a second one of said remaining stages including energy storage means for storing energy furnished by said coupling means and generating an electrical signal representative of the signal developed by said detector head;
- a third one of said remaining stages including first chopper means for sampling said electrical signal;
- a fourth one of said remaining stages including a threshold circuit measuring the level of the sampled signal, for developing an output signal having a first level in the presence of a flame and for developing an output signal of a second level within a predetermined period after the absence of flame.

PLANT PATENTS

GRANTED FEBRUARY 22, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,017

ROSE PLANT-PITICA VARIETY

Rene Royon, Mougins, France, assignor to Universal Plants S. A. R. L., France

Filed Nov. 20, 1975, Ser. No. 633,952

Claims priority, application Morocco, Dec. 4, 1974, 16979

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—18

1 Claim

1. A new and distinct variety of Grandiflora rose plant, of vegetative reproduction, characterized by the fact that: from the physical point of view, the plant, with medium green adult wood, is erect, the flower is double, pale pink, its petals are very firm and overlapping; from the biological point of view, this rose plant is of vigorous vegetation, its re-blooming capacity is excellent, its flowers last a long time either on the plant or when cut; substantially as shown and described.

4,018

ROSE PLANT

Gijsbert de Ruiter, Hazerswoude, Netherlands, assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Jan. 15, 1976, Ser. No. 649,505

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—27

1 Claim

1. A new and distinct cultivar of rose of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its uniform shape; upright and heavily branched plant habit; large, leathery, mildew resistant foliage; abundant flowers of Blood Red (W) color.

PATENTS

GRANTED FEBRUARY 22, 1977

ERRATA

For CLASS	See PATENT NO.
081-003	4,008,632
081-068	4,008,636
320-015	4,009,051
429-191	4,009,052
429-094	4,009,053
429-112	4,009,055
429-126	4,009,056
358-083	4,009,330
358-127	4,009,331
358-280	4,009,332
358-213	4,009,333
358-167	4,009,334
358-240	4,009,335
179-015 BY	4,009,336
179-018 ES	4,009,337
200-336	4,009,363
235-064	4,009,370
361-038	4,009,417
361-038	4,009,418
361-091	4,009,419
361-088	4,009,420
361-119	4,009,421
361-120	4,009,422
361-385	4,009,423
361-433	4,009,424
361-433	4,009,425
200-014 BA	4,009,458
324-156	4,009,477

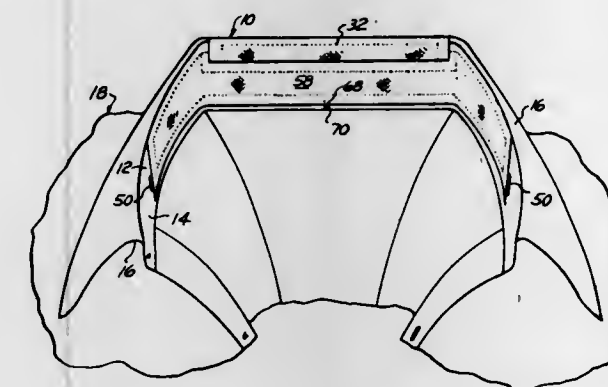
PATENTS

GRANTED FEBRUARY 22, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

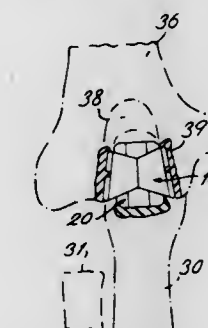
GENERAL AND MECHANICAL

4,008,494
GARMENT COLLAR PROTECTOR
 Clarence W. Hicks, 12835 La Salle, Detroit, Mich. 48238
 Filed Aug. 1, 1975, Ser. No. 600,945
 Int. Cl.² A41D 27/16
 U.S. Cl. 2—60 3 Claims



1. A garment collar protector comprising an elongated base strip of flexible material having a forward side and a rearward side and a central portion, said rearward side having thereon pressure-sensitive adhesive means adapted to detachably secure said base strip to the inner side of the garment collar near the upper edge thereof, an elongated collar protector strip of flexible moisture-absorbed material secured to said base strip adjacent its upper edge and extending along its central portion, and an elongated facing strip of flexible material secured to the forward side of said base strip, said protector strip being reversely bent into elongated forward and rearward portions secured respectively to said forward and rearward sides of said base strip.

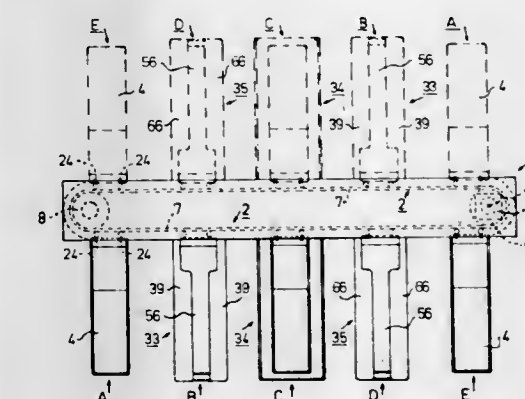
4,008,495
PROSTHETIC BONE JOINT DEVICES
 Michael Edward Cavendish, Rainford, and Martin Arthur Elloy, Liverpool, both of England, assignors to National Research Development Corporation, London, England
 Filed June 26, 1975, Ser. No. 590,823
 Claims priority, application United Kingdom, July 3, 1974, 29483/74
 Int. Cl.² A61F 1/24
 U.S. Cl. 3—1.91 9 Claims



1. An endoprosthesis elbow joint device comprising: a humeral component having a bearing surface defined by a surface of revolution about a longitudinal axis through said component, which surface is circumferentially convex but has a concave longitudinal shape converging in like manner from the opposite ends of the central region thereof, and having two fixation surfaces respectively

located at said ends, which fixation surfaces are inclined in a like and mutually convergent manner in a transverse direction relative to said axis, are each wholly bounded within a space defined by continued longitudinal projection of said bearing surface, and are each formed with a relieved configuration; and an ulnar component having a bearing surface generally complementary with, and in articulatory bearing engagement with, but of lesser circumferential extent than, said humeral bearing surface, and having a fixation surface located remotely from said ulnar bearing surface and formed with a relieved configuration.

4,008,496
AUTOMATED BATHING PLANT
 Hans Arne Valentin Johansson, Treharadsvagen 36, S-241 00 Eslov, Sweden
 Filed Aug. 4, 1975, Ser. No. 601,274
 Claims priority, application Sweden, Aug. 7, 1974, 7410097
 Int. Cl.² A47K 3/22; A61G 7/08; B65G 17/14, 17/20
 U.S. Cl. 4—145 36 Claims



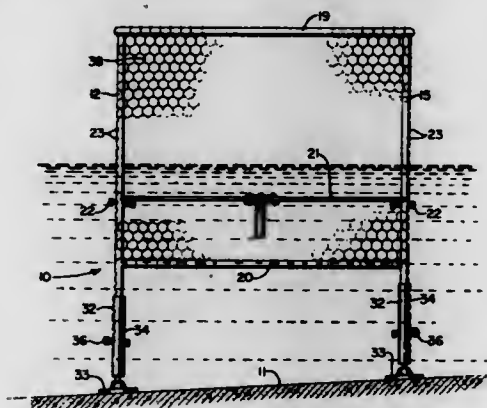
1. An automated bathing plant, comprising: a supporting frame; a plurality of spaced stations arranged in a line on said supporting frame, and including an initial station, a final station, and at least one treatment station between said initial and said final stations; conveyor means mounted above said spaced stations on said supporting frame, and including a plurality of spaced, depending carriages, said conveyor means being operable to progressively move said carriages linearly from one station to another, and further including control means effective to operate said conveyor means for moving said carriages and to position said carriages at said stations for a prescribed period of time; mounting means carried on said depending carriages; a plurality of horizontally disposed carrier plates each adapted to support a patient lying in a prone position, and each including a head end and a foot end; and attaching means on the head end of each of said carrier plates engageable with said mounting means carried on said depending carriages for detachably mounting said carrier plates on said carriages to project horizontally from and generally normal to the direction of movement of said carriages, said carriages being spaced apart a distance sufficient to provide access by attendants to both sides of said carrier plates.

4,008,497

SWIMMING POOL PLAY PEN

Kenneth E. Badon, 1318 Ryan St., Lake Charles, La. 70601
Division of Ser. No. 387,969, Aug. 13, 1973, Pat. No. 3,874,005. This application Feb. 21, 1975, Ser. No. 551,590
Int. Cl.² E04H 3/19, 3/16; E02B 17/00
U.S. Cl. 4-171

4 Claims



1. The method of providing a safe play environment for a small child or infant in water of significant depth comprising the following steps:

- providing a water compatible, relatively lightweight, portable playpen enclosure structure defining an enclosure of substantial size sufficient to allow a small child or infant to freely move around therein, said playpen enclosure structure being provided with members having openings therein which allow water to flow into the enclosure, said playpen enclosure structure including:
 - a basic playpen support frame;
 - rigid playpen platform means supported on said basic support frame for supporting the small child or infant within said enclosure during play in the water;
 - playpen wall enclosure means carried by said basic support frame around said platform means for restricting the small child or infant to said platform means;
 - playpen leg support means connected to said basic frame for supporting said basic frame on the water bottom; and
 - variable support means connected within said platform, said basic frame and said leg means for allowing variation of the vertical position of said platform means with respect to the bottom of said leg means by a substantial amount;
- manually placing said relatively lightweight, portable playpen enclosure structure in the water so that the bottom of said playpen leg support means rests on the water bottom and water flows into the enclosure; and
- adjusting the vertical level of said playpen platform means by means of said variable support means so that said platform means will be located at least near the surface of the water; whereby a small child or infant placed in the enclosure defined by said playpen enclosure structure can safely play and move around in the water.

4,008,498
TUB PAD

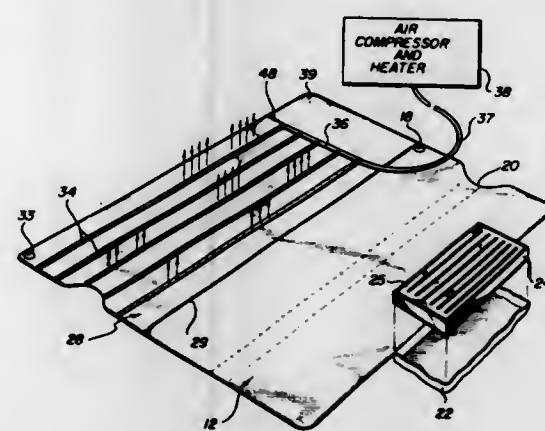
Stephen R. Thomas, 5706 N. Mason, Chicago, Ill. 60646
Filed June 18, 1975, Ser. No. 587,991
Int. Cl.² A61H 9/00, 33/06

U.S. Cl. 4-180

7 Claims

1. A hollow body water fillable assembly including a water fillable pad member dimensioned to be received on a tub bottom to support a bather, said pad having top and bottom side walls sealed along a continuous edge, a water inlet-outlet valve in the top side wall of the water fillable pad member, a plurality of air tubes mounted to said top side wall and extending towards the opposite ends of the water fillable pad member, a series of apertures along the length of each tube,

a manifold tube joined to said plurality of air tubes, means to deliver compressed air, a side air inflatable pad member hinged to the side of said water fillable pad member, said side air inflatable pad member having spaced sidewalls sealed along a continuous edge, and said side pad member having dimensions to



cover the bather when draped over the top of the tub, and means connecting said side pad member with said means to deliver compressed air, and connecting tube joining said manifold tube and the compressed air means to deliver air to said plurality of air tubes for discharge through said apertures to create bubbling agitation through tub water.

4,008,499

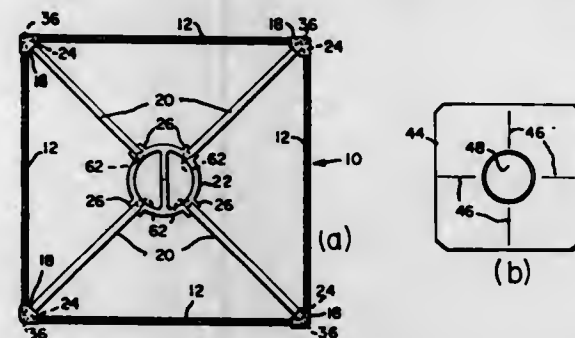
COLLAPSIBLE PLAYPEN

William Arthur Wren, Jr., 736 Ensign Ave., Beachwood, N.J. 08722, and Joseph Paul Gibson, Jr., 52 Sunset Drive, Howell, N.J. 07731

Continuation-in-part of Ser. No. 538,769, Jan. 6, 1975, abandoned. This application Dec. 3, 1975, Ser. No. 637,272
Int. Cl.² A47C 29/00

U.S. Cl. 5-99 C

10 Claims



1. In a playpen enclosed by side materials and intended for portable use, the combination therewith of:
- a plurality of corner legs, to which the side materials of the playpen are attached;
 - a plurality of support arms angularly displaced with respect to said corner legs;
 - a support member situated within the framework structure of said playpen when open; and
 - means coupling opposite ends of said support arms to said corner legs and to said support member, respectively, said means being so constructed and arranged that actuation of said support member in one direction correspondingly rotates said support arms and corner legs in an opposite direction so as to collapse said playpen to a construction of cross section substantially similar to that of said support member;
- said means being operative in conjunction with said corner legs to prevent the collapse of said playpen unless the angular displacement between each of said support arms and said corner legs is first reduced below a predetermined amount prior to the actuation of said support member.

4,008,500

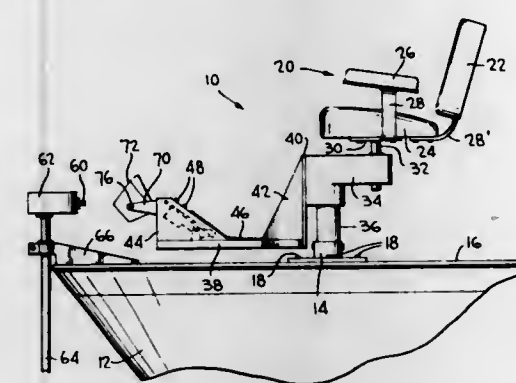
FISHING BOAT PLATFORM

Clarence Addison Hall, Jr., P.O. Box 676, Belzoni, Miss. 39038

Filed Sept. 2, 1975, Ser. No. 609,824
Int. Cl.² B63B 29/00

U.S. Cl. 9-7

18 Claims



1. A fishing boat platform, which comprises: platform means rotatably mounted with respect to a substantially flat surface of a boat; a chair rotatable with respect to said platform means; and foot placement means positioned near an end of and rotatable with said platform means, said platform means being rotatable about a platform axis that is substantially perpendicular to said flat surface of said boat, said platform means including a base member upon one end of which is mounted said foot placement means, said foot placement means including foot pedal means for controlling an outboard motor.

4,008,501

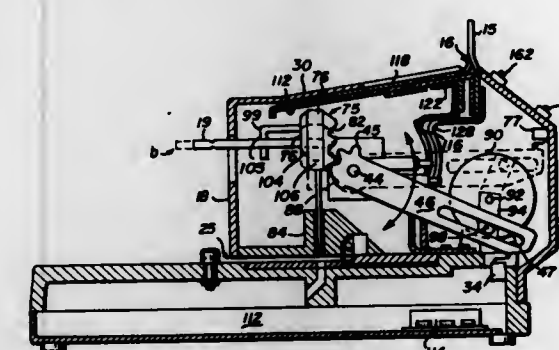
ELECTRICALLY ACTUATED PUNCHING AND BINDING APPARATUS

James W. Cutter, Los Altos, Calif., assignor to NSC International Corporation, Hot Springs, Ark.

Filed Mar. 12, 1976, Ser. No. 666,339
Int. Cl.² B42C 19/00; B26D 5/08

U.S. Cl. 11-1 AC

14 Claims



1. Punching and binding apparatus, comprising:
- means forming a base;
 - punching means for punching apertures along an edge of a stack of sheet material;
 - binding means for inserting the flexible fingers of a comb binder through the punch apertures for binding the sheet material together and including,
 - an elongated rigid comb plate member having a plurality of comb teeth,
 - an elongated rigid hook plate having a plurality of hooks corresponding in number to the number of said comb teeth, and
 - guide means to which said comb plate and said hook plate are mounted, said guide means permitting said comb plate to move in its longitudinal direction between a first position and a second position, said hook plate being mounted adjacent said comb means with its

hooks being positioned proximate said comb plate and being movable away from said comb plate, and actuating means for actuating said punching means and said binding means including, an actuating shaft, an electric motor affixed to said base and first means mechanically coupling the armature of said motor to said shaft to impart rotary energy thereto, second means mechanically coupling said shaft to said punching means; a first camming means affixed to said hook plate and including a second camming surface, a first arm carried by and extending radially from said shaft to cammingly engage said first camming surface and move said comb plate, a second arm carried by and extending radially from said shaft to cammingly engage said second camming surface and move said hook plate, function selector means having a punch setting and bind setting, coupling means responsive to said selector means and operative to selectively couple said first and second arms to said shaft when said coupling means is in said bind setting, and an electronic control module responsive to said selector means and operative to energize said motor, whereby when said selector means is in said punch setting, said motor is caused to actuate said punching means and when said selector means is in said bind setting, said coupling means and motor cause said first arm to move said first camming means which in turn moves said comb plate between said first position and said second position, and further cause said second arm to move said second camming means which in turn moves said hook plate away from and back toward said comb plate.

4,008,502

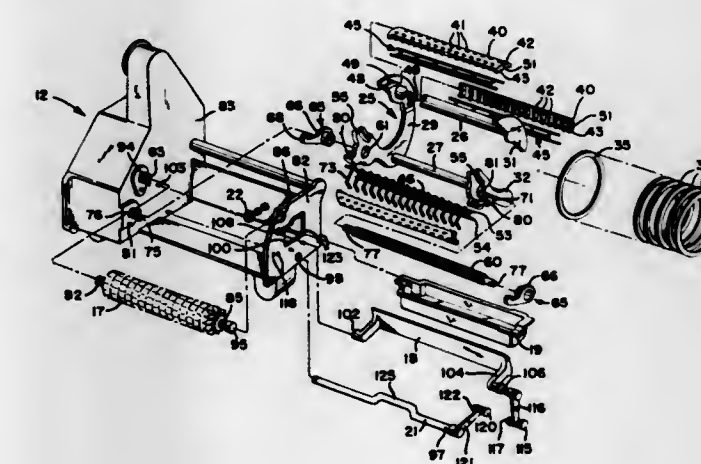
MEAT GRIPPING AND MOVING CYLINDER AND MOUNT THEREFOR

Herbert R. Crane, Tipp City, and Anthony L. Fullenkamp, Ft. Loramie, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Continuation of Ser. No. 535,041, Dec. 20, 1974, abandoned. This application May 6, 1976, Ser. No. 683,913
Int. Cl.² A22C 17/08

U.S. Cl. 15-3.17

6 Claims



1. In a meat scraping machine for removing residues of coagulated blood, bone dust, marrow, meat particles, fat, and so on, from a sawed surface of a piece of meat; means for removing such residues; means for operating the residue removing means; and means for bringing the piece of meat into engagement with the residue removing means, including a framework, a plurality of relatively thin, open, annular, blade-like rings, supports for the rings for engaging and holding each

of the rings coaxially in position with respect to one another to define a cylinder, the ring supports being mountable in predetermined positions on the framework to lock the rings irremovably on the framework when all the ring supports are mounted in their predetermined positions, and the rings being rotatable with respect to the ring supports when locked thereon; the improvement comprising:

- a. means on the framework for mounting at least one of the ring supports independently on the framework for attachment thereto and removal therefrom independently of any of the rings or the remaining ring supports to provide for removal of said one ring support without removing the rings or the remaining ring supports from the framework, the ring supports again locking the ring irremovably on the framework when said one ring support is remounted in position on the framework, and
- b. the framework also including means forming a part thereof for continuing, when said one ring support has been removed and while the framework remains intact, to support the remaining ring supports in their predetermined positions, and for supporting the rings thereon while releasing the rings and the remaining ring supports and providing for removal thereof from the framework for disassembly and reassembly of the rings and ring supports on the framework while the framework remains intact.

4,008,503

ROTARY SHOWER BRUSH

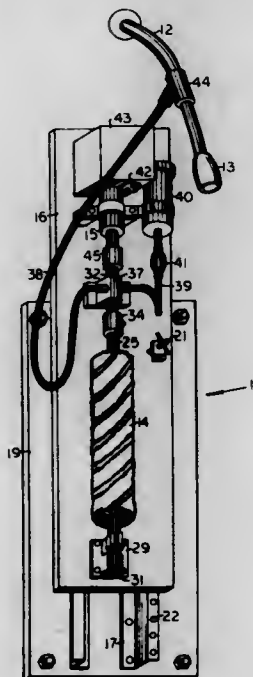
Marvin E. Tharp, 12629 - 56th St. West, Milan, Ill. 61264

Filed June 1, 1976, Ser. No. 691,503

Int. Cl.² A46B 13/02; A61H 7/00

U.S. Cl. 15-21 D

2 Claims



1. A rotary shower brush comprising:

a rotary brush assembly including an adjustable mounting plate adjustable in height, a generally cylindrical brush, bearing means on said adjustable mounting plate for rotatively supporting said brush vertically on the axis thereof near the front side of said adjustable mounting plate, motor means mounted to said adjustable mounting plate and coupled to said brush for rotating said brush about the axis thereof,

a wall plate having on the back side thereof fastening means for readily fastening said wall plate to the wall of a shower by manual application of pressure, an adjustable supporting means having a fixed member fastened to the front side of said wall plate and a mating movable member fastened to the back side of said adjustable mounting plate, said adjustable supporting means permitting said adjustable mounting plate to move along a line parallel to

the face of said wall plate, said wall plate to be oriented to permit vertical positioning of said adjustable mounting plate on said adjustable supporting means, and stopping means for holding said adjustable mounting plate at a selected height on said adjustable supporting means.

4,008,504

PORTABLE SHOE SHINE APPARATUS

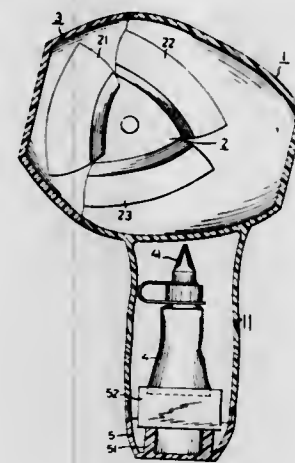
Jan-Chou Ou, 33-7 Lane 46, Kuan Fu South Road, Taipei, China /Taiwan

Filed Mar. 9, 1976, Ser. No. 665,226

Int. Cl.² A47L 23/05, 23/08, 23/28

U.S. Cl. 15-258

5 Claims



1. Portable shoe shine apparatus comprising a casing having a front opening and a roller set having a base provided with a shaft and slidably mounted on the peripheral surface of said base, a brush, a shoe cream spreader and a buffer disposed 120° apart from each other, the said base having on one end of its shaft an internal spline to receive a splined positioning knob provided in a seat at one side wall of the casing for turning the shaft to set any one of the brush, the shoe cream spreader, or the buffer to project through the front opening, the said positioning knob carrying a slidable holding arm with a locking stud to lock into a plurality of locking cavities disposed about the knob seat to hold the roller set in locked position; the other end of the roller shaft being seated on another side wall of the casing and locked in place by a snap locking arm hinged thereon, the roller set being inserted and confined in the casing through guides provided on the side walls of the casing for the shaft ends and being removable therefrom for replacement with a spare set; a handle integral with the casing and having a compartment to house a tube of cream which is gripped and held by a clip attached on a handle cap for closing the compartment.

4,008,505

ABOVE-THE-FLOOR ADAPTOR FOR UPRIGHT VACUUM CLEANERS

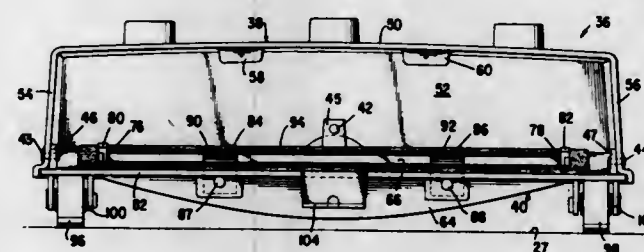
Earl R. Clowers, Anderson, S.C., assignor to The Singer Company, New York, N.Y.

Filed May 27, 1975, Ser. No. 580,999

Int. Cl.² A47L 5/32

U.S. Cl. 15-338

6 Claims



1. An attachment adaptor for an upright vacuum cleaner of the type having a casing enclosing a suction chamber, said

casing including a cantilevered front portion having an under surface formed with an air opening communicating with said suction chamber and an upper surface spaced from said under surface, said attachment adaptor comprising a housing formed with an air chamber having an air opening and a separate hose connection, complementary interlocking means on said housing and on said vacuum cleaner casing adjacent to the openings therein, yieldable projection gripping means formed on said adaptor housing for engaging the upper surface of said cantilevered front portion when said openings are brought into registry, said yieldable projection gripping means being spaced apart from said interlocking means on said adaptor a distance which is less than that which the upper surface of said vacuum cleaner casing is spaced from the under surface thereof for drawing the complementary interlocking means into interlocking relation when the adaptor is mounted on said vacuum cleaner with said openings in registry.

4,008,506

PORTABLE DOCKS AND BRIDGES

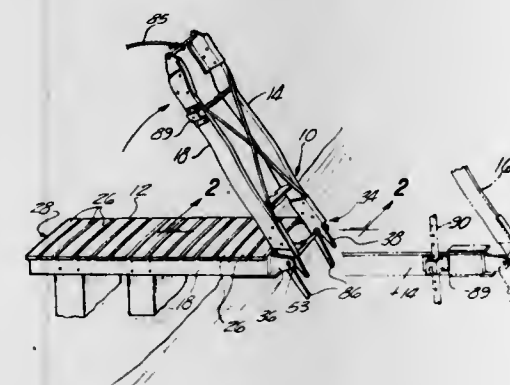
Stuart D. Smith, 28430 Swan Drive, Grosse Ile, Mich. 48138

Filed July 30, 1975, Ser. No. 600,435

Int. Cl.² E01D 15/12

U.S. Cl. 14-71.1

15 Claims



1. In a portable dock of sectional construction, the combination of: a pair of elongated dock sections, pivot means interposed between and connected to adjacent ends of said pair of dock sections for relative pivotal movement between a first position in which one of said sections is disposed at an angle to the other of said sections and a second position in which said pair of sections are disposed in longitudinal alignment with each other, said pivot means including a first pivot member connected to one of said sections and a second pivot member connected to the other of said sections, said first and second pivot members being attachable and detachable from each other when said sections are in said first position and being inseparable from each other when said sections are in said second position, said dock sections including complementary support portions disposed radially of the axis of said pivot means and being movable into engagement with each other upon movement of said sections to said second position to support one of said dock sections in cantilevered relationship to the other of said dock sections.

4,008,507

AXLE MOUNTINGS

Joseph Smith, 177A Hobson St., Auckland, New Zealand

Filed Dec. 30, 1975, Ser. No. 645,346

Claims priority, application New Zealand, Oct. 21, 1975, 179002

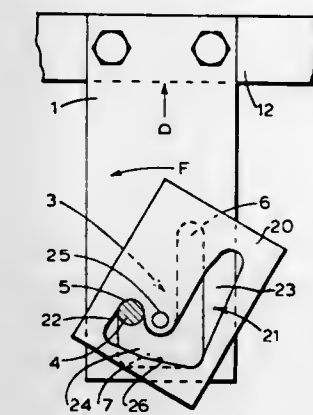
Int. Cl.² B60B 33/06

U.S. Cl. 16-34

4 Claims

1. An axle mounting comprising a first plate; a second plate pivotally mounted on said first plate; first and second interconnected slot portions being provided in each of said plates; each of said first slot portions being longer than said second slot portions; said slots being so adapted as to accommodate

an axle movable therein; the raising and lowering of either end of an article to which said plates are affixed, causing said axle



to move between said first and second slot portions; said second plate pivoting about said first plate so as to enable said axle movement to take place.

4,008,508

METHOD AND APPARATUS FOR PROCESSING SHRIMP AND THE LIKE

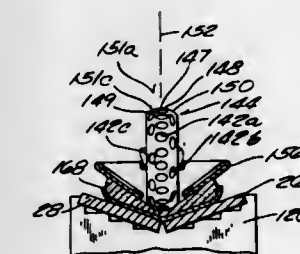
Robert L. LaPine, Wells, Mich., and Melvin J. Crepeau, St. Petersburg, Fla., assignors to Harry H. Bell & Sons, Inc., St. Petersburg, Fla.

Filed May 19, 1975, Ser. No. 578,740

Int. Cl.² A22C 29/00

U.S. Cl. 17-52

46 Claims



1. Apparatus for processing de-headed and unshelled shrimp and the like comprising;

- a cutting station including a cutter means for cutting through the belly of the shrimp to the alimentary canal of the shrimp;
- a spreader station including spreader means for spreading the portions of the shrimp on the opposite sides of the cut formed therein by said cutter means and thereby causing the shrimp to assume a substantially flattened position with the shell remaining attached and the alimentary canal exposed;
- a cleaning station including a rotating cleaning wheel means having an outer peripheral surface for engaging the central portion of the flattened shrimp in the vicinity of the alimentary canal, said peripheral surface including a plurality of circumferentially spaced cavities, each having an edge portion adjoining said peripheral surface, whereby portions of the alimentary canal and/or similar debris can be compressed into said cavities and be pulled away from the shrimp by said cavity edge portions as said cleaning wheel rotates relative to the shrimp; and conveyor means for moving the shrimp successively through said cutting, spreader and cleaning stations.

4,008,509

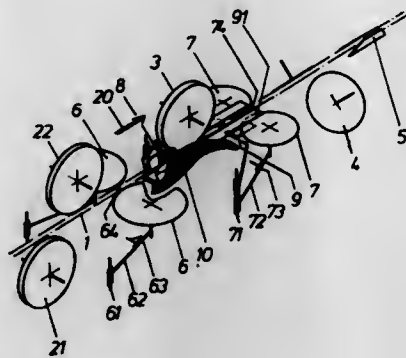
MACHINE FOR FILLETING FISH

Horst Braeger, and Gerhard Groth, both of Lubeck, Germany, assignors to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Dec. 29, 1975, Ser. No. 644,522
Int. Cl.² A22C 25/16

U.S. Cl. 17-56

3 Claims



1. A filleting machine for producing fillets of fish with the fillets, including the belly flaps, entirely free of pinbones, and in which each fish is conveyed along a path parallel to the main backbone of the fish with its tail leading and belly side down, said machine comprising:

- a pair of belly filleting knives arranged to cut the underside of the fish from the root of the tail fin to the trailing end of the belly cavity,
- a pair of back filleting knives located along said path downstream of said belly filleting knives and arranged to sever the upper part of the fillet above the vertebral column over the entire length of the fish to provide upper fillet portions,
- a pair of upper pinbone knives located along said path downstream of said back filleting knives and arranged to provide a transverse cut above the pinbones of the fish for severing said upper portions from the belly flaps,
- a pair of deflectors located along said path downstream of said upper pinbone knives for deflecting said upper fillet portions outwardly of said belly flaps and causing said upper fillet portions to drop downwardly,
- a pair of separating knives located along said path downstream of said deflectors and arranged to separate the tail portion of said fish from said vertebral column, with said upper fillet portions adhering to the fish skeleton only at an intermediate bow located at the upstream end of the belly cavity,
- hold down means located along said path downstream of said separating knives for pressing down the separated upper fillet portions in the region of the bow below the level of the pinbones of the fish, and
- a pair of lower pinbone knives located along said path downstream of said hold down means for cutting beneath the pinbones and above the held down upper fillet portions, thereby separating a narrow strip containing the pinbones from the fillets, and
- a pair of rib knives located along said path downstream of said lower pinbone knives and arranged to sever the fillets from the fish skeleton, leaving only said narrow strip containing the pinbones remaining on the skeleton.

4,008,510

FISH SCALER

Gerald A. Laffin, Rte. 1, Aniwa, Wis. 54408

Filed June 23, 1975, Ser. No. 589,787

Int. Cl.² A22C 25/02

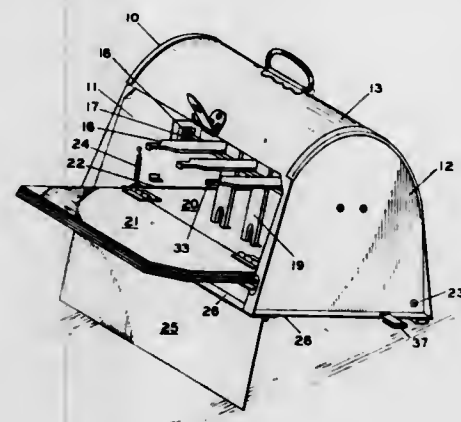
U.S. Cl. 17-64

5 Claims

- 1. A fish scaler comprising:
 - a. a housing having front input opening,
 - b. a scaling rotor having an axle rotatably journaled in said housing and having a series of adjacently positioned flexi-

ble scaling arms attached intermediate their ends to and extending radially from said axle,

- c. a pair of laterally spaced extension fingers at one end of each of said arms and a middle extension finger at the other end, said fingers being of less length than said arms, each of said fingers extending in the same general direction as the arm of which it is an integral part and being narrower in width than such arm to provide greater flexibility of said fingers than said arms,



- d. transverse scaling teeth attached to the outer ends of the laterally spaced and middle extension fingers of said arms at the same radial distance from said axle, the combined width of said teeth being substantially laterally co-extensive with said series of arms so as to arc through a substantially continuous lateral width upon rotation of said scaling rotor, and
- e. a bottom ramp mounted in said housing below said scaling rotor for receiving a fish to be scaled.

4,008,511

DEVICE FOR ADJUSTING POSITION OF TAKER-IN UNDER CASING IN CARD

Shingo Oda, Nagoya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

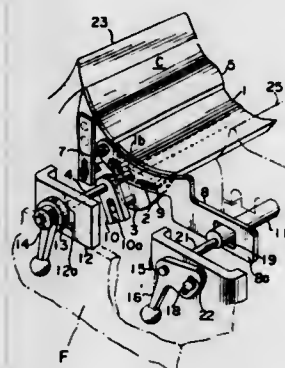
Filed Sept. 3, 1975, Ser. No. 610,007

Claims priority, application Japan, Sept. 10, 1974, 49-103509

U.S. Cl. 19-105

Int. Cl.² D01G 15/42

11 Claims



- 1. A carding machine which comprises:
 - a. a taker-in roller for stripping and feeding a lap;
 - b. a dish plate and cooperating feed roller positioned on the lap feed side of said taker-in roller;
 - c. a taker-in under casing below said taker-in roller and on the downstream side of said taker-in roller relative to said dish plate, said under casing comprising a movable half disposed on the upstream side with respect to the movement of the lap, and a stationary half disposed on the downstream side with respect to the movement of the lap;
 - d. supporting means pivotally supported on said machine and supporting said movable half for turning movement around the pivotal support of said supporting means and

- circumferential movement along a portion of the circumference of said taker-in roller;
- e. a first adjusting means associated with said movable half for causing said movable half to turn around the pivotal support point of said supporting means; and
- f. a second adjusting means associated with said movable half for causing said movable half to move circumferentially along the portion of the circumference of said taker-in roller, said second adjustable means being operable independently of said first adjusting means.

4,008,512

BAND CLAMP OF PLASTICS MATERIAL

Marcel Prodel, Arnac Pampadour, France, assignor to Societe anonyme dite: Mecanoser S.A., Arnac-Pampadour, France

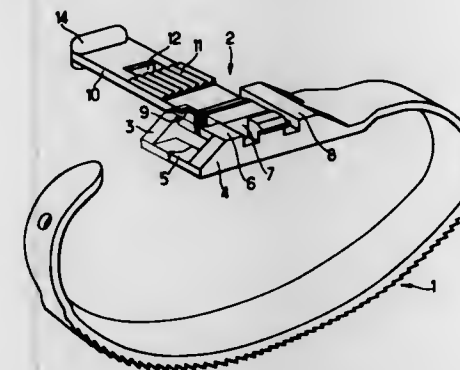
Filed July 9, 1975, Ser. No. 594,304

Claims priority, application France, July 17, 1974, 74.24885; Mar. 26, 1975, 75.09541

Int. Cl.² B65D 63/00

U.S. Cl. 24-16 PB

4 Claims



- 1. A one-piece releasable band clamp of plastics material comprising:
 - a strap having generally transversely extending teeth;
 - a buckle on one end of the strap, a portion of the strap being superimposed on the buckle to form a band;
 - a flap extending perpendicularly to the length of the strap and attached to said buckle by a flexible portion of reduced cross-section for permitting the flap to be turned back at the portion of reduced cross-section to lie over the superimposed portion of the strap, the flap having teeth which, when the flap has been turned back, extend parallel to and engage the teeth of the superimposed portion of the strap;
 - and co-operating coupling means on the buckle and the flap, respectively, for locking the flap in its turned-back position and thereby maintaining the engagement of the teeth of the flap and strap, the coupling means comprising a catch projecting from the buckle and means on said flap defining an aperture in a position such that the catch passes through the aperture for locking the flap in its turned-back position.

4,008,513

CLASP

Kenneth F. Griffiths, 31 London Terrace, New Rochelle, N.Y. 10804

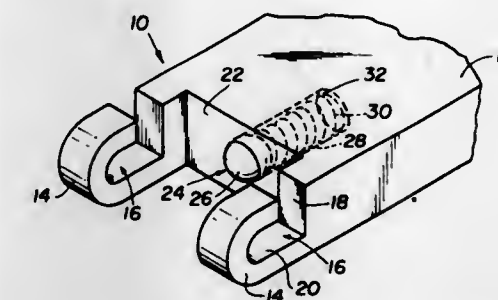
Filed Sept. 24, 1975, Ser. No. 616,298

Int. Cl.² A44B 17/00, 13/02

U.S. Cl. 24-201 A

9 Claims

- 1. A clasp comprising a male element, having a main body portion, at least one prong extending axially outwardly from said main body portion, and exposed bar means extending laterally from said at least one prong, and a female element having a main body portion, at least two prongs extending axially outwardly from said main body portion to receive said male portion and extend along the lateral edges of said prongs on said male portion, each of the prongs from said female element having an L-shaped slot formed therein for receiving



said bar means of said male element; each of said L-shaped slots comprising a vertical portion extending in a common plane transverse to the axis of said female element and a horizontal portion extending in a common plane axially away from the main body of said female element, and pushing means mounted within the main body portion of one of said male or female elements and normally biased outwardly there-

from for resiliently engaging the main body portion of the other element, said pushing means and said main body portion of the other element having cooperatively engaging faces adapted to cause said pushing means to yield axially inward on the downward movement of said bar into the vertical portion of said L-shaped slot, and axially outward to force said bar into locking engagement within the horizontal portion of said L-shaped slot.

4,008,514

METHOD OF MAKING CERAMIC CAPACITOR

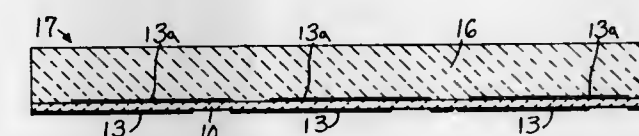
Gilbert J. Elderbaum, 896 Main St., Lynnfield Center, Mass. 01940

Continuation-in-part of Ser. No. 359,229, May 11, 1973, Pat. No. 3,882,059. This application May 5, 1975, Ser. No. 574,589

Int. Cl.² H01G 4/12, 4/30

U.S. Cl. 29-25.42

10 Claims



- 1. A method of making capacitors in multiple which comprises defining a first pattern of a multiplicity of electrodes on a release surface, casting a thin first strip of ceramic greenware over said release surface, defining a second pattern of a multiplicity of electrodes on said strip in registry with the electrodes of said first pattern, adhering a first backing strip of ceramic greenware of greater thickness than said first strip to said first strip, removing said strips from said surface with said first pattern thereon, covering the first pattern of said first strip with a second backing strip of ceramic greenware, laminating said strips, cutting individual capacitor units including electrodes in registry on either side of said first strip from the laminated assembly and curing the units.

4,008,515

METHOD OF TRANSPORTING TOOLHOLDER

Robert Z. Hague, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 501,865, Aug. 30, 1974. This application June 3, 1975, Ser. No. 583,468

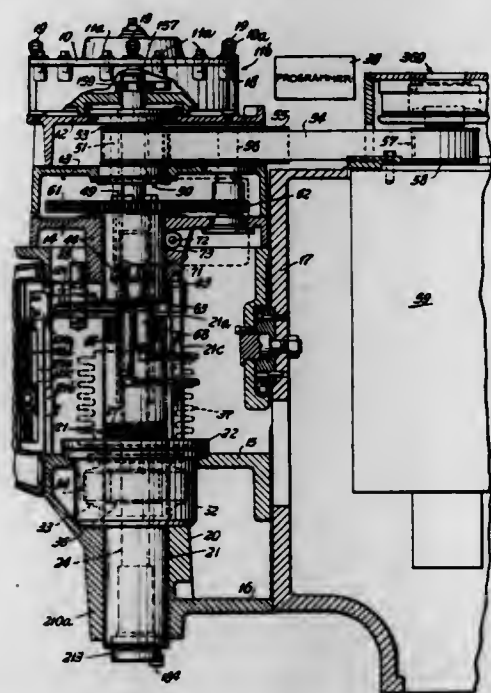
Int. Cl.² B23Q 3/157

U.S. Cl. 29-426

6 Claims

- 1. A method of transferring toolholders from an indexable toolholder storage means having a row of toolholder sockets by a carriage to the spindle of a machine tool and returning the toolholder to said storage means comprising the steps of

grasping and securing to said carriage a toolholder supported in one of said sockets; with a source of power advancing the carriage with the toolholder thereon to position the toolholder beneath the socket of the spindle; causing the carriage to be raised to deposit said toolholder in said spindle socket; releasing the toolholder from the carriage; without interrupting or changing the direction of operation of said source of power, moving the empty carriage to position of rest remote from said spindle; interrupting said source of power while the toolholder in the spindle is performing work; after said work has been performed, reactivating said source of power to operate in



reverse direction to transport the empty carriage back to the spindle; securing the toolholder in the carriage; releasing the toolholder from the spindle and without interrupting said source of power, extracting said toolholder from the spindle, returning that toolholder to the storage means, depositing the toolholder in the storage socket from which it had been taken, moving the carriage beyond the row of toolholder-carrying sockets in the storage means; interrupting said source of power; and indexing said storage means to position the next-to-be used toolholder into position to be engaged by the carriage.

4,008,516

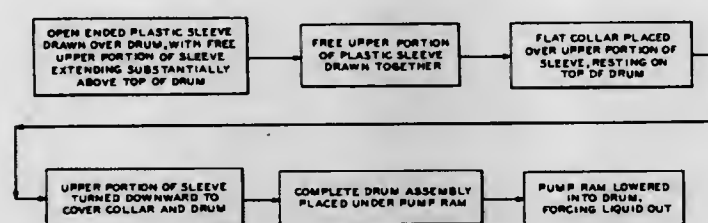
PROTECTIVE SYSTEM FOR EVACUATING DRUMS
Andrew N. Stad, Stamford, Conn., assignor to Baldwin-Gegenheimer Corporation, Stamford, Conn.

Filed Oct. 24, 1972, Ser. No. 299,866

Int. Cl.² G01F 11/00

U.S. Cl. 29—428

3 Claims



2. A method of removing ink from an ink drum by use of a plunger which descends into an ink drum whereby the plunger remains substantially uncontaminated from ink comprising: placing an open ended flexible sleeve in telescoping relationship with said drum, gathering the free end of said sleeve and inserting said free end through a collar having an aperture therein and an outside diameter substantially equal to the inside diameter of said drum, locating said collar adjacent the open end of said ink drum,

reversing the direction of the free end of said sleeve which has been passed through the aperture in said collar and directing that portion of said sleeve that has been passed through the aperture in said collar over the drum so that when the plunger descends to force the ink from the drum the plunger remains substantially uncontaminated.

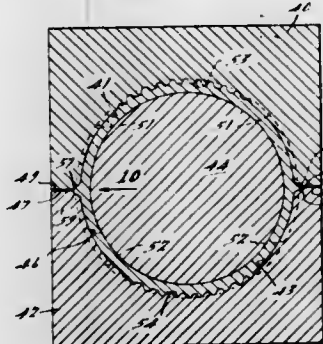
4,008,517

BRAKE DRUM AND METHOD OF MANUFACTURE
Carl N. Schrader, Detroit, Mich., and Frank H. Fisher, Kenton, Ohio, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 374,326, June 28, 1973, Pat. No. 3,889,786. This application Jan. 22, 1975, Ser. No. 542,975
Int. Cl.² B22D 11/126; F16D 65/10

U.S. Cl. 29—527.6

8 Claims



1. A method of manufacturing a cast iron brake drum having a generally cylindrical main body portion, said method comprising:

arranging a pair of split external mold segments in spaced surrounding relationship with respect to an internal mold member to provide an annular mold cavity, the internal surfaces of said segments being generally concave and provided with a plurality of axially spaced, circumferentially extending grooves to form a corresponding plurality of axially spaced circumferentially extending ribs on the brake drum and the lateral edge surfaces of said segments being positioned in closely spaced interfacing relationship,

spacing apart the radially inward portions of the interfacing lateral edge surfaces of said external mold segments to provide a pair of spaces of substantial circumferential width and a radial dimension greater than the radial depth of said grooves, said spaces extending across the axial length of the circumferentially extending grooves provided in each adjacent pair of external mold segments, casting molten iron into the cavity formed by said mold segments and member to fill said cavity and said grooves, filling said spaces with molten iron during the casting operation to provide a flash base of substantial circumferential thickness at the parting lines between the external mold segments and a projection of flash metal extending radially outward from said flash base, cooling the cast molten iron to form a durable casting, removing said mold segments and said member from said casting, and grinding away that flash metal which extends radially outward from each flash base to provide a pair of ridges of durable iron metal traversing said axially spaced, circumferentially extending ribs.

4,008,518

MACHINE TOOLS

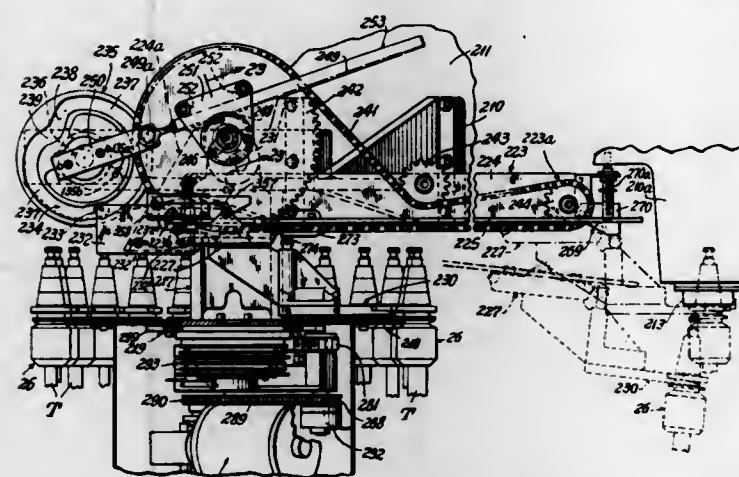
Robert Z. Hague, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 30, 1974, Ser. No. 501,865

Int. Cl.² B23Q 3/157; B65G 49/00

U.S. Cl. 29—568

25 Claims



1. A tool storing and transferring device for use with a machine tool having a vertical spindle having a toolholder receiving socket comprising: a movable circular storage rack having a plurality of spaced peripheral open slots forming sockets for slidably receiving and storing therein vertically a plurality of toolholders in predetermined order and each movable horizontally to a position accessible for removal; an arm extending radially of and substantially horizontally between said storage rack and said spindle and having a carriage track thereon; a toolholder carriage mounted on said track and having a mechanical hand having means for grasping a selected one of said toolholders in said storage rack to remove it therefrom; means for causing said carriage to travel on said track from said storage rack toward said spindle to transport said toolholder to a position below and approximately vertically aligned with said spindle socket; and means for causing the portion of the track supporting said carriage, mechanical hand and toolholder thereon to be raised to insert the toolholder into said spindle socket in position to be secured in said socket.

4,008,519

ELASTOMERIC CONNECTOR AND ITS METHOD OF MANUFACTURE

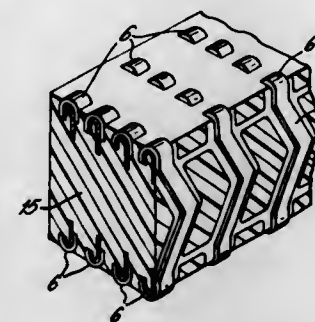
Hermanus Petrus Johannes Gijssen, Esch, and Petrus Richardus Martinus van Dijk, 's-Hertogenbosch, both of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 549,108, Feb. 11, 1975, Pat. No. 3,954,317. This application Jan. 30, 1976, Ser. No. 653,983

Int. Cl.² H01R 43/00

U.S. Cl. 29—625

1 Claim



1. A method of manufacture of a connector comprising the steps of forming a plurality of strip-like flexible lamina printed circuits, each strip-like printed circuit lamina having circuit paths on one side only, the circuit paths comprising conductive strips spaced longitudinally of the strip-like lamina and each extending transversely between opposite side edge por-

tions of the strip, forming the apertures in the insulating lamina, folding over the opposite side edge portions of each strip onto the side of the lamina devoid of circuit paths so that the transverse conductors extend externally of the folds of the side edge portions, disposing between the opposite folds of each strip-like printed circuit and adjacent the side devoid of circuits a first strip of partially cured or thermoplastic elastomeric insulating material, positioning the assemblies of printed circuit laminae and first elastomeric strips in a stack alternating with second strips of elastomeric insulating material, compressing the stack to effect extrusion of the first and second elastomeric strips through the apertures of the printed circuit laminae and into troughs within the folded side edge portions, and curing the elastomer into a homogeneous mass encasing the printed circuit laminae with convex portions of the folded conductors exposed at opposite faces of the elastomeric mass.

4,008,520

CONTACT MEMBER AND METHOD OF MANUFACTURE
Bernhard Rothkegel, and Horst Schreiner, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 112,979, Feb. 5, 1971, Pat. No. 3,927,990.

This application Aug. 6, 1975, Ser. No. 602,464

Claims priority, application Germany, Feb. 7, 1970, 2005681

Int. Cl.² H01R 9/02

U.S. Cl. 29—630 C

5 Claims



1. A method of producing a contact member for high electrical loads comprising a plurality of parts, one of said parts comprising a non-welding material resistant to burn-off, another one of said parts comprising a solderable material having electrically conductive properties, the material of each of said parts being configured as a porous skeleton structure, said parts being disposed next to each other, and both of said parts being impregnated with a metal and the interface of said parts being devoid of a boundary layer which comprises pressing a powder mixture of non-welding material resistant to burn-off to form a first part, pressing a powder mixture of solderable electrically conductive material to form a second part, sintering said second part to make the same a porous structure, placing said parts so as to be fixed in position next to each other, impregnating said first and second parts while said parts are fixed in position next to each other with impregnating metal in a single step to join said parts with said metal.

4,008,521

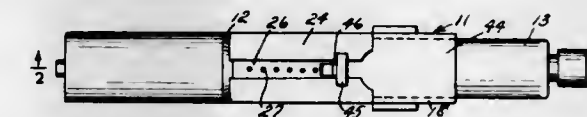
DENTAL TOOLS

Arthur M. Epstein, and Hans E. Baumayr, both of New York, N.Y., assignors to Baumayr Instrument Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 496,786, Aug. 12, 1974, abandoned. This application Mar. 24, 1976, Ser. No. 670,026
Int. Cl.² A61C 1/10

U.S. Cl. 32—27

14 Claims



1. A dental handpiece attachment comprising an articulated

member including a pair of relatively angularly adjustable proximal and distal housing sections, a longitudinally extending shaft rotatably supported in said proximal section and restricted against axial movement, a slide member longitudinally reciprocally supported in said distal section and restricted against rotation, means for attaching a tool to the distal portion of said slide member and a rotation to reciprocation motion translator in proximal section transmitting said translation to distal member by means of a link coupling said shaft to said slide member and effective to reciprocate said slide member with rotation of said shaft substantially independently of the relative angular relationship between said tubular sections for at least a predetermined range of said angular adjustment.

4,008,522

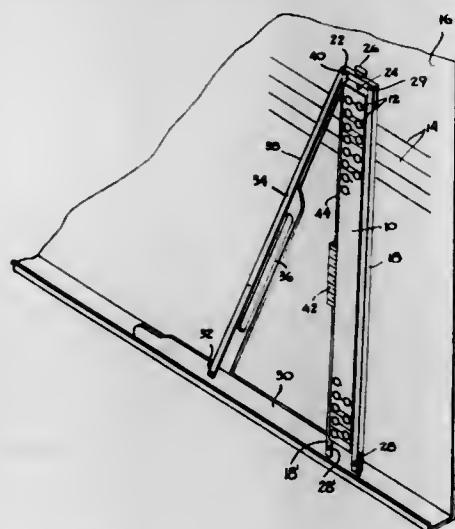
CHALKBOARD LINE TOOL

Gordon W. Anderson, 905 Canosa, Las Vegas, Nev. 89105
Filed Aug. 18, 1975, Ser. No. 605,678

Int. Cl.² B43L 13/02

U.S. Cl. 33—44

10 Claims



1. A tool for use in drawing parallel horizontal lines on a chalkboard or the like, including, in combination:

- a staff means including spaced apart major surfaces and a plurality of selectively spaced passages extending between said major surfaces for receiving marker pens or the like substantially perpendicular to said major surfaces, whereby a marker pen will contact said chalkboard as one of said major surfaces leans theretoward;
- slide means rigidly coupled to one end of said staff means and having a lower edge adapted for sliding in a chalkboard tray, wherein said slide means and said staff means are secured one to another, by means of a vertical frame member which is secured at one end thereof to said slide means;
- said staff means slidably engaging said vertical frame member to allow for the adjustable positioning of said staff means relative to said frame member prior to drawing lines on a chalkboard;
- a vertical adjustment screw disposed through an opening in said frame member and threadably engaged to said staff means for raising or lowering said staff means prior to drawing lines on a chalkboard; and
- handle means rigidly coupled between a selected location on said slide means and a selected location on said staff means, whereby the simplicity of tool construction is achieved by maximizing the function of each of said staff means, said slide means, and said handle means.

4,008,523

DIGITAL ELECTRO-OPTICAL MICROMETER AND GAGES

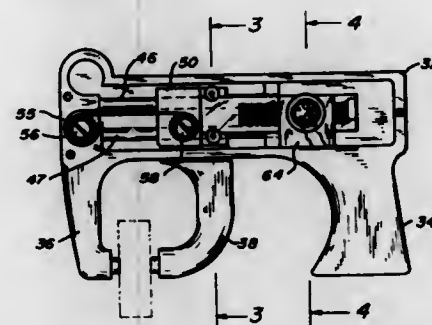
Geza von Voros, Glen Rock, N.J., assignor to Optograms, Inc., Oakland, N.J.

Continuation-in-part of Ser. No. 229,944, Feb. 28, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,272

Int. Cl.² G01B 11/04

U.S. Cl. 33—143 L

4 Claims



1. A digital electro-optical measuring micrometer in which the measurement is precisely determined and initiates electrical pulses fed to a digital readout, computer and the like, said micrometer including: (a) a U-shaped housing readily transportable to a point of measurement and within which all mechanically movable elements used to derive the precise measurement are self-contained, said housing further including a fixedly supported anvil; (b) a movable anvil carried by a precision guide means for movement toward and away from the fixedly supported anvil, said guide means disposed within the housing so that the movable anvil is precisely movable along a prescribed precision path and for a distance which is at least as great as the linear differential measurement capacity of the micrometer; (c) a constant force spring attached at one end to the housing and at the other end to the movable anvil so as to urge the movable anvil from a maximum open to a closed condition and toward and to the supported anvil and all intermediate positions therealong with an equal and selected force at all positions from and including the open and closed positions so that at the time of measurement the force applied by the moveable anvil is equal, consistent and predetermined; (d) an encoder containing a light source and a pair of photosensors and including a passageway therethrough for a linear scale-like interrupter member, the encoder carried by the housing; (e) a linear interrupter member carried by and precisely moved in said passageway with the movement of the movable anvil against and with the bias of the constant force spring, said interrupter member having a sequence of a multiplicity of precisely equally spaced lines disposed thereon; (f) said light source and photosensors being positioned so that the lines of the interrupter member interrupt the beam of light as the interrupter member is moved, said interruptions as read by the photosensors being converted to electrical pulse signals; (g) a dash pot having a piston movable therein, said piston being movable by and with the movement of the movable anvil in association with said constant force spring for establishing means for regulating the maximum speed of travel of the interrupter member and the movable anvil to establish a sufficiently slow rate of movement of the interrupter member whereat and whereby each and every interruption of the beam of light is distinctly read by the photosensors to insure that each and every line of the interrupter member as it interrupts the beam of light converts said interruption to an electrical pulse signal; (h) said pair of photosensors being optically aligned so as to produce substantially simultaneously phase-shifted waves and pulses each time a line interruption occurs and to feed this information to a discriminator circuit which ascertains the direction of travel at that instant, and (i) a digital counter and readout adapted to receive said electrical signals and convert said pulse signals to information which is fed to converting apparatus such as a computer, memory, indicia display and the like with said information corresponding to the precise linear movement of the movable member.

4,008,524

GROWTH MEASURING SCALE

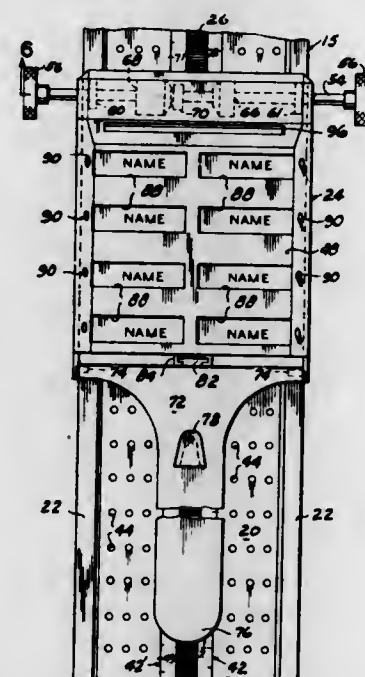
Cloy L. Allen, P. O. Box 224, Wingate, Tex. 79566

Filed Feb. 20, 1976, Ser. No. 659,887

Int. Cl.² G01B 5/02, 3/20

U.S. Cl. 33—169 R

7 Claims



1. A growth measuring scale, comprising:
- elongated rigid panel means adapted to be vertically secured to a wall surface;
 - said panel means having spaced-apart rails forming a pair of coextensive tracks;
 - a primary rack coextensive with and secured to said panel means between said tracks;
 - indicia indicating units of measurement extending longitudinally along said panel means on opposite sides of said rack;
 - a head member having track engaging walls vertically slidable along said tracks;
 - manually rotatable control shaft means extending transversely through said head member and engageable with said primary rack for moving said head member relative to said panel means; and,
 - a head bar pivotally connected, at one end, with said head member for vertical pivoting movement of its other end portion about a horizontal axis toward and away from said panel means for determining the position of the lowermost limit of said head bar with respect to said indicia when the head bar is horizontally disposed.

4,008,525

APPARATUS FOR PROCESSING WARE

Anthony T. Zappia, Carmel, Ind., assignor to Ball Brothers Service Corporation, Muncie, Ind.

Filed Apr. 19, 1976, Ser. No. 678,252

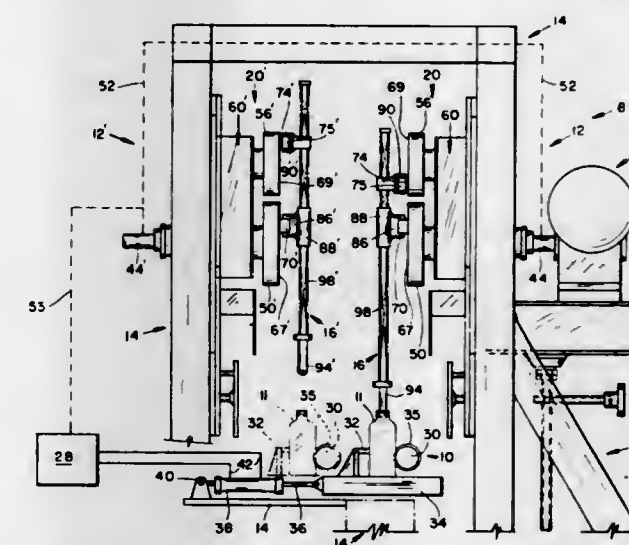
Int. Cl.² G01B 3/46

U.S. Cl. 33—174 L

9 Claims

1. An apparatus for testing ware comprising a testing station and means for conveying ware past said station, said conveying means defining a conveying path, said testing station including a first test member and first means for moving said first test member from a starting position toward said conveying path to engage ware, along the path in the direction of movement of the ware, away from the path to disengage the ware, and then to return to said starting point, said first moving means comprising first and second cranks spaced apart along said conveyor path with their axes parallel and extending transversely to said path, each said crank having a radially displaced crank pin extending axially outwardly therefrom, an orbital link having opposite ends supported respectively on said crank pins, means for mounting said first test member on

said link for movement thereon toward and away from said conveyor path, a third crank having an axis parallel to said first and second crank axes and having a third radially displaced crank pin extending axially therefrom, means for connecting said first test member to said third crank pin, and first means for synchronously driving said cranks, said first synchronous drive means comprises an endless flexible means trained about said first, second and third cranks said first,



4,008,526

OPENABLE CURVILINEAR OPENINGS OF DIFFERENT GEOMETRICAL SHAPES

James B. Swett, Barrington, and Harold P. Ashton, Providence, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.

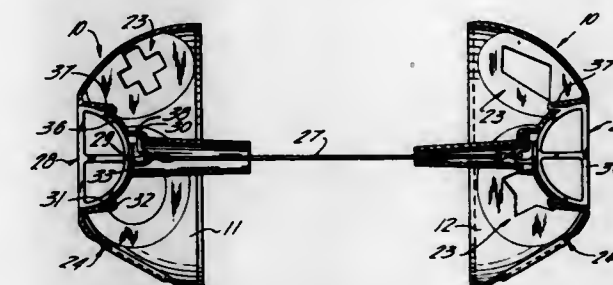
Continuation of Ser. No. 752,025, Aug. 12, 1968, abandoned.

This application Oct. 2, 1972, Ser. No. 297,585

Int. Cl.² G09B 19/00

U.S. Cl. 35—22 A

3 Claims



1. A toy adapted for the introduction into and storage therein of individual block members and comprising an enclosed hollow body member having curvilinear surface portions and a plurality of plane defining portions adjacent one another, said plane defining portions being adapted to maintain said toy in stable resting positions on any suitable supporting surface and further having openings of different geometrical shapes formed therein communicating with the interior of said hollow body member, each of which is adapted only to accommodate the passage therethrough of a said block member which is of the geometrical shape corresponding thereto, and additional means to gain access to the interior of said hollow body for removing said block members therefrom.

4,008,527

EDUCATIONAL ACCOUNTING DEVICE

Snyder M. Zegel, 108 Monell Ave., Islip, N.Y. 11751
Continuation-in-part of Ser. No. 462,439, April 19, 1974, Pat.
No. 3,889,395. This application Apr. 2, 1975, Ser. No.
564,458

The portion of the term of this patent subsequent to June 17,
1993, has been disclaimed.
Int. Cl.² G09B 19/18

U.S. Cl. 35—24 R

3 Claims



1. A transaction card adapted for use with an educational accounting device comprising: a flat rectangular body having an upper and a lower portion and bearing accounting indicia on the face thereof; a pair of adjacent disks rotatably attached to said upper portion and protruding slightly from the top edge of said body; a sight window on the face of said body in proximity to said top edge; each disk having a circular series of numerals from 0 through 9 appearing thereon whereby each disk may be conveniently turned by the fingers and thereby selectively display one numeral from each disk through said sight window; and, the numerical value displayed through said window together with said accounting indicia representing a part of an accounting entry.

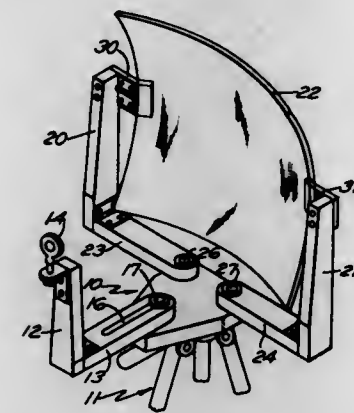
4,008,528

DRAWING APPARATUS

Richard A. Caulfield, 5 Connors Ave., Westerly, R.I. 02891
Filed Mar. 22, 1976, Ser. No. 669,148
Int. Cl.² G09B 11/06, 11/10

U.S. Cl. 35—26

4 Claims



1. A drawing apparatus comprising an eyepiece, a marking surface through which the scene to be drawn may be viewed, said marking surface being arcuate and substantially equally distant at all areas from said eyepiece, mounting means for holding said eyepiece and marking surface in fixed relation for aiming at the scene to be produced on said marking surface.

4,008,529

TEACHING APPARATUS AND METHOD

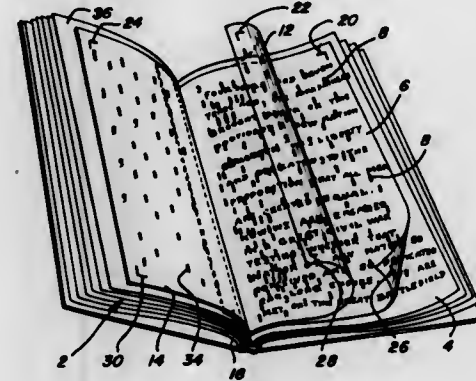
Neil Yorkston, 21 Liskeard Gardens, Blackheath, London SE3
OPE, England
Continuation of Ser. No. 509,461, Sept. 26, 1974, abandoned.
This application Nov. 7, 1975, Ser. No. 629,832
Int. Cl.² G09B 17/00

U.S. Cl. 35—35 E

12 Claims

1. A visual display apparatus for use in controlling the observable information content of an arbitrarily selectable page of written material bearing intelligible indicia of one visual characteristic disposed on a background of a distinguishable second visual characteristic comprising:

a plurality of transparent sheets adapted to overlie the page of written material in an arbitrarily selectable position relative to said page and removable therefrom, each of said sheets containing a field of opaque blots spaced irregularly relative to said written material, the area of said sheet containing said field being otherwise substantially transparent, said blots on each sheet being disposed to obscure a plurality of portions of the written material, said portions being small relative to said written material,



said blots on each sheet being arranged in relation to the opaque blots on others of said sheets to obscure different portions of the written material and progressively obscure a greater amount of said written material as additional ones of said sheets are placed over said page; and means separable from said page and attached to each of said plurality of transparent sheets adjacent an edge portion thereof to permit said transparent sheets to be disposed in overlying relationship and to maintain said sheets in registry.

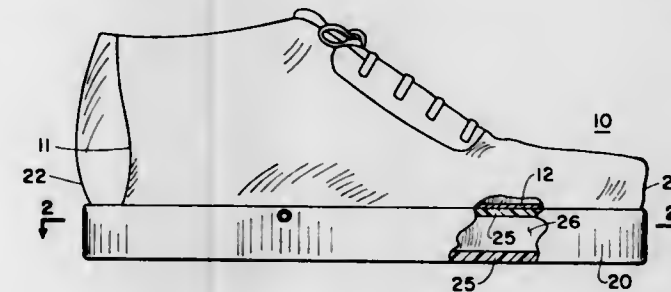
4,008,530

INFLATABLE SOLE SHOE

Dennis J. Gager, Medford, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Jan. 5, 1976, Ser. No. 646,614
Int. Cl.² A43B 13/18

U.S. Cl. 36—28

1 Claim



1. An orthopedic inflatable shoe, formed with a first inflatable sole section and a second inflatable inner sole section, with each of said sole sections individually fitted with valves for independent inflation of each said section by a fluid under pressure, each said inflatable section formed of a top wall, and a bottom wall joined continuously together by a side wall, with the first inflatable sole section shaped so that in the inflated condition, the upper wall is generally flat and the bottom wall extends from the said upper wall by a greater distance at the front portion of the sole section than at the rear portion of the sole section, and with the second inflatable section shaped so that in the inflated condition, the bottom wall is generally flat and the top wall is formed as a convex arcuate surface extending along the longitudinal axis of the said second sole.

4,008,531

PROTECTIVE FOOTWEAR

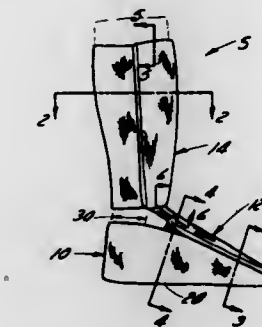
Tibor Schonbrun, Montreal, and Victor Tremblay, Laval, both of Canada, assignors to Genesport Industries Limited, Montreal, Canada

Filed Mar. 4, 1976, Ser. No. 663,749

Int. Cl.² A43B 00/00; A41D 17/00

U.S. Cl. 36—106

11 Claims



1. A protective device adapted to protect the foot and shin area of a person, said device comprising a first member adapted to fit about the heel area, a second member adapted to cover the top portion of the foot, and a third member covering at least a portion of the shin area, said three members being secured together to form a composite structure, each of said members being formed of a core of protective material and a covering thereabout, each of said coverings having at least one flange situated along an edge of said members, said members being secured together by means of said flanges.

4,008,532

SKI BOOT

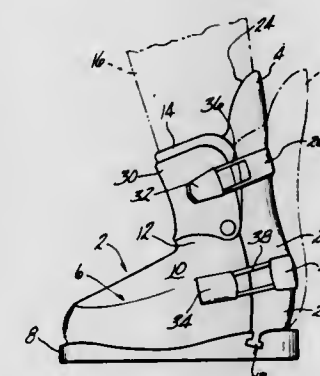
Lawrence Layton Kilbourn, Middletown, Conn., and Robert Brunkhorst, Nashua, N.H., assignors to Olin Corporation, New Haven, Conn.

Filed July 12, 1976, Ser. No. 704,213

Int. Cl.² A43B 5/04

U.S. Cl. 36—120

4 Claims



1. In a ski boot of the rear or modified top entry variety which includes a plastic shell having a forward part and a rearward part hingedly connected together, a hinge structure comprising: a projection formed in one piece with and of the same material as one of said boot parts, said projection having a major dimension which extends transversely of the boot and said projection having a basal stem part of restricted thickness, when measured perpendicularly to said major dimension, merging with a terminal head part of expanded thickness, when measured perpendicularly to said major dimension; and a groove in the other of said parts, said groove extending transversely of the boot and having an open mouth of restricted dimension through which said stem extends, and an enlarged bottom part in which said head is disposed, said mouth being sufficiently restricted to prevent said head from being passed therethrough in a direction to disconnect said one boot part from said other boot part.

4,008,533

PRICE MARKER

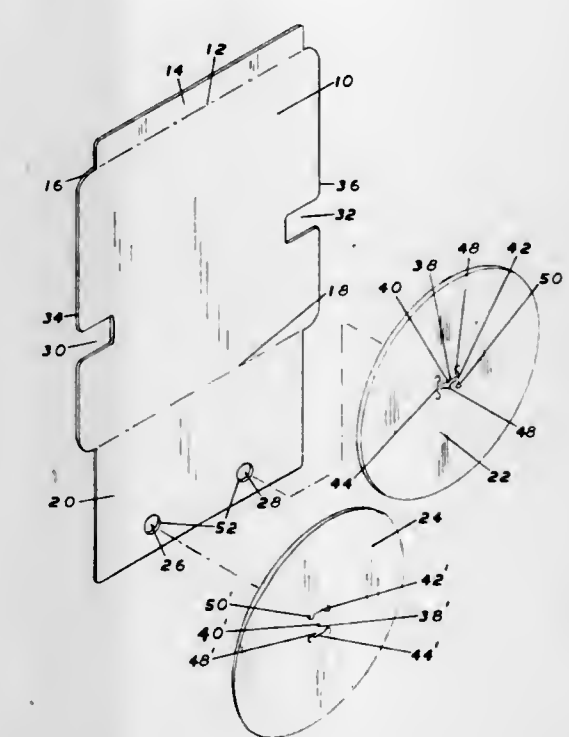
William Greenberger, White Plains, N.Y., assignor to The Hopp Press, Inc., New York, N.Y.

Filed Mar. 12, 1976, Ser. No. 666,249

Int. Cl.² G09F 11/04

U.S. Cl. 40—70 R

1 Claim



1. A changeable price marker, which comprises; a first sheet having an aperture therein; a circular second sheet having

1. a primary first slit therein beginning at a first point and terminating at a second point, each of said points being at a position on said second sheet apart from the peripheral edge thereof, the distance between said first and second points being greater than the largest dimension of said aperture;

2. a secondary second slit transverse to said first slit, traversing said first point, originating and terminating at third and fourth points, respectively, said third and fourth points being at positions apart from the peripheral edge of said second sheet;

3. a secondary third slit transverse to said first slit, traversing said second point, originating and terminating at fifth and sixth points, respectively, said fifth and sixth points being at positions spaced apart from the peripheral edge of said second sheet;

4. tertiary fourth, fifth, sixth and seventh slits originating at points third, fourth, fifth and sixth, respectively, and extending at an obtuse angle to the respective secondary slits, a distance sufficient to form tabs defined by said fourth, fifth, sixth and seventh slits, respectively, together with the adjacent portions of said primary slit and said secondary slits;

said first and second sheets being interconnected by superimposing said second sheet over said first sheet, aligning the mid-point of said primary first slit with the center of said aperture and pressing said tabs through said aperture;

whereby said interconnection permits rotary movement between said first and second sheets;

said second sheet having printed on a planar surface pricing indicia; and a portion of said first sheet foldable over said second sheet, a cutout section of said portion exposing said pricing indicia to view.

4,008,534

ROTATING DISPLAY WITH BLACK LIGHT ILLUMINATION

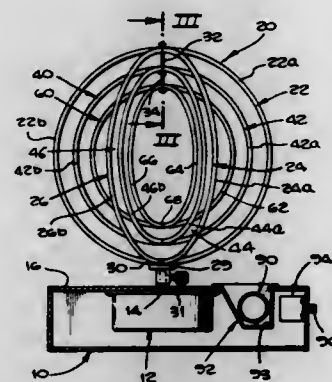
Gordon P. Swartz, 22945-A Nadine Circle, Torrance, Calif. 90505

Filed Sept. 22, 1975, Ser. No. 615,551

Int. Cl.² G09F 13/34

U.S. Cl. 40—106.52

10 Claims

**1. A dynamic display comprising:**

- a first display member having a central axis terminating at upper and lower poles and comprising a plurality of elongated display elements each extending from one pole to the other and, therebetween, being spaced radially outwardly from said axis and angularly from one another;
- a second display member disposed within said first display member and having a central axis shorter than the first named axis terminating in upper and lower poles, said second display member comprising a plurality of elongated display elements each extending from one of said second named poles to the other and, therebetween, being spaced radially outwardly from said second axis and angularly from one another;
- a thin elongated flexible support element fixed at one end to the upper pole of the first display member and at its other end being supportingly attached to the upper pole of the second display member;
- and means for rotating said first display member about its axis.

4,008,535

WRITING INSTRUMENT TOP

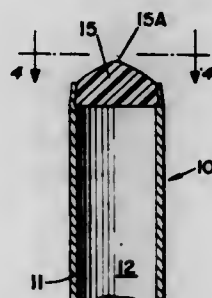
Olof Verner Anderson, North Kingstown, R.I., assignor to Anson Incorporated, Providence and Providence Plantations, R.I.

Filed June 17, 1974, Ser. No. 480,005

Int. Cl.² G09F 3/00

U.S. Cl. 40—334

4 Claims



- 1. A writing instrument top consisting of a hollow tube having a wall and an axial passageway, the thickness of said wall being a selected unit of measure, a counterbore in said wall located in one end of said hollow tube having a depth equal to three times the selected unit of measure, and having a diameter to provide a shelf in said wall with a width, one half the selected unit of measure, an ornament having a bottom and a side provided with an approximate 5° taper from said

bottom upward, said ornament being adapted to be inserted into said axial passageway with said bottom engaging said shelf, and spinning said wall against said tapered side to secure said ornament in said counterbore through engagement of said wall with said approximate 5° tapered side.

4,008,536

DETACHABLE GUN SIGHT MOUNTS

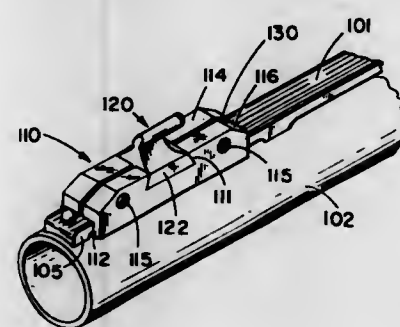
Jean M. Adams, P.O. Box 193, Neenah, Wis. 54956

Filed Mar. 10, 1975, Ser. No. 557,054

Int. Cl.² F41G 1/46

U.S. Cl. 42—1 S

13 Claims



- 1. A readily detachable gun sight mount which cooperates with a second gun sight mount of similar construction to provide a conventional shotgun with a mounting means for mounting a pair of rifle-like sights to said shotgun without the need for modification of the shotgun barrel or its associated structures and said gun sight mount having a body comprising:
 - a. an upper sight mounting portion formed to mount a gun sight,
 - b. a lower noncircumferential clamping portion for clampingly attaching said gun sight mount to an existing longitudinal gun barrel structure,
 - c. at least one portion of said gun sight mount having formed thereto an indexing means and an engaging means for mechanically engaging with and indexing to a gun barrel structure, and
 - d. fastening means for maintaining said gun sight mount in clamping attachment with said gun barrel structure, and wherein said body comprises two body members; a first body member, and a second body member, and the lower portions of said body members are configured so that when said first body member is assembled with said second body member said lower portions combine to form a longitudinal groove which conforms to the geometries of a longitudinal segment of a gun barrel structure and said longitudinal groove is configured to embrace more than 60% but less than 100% of said longitudinal segment of said gun barrel structure.

4,008,537

MODIFICATION OF RIFLE ADAPTER ASSEMBLY TO PREVENT DOUBLING

Ronald E. Elbe, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,154

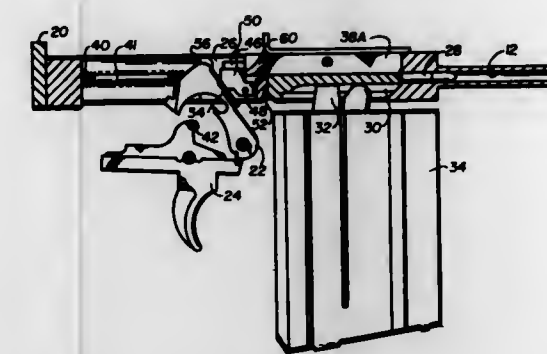
Int. Cl.² F41C 11/00, 21/10

U.S. Cl. 42—16

9 Claims

- 1. A conversion unit for a rifle bolt for a rifle having a hammer, and a firing pin on the rifle bolt, said unit being used to prevent doubling by insuring that the rifle hammer is cocked upon recoil of the rifle bolt before chambering a subsequent round upon counterrecoil of the bolt, said conversion unit comprising:
 - a bolt extension block affixed to the aft end of said bolt, said block having an extended hammer cocking surface for engaging said hammer during recoil, and

an extension movably mounted on said block for transmitting



ting striking force from said hammer to the firing pin on said bolt.

4,008,538

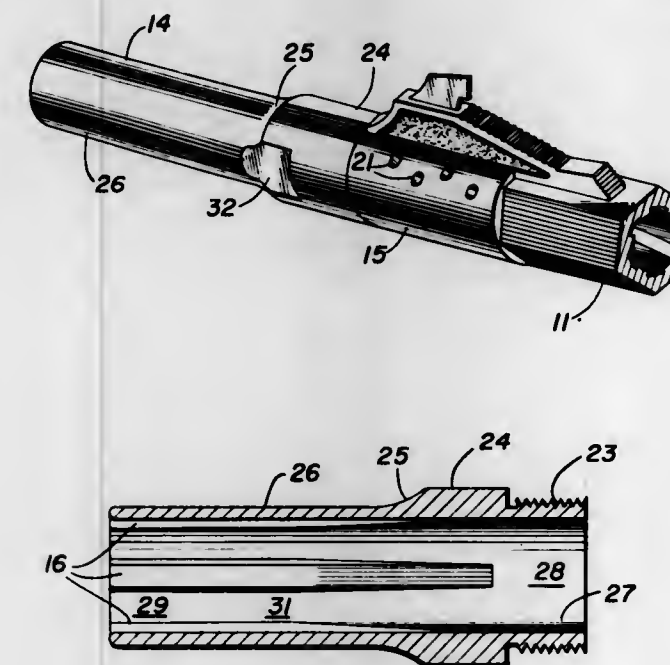
GUN

Warren A. Center, Laurel Road, Westminster, Mass. 01473
Continuation of Ser. No. 405,021, Oct. 10, 1973, abandoned, which is a continuation of Ser. No. 235,617, March 17, 1972, abandoned, which is a continuation of Ser. No. 869,135, Oct. 24, 1969, abandoned. This application Mar. 14, 1975, Ser. No. 558,467

Int. Cl.² F41C 21/00

U.S. Cl. 42—78

3 Claims



1. A gun for use alternately with a shotgun shell and a bullet, comprising:

- a. a barrel having spiraled rifling, an axial bore, and a muzzle at an end of the barrel,
- b. a first tubular integral element attachable to the muzzle of the barrel and having a first end and a second end, the inner surface of the element being formed with longitudinally-extending vanes to remove spiral motion from shot to prevent it from spreading as it leaves the gun, the inner surface of the tubular element consisting of a cylindrical bore extending entirely therethrough and coaxial with the bore of the barrel, the tubular element consisting of a first portion located adjacent the first end of the element adjacent the muzzle and having no vanes, and a second portion located adjacent the second end of the element having vanes which extend inwardly a substantial distance, thereby defining a cylinder coaxial with and having a smaller diameter than the bore of the barrel, and a third portion between the other two portions having parts of the vanes which increase smoothly in a radial extent from

a zero radial extent at the first portion to the full radial extent at the second portion while the bore remains the same size, the second and third portions extending substantially the same substantial axial distance, and
c. a second tubular element provided with gas vents interposed between the muzzle of the barrel and the first-mentioned first tubular element, the outer end of the second tubular element being provided with internal threads and the first tubular element being provided at the said first end with cooperating external threads, the first tubular element being provided with flat wrench-engaging surfaces.

4,008,539

NOISE MAKING SLIP SINKER

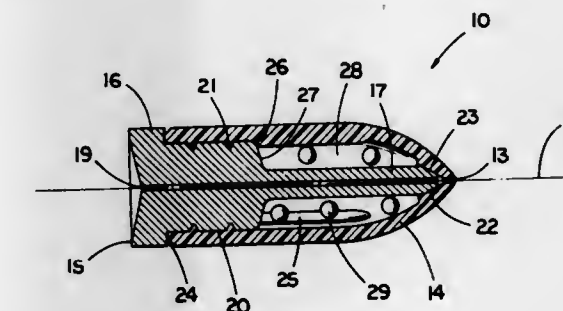
Jeffrey O. Gardner, R.R. 5, Box 492, Newburgh, Ind. 47630

Filed Nov. 5, 1975, Ser. No. 628,892

Int. Cl.² A01K 85/00, 95/00

U.S. Cl. 43—42.31

8 Claims

**1. A slip sinker which comprises:**

- a shell having a distal end defining an opening and having a proximal end defining an aperture;
- a guide plug having a plug portion which is sealingly received near the distal end of the shell and having a guide portion extending inside the shell from the plug portion to the proximal end of the shell, the guide portion having a proximal end which is sealingly received near the proximal end of the shell, the guide plug having a passageway extending therethrough from the plug portion to the proximal end of the guide portion, each end of the passageway being accessible from outside the shell, a chamber being defined by the interior wall of the shell, the guide portion and the plug portion;
- at least one noise-making object loosely held within the chamber; and
- the plug portion having a first surface sealingly received near the distal end of the shell, the first surface including a recess whereby a softened portion of the interior wall of the shell may be received for causing the guide plug to be firmly sealed with the shell.

4,008,540

INSULATED FISHING CREEL

Jerrold J. Brower, 319 W. Riverside Ave., Kellogg, Idaho 83837

Filed Nov. 13, 1975, Ser. No. 631,486

Int. Cl.² A01K 97/04

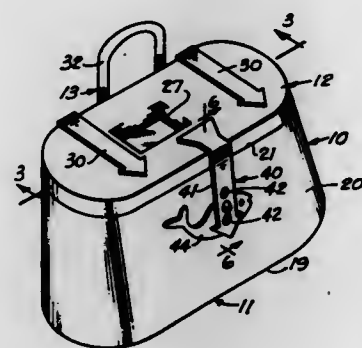
U.S. Cl. 43—55

7 Claims

1. An insulated fishing creel, comprising:

- an upwardly open container formed of heat insulating material and including upright side walls defining an open container top and joined together about a horizontal bottom wall;
- a container lid also formed of heat insulating material; integral flexible hinge and handle means for hingedly connecting the lid to the container to cover the container top and to provide a grip for holding the creel;
- said integral flexible hinge and handle means being attached to the exterior of one of the side walls and extending

upward along the side wall and over the container lid and attaching to the container lid;
an inwardly facing bead extending about an inner surface of the lid for releasable mating engagement with the side walls at the container top to selectively seal the container interior;



an opening formed through the lid;
an inwardly swinging hinged door mounted to an inside surface of the lid and overlapping the opening; and
biasing means for continuously urging the door to a closed condition.

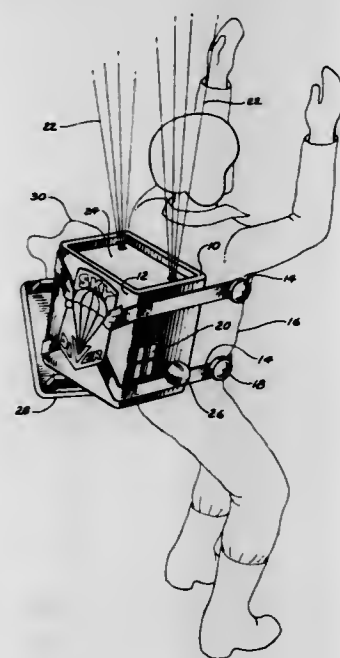
4,008,541 TOY PARACHUTE

Martin R. Russer, P.O. Box 5564, Santa Barbara, Calif. 93108
Filed July 28, 1975, Ser. No. 599,933

Int. Cl.² A63H 33/20

U.S. Cl. 46-86 R

10 Claims



1. A parachute toy including:
a container
a piston within the container
means to latch the piston within the container to provide a space for receiving a parachute and shroud lines;
a parachute attached to the container by shroud lines;
spring means to drive the piston within the container to eject the parachute and shroud lines from said space;
an air duct to vent air to the space vacated by the piston as it ejects the parachute to prevent vacuum retardation of the ejection action; and
means to release the latch means whereby upon being latched and loaded with the parachute, the toy may be actuated to eject the parachute.

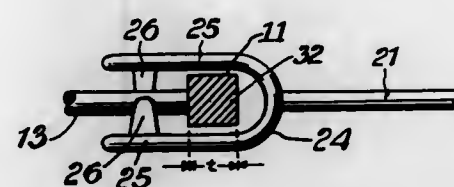
4,008,542 SOUNDING TRUNDLE AND HOOP

Chris J. Schneider, McAllen, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Dec. 29, 1975, Ser. No. 644,552

Int. Cl.² A63H 33/02

U.S. Cl. 46-220

1 Claim



1. A toy comprising a spoked wheel and a push-pull rod that may be employed to rotate the wheel in a reciprocal motion, said wheel being formed with a rim joined to a hub by a plurality of spokes,
said push-pull rod formed of a shaft fixed at one end to a U-shaped bracket of a size to fit about the wheel rim,
said U-shaped bracket formed of a mid-section joined to a pair of spaced legs generally parallel to each other and to the shaft and extending away from said shaft, with a flexible detent mounted to the inside of each leg of the bracket, each said detent located at a distance from the said bracket mid-section that is greater than the thickness of the rim of the said wheel so as to be in a position to engage a spoke of the said wheel when the bracket is fitted about the said rim, with
each detent extending from the attached leg by a distance greater than one-half the spacing between said legs, with the axes of said detents off-set from each other so that one detent overlaps the other detent, such that the wheel may be manipulated to roll or to stop rolling by manual use of the shaft with the bracket inserted about the wheel rim and with the detents momentarily engaged to the spokes of the wheel, as desired.

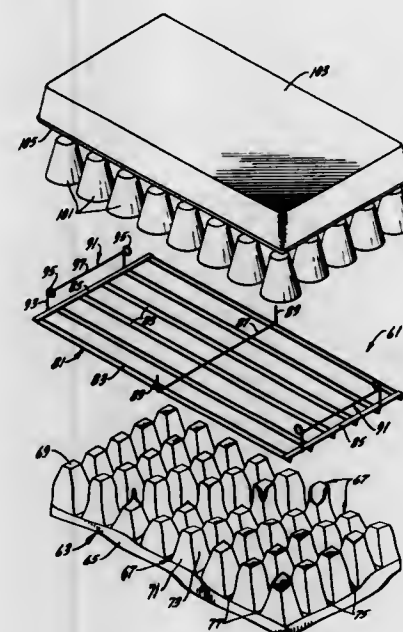
4,008,543 METHOD AND APPARATUS FOR POSITIONING DEFORMABLE POTS IN A PREDETERMINED ARRAY

Anton L. Vilt, R.R. No. 4, Box 356-D, Wilmington, Ill. 60481
Filed Feb. 2, 1976, Ser. No. 654,388

Int. Cl.² A47G 29/00

U.S. Cl. 47-1 A

18 Claims



1. An apparatus for use in positioning deformable pots in a predetermined pattern for insertion in a flat or like container, comprising:
a frame, including a rim defining a central opening and a

plurality of individual, upstanding pot supporting members arranged in a predetermined pattern filling said central opening, each pot supporting member engaging and supporting a single flexible pot to maintain a plurality of pots in a tightly packed array corresponding to said pattern,
and a release grate, including a member of release elements positioned between said frame and the pots positioned on said pot supporting members,
said release elements engaging all of said pots upon movement of said release grate away from said frame to thereby release said pots in unison from said supporting members.

by means of a shaft in such a way that their end portions are brought to the position flush with said knife edge and in contact therewith, a pointing plate, a belt material hold down roller is disposed on the top surface of said second flap, and furthermore, in said cutting and working unit section, an upper working unit and a lower working unit are disposed above and below said horizontal table, said upper working unit having a circular cutter for cutting the grinding belt material, a grinding wheel for skiving, and a shaving grinding belt for pointing the upper end surface of the grinding belt material, and said lower working unit having a shaving grinding belt for pointing the lower end surface of the grinding belt material which is being pinched between said second flap and said pointing plate.

4,008,544 PLASTIC PLANTING CONTAINER

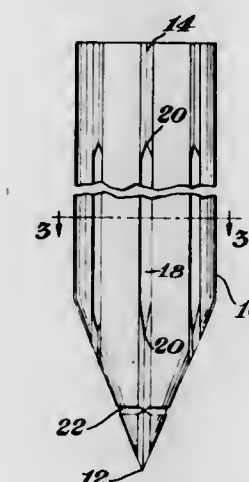
Walter E. F. Rupprecht; Eckel R. Lane, and Joseph W. Rakshys, Jr., all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 8, 1975, Ser. No. 611,287

Int. Cl.² A01G 9/02

U.S. Cl. 47-77

6 Claims



1. An elongated thermoplastic planting container having one end generally pointed and an opposite end open for receiving soil and seedling, said container formed with substantial orientation strength in its longitudinal direction and with a lack of substantial orientation strength in the transverse direction, and a plurality of openings extending longitudinally along the container sidewall to further weaken the container in said transverse direction.

1. An improved building construction including at least one first juncture, a fixed floor and a fixed ceiling, a pair of fixed walls joining said floor and ceiling and extending toward said juncture, means for permitting the alteration of the building's appearance both exteriorly and interiorly from one shape to another at the desire of the building's owner and for his psychological benefit utilizing essentially the same building materials within a relatively short and reduced period of time at minimum cost and expense to the owner while coordinating the altered appearance with the original architectural design, said means including a pair of movable wall portions, said movable wall portions meeting at said juncture and enclosing a first peripheral area of the building construction adjacent said juncture connecting means connecting said movable wall portions to said fixed walls at a locations spaced from the juncture and said movable wall portions being shiftable about said connecting means and being thus movable from a first position which encloses the first peripheral area to a second position so as to open and expose the first peripheral area to thereby change the enclosed space and accordingly alter the shape and appearance of the building.

4,008,545 MACHINE FOR PREWORKING OVERLAPPING ABRASIVE COATED BELT JOINT

Sakae Koide, Tokyo; Masatoshi Ishii, Inagi, and Yukiharu Yamamoto, Tokyo, all of Japan, assignors to Tajara Shoyei Kiko K.K., Tokyo, Japan

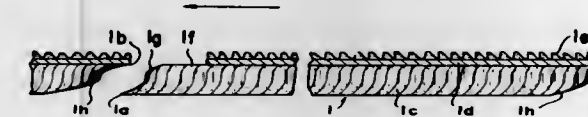
Filed Feb. 10, 1976, Ser. No. 656,801

Claims priority, application Japan, June 10, 1975, 50-70035

Int. Cl.² B24B 7/02; B32B 31/04

U.S. Cl. 51-5 C

1 Claim



1. A machine for preworking overlapping abrasive coated joint comprising an original roll unit section, a cutting and working unit section, and a slit unit section, wherein in said cutting and working unit section, a horizontal table (9) has a knife blade (21) attached to its forward end, first and second flaps swivelably mounted on said cutting and working section

4,008,547 IN-GROUND SWIMMING POOL

Frederick Katzman, 5 Stonewyck Drive, Belle Meade, N.J. 08502

Filed Aug. 11, 1975, Ser. No. 603,334

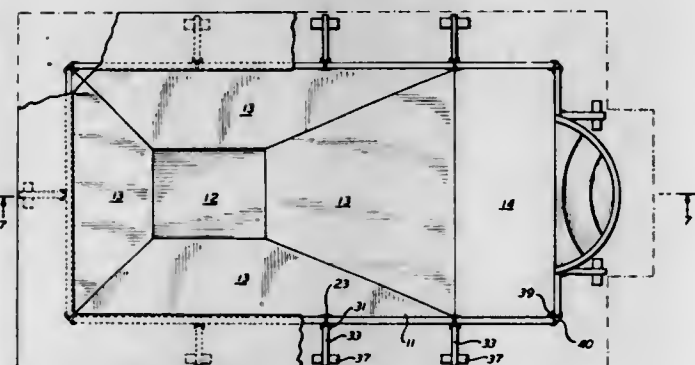
Int. Cl.² E04H 3/16

U.S. Cl. 52-169.7

1 Claim

1. A swimming pool construction comprising:
a. vertically disposed coplanar panels having a front and a back defining the wall of a swimming pool,
b. vertical edges of the panels in abutment with each other,
c. a first channel at the back of a pair of the panels at their vertical abutting edges,
d. a convex wall-joint attached to the first channel and covering the front of the pair of panels, at their vertical abutting edges, the wall-joint being convex with relation to the front of the pair of panels,

- e. means to attach together the first channel and the convex wall-joint to seize the pair of panels together, at their vertical edges,
- f. a generally triangular brace, having two side edges,
- g. one side edge of the triangular brace seated in and attached to the first channel,
- h. a second channel horizontally attached to at least a portion of the other side edge of the triangular brace,
- i. a support under the second channel,
- j. a third channel attached at the top of the panels,
- k. a deck member having an inner edge and an outer edge attached at its inner edge in the third channel,
- l. double-channel members, having a regular channel and an adjacent offset channel,
- m. regular channels of the double channel member attached to the bottom edges of the panels,



- n. regular channels of a double channel attached to an outer edge of a deck member,
- o. panels disposed vertically at an angle to each other defining a corner of a wall of a swimming pool,
- p. a corner-joint disposed vertically inside the corner of the wall,
- q. a bolt channel on the back of the corner-joint,
- r. a pair of arms on the corner joint, extending over the front portions of the panels which define a corner of the wall of the swimming pool,
- s. a corner back-up joint disposed vertically outside the corner of the wall of the swimming pool,
- t. a pair of flanges on the back of the corner back-up joint,
- u. the panels defining a pool wall corner having their vertical edges seated on the flanges,
- v. means to attach the corner-joint and the corner back-up joint together and to seize the panels, defining a corner.

4,008,548

PLAYING SURFACE

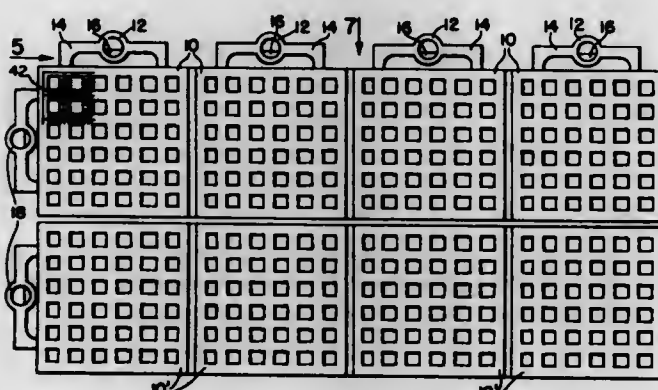
Raymond W. Leclerc, 1045 Oakhill Road, Fitchburg, Mass. 01420

Filed Sept. 24, 1975, Ser. No. 616,497

Int. Cl.² E04F 15/00

U.S. Cl. 52—180

4 Claims



1. A supplementary surface construction comprising a series of rectangular plastic molded one-piece strips, a plurality of apertures in each strip,

outstanding interlocking loops integral with each strip arranged along the long side edge thereof, each loop containing a straight edge snap over tooth, outstanding free-ended projections at the two opposite edges from said loops, each projection including a straight side snap over tooth complementary to and for cooperation with the teeth in the loops of the next succeeding strip, and a interlocking snap over loop integral with said strip at one end thereof for interlocking engagement with a projection on an extending strip, a plurality of supporting pins depending from the lower portion of said surface construction to support the same in elevated condition on a supporting floor or ground surface, said loops extending upwardly from the supporting floor only partially to the top surface of the construction and the projections extending substantially the full height of the construction, the loops extending outwardly laterally of the construction, the projections lying wholly within the area of the construction, each of said plastic one-piece molded strips comprising a plurality of generally rigid pieces serially connected in said strip, and flexible means for interconnecting adjacent of said generally rigid pieces in said strip and providing flexibility to said strip.

4,008,549

PANEL MOLDING SYSTEM

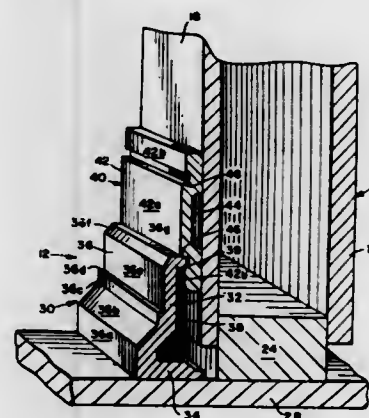
Michael J. Dobija, New Philadelphia, Ohio, assignor to Masonite Corporation, Chicago, Ill.

Filed Aug. 15, 1975, Ser. No. 605,025

Int. Cl.² E04F 19/02

U.S. Cl. 52—287

12 Claims



1. A panel molding system comprising, in combination; a first elongated molding member having an outer viewing face and an opposite back face adapted to confront in spaced apart relation a wall surface or the like, said first member having a longitudinally extending base portion along a lower edge of said faces having an inwardly extending support surface adapted to rest on a floor or surface at right angles to said wall surface, and including a longitudinally extending rib projecting oppositely away from said outer face toward said wall surface, and a second elongated molding member having an outer viewing face and an opposite back face adapted to confront said wall surface, said second member adapted to be spaced from said floor or right angle surface and having a longitudinally extending groove defined in said outer face thereof and spaced between upper and lower edges dimensioned to interlockingly receive at least a portion of said rib of said first member when placed in partially overlapping relation on said second member.

4,008,550

DEVICE FOR SETTING SOCKETS FOR SWIMMING POOL LADDERS

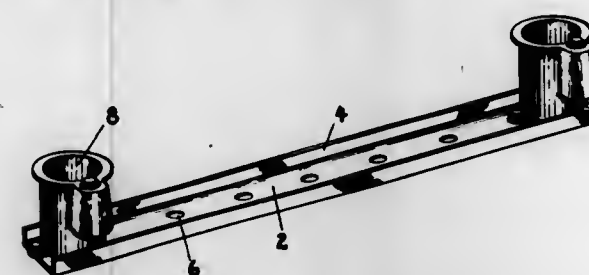
Samuel Kaufman, P.O. Box 1124, Hagerstown, Md. 21740

Filed Sept. 19, 1974, Ser. No. 507,608

Int. Cl.² E02D 27/00

U.S. Cl. 52—298

1 Claim



1. An arrangement for setting sockets for swimming pool ladders comprising an elongated channel member having two sockets carried thereby at the proper distance to receive the ends of a ladder, such channel member comprising a body portion having holes therein in an area outside the area of the sockets and having upwardly directed and inwardly bent longitudinal flanges, whereby, when deformed rods are driven through some of the holes and the channel is filled with grout, the unit is held firmly in proper position during the pouring and curing of the deck.

4,008,551

RELIEF PANEL AND METHOD OF MAKING SAME

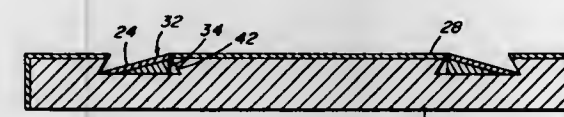
Edward J. MacDonald, 180 Border St., Scituate, Mass. 02066, and Kenneth A. MacDonald, 251 York St., Canton, Mass. 02021

Filed Apr. 4, 1975, Ser. No. 565,143

Int. Cl.² E04C 1/40

U.S. Cl. 52—316

9 Claims



4. A relief panel, comprising
 - a. a relatively thick one-piece core,
 - b. a relatively thin hard plastic veneer bonded to the outer surface of said core,
 - c. said panel being formed inwardly from the edges thereof with an elongated undercut groove of substantially constant width and depth in a predetermined pattern completely through said veneer and partially into said core,
 - d. an elongated hard plastic veneer strip of substantially constant width mounted over at least one exposed wall of said core groove, the outermost edge of said strip being in butting edge-to-edge contact with the edge of said veneer bordering said groove to form a substantially continuous veneer surface therewith.

4,008,552

WALL STRUCTURE AND ELEMENTS THEREFOR

Lawrence F. Biebuyck, Dallas, Tex., assignor to Howmet Corporation, New York, N.Y.

Continuation of Ser. No. 378,321, July 11, 1973, abandoned.

This application Mar. 21, 1975, Ser. No. 560,820

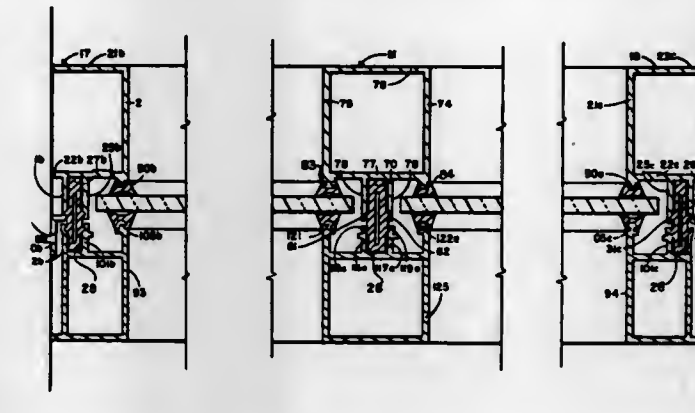
Int. Cl.² E04B 1/62; E04C 2/38

U.S. Cl. 52—397

5 Claims

1. A wall structure assembly including: a pair of frame members each having an elongate body, a first pair of longitudinal parallel flanges extending outwardly therefrom on a face of said body centrally of said face and a second pair of longitudinal parallel flanges extending outwardly therefrom on said face at the edges thereof; and a generally T-shaped joint clip for connecting one end of one of said members to the other of said members intermediate its ends to join said members in perpendicular relationship, said joint clip including a head portion connectible to said flange bearing face of said other of

said members outwardly of said first pair of parallel flanges thereon and inwardly of one of said second pair of parallel flanges thereon; and a rib portion extending perpendicularly from said head portion and telescopic between the first pair



of parallel flanges of said one of said members when said one end is positioned adjacent and perpendicular to said other of said members; and means for securing said rib portion to at least one of said flanges of said one of said members.

4,008,553

WALL PANEL STRUCTURE AND CONNECTING MEANS THEREFOR

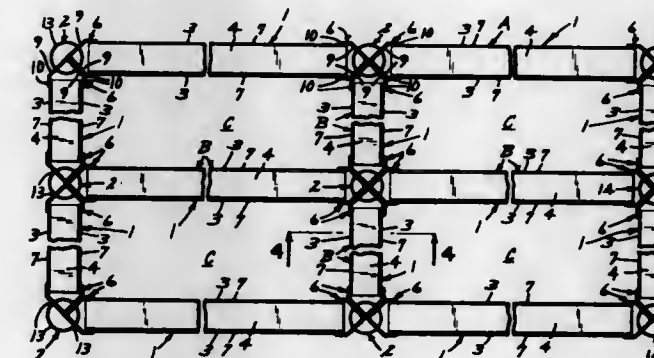
Wayne H. Oliver, 1305 Spring Valley Road, Minneapolis, Minn. 55422

Filed Apr. 19, 1976, Ser. No. 678,242

Int. Cl.² E04B 1/08; E04C 1/10

U.S. Cl. 52—584

10 Claims



1. Wall panel structure and connecting means comprising:
 - a. a generally rectangular panel having spaced parallel side walls, top and bottom edge walls and opposite end elements;
 - b. said edge walls being arranged to have interfitting engagement with edge walls of other similar panels disposed in edge wall abutting engagement with said panel;
 - c. said end elements each having opposite ends disposed adjacent respective ones of said edge walls;
 - d. each end element including a pair of flat sides the planes of which are angularly displaced from each other and from the planes of said side walls;
 - e. the sides of each end element having aligned slots extending longitudinally inwardly toward each other from said opposite ends of said end elements;
 - f. and tubular connectors for holding said end elements in end-to-end aligned relationship with the end elements of other similar panels when disposed in edge wall to edge wall abutting engagement with said panel;
 - g. each connector having pairs of aligned slots, the slots of each pair extending longitudinally inwardly toward each other from opposite ends of said connector and spaced apart from the slots of other pairs thereof about the periphery of said connector;
 - h. the slots in said end element sides and said connector each being arranged to receive portions of said connector and said end element sides, respectively, longitudinally inwardly of the slots thereof.

4,008,554

PACKAGING MACHINES AND METHODS OF PACKAGING ARTICLES

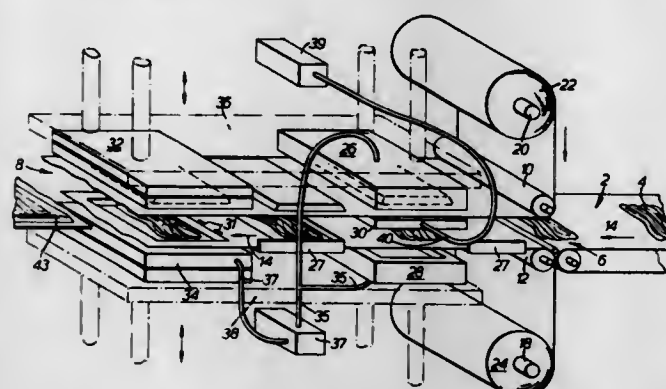
Peter D. Hardy, Welwyn Garden City, England, assignor to The Metal Box Limited, Reading, England
Filed Oct. 7, 1975, Ser. No. 620,268

Claims priority, application United Kingdom, Oct. 12, 1974, 44298/74

Int. Cl.² B65B 47/10

U.S. Cl. 53—30 R

13 Claims



1. A method of producing packs, comprising the steps of supporting a sheet of inelastically stretchable packing material generally horizontally, locating the intended contents of the packs in succession on the sheet, clamping the sheet peripherally of each region of the sheet material which supports the intended contents, applying differential pressure to each region to inelastically stretch the sheet in the downward direction to form an upwardly open pocket holding the said contents, superimposing a further sheet of material upon the first-mentioned sheet material to close the pocket, and bonding the further sheet to the first mentioned sheet of material peripherally of the said region to form a said pack.

4. A packaging machine for forming packs, comprising first guide means arranged for guiding a first web of a plastics or cellulosic material along a generally horizontal path from an inlet to an outlet, means for feeding the intended contents of said packs to said inlet onto successive regions of the upper surface of the web for transport along said path in longitudinally spaced relation, web clamping means mounted to clamp the web peripherally of the regions, web forming means mounted in relation to the web clamping means to stretch the clamped web inelastically in the downward direction by differential pressure with the intended contents thereon and thereby form upwardly open pockets having the intended contents received therein, second guide means to guide a second web of material over the first web, after the said stretching thereof, and sealing means effective upon the superimposed webs to seal the webs together peripherally of, and to close, the pockets.

4,008,555

APPARATUS FOR PILING ROD-SHAPED ARTICLES IN A CONTAINER

Koh Ainoya, Kiichi Arai, both of Tokyo; Akira Kato, Sanjo, and Michio Tanaka, Niigata, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation; Neo Filter Co., Ltd., both of Tokyo and Sanjo Machine Works Ltd., Minami-kanbara, all of Japan

Filed Aug. 11, 1975, Ser. No. 603,602

Claims priority, application Japan, Aug. 20, 1974, 49-094640

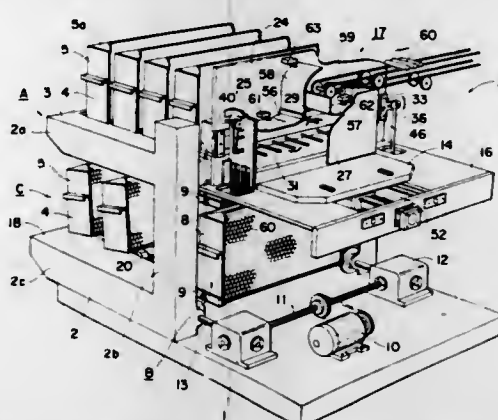
Int. Cl.² B65B 19/04, 19/12

U.S. Cl. 53—148

11 Claims

1. In an apparatus for piling up rod-shaped articles within a hopper means so that the articles are maintained in an orderly pile having a honeycombed configuration, the hopper means

including a bottom wall and a pair of upwardly projecting sidewalls between which said pile of articles is formed, means for supporting a container means disposed adjacent and vertically movable relative to said hopper means for receiving therein the articles which are piled within the hopper means, pushing means for transferring at least the lowermost row of articles from said hopper means into said container means, said pushing means including a pushing element movable transversely across the bottom wall for displacing at least the lowermost row of articles from said hopper means into said container means, and leveling means associated with the hopper means for distributing and leveling the rod-shaped articles within the hopper means, comprising the improvement wherein said hopper means includes adjusting means associated therewith for maintaining the lowermost rows of articles in an orderly pile after they have moved downwardly in the hopper means due to the lowermost row of articles being



pushed into said container means, said adjusting means including a pair of movable members provided adjacent the lower part of the hopper means and movable between an inner position wherein they protrude inwardly from the sidewalls of the hopper means and an outer position wherein they are spaced outwardly from said inner position, said movable members being engageable with the lowermost rows of articles within said pile when said members are in said inner position for holding said lowermost rows in an orderly fashion, means for moving said members between said inner and outer positions in a selected relationship with respect to the movement of said pusher means, said members being movable in a direction which is substantially perpendicular to the direction of movement of said lowermost row when it is displaced by said pusher means, said movable members having a nonlinear surface profile which extends in the vertical direction of the hopper means and defines adjacent projection means and recess means disposed for cooperation with a pair of vertically adjacent rows as disposed adjacent the bottom of said pile.

4,008,556

ISOLATED HARVESTER CUTTER BAR

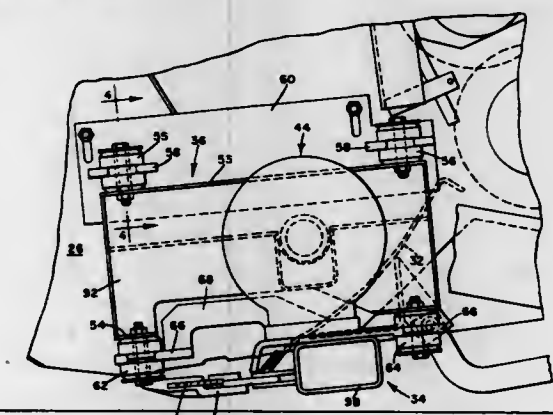
Edmund Lawrence Wegscheid, Milan, Ill., and Larry Wilson Cofer, Drakesville, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 19, 1976, Ser. No. 659,574

Int. Cl.² A01D 49/00

U.S. Cl. 56—12.6

12 Claims



1. In a harvesting machine having a mobile frame including a subframe with opposite lateral sides, the combination there-

with of an improved cutting apparatus and means for mounting the apparatus on the frame comprising: a cutter bar assembly extending between the opposite frame sides and including a transverse support member and a laterally reciprocating cutting element mounted on the support member and operative to sever crop material from the field as the machine advances; a pair of resilient mounting means operatively connecting the opposite ends of the cutter bar assembly to the opposite frame sides to at least partially isolate vibration of the cutter bar assembly from the frame; and drive means drivingly connected to the cutting element for reciprocating said cutting element.

4,008,557

TOPPING MECHANISM FOR SUGAR CANE HARVESTERS

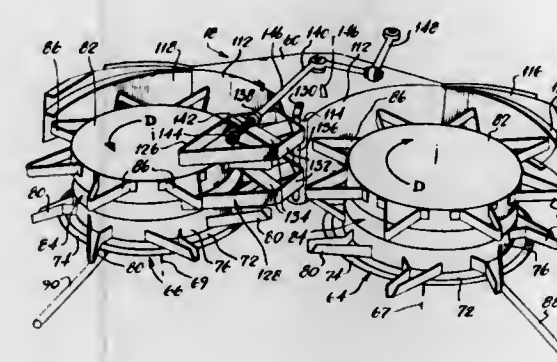
Keith Ruback, and Rolf Haines, both of Bundaberg, Australia, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Oct. 10, 1975, Ser. No. 621,273

Int. Cl.² A01D 45/02

U.S. Cl. 56—63

10 Claims



1. A topping mechanism for a sugar cane harvester including a main frame, attachment means on the main frame for attaching the topping mechanism to a sugar cane harvester, a right hand arm extending generally forward from the main frame, a left hand arm extending generally forward from the main frame, a right hand cutter mounted on the right hand arm for rotation about a generally vertical axis, a left hand cutter mounted on the left hand arm for rotation about a generally vertical axis, drive means for both cutters which drive the cutters in opposite directions so that adjacent portions of the two cutters move in a direction to pass sugar cane therebetween, a deflector member pivotally mounted on the main frame between the right hand arm and the left hand arm for deflecting sugar cane toward the right hand cutter, or for deflecting sugar cane toward the left hand cutter, and sugar cane gathering means for directing sugar cane toward the deflector member and the cutters.

4,008,558

ADJUSTABLE REEL FOR A HARVESTER PLATFORM

Roger Eugene Mott, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 2, 1975, Ser. No. 592,785

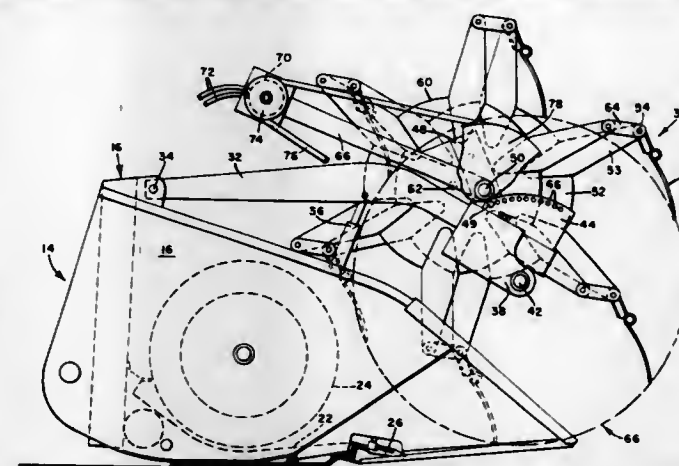
Int. Cl.² A01D 57/02

U.S. Cl. 56—226

10 Claims

1. A pickup reel for a transversely elongated harvesting platform having opposite sides comprising: a reel supporting structure mounted on the platform and including a pair of support elements respectively disposed at the opposite platform sides; a pair of adjustable elements respectively mounted on the support elements by coaxial transverse pivot means; locking means operative between the support elements and the adjustable elements for selectively locking the adjustable elements in alternate angular positions about said pivot means; a transverse shaft means rotatably supported on and

extending between the adjustable elements axially parallel to the pivot means; a plurality of radial members mounted on the shaft means; a plurality of axially transverse rockshafts journaled on the radial members equally offset and parallel to the shaft means axis and substantially spanning the width of the platform; a plurality of radial fingers mounted on each rockshaft and having outer tips; an eccentric rockshaft actuating means rotatably mounted on the adjustable elements axially



parallel to the shaft means the pivot means and operatively connected to the rockshafts to rock the rockshaft as the reel rotates so that the fingers maintain a relatively constant attitude relative to the ground, with the fingertips generating a cylinder that is generally coaxial with the pivot means, whereby changing the position of the adjustable elements changes the attitude of the fingers relative to the ground while maintaining a relatively constant position of the cylinder generated by the fingertips.

4,008,559

SAFETY DEFLECTOR ASSEMBLY FOR POWER LAWN DISCHARGE CHUTE

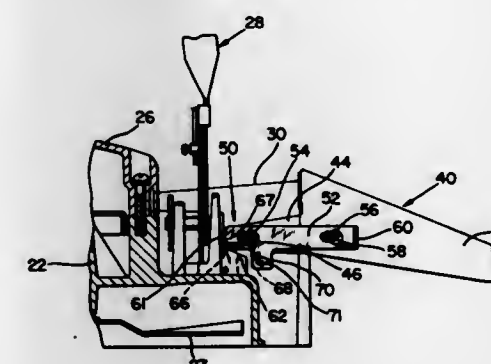
William Ralph Lessig, III, and Allen George Beares, both of Towson, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Feb. 26, 1974, Ser. No. 445,872

Int. Cl.² A01D 75/20

U.S. Cl. 56—320.2

8 Claims



1. A safety deflector assembly for a power lawn mower including a mower body provided with a discharge chute, comprising:

- a deflector including an arm extending from one edge thereof;
- a first pin for pivotally connecting said arm to the mower body to support said deflector for pivotal movement between a guard position located in the path of movement of material discharged from the discharge chute to deflect the material toward the ground and an unguard position out of the path of movement of the discharged material;
- a second pin mounted on said arm and spaced from said first pin;
- a lever including first and second spaced elongated slots for receiving said first and second pins, respectively, to slid-

ably support said lever on said arm for movement between a latching position in engagement with a stop on the mower body to latch said deflector in its guard position and a non-latching position out of engagement with the stop to allow said deflector to pivot from its guard position to its unguard position; and means normally biasing said deflector to its guard position and said lever to its latching position.

4,008,560

THREADING DEVICE FOR A FALSE-TWIST TEXTURING MACHINE WITHOUT UPPER STRUCTURE

Max Schnetzer, and Risto Merimäki, both of Wattwil, Switzerland, assignors to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

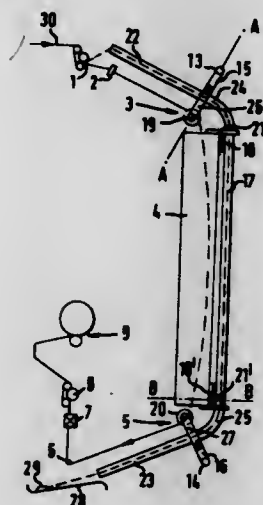
Filed Feb. 23, 1976, Ser. No. 660,279

Claims priority, application Switzerland, Mar. 7, 1975, 2893/75; Jan. 14, 1976, 362/76

Int. Cl.² D02G 1/02

U.S. Cl. 57—34 HS

7 Claims



1. In a false-twist texturing machine having an assembly comprising a vertically extending contact heating device for yarn travelling downwards therealong, a yarn input delivery device and first thread-guide means for delivering yarn to the upper end of said heating device, a yarn output delivery device, second thread-guide means and a false-twist imparting device for yarn from the lower end of said heating device to pass therethrough to said output delivery device and a wind-up device for winding up yarn received from said output delivery device, said heating device being on one side of the machine and said wind-up device on the opposite side of the machine; a threading device for said assembly comprising a channel guide extending along one side of said heating device from a location above said heating device to a second location beneath said heating device, said channel guide being shaped as a guide for a weight attached to one end of yarn extending from said input delivery device and falling under gravity there-through to said second location, and said channel guide having its open side constituted by a slot presented towards said heating device and towards said first and second thread-guide means whereby the yarn can pass into contact with said heating device and said first and second thread-guide means after being drawn through said channel guide by the weight.

4,008,561

OPEN-END SPINNING DEVICE

Gerhard Grau, Albershausen, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Germany

Filed Oct. 11, 1974, Ser. No. 514,086

Claims priority, application Germany, Oct. 11, 1973, 2351092

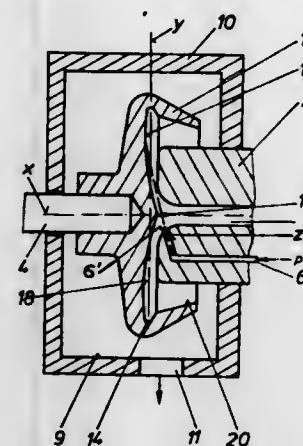
Int. Cl.² D01H 1/12, 1/100

U.S. Cl. 57—56

8 Claims

1. In an open-end spinning device which includes a spinning

rotor having an axis of rotation, a bottom face, a lateral sliding face conically widening toward the bottom face and intended for receiving fibers which have been fed into the spinning rotor and a fiber collecting groove located between the bottom face and the sliding face; and a blast air opening means having an axis disposed on a stationary part of the spinning device adjacent to an inner chamber of the spinning rotor for blowing fibers and foreign bodies from the fiber collecting groove to clean the same, the improvement comprising a



shallow, concave curve defining an inwardly curved portion of said bottom face of said spinning rotor between said axis of rotation of said spinning rotor and said fiber collecting groove, with the cross-section of said inwardly curved portion of said bottom face being constantly curved between said axis of rotation of said spinning rotor and said fiber collecting groove gradually changing into said fiber collecting groove, and with said axis of said blast air opening being directed generally tangentially onto said inwardly curved surface of said bottom face.

4,008,562

APPARATUS FOR SUPPLYING A STAPLE FIBER FORMATION TO A FIBER SEPARATING DEVICE OF AN OPEN-END SPINNING UNIT

Milos Vecera; Josef Skala, and Oldrich Tesar, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlarsky, Usti nad Orlici, Czechoslovakia

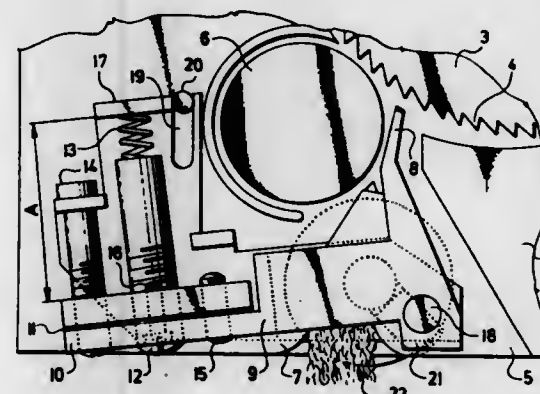
Filed June 12, 1975, Ser. No. 586,400

Claims priority, application Czechoslovakia, June 18, 1974, 4276/74

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.95

2 Claims



1. In an open-end spinning unit comprising an apparatus for supplying a staple fiber formation to a fiber separating device having a rotatable combing-out cylinder adapted to cooperate with a feed roller and with a pressure shoe mounted on a pivot shaft of said apparatus and biased toward said feed roller, the improvement which comprises, a swingably arranged link mounted on said pivot shaft, said pivot shaft being eccentric, the link being provided with a cutout and stop means, a stationary guide member on said apparatus adapted to be re-

ceived in the cutout thereby guiding and limiting the swingable movement of said link about said pivot shaft, an arm pivotally mounted on the pivot shaft and carrying the pressure shoe, and stop members mounted on said arm and coaxing with said stop means on said link to limit the movement and bias of said pressure shoe relative to said feed roller and said combing-out cylinder.

4,008,563

FALSE TWISTING DEVICE

Hans Gassner, Schweinfurt, and Manfred Kress, Grafenheinfeld, both of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

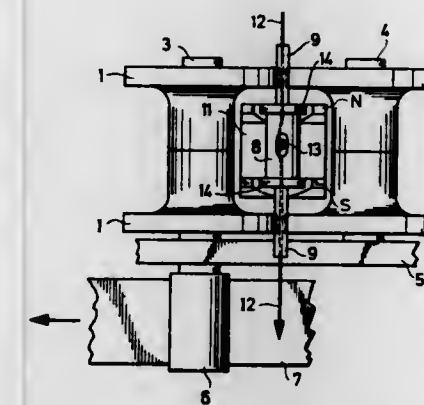
Filed June 17, 1975, Ser. No. 587,596

Claims priority, application Germany, June 20, 1974, 2429493

Int. Cl.² D02G 1/06; D01H 1/12, 1/20

U.S. Cl. 57—77.45

4 Claims



1. In an open end spinning or false twisting device having two parallel pairs of rollers for driving a spinning rotor or twisting tube disposed in the nip therebetween and a horseshoe-shaped magnet for retaining the twisting tube or rotor in the nip, said twisting tube or rotor having a pair of longitudinally spaced collars, the improvement wherein said magnet has north and south longitudinally spaced poles having a curved surface each disposed substantially concentrically about one of said collars over more than one-half of the periphery of the collar, at least one pole of the magnet having at least its surface facing in the direction in which the twisting tube or rotor tends to be displaced from its position by the pull of a thread passing axially therethrough beveled whereby upon axial displacement of the tube or rotor each collar still lies opposite the magnet at least at the base of its said curved surface.

4,008,564

LIQUID CRYSTAL DISPLAY DEVICE

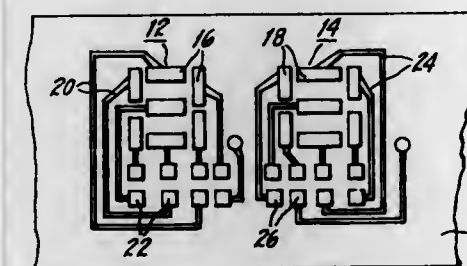
Nunzio A. Luce, 39 Galston Drive, R.D. No. 4, Trenton, N.J. 08691, and Louis A. Zanon, 13 Greentree Road, Mercerville, N.J. 08619

Filed June 9, 1972, Ser. No. 261,252

Int. Cl.² G04C 3/00; G04B 19/06; G02F 1/13

U.S. Cl. 58—23 R

3 Claims



1. A digital electronic watch comprises a liquid crystal display cell, a power supply, an oscillator and associated cir-

cuit elements, interconnected for operating said watch, including circuit elements for performing functions of dividing, counting, decoding, and increasing voltage, said liquid crystal display cell of said watch comprises a substrate having thin film segmented electrodes thereon forming numeric character patterns, a support plate having an electrode coating thereon spaced from said substrate by spacer means, an electro-optically active liquid crystal composition in said space between said electrodes of said substrate and support plate, thin film conducting leads on said substrate extending from said electrode segments, said conductive leads terminating on said substrate at a solderable circuit element mounting pad, said associated circuit elements being mounted on said mounting pads and means for sealing said liquid crystal cell, wherein said substrate, segmented electrodes and conductive leads are transparent and wherein said electrode on said support plate is a reflective metal film, said segmented electrodes and conductive leads comprising an indium oxide film.

4,008,565

TIMEPIECE HAVING AN OSCILLATING REGULATING MEMBER

Paul Vogt, Les Hauts-Geneveys, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

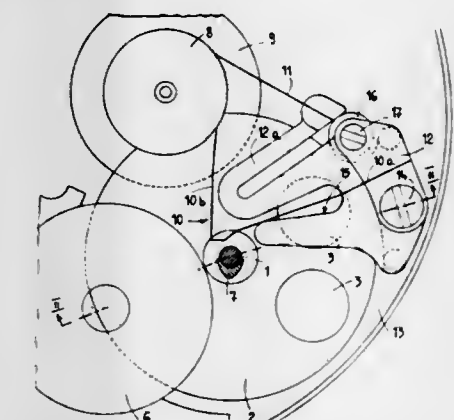
Filed Aug. 20, 1975, Ser. No. 606,120

Claims priority, application Switzerland, Sept. 6, 1974, 12130/74.

Int. Cl.² G04B 15/14; G04C 3/04

U.S. Cl. 58—28 D

4 Claims



1. A timepiece having a frame and having an oscillating regulating member, the oscillations of which are counted by means of a click counting mechanism including a ratchet wheel submitted to the action of a driving pawl and a retaining pawl, said click counting mechanism comprising: two metallic blades constituting respectively said driving pawl and said retaining pawl, said driving blade being bent at substantially a right angle forming two portions with an elbow therebetween and being secured to said frame by an end of one of its portions and cooperating by the opposite end of said portion, substantially at said elbow, with said oscillating regulating member, which member imparts a back and forth movement to said driving blade, a free end of the second portion of said driving blade cooperating with said ratchet wheel.

4,008,566

ELECTRONIC WATCH GENERATOR

Richard D. McClintock, 237 Washington Road, Woodbury, Conn. 06798

Filed Nov. 10, 1975, Ser. No. 630,200

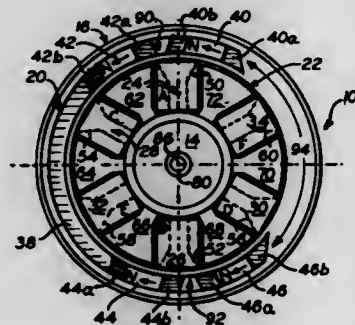
Int. Cl.² G04B 19/30; H01M 10/46

U.S. Cl. 58—50 R

17 Claims

1. An electronic timepiece having an electronically operated time display and a rechargeable storage means operatively connected to said display for supplying electrical power thereto, said timepiece comprising a stator comprised of a magnetically permeable material, said stator having a first coil of electrically conductive material disposed about said mag-

netically permeable material; a rotor rotatably mounted in said timepiece for free rotation about said stator, said rotor having a variable angle of inclination and comprising a pendulum having an offset weight distributed therein and a first magnet mounted therein for adjacent relative movement past said first stator coil during said free rotation of said rotor for inducing a voltage in said first stator coil as a result of said relative movement; and means operatively connecting said first stator coil to said rechargeable storage means for recharging said rechargeable storage means from said induced voltage; said first magnet magnetically latching said rotor against said free rotation with respect to said stator with a predetermined magnetic latching force until said rotor angle of inclination



tion is varied sufficiently from an initial position to enable gravity to initially overcome said magnetic latching force whereupon said rotor freely rotates about said stator from its initial magnetically latched position with an initial acceleration due to the rate of change of said angle of inclination until said movement decreases sufficiently to enable said magnetic latching force to again overcome said rotor and magnetically latch said rotor against further free rotation until said latching force is again overcome to reenable said free rotation, said induced voltage supplied to said rechargeable storage means as a result of said free rotation being dependent on the number of times said first magnet passes said first stator coil during said free rotation.

4,008,567

TORQUE CONTROL SYSTEM

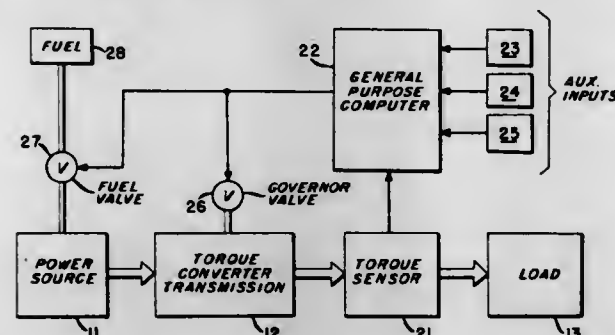
Joseph Hirsch, 4746 59th St., San Diego, Calif. 92115

Filed Apr. 28, 1975, Ser. No. 572,236

Int. Cl.² F02C 9/08

U.S. Cl. 60—39.28 P

13 Claims



1. A torque control system for effecting maximum economic utilization of motive energy comprising:

- a source of rotary motive power;
- operating means connected to said source of rotary motive power for selectively altering the operational characteristics thereof;
- load means having a rotary mechanical input for utilizing the rotary motive power supplied by said source of rotary motive power;
- transmission means connected between said source of rotary motive power and said load means for transferring the rotary motive power therebetween thereby establishing a rotary torque drive system for said load means;
- electromechanical, torque responsive transducer means attached to said load means at the rotary mechanical input thereof so as to be between said transmission means

and said load means for producing an electrical analog of the torque applied thereto;

- a source of electrical energy corresponding to the electrical analog signal representing the torque at a predetermined operational condition;
- an electrical circuit means connected to said electromechanical, torque-responsive transducer and to said source of electrical energy for comparison thereof for the generation of a control signal in response thereto; and
- electrical drive means connected to said electrical circuit means to receive said control signal therefrom and connected to said operating means for controlling the application of torque by the torque drive system in response to said control signal, whereby a predetermined torque may be applied to said load means.

4,008,568

COMBUSTOR SUPPORT

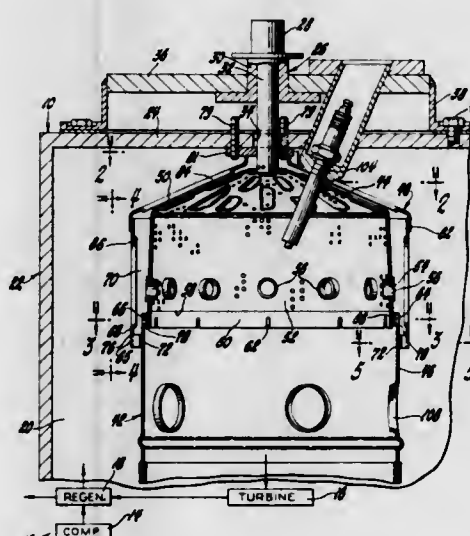
Esten W. Spears, Jr., Indianapolis, and Eugene R. Young, Plainfield, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1976, Ser. No. 662,434

Int. Cl.² F02C 3/00, 7/20

U.S. Cl. 60—39.32

2 Claims



1. A combustor support assembly for vertically supporting axially aligned combustor dome and liner segments on nozzle support pad comprising a spider support member having a top flange at one end thereof with a central opening adapted to receive a fuel distribution nozzle and a peripheral flange of the other end thereof, means on said top flange for fixedly securing it to the nozzle support pad, said spider support member having a plurality of circumferentially spaced radially outwardly formed spider arms extending from said top flange to said peripheral flange, an annular support plate having opposite ends thereon with one end thereof secured to said peripheral flange, a combustor liner having one end telescoped into the opposite end of said support plate in radially inward spaced relationship therewith, convoluted spacer elements interposed between said combustor liner and said support plate having circumferentially spaced segments thereon secured to said combustor liner and support plate and flex segments between said fixed segments for yieldably supporting said liner on said support plate, a dome of porous material located concentrically within said support plate and having an inclined top in spaced parallelism with said spider arms, means for supporting said dome on said one end of said liner for free axial and radial movement with respect to said spider support plate with said spider support plate assuming the full vertical weight of said liner and dome and said dome being unloaded vertically to reduce stress loading thereof.

4,008,569

GAS TURBINE ENGINE

Harry Wrighton Bennett, Duffield, England, assignor to Rolls-Royce (1971) Limited, London, England

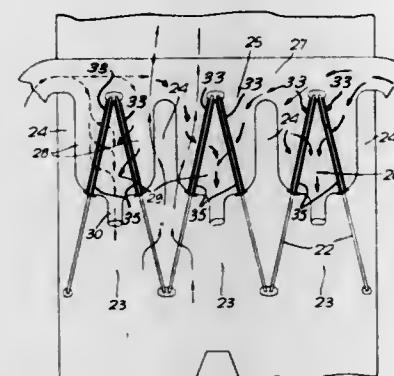
Filed Nov. 24, 1975, Ser. No. 634,754

Claims priority, application United Kingdom, Dec. 3, 1974, 52181/74

Int. Cl.² F02C 7/10; F23L 15/02

U.S. Cl. 60—39.51 H

8 Claims



1. A gas turbine engine comprising a compressor, combustion equipment and a turbine, the compressor and turbine being drivably interconnected, and a heat exchanger adapted to exchange heat between the compressor delivery air and the turbine exhaust, said heat exchanger comprising a plurality of rotatable regenerator discs whose axes are angled in alternate directions so that the discs define between them a plurality of wedge-shaped flow areas, drive means adapted to rotate the discs, first duct means adapted to allow turbine exhaust gases to flow into a first set of said flow areas, through at least part of each disc and through a second set of said flow areas, an exhaust nozzle connected to receive the turbine exhaust gases flowing through said second set of flow areas, and second duct means adapted to direct compressor delivery air to flow in contra-flow to, and separated from, the turbine exhaust gas through a segment of each disc and to said combustion equipment.

4,008,570

METHOD AND APPARATUS FOR PURIFYING EXHAUST GASES

Masanori Harada, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

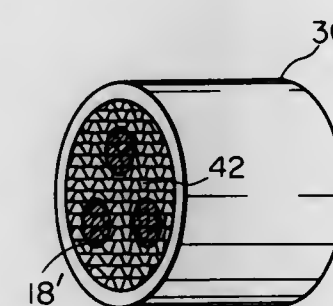
Continuation of Ser. No. 368,487, June 11, 1973, abandoned.

This application Apr. 8, 1975, Ser. No. 566,131

Int. Cl.² F01N 3/15

U.S. Cl. 60—299

5 Claims



1. An apparatus for purifying exhaust gases discharged from an internal combustion engine having an exhaust manifold, comprising:

- an exhaust gas pipe leading from said exhaust manifold to the atmosphere;
- a catalytic converter disposed in said exhaust gas pipe at a certain distance from the engine, said catalytic converter including a monolithic ceramic honeycomb cylinder which is formed with a thin wall structure and has a

upstream end and a downstream end, said honeycomb cylinder being separated into a catalytic portion which is formed with a plurality of thin walls carrying a catalytic material and a passage portion other than said catalytic portion which is formed with a plurality of thin walls carrying no catalytic material and integral with the thin walls of said catalytic portion, said catalytic portion extending through said honeycomb cylinder from the upstream to downstream ends thereof and serves as a catalytic reactor, said passage portion extending through said honeycomb cylinder from the upstream to downstream ends thereof and serving as a mere passage for allowing the exhaust gases to pass through said honeycomb cylinder; and

a thermal reactor disposed in said exhaust pipe downstream of said catalytic converter.

4,008,571

HYDRAULIC SYSTEM FOR ELECTRIC LIFT TRUCKS

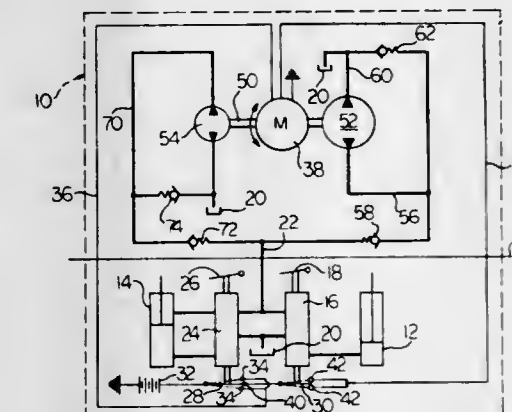
Dafydd Williams Evans, Euclid, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Mar. 31, 1976, Ser. No. 672,371

Int. Cl.² F15B 13/09

U.S. Cl. 60—423

11 Claims



1. An energy conserving hydraulic system, comprising: a hydraulic, work performing mechanism of the type having varying load requirements; valve means for controlling said mechanism; a first high volume hydraulic pump; a second low volume hydraulic pump; a reversible, bidirectional prime mover for simultaneously driving both said pumps; conduit means connecting said pumps to said valve means such that for one direction of drive of said prime mover, said first pump will deliver a high volume of hydraulic fluid to said valve means and for the other direction of drive said first pump will be unloaded and said second pump will deliver a low volume of hydraulic fluid to said valve means; and means for selecting the direction of drive of said prime mover.

4,008,572

TURBINE HOUSING

William E. Woolenweber, Jr., Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 25, 1975, Ser. No. 552,861

The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

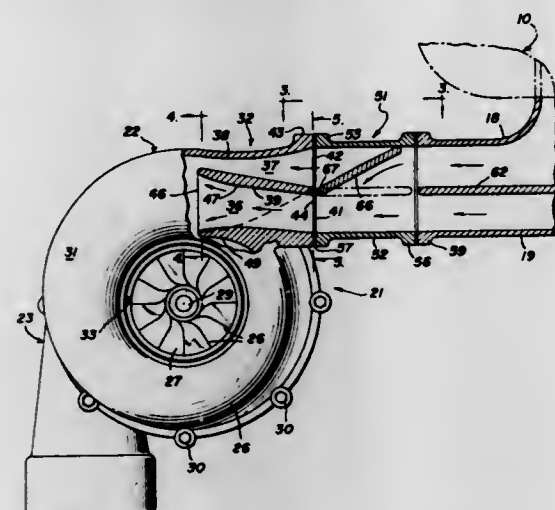
Int. Cl.² F02D 23/00

U.S. Cl. 60—602

15 Claims

1. A turbine housing for a centripetal flow turbine used with a driving fluid source which supplies varying volumes of said driving fluid, comprising means forming a first inlet passageway for receiving said fluid flow, a volute section formed from said first inlet passageway for discharging said fluid flow, means forming an additional inlet passageway for receiving

said fluid flow and defining an outlet for directing said fluid flow in a direction which is substantially parallel to the direction of flow through said first inlet passageway, said additional inlet passageway being contained within said first inlet passageway and being at least partially surrounded by said first inlet passageway as viewed in a plane generally normal with respect to the flow through said additional inlet passageway,



and valve means mounted adjacent the upstream ends of said inlet passageways, said valve means being adjustable from a first position where it directs all of said fluid flow through said additional inlet passageway, said additional inlet passageway being shaped to produce high velocity fluid flow in said volute section, to a second position where it allows said fluid flow through both of said passageways, and to positions intermediate between said first and second positions.

4,008,573

MOTIVE FLUIDS FOR EXTERNAL COMBUSTION ENGINES

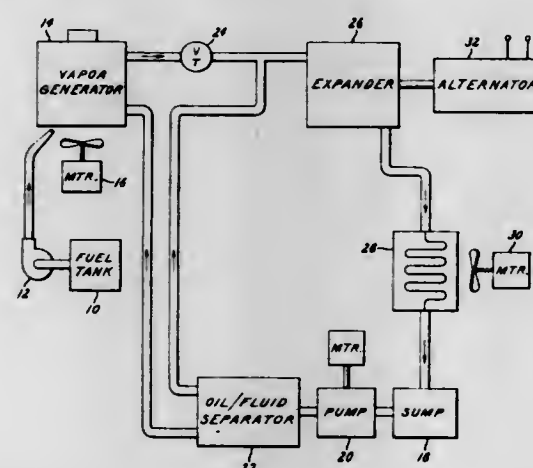
Vincent Carmen Petrillo, Springfield, Pa., assignor to General Electric Company, Fairfield, Conn.

Filed Dec. 9, 1975, Ser. No. 639,241

Int. Cl.² F01K 25/08

U.S. Cl. 60-651

2 Claims

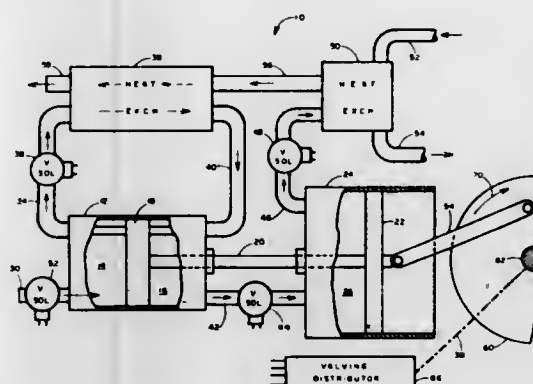


1. A method of converting heat energy to mechanical energy comprising:
vaporizing a fluid by passing it in heat exchange relationship with a heat source,
said fluid comprising in parts by volume:
ethyl alcohol: 45 to 45.5%
distilled water: 45 to 45.5%
pyridine: 9 to 10%
utilizing the energy of the vaporized fluid to perform work.

4,008,574
POWER PLANT WITH AIR WORKING FLUID
Charles R. Rein, 103 Carolyn Ave., Panama City, Fla. 32401
Filed Oct. 20, 1975, Ser. No. 623,880
Int. Cl.² F02G 1/02

U.S. Cl. 60-682

8 Claims



7. A thermal engine of the type wherein atmospheric air is inspired at first temperature and first pressure into a variable volume first chamber, displaced from the first chamber through a heat exchanger at a constant volume to a second variable volume second chamber at an elevated second temperature and elevated pressure, expanded to perform work in a variable volume third chamber, and exhausted from said third chamber as spent working fluid at an intermediate third temperature with respect to said first and said elevated second temperatures, said engine being characterized by the improvement comprising:

heat input means, connected between said third chamber and said heat exchanger, for adding heat to said spent working fluid to provide a heating fluid medium to said heat exchanger at a fourth temperature above said elevated second temperature.

4,008,575

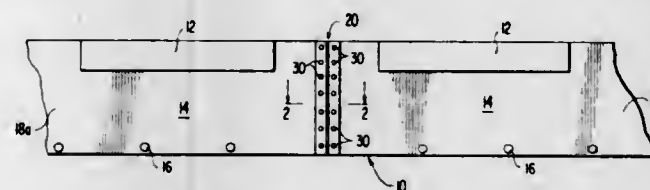
LIGHTWEIGHT END CONNECTORS FOR POLLUTION CONTAINMENT BOOM

John J. Gallagher, 171 Williams Drive, Annapolis, Md. 21401
Filed Apr. 16, 1975, Ser. No. 568,678

Int. Cl.² E02B 3/00

U.S. Cl. 61-1 F

3 Claims



1. A fluid-tight connector for elements of floating pollution containment booms comprising disconnectible elements including at least one floating pollution containment boom, at least one of the elements being secured along substantially the entire extent of a vertical edge of said pollution containment boom, complimentary slides on the ends of each of the elements, at least one of said slides including:

a pair of flanges parallelplanar with the plane of and extending from the end of said element to form a groove therebetween; and
transverse members on the free ends of said flanges, said transverse members having rearward faces on each side thereof disposed to form an angle of less than 90° with the plane of said element and to partially close the opening in the groove formed by said flanges,
said flanges being of a thickness substantially equal to the width of said opening,
said transverse members and flanges forming tongues which, when inserted into the groove of a corresponding

slide, are configured to form a fluid-tight connection between elements, and said transverse members and flanges including means to direct resultant transverse forces imposed on the flanges forming the groove inwardly through reaction on the abutting rearward faces and to block withdrawal of said tongue from said groove in directions other than parallel to said groove.

4,008,576 METHOD OF SECURING OBJECTS IN PASSAGES AND ARRANGEMENT OBTAINED THEREBY, PARTICULARLY HOSE LINES SEALINGLY SECURED IN THE PASSAGES OF COAL MINES FOR DUST SUPPRESSION

Frank Meyer; Helmut Becker, both of Essen, and Heinz Goetz, Gelsenkirchen-Buer, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

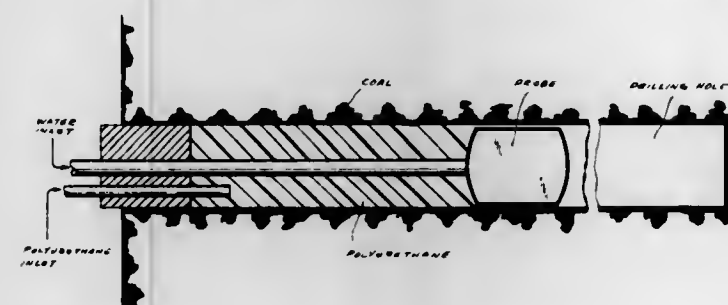
Filed Sept. 9, 1974, Ser. No. 503,899

Claims priority, application Germany, Sept. 8, 1973, 2345393

Int. Cl.² E21C 35/22

U.S. Cl. 61-36 R

26 Claims



1. A method of securing liquid-conveying elements for dust suppression in mines, comprising forming an underground passage which opens to a source of dust in a mine; positioning a liquid-conveying element in such a manner that said element extends along said passage and is arranged to permit impingement of said dust source by a stream of liquid to thereby wet said dust source and suppress the escape of dust therefrom, said element defining a clearance space with the inner wall of said passage; admitting into said space a hardenable synthetic resin which is in flowable state; hardening said resin in said space to thereby secure said element in said passage; and connecting said element with a source of liquid.

4,008,577

CUT AND COVER CONSTRUCTION OF SUBWAY WITH UTILITY CHAMBER AND AIR CONDITIONING WITH MINIMUM STREET TRAFFIC DISTURBANCE

Sidney H. Bingham, 109 E. 35th St., New York, N.Y. 10016, and William H. Eberhardt, 3 Wheatley Ave., East Williston, N.Y. 11596

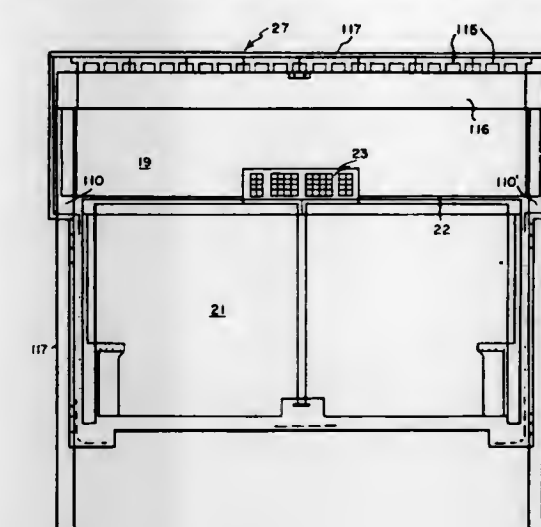
Division of Ser. No. 519,254, Oct. 31, 1974, Pat. No. 3,914,916. This application Mar. 5, 1975, Ser. No. 553,793
Int. Cl.² E01G 4/02; E02D 5/00

U.S. Cl. 61-44

3 Claims

1. An underground subway having longitudinal edges and an exposed finished roadway, comprising:
a plurality of spaced apart soldier beams embedded underground along each of said edges, the soldier beams of the respective pluralities being oppositely located;
concrete walls partially embedding each plurality of soldier beams to define said edges;
said walls bounding a utility chamber;
a train tunnel beneath said utility chamber;
air penetrable flooring for the utility chamber separating the chamber from the train tunnel to support utilities and accommodate air conditioning;
transverse decking beams supported by the oppositely disposed soldier beams; and,

precast concrete ribbed arch concrete ribbed arch decking



carried by said decking beams to support said finished roadway.

4,008,578

PIT PROP ASSEMBLY

Günter Blumenthal, Westerholt, and Peter Marr, Bochum, both of Germany, assignors to Bochumer Eisenhütte Heintzmann & Company, Bochum, Germany

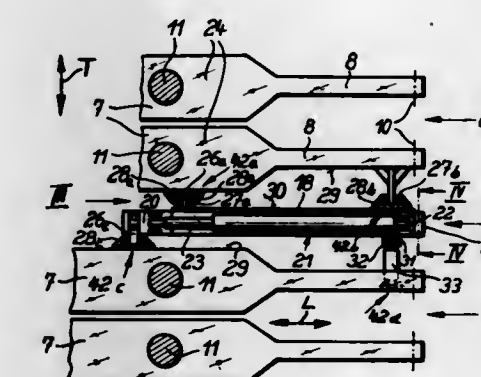
Filed May 11, 1976, Ser. No. 685,162

Claims priority, application Germany, May 17, 1975, 2522111

Int. Cl.² E21D 15/44

U.S. Cl. 61-45 D

10 Claims



1. A pit prop assembly for use in a mine having a floor, a roof, and a face, said assembly comprising: a pair of pit props having parallel elongated floor-engaging bases each with a front end adapted to be turned toward said face and a rear end turned away from said face and spaced in the longitudinal direction of the respective base from the respective front end, a roof-engaging arm pivoted on each of said bases at the respective rear end thereof, and means between each of said arms and the respective base for pressing the respective arm against said roof; a longitudinal hydraulic ram extending in said direction and having one end operatively connected to one of said bases and another end operatively connected to the other of said bases, whereby longitudinal contraction or extension of said ram displaces said bases relative to each other in said direction; and means including an element of variable length between said bases for varying the spacing transverse to said direction therebetween.

4,008,579

APPARATUS FOR HEAT CONTROL OF A REFRIGERATION SYSTEM

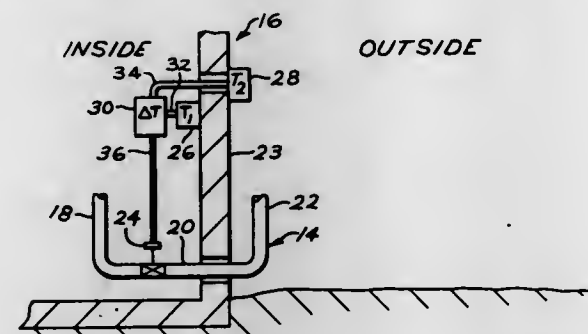
Julius B. Horvay, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 31, 1975, Ser. No. 600,772

Int. Cl.² F25B 39/04

U.S. Cl. 62-183

5 Claims



1. Apparatus for controlling the temperature of a refrigeration system of a refrigerator positioned within a house, said apparatus comprising:

- a heat pipe of general U configuration having middle and first and second leg portions, said first leg portion being in heat exchange relationship with the refrigeration system, said middle portion passing through a wall of the house, and said second leg portion being outside the house for passing heat from the refrigeration system to a location outside the house;
- a control valve positioned between said first and second heat pipe leg portions for controllably isolating said first leg portion from said second leg portion; and
- means for moving the control valve between an open and a closed position in response to the difference between the temperatures outside and inside the house.

4,008,580

INITIAL QUICK FREEZE PAN FOR DIRECT REFRIGERANT CONTACT COOLER

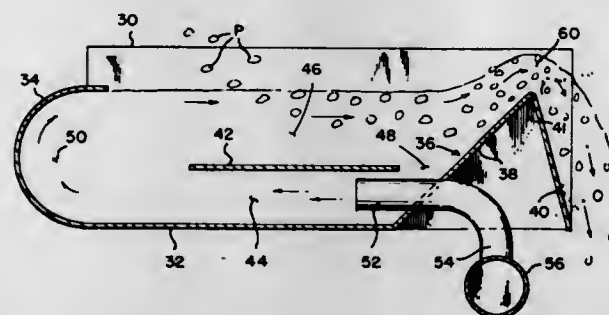
Gerald James Heber, Bellevue, and Daniel Arthur George Roxburgh, Redmond, both of Wash., assignors to Frigoscandia Contracting, Inc., Baltimore, Md.

Filed Dec. 4, 1974, Ser. No. 529,487

Int. Cl.² F25D 17/02

U.S. Cl. 62-376

19 Claims



1. In combination with a cooler for extracting heat from articles by directly contacting the articles with a liquid freezant, an initial quick freeze pan in communication with the cooler interior and having an inlet and an outlet, and means forming three serially arranged interconnected channels providing a continuously recirculating freezant flow path with entrained back flow in which articles are contacted directly with liquid freezant, the first channel communicating with said inlet for directing freezant in a reverse direction, the second channel communicating with said outlet for directing freezant in a forward direction opposite said reverse direction, the intermediate channel interconnecting adjacent ends of said first and second channels and having a configuration adapted for progressively turning freezant from said reverse direction

to said forward direction, the other ends of said first and second channels communicating for direct continuous recirculation of liquid freezant from said second channel to said first channel.

4,008,581

SUCTION ACCUMULATOR

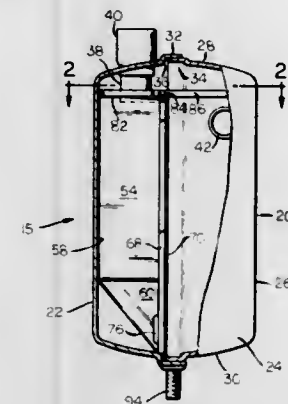
Sharon J. Hudson, Jr., Toledo, Ohio, assignor to Sharon Manufacturing Company, Toledo, Ohio

Filed July 21, 1975, Ser. No. 597,585

Int. Cl.² F25B 43/00

U.S. Cl. 62-503

20 Claims



1. A liquid refrigerant retention device for a refrigerant compressing-evaporating system, said device comprising: in combination a pressure vessel, a vertically disposed weir member within said vessel, said weir member having a reservoir side and a flume side, said pressure vessel having wall sections respectively confronting said reservoir side and said flume side of said weir member, said weir member forming a reservoir with the confronting vessel wall section on the reservoir side of said weir member and an outlet flume with the confronting vessel wall section on the flume side of said weir member, a liquid metering aperture through the bottom of said weir member from the reservoir to the flume, a fluid inlet to the vessel on the reservoir side of said weir member and a fluid outlet from the vessel on the flume side of said weir member.

4,008,582

CONSTANT VELOCITY UNIVERSAL JOINT

Hans-Heinrich Welschhof, Rodenbach, Germany, assignor to Lohr & Bromkamp GmbH, Offenbach (Main), Germany

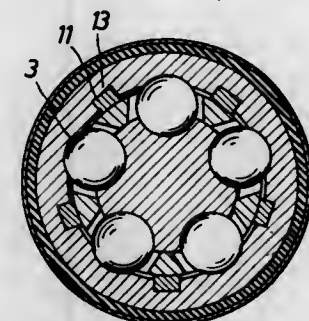
Filed June 2, 1975, Ser. No. 582,815

Claims priority, application Germany, June 22, 1974, 2430027

Int. Cl.² F16D 3/30

U.S. Cl. 64-21

9 Claims



1. A constant velocity torque transmitting universal joint comprising an outer joint member having a cylindrical bore therethrough and a plurality of grooves in the surface of said bore, an inner joint member within said bore and having a corresponding plurality of grooves in the outer surface thereof opposing said outer joint member grooves, means jointly received in each pair of opposed inner and outer grooves for transmitting torque therebetween, a cage between said joint

members and having a plurality of openings therein spaced to correspond with said pairs of opposed grooves to dispose the centers of said torque transmitting means in a plane perpendicular to the axis of the cage, said cage having a first spherical surface on its outer face and a second spherical surface on its inner face, means on the outer surface of said inner joint member coacting with said cage second spherical surface for guiding said cage with respect to said inner joint member, the centers of said first and second cage spherical surfaces being equidistant on opposite sides of said plant passing through the centers of said torque transmitting means, there being axially extending second grooves in the surface of said outer joint member bore and a said second groove disposed between two adjacent torque transmitting means grooves in said bore surface, keys within said second grooves engaging the outer spherical surface of said cage to guide said cage, and means for restraining said key to one of no axial displacement or limited axial displacement.

4,008,583

SWINGABLE SHIELD ASSEMBLY FOR TRACTOR POWER TAKE-OFF

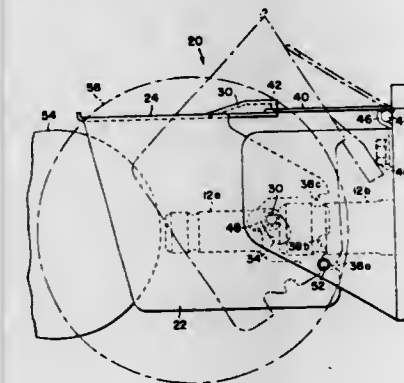
Lewis Kie Davis, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 21, 1975, Ser. No. 606,361

Int. Cl.² F16D 3/84

U.S. Cl. 64-32 R

8 Claims



1. A PTO shield assembly for a tractor having a PTO shaft protruding therefrom, comprising: an inverted, U-shaped, shield member extending above and to the sides of the PTO shaft and secured to the tractor for pivotation about a horizontal axis perpendicular to the axis of the PTO shaft; said shield member having orientation means provided therein for establishing a plurality of pivotable positions for the shield member; and holding means on the tractor engageable with the orientation means for holding the shield member pivoted in one of the plurality of pivotable positions.

4,008,584

DRAW BOLT

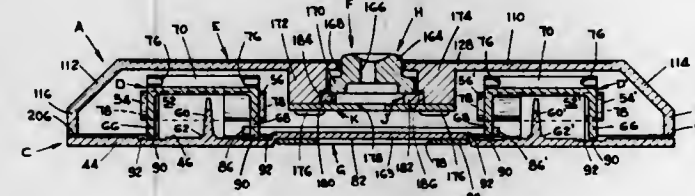
Rudolf Wingert, High Crest Lake, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.

Filed Jan. 7, 1975, Ser. No. 539,076

Int. Cl.² E05B 65/48

U.S. Cl. 70-73

11 Claims



1. A draw bolt cooperable with an associated hasp, the draw bolt comprising a frame; link means having one end thereof pivotally connected to the frame; a manually operable latch

member pivotally connected to the other end of the link means for movement to latching and unlatching positions, the link means having lowered and raised positions in the latching and unlatching positions, respectively, of the latch member, the latch member and the link means having engageable limiting means for limiting pivotal movement of the link means in a first direction from the lowered position thereof to a third position beyond the raised position; and biasing means for pivoting the link means in the direction opposite to the first direction to reach the raised position thereof, the biasing means resiliently opposing pivotal movement of the link means in both directions from the raised position, the latch member and the link means having cooperable means for resiliently opposing pivotal movement of the latched member relative to the link means.

4,008,585

LOCKING COVER FOR METER CLAMPING RING

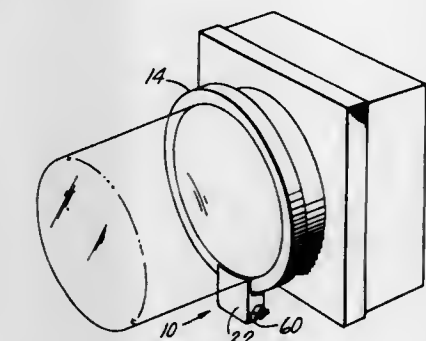
George A. Lundberg, Pompton Lakes, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Dec. 1, 1975, Ser. No. 636,356

Int. Cl.² G01R 11/04; F16L 21/06

U.S. Cl. 70-164

6 Claims



1. A locking assembly particularly adapted for use with an electric meter clamping ring of the type having outwardly turned adjacent ends fastened together, and aligned apertures for receiving a locking member of the type having an enlarged head at one end and expansible locking projections at the other end, said assembly comprising a cup-shaped housing open at one end only to receive and enclose the outwardly turned ends, one side of said housing wall having an aperture positioned to be aligned with the apertures in the clamping ring ends when assembled thereon to receive the locking member, a pair of locking member engaging legs disposed in the housing, said legs being secured to the housing and having apertures aligned with the aperture in said one side of the housing to receive the locking member and being positioned in the housing in such spaced relation to each other and to said side of the housing that the enlarged head of an assembled locking member bears against the leg nearest said side of the housing, the locking mechanism of the locking device extends through the aperture in the other leg and locks on the remote side thereof to prevent axial movement of said locking member and retain it so positioned that the outer surface of the enlarged head is disposed at or inside of the outer surface of the housing wall.

4,008,586

KEY ATTACHMENT DEVICE FOR KEY CASE

Edmund Schnitzer, Montreal, Canada, assignor to Renwick of Canada Inc., Montreal, Canada

Filed Feb. 12, 1976, Ser. No. 657,478

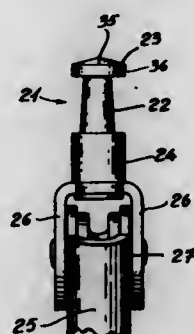
Int. Cl.² A47G 29/10

U.S. Cl. 70-456 B

8 Claims

1. A key attachment device for securing at least one key in a key case or the like receptacles, said device comprising an attachment plate having a hollow housing, said housing having a side wall and disposed in a face of said attachment plate, at

least one transverse slot in said side wall for receiving an attachment end of a key hook member therein, means for retaining said attachment end in said slot; said attachment end having a tapered shaft portion of circular cross-section, an enlarged head at a free upper end of said shaft portion, said tapered shaft tapering outwardly from said head, said head being retained captive in said hollow housing with said shaft portions protruding through said slot, said shaft portion per-



mitting rocking side displacement of said attachment end in said slot and arcuate displacement along said slot, said attachment end being further provided with a base portion formed integral with said shaft portion at an end opposite said end having said head, said base portion having a cross-section larger than said shaft whereby said shaft is recessed between said head and said base portion, and a key hook pivotally secured to said base portion between a pair of parallel side arms.

4,008,587

BICYCLE LOCK ASSEMBLY

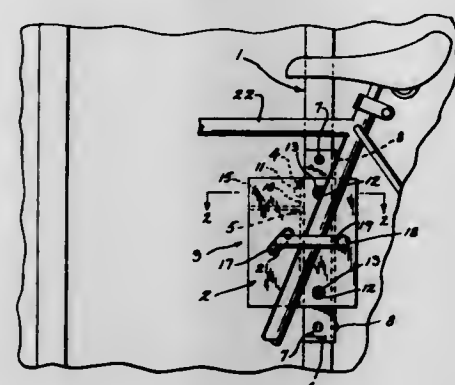
Herman C. Frentzel, Shorewood, and Thomas H. Frentzel, Whitefish Bay, both of Wis., assignors to Frentzel Products, Inc., Milwaukee, Wis.

Filed Jan. 12, 1976, Ser. No. 648,145

Int. Cl.² E05B 71/00, 67/38

U.S. Cl. 70-235

8 Claims



1. A locking assembly, the combination comprising: a face plate having a pair of laterally spaced openings; means for mounting said face plate to a wooden wall stud having an exposed edge and a pair of sides, said mounting means includes a stud guard which is fastened to said stud to substantially cover a portion of its exposed edge and one of its sides, and a base member which fastens to said face plate and extends rearward therefrom to fasten to said stud and substantially cover its other side immediately behind said face plate, said face plate being positioned over and against the portion of said stud guard which covers the edge of the wall stud; and a rigid, U-shaped locking member having leg portions which extend through said spaced openings, one of said legs having an eye formed on its end, through which a lock may extend to inhibit the withdrawal of said locking member from said openings.
7. In a lock assembly for mounting on an upright support, the combination comprising:

a face plate for extending across the front of said upright support; shielding webs extending rearward from said face plate to overlie opposite side surfaces of said upright support; a hood between said shielding web and said face plate forming a lock cavity behind said face plate; and an encircling loop extending forward from and then turning back toward said face plate, said loop having a leg with a locking eye that extends through said face plate to position said eye in said cavity.

4,008,588

ROTARY PLUG CYLINDER LOCK CONSTRUCTION

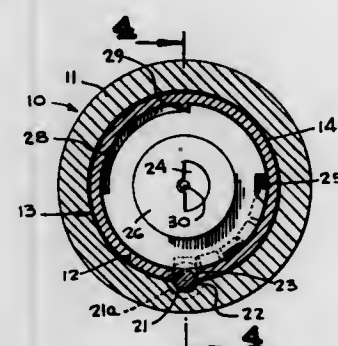
Harry C. Miller, Rochester, N.Y., and Herman Edward Tickel, Jr., Centreville, Va., assignors to H. Edward Tickel, Jr., Centreville, Va. and Harry C. Miller, Rochester, N.Y., part interest to each

Filed Apr. 28, 1976, Ser. No. 681,241

Int. Cl.² E05B 29/04, 63/00

U.S. Cl. 70-366

23 Claims



1. A cylinder lock of the rotatable disc tumbler type comprising a stationary cylinder casing, a rotatable plug assembly in said casing including an inner shell member rotatable in said casing and a plurality of locking disc tumblers encircled within said shell member and rotatable about a common axis therein, locking means normally restrained by said disc tumblers at a position for locking said inner shell to the casing, the disc tumblers having gates alignable with and adapted to receive said lockings means to permit rotation of the inner shell relative to the casing and said tumblers having key openings therein collectively defining a forwardly opening key way and shaped to be engaged and angularly moved by a key inserted therein for aligning the gates with the locking means, said locking disc tumblers each having a cylindrical boss formation projecting axially of the plug assembly from a first face thereof in a first direction and having a cylindrical recess in the opposite face thereof conforming in size and shape to said boss, said disc tumblers being arranged in an interlocking stacked array with said boss formation received in nested relation in the recess of an immediately adjacent tumbler and said boss formations each having an axial extent greater than the space between adjacent disc tumblers in the stacked array whereby a barrier is formed across each intertumbler space at a location radially outwardly encircling the key way to prevent insertion of picking tool portions between tumblers from the key way into the gate regions thereof.

4,008,589

IGNITION SWITCH SECURITY SHIELD PROTECTION AGAINST CAR THEFT

Washington Harrell, 143-18 182nd Place, Springfield Gardens, N.Y. 11413

Filed Feb. 2, 1976, Ser. No. 654,723

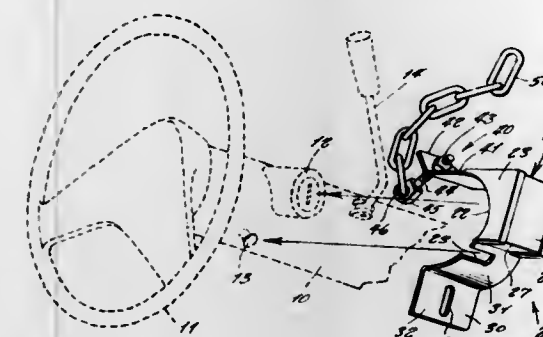
Int. Cl.² E05B 17/14

U.S. Cl. 70-424

6 Claims

1. An ignition switch security shield comprising a base portion having a first side wall, a second side wall, a first end wall, a second end wall, and a base wall, each of said first and

second sidewalls having one curved edge for mating engagement with a steering post of an automobile or the like, a first bracket extending from one edge of said first end wall and having a first curved portion and a second straight portion, said second straight portion having an opening therein for the reception of a link of a chain therethrough, a second bracket extending from one edge of said second end wall and having a straight portion projecting from said one edge of said second end wall, and an angle plate projecting from said straight



portion, and means for securing said base portion, said first bracket, and said second bracket to a steering post of an automobile or the like, wherein said means for securing comprises a chain, a bolt having an enlarged head, said enlarged head having an opening formed therein for the reception and securement therein of a link of said chain, and a nut welded to the inner surface of said angle plate, said angle plate having an opening therein for the reception of said bolt therethrough so that said bolt may be rotated in said nut and thereby adjust the length of said chain.

4,008,590

AUTO STEERING WHEEL LOCK PROTECTOR

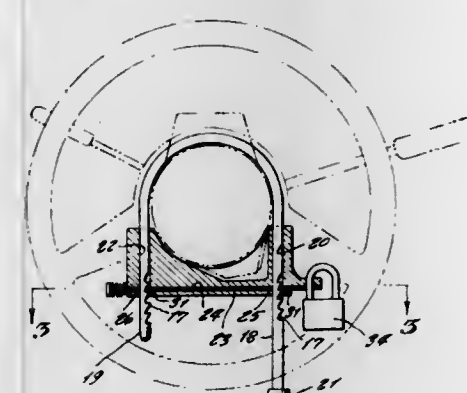
Joseph Berkowitz, and Minerva Berkowitz, both of 8 Tyler Place, Hewitt, N.J. 07421

Filed Mar. 29, 1976, Ser. No. 671,366

Int. Cl.² E05B 17/14

U.S. Cl. 70-424

1 Claim



1. In an auto steering wheel lock protector, the combination of a case for enclosing an ignition lock protruding from a side of a steering post column, a U-shaped rod for retaining said case to said column, and a locking means for rigidly securing said rod to said case so to prevent dislodging thereof from enclosing said ignition switch; said case comprising a strong metal member having a notch on one side so to receive a cylindrical side of said column, and a cavity in said notch to receive said ignition lock; each opposite end of said U-shaped rod having a row of ratchet teeth, one said rod end being slidable in a first opening through said block while the other said rod end is slidable in a second opening through said block, each said rod ends also being slid through a separate slot formed in a transversely slidable plate within said case, a third opening of said case being aligned with a circular open-

ing through said plate for receiving a padlock when said rows of ratchet teeth engage one end edges of said slots and providing said locking means.

4,008,591

DEVICE FOR ZIGZAG FOLDING OF STRIP MATERIAL
Leonardus Vos; Joannes Theodorus van der Sanden, and Adrianus Johannes Van Mensvoort, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

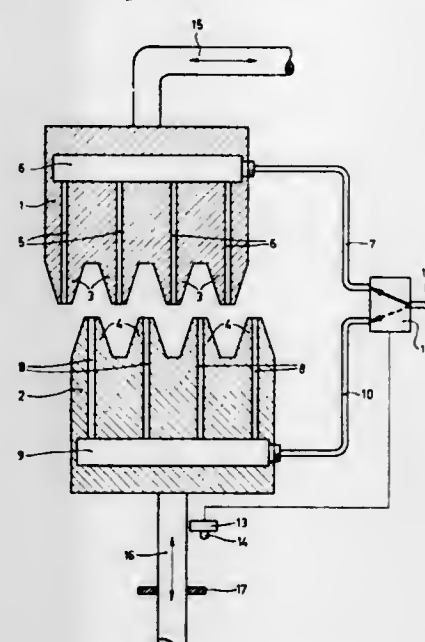
Filed Aug. 25, 1975, Ser. No. 607,609

Claims priority, application Netherlands, Sept. 11, 1974, 7412054

Int. Cl.² B21D 13/02

U.S. Cl. 72-38

4 Claims



1. A device for zigzag folding of material, comprising two oppositely arranged dies having faces facing each other and a set of strip deforming teeth in each respective face; and means for reciprocally moving said dies relative to each other in an axial direction, and in a direction transverse to said axial direction, such that the dies are moved axially alternately from a closed position in which said sets of teeth engage each other to an open position in which said sets of teeth are apart from each other, and are alternately displaced in opposite transverse directions over a distance corresponding to a pitch distance of the teeth;

wherein said device comprises means for providing a fluid pressure different from atmospheric pressure; a control device; and two duct systems, each opening at one end into a respective die face having teeth, and communicating at another end with said control device; said control device comprising means for alternately connecting one of said duct systems to said providing means during successive open positions of the dies, whereby material being folded is held alternately against one of the two die faces.

4,008,592

METHOD AND APPARATUS FOR FLANGING A LENGTH OF SPIRALLY WOUND CORRUGATED PIPE

Robert E. Hall, Newport Beach, and Clyde Lamar, West Sacramento, both of Calif., assignors to W. E. Hall Company, Irvine, Calif.

Filed July 23, 1975, Ser. No. 598,173

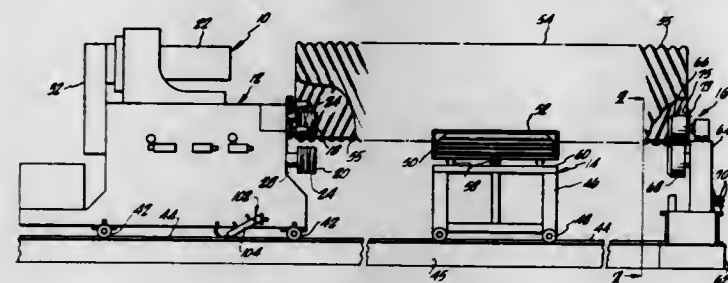
Int. Cl.² B21D 19/04

U.S. Cl. 72-70

26 Claims

1. An apparatus for flanging a length of spirally wound corrugated pipe which comprises: means for supporting said pipe length; and a recorrugating and flanging assembly, said assembly including a pair of rollers for gripping one end of said pipe length, said rollers having corrugations on the surfaces thereof, means for driving said rollers to impart annular

corrugations to said end of said pipe length, means for flaring said end of said pipe length outwardly therefrom, forming means for converting said outwardly flared end of said pipe length into a substantially perpendicular disposition with re-



spect to the longitudinal axis of said pipe length thereby forming, and means for trimming the perimeter portion of said radial end flange to provide a substantially uniform radial dimension.

4,008,593

DEVICE FOR SPINNING OF METAL OBJECTS

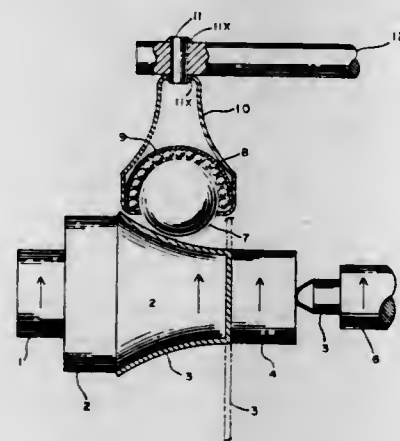
Richard L. Ciccarello, 7 Park Ave., Glen Cove, N.Y. 11542

Filed June 27, 1975, Ser. No. 590,965

Int. Cl.² B21D 22/16

U.S. Cl. 72-75

1 Claim



1. As an article of manufacture, a hand held individually operated tool for selectively spinning a metal sheet into curved artistic objects consisting essentially of a longitudinal handle having an aperture at a right angle to the handle axis in suitable spaced relationship to an end thereof; a ball assembly consisting of a large metal hard ball having an exposed portion for contacting said metal sheet while spinning, a housing captively retaining said hard ball with an exposed ball surface and having an apertured neck portion disposed away from said exposed surface, a plurality of ball bearings disposed in said housing captively between said hard ball and the housing wall, a rod fixedly secured to said neck portion and passing through its aperture at a right angle, said rod having a threaded portion at the unsecured end thereof; a first disc having a serrated teeth face and secured fixedly upon and to said rod adjacent to said neck housing portion; a second serrated disc adapted to co-act with said first disc in selective locked serrated relationship and having a tubular portion for slidably engaging said rod in the handle aperture; and threaded nut means for engaging the threaded rod end extending through said handle aperture whereby the hard ball retaining housing is selectively rotated through a suitable arc at a right angle to the handle axis and thereafter locked in serrated teeth relationship for artistically deforming said sheet metal.

4,008,594 WIRE COILING MACHINE

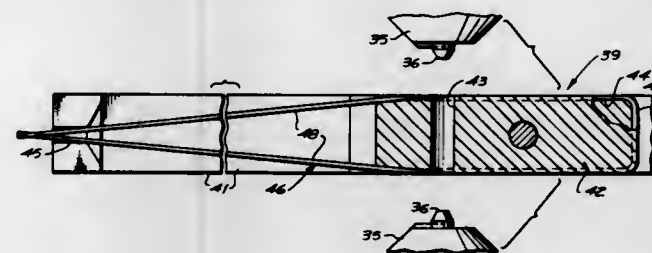
George Noyce, Cucamonga, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Oct. 2, 1975, Ser. No. 618,957

Int. Cl.² B21F 3/04, 35/00

U.S. Cl. 72-142

11 Claims



1. A wire coiling machine comprising:
 - a. a supporting means for a wire blank having a cross element and a pair of essentially parallel and coplanar arm elements, the supporting means including an end support for the cross element and opposed side supports for the portions of the arm elements adjacent the cross element, and at least one journal bore tangent to a corresponding arm element intermediate its ends, the portions of the arm elements extending beyond the journal bore being free to coil about the axis of the journal bore;
 - b. a mandrel axially movable into and out of the journal bore for receiving the extended portion of the arm element as it is coiled;
 - c. a coiling head rotatable about the mandrel to coil the extended portion of the arm element while the remainder of the wire blank remains fixed on the supporting means.

4,008,595 METHOD AND APPARATUS FOR ARCUATELY BENDING AND ROLLING AN ELONGATED METALLIC WORKPIECE

Walter Allenspach, Bachtobelstrasse 66, CH-8560 Otterberg, Switzerland

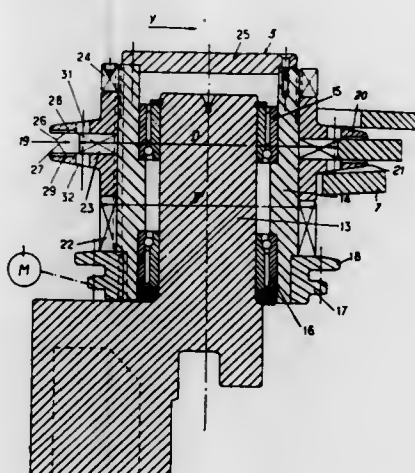
Filed Apr. 7, 1976, Ser. No. 674,631

Claims priority, application Switzerland, Apr. 8, 1975, 4409/75

Int. Cl.² B21D 7/08

U.S. Cl. 72-170

10 Claims



1. A method of treating an elongated workpiece comprising the steps of: orienting three bending rollers to define an arcuate path; passing said workpiece longitudinally along said path to bend said workpiece into an arcuate shape, whereby ridges form on said workpiece during such bending; and machining said ridges off said workpiece at least partially as said workpiece passes along said path.

4,008,596 APPARATUS FOR TRANSFORMING THE CROSS-SECTION OF A THIN-WALLED CYLINDER

Radoslav Stanev Petrov; Stefan Elenkov Zahariev; Ivan Kirilov Markov, and Georgi Vassilev Peychev, all of Sofia, Bulgaria, assignors to DSO "Montagi", Sofia, Bulgaria

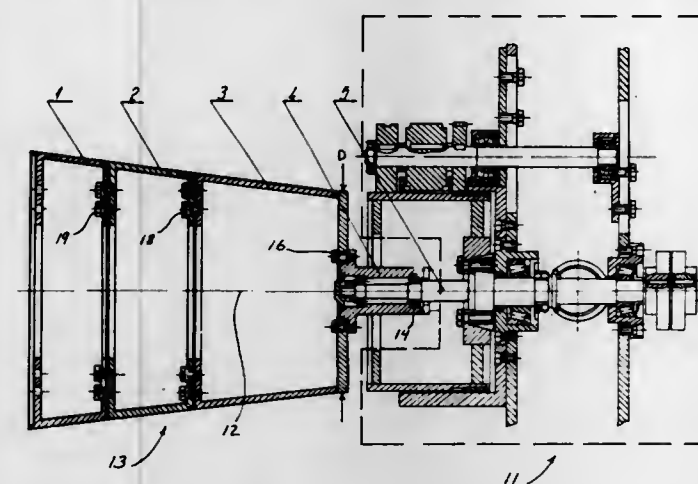
Filed Dec. 19, 1975, Ser. No. 642,495

Claims priority, application Bulgaria, Dec. 19, 1974, 28504

Int. Cl.² B21D 41/00

U.S. Cl. 72-176

4 Claims



1. In an apparatus for transforming the internal cross-section of a thin-walled cylinder, advanceable in a first direction along a first axis, from a first circular form to a second symmetrical, non-circular closed form, a cylindrical mandrel coaxial with the thin-walled cylinder, the mandrel having an outer surface aligned with and corresponding at its input end in shape to the first circular form of the advancing pipe, the contour of the outer surface of the mandrel varying in the first direction from the first circular form at its input end to the second non-circular form at its output end, whereby the internal cross-section of the cylinder is constantly and gradually urged from the first form to the second form as the cylinder traversed the mandrel, the improvement wherein the circumference of the mandrel is constant throughout the length thereof and wherein the apparatus further comprises means supporting the mandrel for rotation about the first axis.

4,008,597 METHOD FOR SHAPING A SLIT PRODUCT

Ronald D. Bartram, Raleigh, N.C., and Charles J. Runkle, Guntersville, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 10, 1975, Ser. No. 630,462

Int. Cl.² B21B 1/00

U.S. Cl. 72-199

1 Claim



1. A method for shaping a slit product having a burr formation, comprising the steps of: positioning in engaging relationship a pair of revolving rolls wherein one roll contains a continuous annular groove having a curved bottom position and a second roll has a continuous annular land; and feeding said slit product into said rolls at an angle of 7°-30°

with the tangent plane of said rolls and in such a manner that said burr formation is oriented in said curved bottom position.

4,008,598 WORK REDUCING

John Charles Purcupile, Monroeville; Martin J. Dempsey, Bethel Park, and Selwyn Raymond Rackoff, Pittsburgh, Pa., assignors to Asko, Inc., West Homestead, Pa.

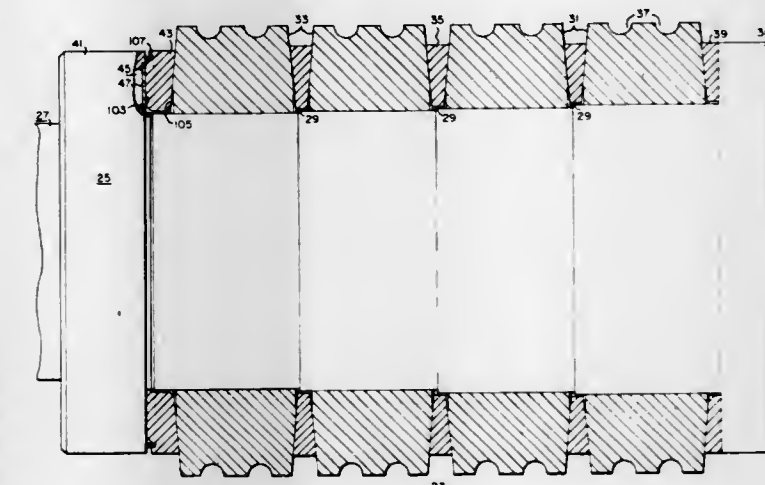
Filed Nov. 13, 1975, Ser. No. 631,635

The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.² B21B 31/08

U.S. Cl. 72-237

10 Claims



1. Roll apparatus for reducing work including an arbor, at least one roll mounted on said arbor for rotation therewith, an annulus having an annular cavity therein, mounted on said arbor coaxial with said roll for rotation with said arbor, a deformable membrane, of a material capable of withstanding high pressure, sealed pressure tight to said annulus about said cavity, forming a closure for said cavity by a weld, and connected to said roll to transmit lateral force to said roll on the deformation of said membrane on the application of pressure thereto, and means, connected to said cavity, for injecting hydraulic fluid under pressure therein to deflect said membrane, whereby rotation of said roll relative to said arbor is suppressed.

4,008,599 APPARATUS FOR MAKING BEVEL GEAR

Fritz Dohmann, Ruckersdorf, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Sept. 26, 1975, Ser. No. 617,008

Claims priority, application Germany, Sept. 28, 1974, 2446413

Int. Cl.² B21D 22/00, 53/28

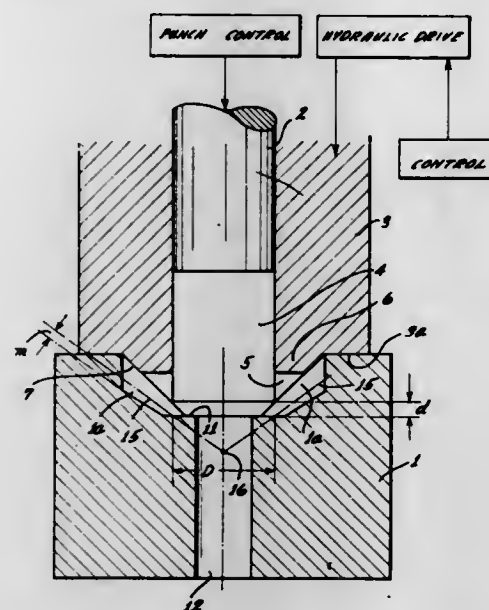
U.S. Cl. 72-354

3 Claims

1. In an apparatus for making bevel gear the apparatus having a die with a cavity corresponding to the contour of the bevel gear to be made, the cavity having a bottom at the smallest gear diameter and ridges corresponding to the grooves of the bevel gear, the ridges also defining the pitch cone for the bevel gear, the apparatus further having a punch and a counter-punch, the punch moving axially in the counter punch both being situated at the same side of the die, the improvement comprising:

the punch having an outer diameter and the counter punch having a corresponding inner diameter, these diameters being equal to the diameter of a circle defined by the intersection of said pitch cone with said bottom, at an accuracy of not more than 20 % tolerance; and the counter punch having a lower front face from which projects a truncated, conical projection having a contour

corresponding to a cone as defined by said ridges, said counter-punch being disposed for retraction in a direc-



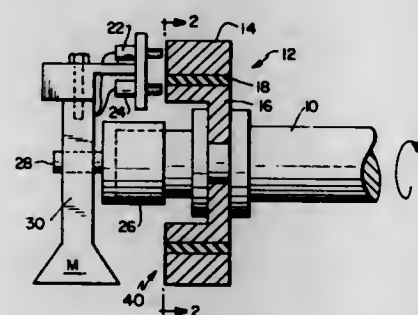
tion opposite to the punch as moving during pressing a blank into the die cavity.

4,008,600

TORSIONAL VIBRATION DAMPER MEASURING
Robert Charles Bremer, Jr., Brownsburg, and Hans Otto Haupt, Indianapolis, both of Ind., assignors to Wallace-Murray Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 622,533, Oct. 15, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,278
Int. Cl.² G01M 13/00

U.S. Cl. 73-11

8 Claims



1. A method of measuring the performance of a rotating torsional vibration damper, the damper being of the type having a hub adapted to be coupled to a rotating shaft, the shaft subject to torsional vibrations while rotating, the hub carrying an annular inertia member, whereby the inertia member torsionally vibrates out of phase with the torsional vibrations of the hub, the method characterized by,

- providing means carried by a surface portion of said hub member for varying the intensity of light reflected therefrom upon rotation of the hub,
- providing means carried by a surface portion of said inertia member for varying the intensity of light reflected therefrom upon rotation of the inertia member,
- illuminating each of said hub and inertia member means and then sensing the light reflected therefrom,
- converting said sensed, reflected light from said hub means into a first electrical signal and converting said sensed, reflected light from said inertia member means into a second electrical signal,
- comparing said electrical signals, to thereby measure damper performance.

4,008,601

FLUIDIC PARTIAL PRESSURE SENSOR

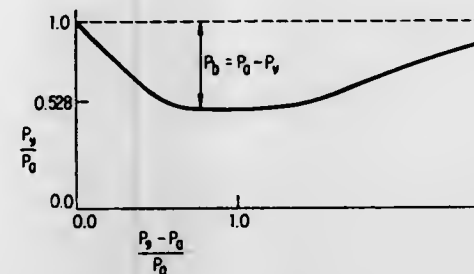
Robert L. Woods, Arlington, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 16, 1975, Ser. No. 587,474

Int. Cl.² G01N 1/24

U.S. Cl. 73-23

2 Claims



1. A method for obtaining a direct indication of partial pressure of a first gas in a reference gas, comprising the steps of:

- supplying a fluidic bridge concentration sensor with said reference gas in a first input channel of said sensor and with a sample mixture comprising said first gas whose partial pressure is desired to be measured in said reference gas in a second input channel of said sensor;
- exhausting said sample mixture and said reference gas through a reference output which ensures that said pressure drop across said fluidic bridge concentration is proportional to the ambient pressure by application of a vacuum, wherein said vacuum is achieved by means of a fluidic aspirator operated in its sonic region; and
- measuring the pressure difference across said input channels thereby obtaining a signal output which provides a pressure directly proportional to the partial pressure of said first gas in said reference gas.

4,008,602

ULTRASONIC TESTING OF MULTILAYER CERAMIC CAPACITORS

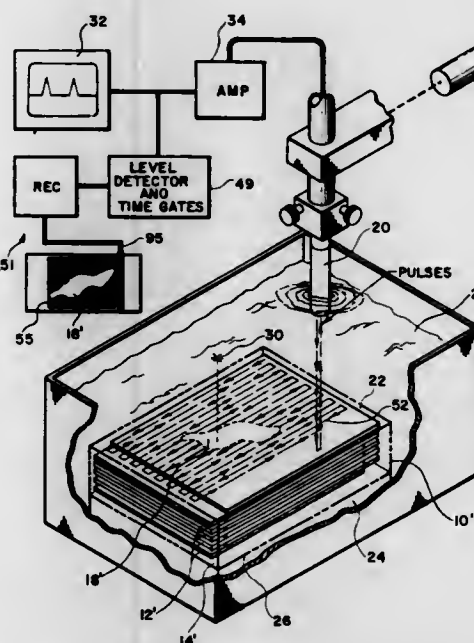
Gordon R. Love, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,420

Int. Cl.² G01N 29/04

U.S. Cl. 73-67.8 R

6 Claims



1. A method of determining the presence of detrimental void defects in a multilayer ceramic capacitor body having a pair of parallel opposed surfaces and having a plurality of planar metal electrodes, the planar surfaces of said metal

electrodes being arranged parallel to said parallel opposed surfaces and separated by and completely enclosed within ceramic dielectric said method comprising transmitting ultrasonic energy at a selected ultrasonic frequency into a fired ceramic capacitor body having from about 5 to 100 planar parallel metal electrodes, said electrodes being from about 2 to 10 microns thick and separated from each other by about 15 to 100 microns of ceramic, the direction of said ultrasonic energy being substantially perpendicular to a surface of said capacitor body and to said planar metal electrodes; detecting a portion of said ultrasonic energy which passes through said metal electrodes and said ceramic dielectric and emerges from said capacitor body; and comparing the magnitude of said portion of ultrasonic with a predetermined magnitude to provide an indication of the presence in said capacitor body of a detrimental void defect having a dimension parallel to said electrodes as small as 100 microns and a thickness as small as 5 microns.

4,008,604

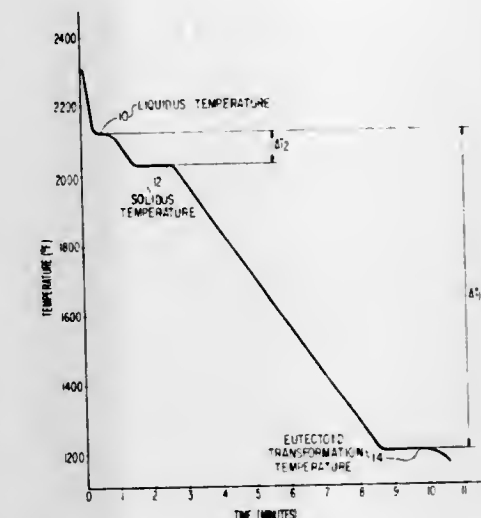
DETERMINATION OF CARBON ANALYSIS IN IRONS
Maurice P. Roach; Ann E. Schoenjahn, and Larry G. Carmack, all of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 7, 1976, Ser. No. 674,427

Int. Cl.² G01N 25/02

U.S. Cl. 73-17 R

10 Claims



1. A method for determining the total carbon content of carbon-containing iron which comprises:
allowing samples of molten iron of known total carbon content to cool at least through the first eutectoid transformation temperature;
determining the temperature difference between the liquidus and first eutectoid transformation temperature for each of the said samples of known total carbon content;
determining a standard liquidus-first eutectoid transformation temperature difference with respect to carbon content;
allowing a sample of iron of unknown total carbon content to cool at least through the first eutectoid transformation temperature;
determining the liquidus-first eutectoid transformation temperature difference for the said sample of unknown total carbon content; and
comparing the resulting liquidus-first eutectoid transformation temperature difference for the sample of unknown total carbon content with the standard liquidus-first eutectoid transformation temperature difference to determine the total carbon content thereof.

4,008,605

IMPACT TEST METHOD

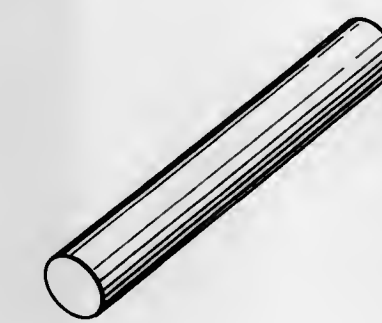
Rubin Kravitz, Worcester, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Jan. 21, 1976, Ser. No. 651,326

Int. Cl.² G01N 3/30

U.S. Cl. 73-101

9 Claims



1. A method for measuring the wall thickness of a tubular member comprising:
repetitively generating within said member an ultrasonic pulse;
directing said pulses in a direction normal to the wall of the member;
detecting the returning echoes of said pulses;
measuring time period between the echoes from inner and outer walls of the member; and
accumulating said measured time periods in a series of counter memories, each of said counter memories accumulating the time periods falling within preset limits.

1. A method for determining the impact properties of a stiff plastic material comprising the steps of:
a. providing a cylindrical strand of solid plastic having a

- substantially uniform density and having a smooth continuous circumferential surface area;
- providing an impact measuring device comprising a specimen holding means, a free swinging pendulum of known energy content having a specimen striking surface, and scale means for measuring the energy extracted from said pendulum;
 - fixedly mounting said strand in said holding means such that a portion of said strand is in the path of said specimen striking surface and substantially perpendicular thereto when said pendulum is allowed to swing, the base of said strand adjacent and above the top planar surface of said specimen holding means being of predetermined diameter;
 - producing an impact against the side of said strand at a point adjacent its base, said impact being substantially perpendicular to the longitudinal axis of said strand; and
 - determining the excess energy remaining in said pendulum after breaking said strand.

4,008,606

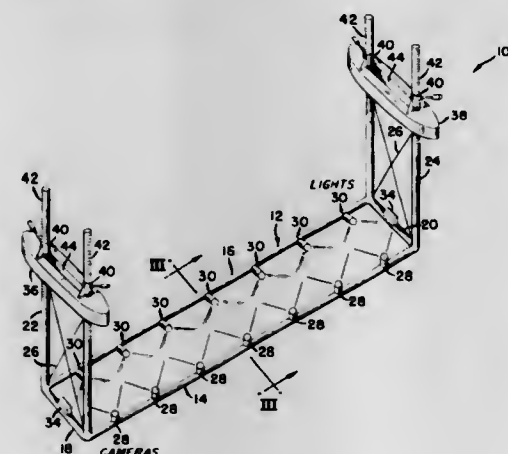
SHIP'S BOTTOM INSPECTION APPARATUS
Howard R. Talkington, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1975, Ser. No. 623,858

Int. Cl.² G01N 19/02; G03B 29/00

U.S. Cl. 73-104

10 Claims



1. An apparatus for inspecting the bottom of a ship while the ship is moving forward in a body of water comprising:
 - a generally U-shaped framework which is adapted to be suspended in the water for receiving the width of the ship therethrough;
 - a series of cameras mounted in a spaced relationship along the framework to view vertically upward; and
 - a series of lights mounted in a spaced relationship along the framework at an acute angle to vertical and directed generally toward the viewing area of the cameras so that backscattering is minimized while ship bottom discontinuities are made evident by shadow effects; whereby multiple photographs can be taken of the ships bottom to display structural defects.

4,008,607

FUEL CONSUMPTION RATE DETECTING APPARATUS
Katsuhiko Ooiwa, Handa; Shigehiko Ito, Aichi, and Shinichi Maeda, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed June 30, 1975, Ser. No. 592,203

Claims priority, application Japan, July 15, 1974, 49-81276

Int. Cl.² G01M 15/00

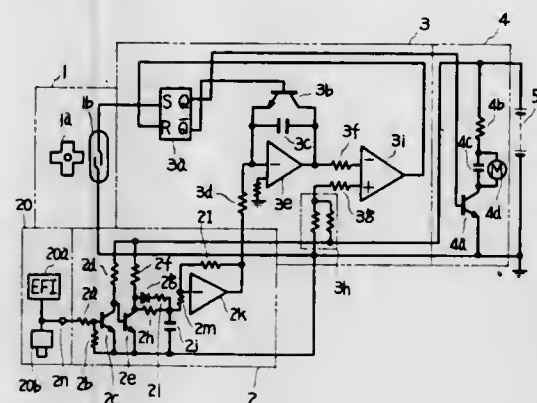
U.S. Cl. 73-114

7 Claims

1. A fuel consumption rate detecting apparatus for a vehicle having an engine comprising:
 - means for generating a direct current voltage representing an amount of fuel consumption per unit time;

means for generating a first pulse signal whose frequency is proportional to the vehicle speed;

- means, connected to the above two means, for generating, in synchronism with said first pulse signal, a second pulse signal whose pulse width is inversely proportional to said amount of fuel consumption per unit time;



means, connected to said second pulse signal generating means, for sensing the mean value of said second pulse signal; and

means, connected to last said means, for indicating said mean value representing a vehicle running distance per unit fuel consumption amount.

4,008,608

METHOD OF PREDICTING GEOTHERMAL GRADIENTS IN WELLS

Edward B. Reynolds, Spring, Tex., assignor to Continental Oil Company, Ponca City, Okla.

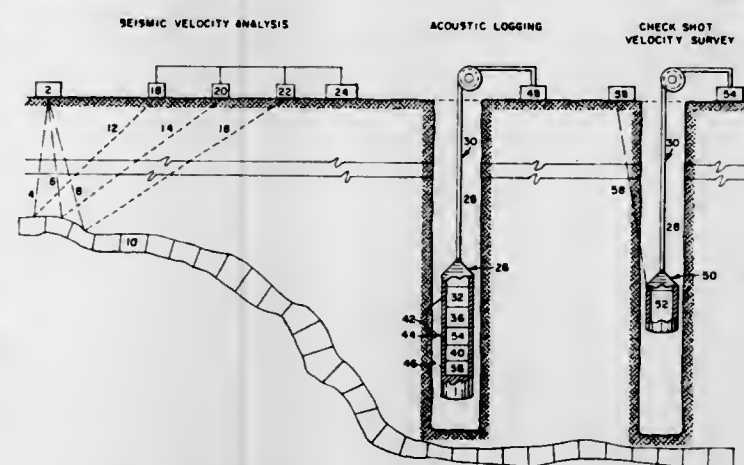
Filed Oct. 10, 1974, Ser. No. 513,791

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² E21B 47/06

U.S. Cl. 73-154

10 Claims



1. A method of predicting the geothermal gradient of subterranean strata by determining velocity trends in the strata and comparing same with the velocity trends of formations for which geothermal gradients have previously been determined and plotted on semi-logarithmic paper as a family of curves of velocity trends versus geothermal gradients comprising:
 - determining the velocity trend at various depths of a wave propagated through the subterranean strata,
 - plotting the velocity trend versus depth on semi-logarithmic paper to generate a curve, and
 - comparing the curve obtained with a family of similar curves of known geothermal gradients.

4,008,609

INDUCTIVE FLOWMETER

Josef Lambrecht, Porz-Eil; Klaus Mendte, Bensberg-Refrath, and Rudolf Schmidt, Rosrath, all of Germany, assignors to Interatom, Internationale Atomreaktorbau GmbH, Bensberg, Cologne, Germany

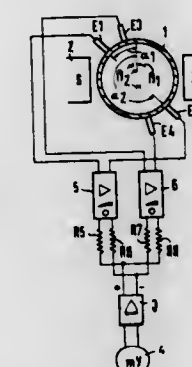
Filed Oct. 2, 1975, Ser. No. 619,029

Claims priority, application Germany, Oct. 15, 1974, 2448945

Int. Cl.² G01F 1/58

U.S. Cl. 73-194 EM

4 Claims



1. An inductive flow meter for the flow of an electrically conductive fluid, comprising a metal pipe through which said fluid flows, north and south magnetic poles respectively positioned diametrically outside the pipe and forming a magnetic field having an axis extending through the pipe's inside perpendicular to the pipe's axis, a first pair of electrodes formed by two interspaced electrodes attached to the pipe's outside, a second pair of interspaced electrodes attached to the pipe's outside and means for measuring electric currents between said electrodes, wherein the improvement comprises:

- a. said second pair of electrodes being formed by first and second electrodes of which at least one is positioned at an angle substantially different than 90° around the pipe's circumference with respect to at least one of the electrodes of said first pair, all of said electrodes of said first pair and said second pair along with the axis of the magnetic field being positioned in substantially the same radial plane; and
- b. said means for measuring electric currents being a differential circuit weighted so that the difference currents between said electrodes depend substantially linearly on the flow rate of said fluid in the pipe.

4,008,610

SELF-BALANCING D.C.-SUBSTITUTION MEASURING SYSTEM

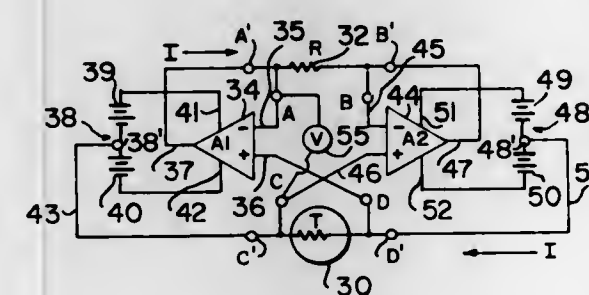
Neil T. Larsen, Boulder, and Gerome R. Reeve, Lafayette, both of Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Continuation-in-part of Ser. No. 476,646, June 5, 1975, abandoned. This application June 17, 1975, Ser. No. 587,565

Int. Cl.² G01F 1/68; G01R 21/02

U.S. Cl. 73-204

18 Claims



10. A self-balanced D.C.-substitution system for the measurement of R.F. power comprising:

a temperature dependent bolometer element;

a substantially temperature independent reference resistor element;

first amplifying means;

second amplifying means;

circuit means connecting said first amplifying means, said bolometer element, said second amplifying means, and said reference resistor element in a current loop, one of said amplifying means generating said current with a value to drive the resistance of said bolometer into equality with the resistance of said reference resistor element; and

means for measuring a voltage from a pair of points on said current loop which is a function of direct current power dissipation in said bolometer element.

4,008,611

FLUID FLOW MEASURING APPARATUS

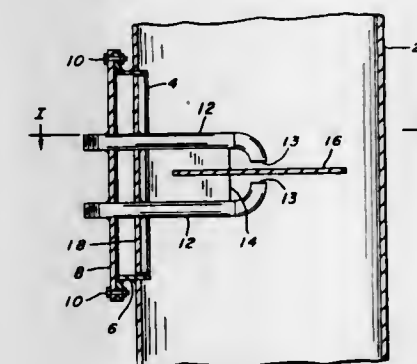
Elmer W. Turocy, Bridgeville, Pa., assignor to S. P. Kinney Engineers, Inc., Carnegie, Pa.

Filed July 1, 1975, Ser. No. 592,108

Int. Cl.² G01F 1/37

U.S. Cl. 73-205 R

4 Claims



1. Apparatus for producing a pressure differential for measuring flow of a gaseous fluid through a conduit of circular cross-section, comprising:
 - a pair of hollow tubes secured to the conduit, the axes of the tubes being located in a half plane which extends from and is perpendicular to the axis of the conduit, each of said tubes passing from without to within the conduit, the inner ends of said tubes being open, parallel, confronting, and perpendicular to the axis of the conduit;
 - a support plate attached to and between the tubes in the half plane of the axes of the tubes; and
 - a circular plate, having a diameter less than the diameter of the conduit, attached to and supported by the support plate, lying in a plane perpendicular to the axis of the conduit, and parallel to and between the open ends of the tubes, the center of the plate being on the axis of the conduit.

4,008,612

LIQUID QUANTITY DETECTING DEVICE

Tateki Nagaoka, Tokyo; Yoshimasa Kimura, Kawasaki, and Yutaka Komiya, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 17, 1975, Ser. No. 614,183

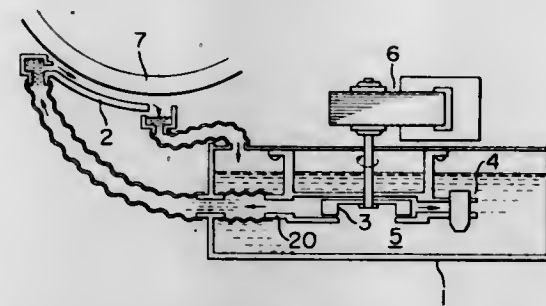
Int. Cl.² G08B 21/00; G01F 23/00

U.S. Cl. 73-290 R

20 Claims

1. A liquid quantity detecting device comprising:
 - a liquid container;
 - liquid circulating means disposed within said container for circulating liquid through a predetermined path so that bubbles are produced in the liquid when the quantity of same decreases below a particular level; and

bubble detector means disposed adjacent said liquid path



for detecting said bubbles and for producing a corresponding detection signal.

4,008,613

VIBRATORY BIN LEVEL INDICATORS

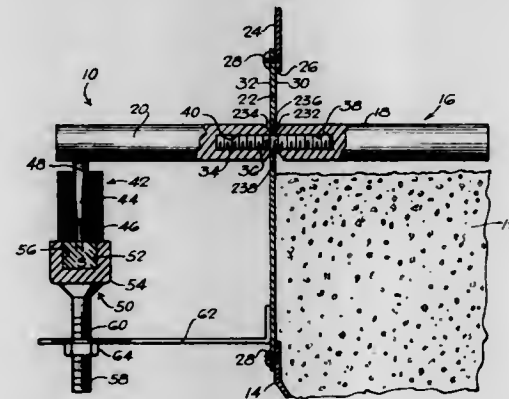
Donald M. Myers, Berrien Springs, Mich., assignor to Ludlow Industries, Inc., Batavia, Ill.

Filed Oct. 3, 1975, Ser. No. 619,524

Int. Cl.² G01F 23/28

U.S. Cl. 73-290 V

9 Claims



1. A level indicator for indicating the level of a flowable material in a bin or other receptacle, comprising a wall member adapted to form a wall element of the receptacle, said wall member having inner and outer sides, a vibratory system including an inner rod element extending transversely from said inner side of said wall member, an outer rod element extending transversely from said outer side of said wall member, and means for securing said inner and outer rod elements to said respective inner and outer sides of said wall member, said inner and outer rod elements having axes in substantial alignment, said means including a threaded screw stud extending between said inner and outer rod elements for clamping said rod elements against said inner and outer sides of said wall member, said wall member having an opening for receiving said stud, said rod elements having threaded openings for receiving said stud, vibration inducing means for causing vibrations of said outer rod element and thereby causing sympathetic vibrations of said inner rod element, sensor means for sensing the magnitude of the vibrations of said outer rod element, such magnitude being decreased by any engagement of the flowable material with said inner rod element, said outer rod element having a natural vibration frequency, said vibration inducing means including impulse means for producing impulses of force upon said outer rod element at a low repetition frequency substantially below said natural vibration frequency, said sensor means including means responsive to vibrations at said natural vibration frequency,

and gating means for causing said sensor means to be inactive during said impulses while causing said sensor means to be active during the intervals between said impulses.

4,008,614

REMOVABLE PROBE UNIT FOR ELECTRONIC MEASURING SYSTEM

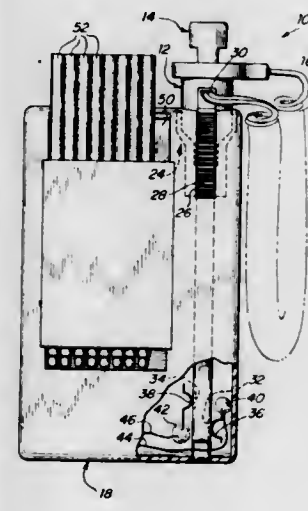
Robert Bruce Turner, Weymouth, and Paul E. Brefka, Southboro, both of Mass., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Apr. 28, 1976, Ser. No. 681,211

Int. Cl.² G01K 1/14

U.S. Cl. 73-343 R

10 Claims



1. An independent, replaceable probe unit for an electronic measuring system having a housing with a compartment for receiving said probe unit, comprising:

- a probe member including a probe element bearing a sensor device for sensing the parameter to be measured by the system and a cable electrically connected to said sensor device; and
- a probe chamber removably mountable in said compartment and having a recess for receiving said probe member, said chamber including contact means interconnected with said cable and disposed to engage corresponding contact means in said compartment for interconnecting said probe member with the electronic measuring system.

4,008,615

TEMPERATURE AVERAGING DEVICE

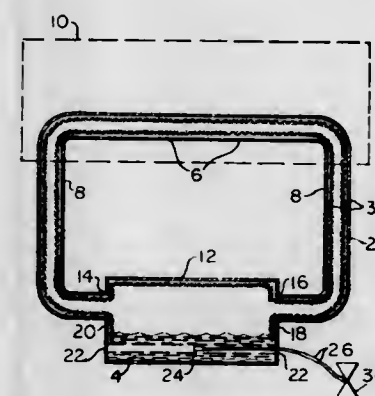
Malcolm D. MacMaster, Washington Crossing, Pa., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Apr. 28, 1975, Ser. No. 572,252

Int. Cl.² F25B 49/00; G01K 1/16

U.S. Cl. 73-343 R

9 Claims



1. A temperature averaging and sensing device for use with a refrigeration control system for monitoring refrigeration requirements of a food case or other selected environment which comprises:

a. a hermetically sealed refrigeration conduit such as a closed loop tube partially filled with refrigerant, which comprises:

1. an elongated condenser section located directly within the refrigerated environment; and
 2. an evaporator section in full fluid flow communication with said condenser section;
- b. a collection pot for the liquid refrigerant which will assume the average temperature sensed in the refrigerated environment and located below and between said condenser section and said evaporator section and connected to be in full fluid flow communication therewith, said collection pot providing a storage location for the coldest liquid refrigerant and being hermetically sealed from the ambient, said pot being located within said evaporator section of said refrigeration conduit;
- c. a sensing well attached to and positioned towards the bottom of said collection pot for providing a location for sensing the temperature of refrigerant in the bottom of said pot, said well being hermetically sealed with respect to the interior of said collection pot; and
- d. a temperature sensing probe located within said well in the bottom of said collection pot for sensing the temperature of refrigerant located within the bottom of said collecting pot as an indication of the average of the temperatures sensed throughout the refrigerated environment.

4,008,616

SCANNING PYROMETER

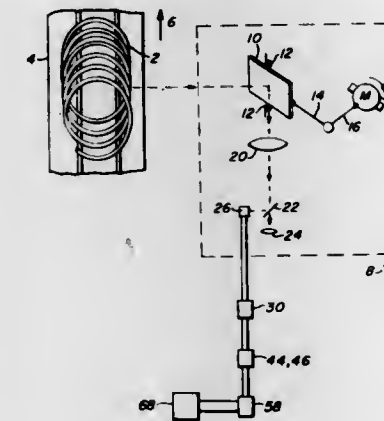
Thomas P. Murray, Churchill Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1975, Ser. No. 624,024

Int. Cl.² G01K 13/06

U.S. Cl. 73-355 R

5 Claims



1. A scanning pyrometer for measuring the maximum temperature of moving material having a plurality of separate components which may occur in a non-uniform pattern comprising:

- a thermal radiation detector for providing an electrical output in response to thermal radiation received by the detector,
- an optical system for focusing thermal radiation from part of the separate components of the material on the detector,
- oscillating means in said optical system whereby the detector receives radiation from traversing a region generally transverse to the direction of movement of the separate components and said electrical output is a series of electrical pulses from each traverse, each electrical output being representative of the temperature of a separate component, and
- means connected to said detector for providing a continuous electrical signal representative of the peaks of said electrical pulses.

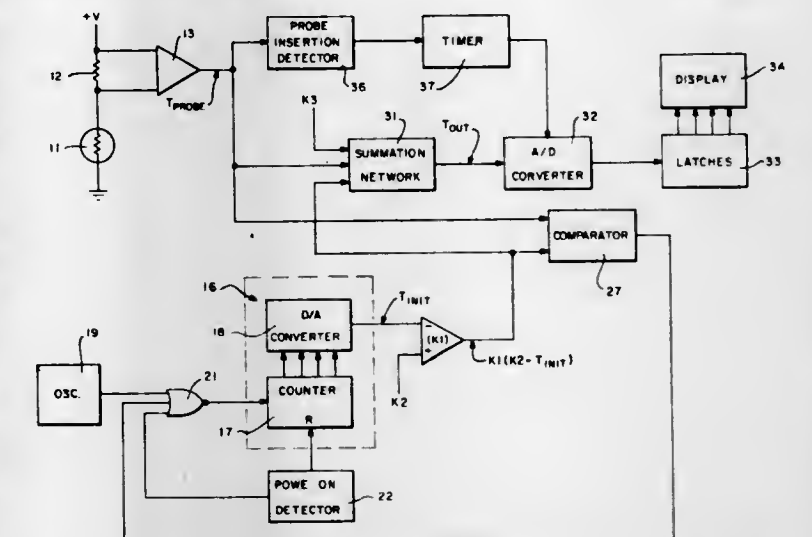
4,008,617

ELECTRONIC THERMOMETER AND METHOD
David H. Yen, Sunnyvale; Tim R. Connelly, Campbell, and John J. Lee, Cupertino, all of Calif., assignors to Filac Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 539,927, Jan. 9, 1975, abandoned. This application Dec. 8, 1975, Ser. No. 638,430
Int. Cl.² G01K 3/00

U.S. Cl. 73-362 R

9 Claims



1. In a method of determining the temperature of a body utilizing a sensing element having an initial temperature different than the temperature of the body, the steps of: bringing the sensing element into contact with a predetermined region of the body, the temperature of said region being changed by the contact with the sensing element, maintaining the sensing element in contact with the body to permit the temperature of the sensing element and the temperature of the predetermined region to approach equilibrium with the temperature of the remainder of the body, providing an electrical signal corresponding to the temperature of the sensing element, storing a signal corresponding to the initial temperature of the sensing element, and combining the stored signal with the temperature signal a predetermined time after the sensing element is brought into contact with the body to provide an advance indication of the equilibrium temperature.

4,008,618

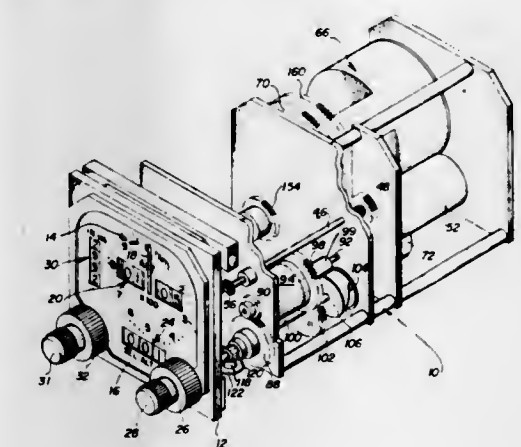
FLIGHT INSTRUMENT

James R. Younkin, Fayetteville, Ark., assignor to Edo-Aire Mitchell Industries, Inc., Mineral Wells, Tex.

Division of Ser. No. 454,305, March 25, 1974, Pat. No. 3,940,990. This application Aug. 4, 1975, Ser. No. 601,823
Int. Cl.² G01L 7/14

U.S. Cl. 73-387

14 Claims



1. A flight instrument as part of an altitude indicator system having a pressure transducer generating a signal varying with aircraft altitude and including an atmospheric pressure set point adjustment, comprising in combination:
altitude indicator means having digital display means and

analog display means each responsive to the signal varying with aircraft altitude,
altitude selector means for generating a signal to an altitude control system to establish a desired aircraft altitude, said altitude selector means including a first adjustment means and a second adjustment means, the first adjustment means varying the altitude selection over the most significant increments thereof and the second adjustment means varying the altitude selection over the least significant increments, and
a digital indicator including means coupled to said altitude selector means for digitally indicating a set point of the desired aircraft altitude.

4,008,619

VACUUM MONITORING

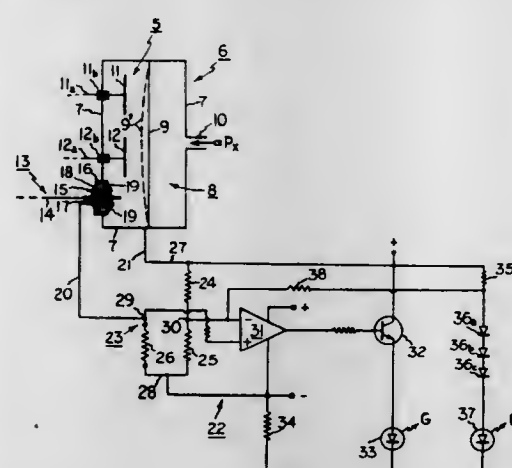
H. David Alkaide, Bedford, and James H. Ewing, Brockton, both of Mass., assignors to MKS Instruments, Inc., Burlington, Mass.

Filed Nov. 17, 1975, Ser. No. 632,460

Int. Cl.² G01L 9/12; G01N 27/04

U.S. Cl. 73—398 C

16 Claims



1. Apparatus for monitoring the change in the electrical resistive condition from an initially determined resistive condition of a layer of highly-reactive getter material located at an initially substantially evacuated site which is rendered physically inaccessible by sealing, comprising at least a pair of electrically-isolated electrically-conductive members each having surfaces both within and remote from said site, electrically-insulating material sealed with said members and preserving the electrically-isolated relationship thereof while disposing surface area therebetween at said site, a continuous layer of said getter material deposited upon said surface area and making electrical contacts with said surfaces of both of said conductive members within said site, and electrical measurement means remote from said site electrically coupled with said conductive members and responsive to said change as exhibited by said layer as a result of its reaction with gases present at said site, thereby to provide an external indication of the degree of degradation of the initial evacuation at said site prior to the exhaustion of the getter.

4,008,620

SAMPLER FOR ANALYZERS

Kiyoshi Narato, Ibaraki; Keizo Ootsuka, and Syoichi Sawahata, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 5, 1975, Ser. No. 574,336

Claims priority, application Japan, May 7, 1974, 49-49757

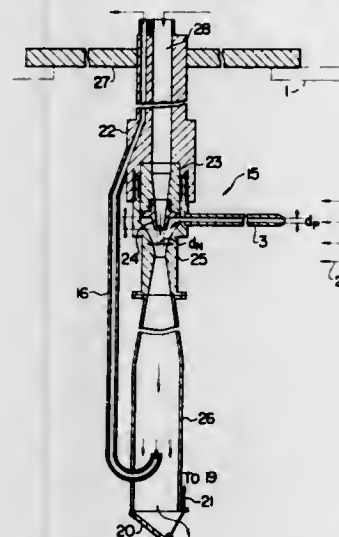
Int. Cl.² G01N 1/24

U.S. Cl. 73—421.5 A

6 Claims

1. A sampler for analyzers comprising a clean-gas supply pipe provided with a nozzle tip which may or may not be interchangeable, a sampling tube for drawing in a sample for analysis, an extracting tube for conducting the sample after

dilution to an analyzing instrument, said sample being admitted to the sampler as a result of the suction created by the clean gas during its introduction into the same vessel, said sample then being diluted with the clean gas and led to the



analyzer via the extracting tube, and which also comprises a suction pipe in which the free end of the extracting tube for conducting the sample to the analyzer is extended to an intermediate point of the pipe, and a sampling nozzle attached to the free end of the suction pipe.

4,008,621

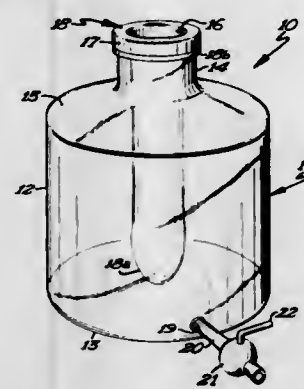
METHOD AND APPARATUS FOR SAMPLING GAS
Nedeljko Ostojic, Coon Rapids, and Vladimir G. Boscak, Minneapolis, both of Minn., assignors to Geo. A. Hormel & Co., Austin, Minn.

Filed July 7, 1975, Ser. No. 593,871

Int. Cl.² G01N 1/24

U.S. Cl. 73—421.5 R

1 Claim



1. A method of obtaining a sample of gas, said method comprising the steps of:

opening a valve controlled port of a rigid portable container with an externally located valve, said rigid container having an upwardly opening reduced diameter neck portion having an opening therein, said neck portion comprising an outer peripheral annular lip portion, a fluid impervious elastic diaphragm extending into and closing said opening, said diaphragm having an annular retaining element for grippingly engaging said container neck lip portion;

directing air into said opening by blowing into said neck to thereby cause the elastic diaphragm to expand into the container to progressively force air from the container out through the port until the diaphragm engages substantially the entire inner surface of the container;

manually closing the valve for said port while said elastic diaphragm engages the inner surface of the container, whereby said diaphragm will adhere to the inner surface of the container;

manually placing the container in the gaseous sampling zone and thereafter manually opening the valve to inter-

communicate the container with the sampling zone, whereby the gaseous atmosphere constituting the sampling zone will enter the port and the elastic diaphragm will contract and return to its original position to create suction within the container and cause the gaseous sample to fill the container; and
manually closing said externally located valve thereby closing the valve controlled port.

4,008,622

METHOD OF TESTING THE QUALITIES OF A MATERIAL

Hassan Youssef, Taverny, France, assignor to La Metallurgie Francaise des Poudres Metafram, Paris, France
Filed May 29, 1975, Ser. No. 581,922

Claims priority, application France, June 13, 1974, 74.20487

Int. Cl.² G01N 33/20

U.S. Cl. 73—432 R

7 Claims

1. A method of testing the qualities of a porous material for forming at least one portion of a self-lubricating bearing-member containing oil, said method comprising immersing a quantity of said material reduced to powder form in said oil, maintaining said oil at a temperature at most equal to its maximum temperature of use for a period of time of tens of hours, separately maintaining at said temperature and for the same period of time a sample of the same oil without the powder material immersed therein, and verifying that the presence of said powder material in said oil does not produce in the course of said time period perceptible deterioration of the oil, by comparing said oil with the sample of the same oil kept for the same period of time at the same temperature whereby the powder material can be determined as suitable for use as the porous material of the self-lubricating bearing member.

electrical energy to said gyroscope through the liquid in said gap, said inlet being located at a lower level than said outlet, said gap having a relatively narrow bearing zone communicating with said inlet and a relatively wider zone communicating with said outlet, said bearing zone having an exit merging said bearing zone with said wider zone, the liquid in said bearing zone portion of said gap forming a bearing supporting said sphere in floating condition spaced from the inner surface of said vessel against vertical and horizontal forces exerted on said sphere by gravity and acceleration, the width s of said bearing zone of said gap amounting at any point between said inlet and said exit during the circulation of said liquid in the operative condition of said instrument to

$$K \frac{d_0}{d} \cdot s_0$$

s_0 being the width of said gap at the level of said inlet, d_0 being the outer horizontal diameter of said sphere at the level of said inlet, d being the outer horizontal diameter of said sphere at said point, and K being a constant amounting to from 0.9 to 1.3, s being a steady function of d between said inlet and said exit, the feeding capacity of said pump being such that the flow of the liquid through said gap from said inlet to said outlet is laminar, whereby displacement of the center of said sphere from the axis of said internal surface of revolution causes a high lateral force to be produced by the bearing pressure exerted by said liquid on said sphere in said bearing zone to thereby counteract said displacement.

4,008,624

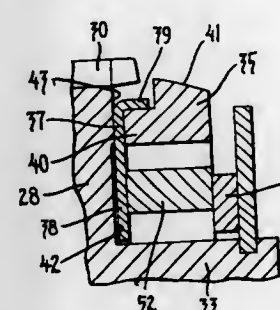
SYNCHRONIZING MECHANISM FOR CHANGE SPEED GEARS

Jean C. Van Dest, Ris-Orangis, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles
Filed Apr. 23, 1975, Ser. No. 570,900

Int. Cl.² F16H 3/38

U.S. Cl. 74—339

6 Claims



1. In a synchronizing mechanism for change speed gear systems, including a split resilient synchronizer ring encircling the hub of a gear, a locking member for acting on the synchronizer ring in one working direction during synchronizing operation, with said locking member being curved and located within the synchronizer ring, and having stops located opposite each other, with the locking member being separate from said stops and braced between them with its ends respectively bearing against the stops when in its locked position, the improvement wherein a carrier is provided for holding the synchronizer ring, said carrier having an annular disc portion with axially extending flange means for restraining said synchronizer ring from expanding beyond a desired diameter, said annular disc portion of said carrier having a central opening of greater diameter than the diameter of said hub of said gear to permit limited floating movement of said carrier and synchronizer ring in radial directions relative to the axis of rotation of said gear.

4,008,623

GYROSCOPIC INSTRUMENT

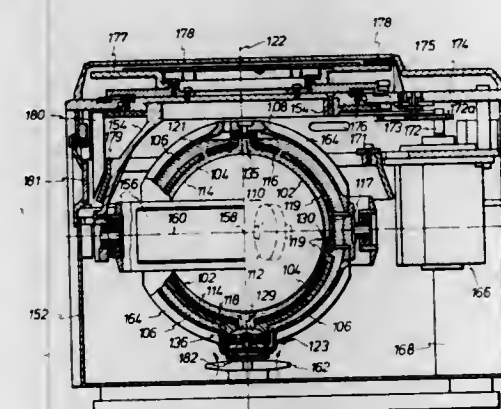
Hans Ehrlich, Kiel-Schulensee; Helko Emshoff, Kiel-Holtensau, and Hans-Peter Otto, Kiel-Projensdorf, all of Germany, assignors to Anschütz & Co. GmbH, Kiel-Wik, Germany
Filed June 3, 1975, Ser. No. 583,206

Claims priority, application Germany, June 5, 1974, 2427192

Int. Cl.² G01C 19/20

U.S. Cl. 74—5 R

7 Claims



1. In a gyroscopic instrument, the combination comprising a hollow sphere, at least one motor-driven gyroscope mounted within said sphere, a vessel having an inlet and an outlet and an internal surface of revolution surrounding said sphere at a distance therefrom providing for a gap between the outer surface of said sphere and the inner surface of said vessel, a liquid filling said vessel, guide means on said vessel outside of said gap constituting a passageway leading from said outlet to said inlet, a motor-driven pump included in said passageway for circulating the liquid through said gap and through said passageway, and electrical current-supplying means including conductive electrode portions of said surfaces for supplying

4,008,625

FLOATING NUT CONSTRUCTION

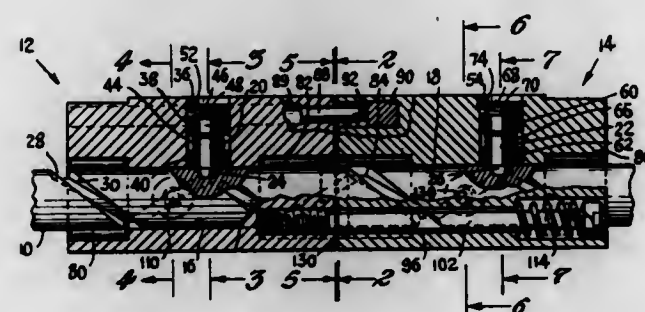
Surinder M. Malhotra, Georgetown, Conn., assignor to Norco, Inc., Ridgefield, Conn.

Filed Dec. 15, 1975, Ser. No. 641,082

Int. Cl.² F16H 55/18, 1/18, 55/22, 55/06

U.S. Cl. 74-441

9 Claims



1. A zero-backlash anti-friction nut construction for engagement with the threads of a screw, comprising in combination:

- a first nut section having a through bore to receive the screw,
- a second nut section disposed end to end to the first section and having a through bore in axial alignment with the first bore,
- a roller carried by the first nut section, having a tip portion extending into the bore thereof for engagement with the walls of the grooves in the screw,
- anti-friction means mounting said roller on the nut section for rotation about its axis during such engagement,
- spring means biasing said roller in a generally radially inward direction with respect to the first nut section to thereby maintain such engagement,
- an additional roller, said additional roller being carried by the second nut section and having a tip portion extending into the bore thereof, for engagement with the walls of the grooves in the screw,
- anti-friction means mounting said additional roller on the second nut section for rotation about its axis during such engagement,
- spring means biasing said additional roller in a generally radially inward direction with respect to the second nut section,
- bearing means carried by said nut sections for maintaining their bores substantially in axial alignment with respect to one another, and with respect to the axis of the screw, and
- means carried by at least one of said sections, for biasing the sections in axial opposed directions with respect to one another and opposing the action of the spring means associated with said rollers, said section biasing and spring means cooperating to minimize looseness and slop in relative axial directions between each of the nut sections and the threads of the screw while at the same time said section biasing means enables the nut sections to float laterally to their axes with respect to each other,
- said bearing means comprising two pairs of end bearings,
- one pair of end bearings being disposed near opposite ends respectively of one nut section,
- the other pair of end bearings being disposed near opposite ends respectively of the other nut section, said bearing means preventing the lateral float movement of the nut sections as permitted by said section biasing means.

4,008,626

LINKAGES FOR MOVING AND RETAINING A CONTROL LEVER TO AND IN A NON-USE POSITION

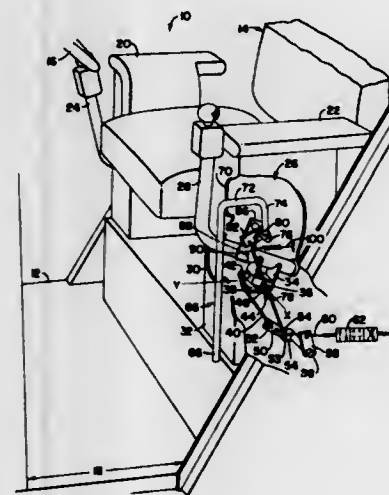
Gary Lee Schulte, Dubuque, and Edwin Lee Whisler, Peosta, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sept. 10, 1975, Ser. No. 612,188

Int. Cl.² G05G 1/00

U.S. Cl. 74-491

4 Claims



1. In a combination of a control linkage including a control lever mounted for pivotal movement in at least one plane between a neutral position and at least one actuating position, an output member mounted for rotation about a first axis, first motion transmitting means connected between the lever and the output member for causing movement of the latter between neutral and actuating positions corresponding to the neutral and actuating positions of the lever, biasing means connected to the output member for yieldably maintaining the latter in its neutral position, and a safety bar mounted in the vicinity of the lever for pivotal movement in a plane extending generally parallel to the one plane between a normal position disposed free of the control linkage and a locking position engaged with the control linkage for preventing movement of the output member from its neutral position, the improvement comprising: said first motion transmitting means including a first link pivotally connected to a first end of an interlock link having a second end and being pivotally connected between its first and second ends to the output member for movement about a second axis extending parallel to the first axis; a second motion transmitting means connecting the safety bar to the interlock link and including a second link pivotally connected to the second end of the interlock link at a location chosen so as to lie on the first axis when the safety bar is in its normal position; said lever being movable in the first plane to a non-use position; the first and second motion transmitting means and the interlock link being dimensioned and arranged such that movement of the lever when the safety bar is in its normal position will result in movement of the interlock link about the first axis for effecting movement of the output member and movement of the safety bar will result in movement of the interlock link about the second axis for effecting movement of the control lever, the latter movement disposing the control lever in the non-use position when the safety bar is in its locking position; and lock means, including first means fixed for movement with the safety bar and second means fixed for movement with the control lever, disposed for engagement only when the safety bar is in its locking position and the control lever is in its non-use position.

4,008,627

RACK AND PINION UNITS

Kenneth Bradshaw, and James Ernest Buckingham, both of Bristol, England, assignors to Cam Gears Limited, Hitchin, England

Filed July 18, 1973, Ser. No. 380,259

Int. Cl.² B62D 1/20

U.S. Cl. 74-498

19 Claims



1. A rack and pinion steering gear comprising:
- a rack bar carrying a rack;
 - pinion means including a shaft,
 - a pinion on said shaft, and bearing means for mounting said shaft for rotation; and a unitary housing including at least two mating housing shells enclosing said rack bar, said pinion and said bearing means, each of said shells including
 - first support means slidably mounting said rack bar,
 - second support means fixedly mounting said pinion assembly with said pinion operatively engaging said rack, and
 - securing means permanently securing said shells together in a fixed, mated relationship.

4,008,628

HYDROMECHANICAL TRANSMISSION

Elias Orshansky, Jr., San Francisco, Calif., assignor to Orshansky Transmission Corporation, New York, N.Y.

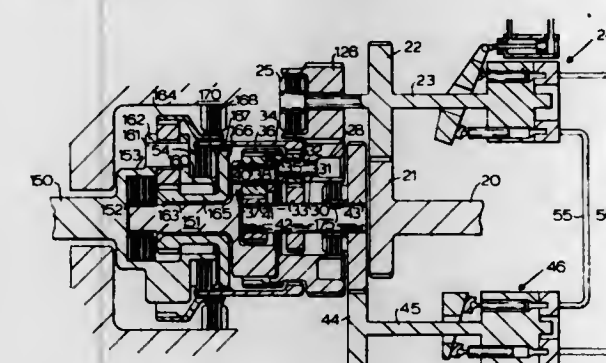
Continuation of Ser. No. 477,082, June 6, 1974, abandoned, Division of Ser. No. 291,803, Sept. 25, 1972, Pat. No. 3,888,139, which is a continuation-in-part of Ser. No. 259,549, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 154,976, June 21, 1971, abandoned. This application

Aug. 26, 1975, Ser. No. 607,833

Int. Cl.² F16H 47/04, 57/10, 37/06

U.S. Cl. 74-687

8 Claims



1. In a power transmission having input means and output means, the combination therewith of
- two planetary gear trains each having an input member, an output member and a reaction member,
 - the input member of one said gear train being connectable to said input means, the input members of the two gear trains being interconnected so that both are driven by said input means,
 - the reaction members of the two gear trains being at all times rotatable and at all times being interconnected so that they are not rotatable relative to each other, and
 - the output members of the two gear trains being coaxial and rotatable with respect to each other, and
 - rotary clutch means for separately clutching said output members to said output means.

6. In a power transmission having input means and output means, the combination therewith of:

- two planetary gear trains each having its own carrier and its own planet, sun, and ring gears, to provide an input member, an output member and a reaction member,
- the input member of a first said gear train being a carrier and being connectable to said input means, the input member of a second said gear train being a ring gear and being connected by gear coupling to the carrier of said first gear train, so that both are driven by said input means,
- the reaction members of the two gear trains being sun gears mounted on a common reaction shaft,
- the output members of the two gear trains being separately clutchable to said output means, the output member of said first gear train being a ring gear,
- a stationary casing,
- a reduction planetary assembly having a sun gear, a ring gear, and planet gears and a carrier secured to said output means,
- driving connection means connecting said ring gear of said first gear train to the sun gear of said reduction planetary assembly,
- first clutch means for connecting said carrier of said second gear train to said carrier of said reduction planetary assembly, and
- first brake means for connecting said ring gear of said reduction planetary assembly to said stationary casing, to hold that ring gear stationary,
- said reduction planetary assembly and said first and second planetary assemblies all being identical to each other as to the sizes and teeth of their gears and carriers.

4,008,629

SUN GEAR RETAINER IN PLANETARY GEARSET

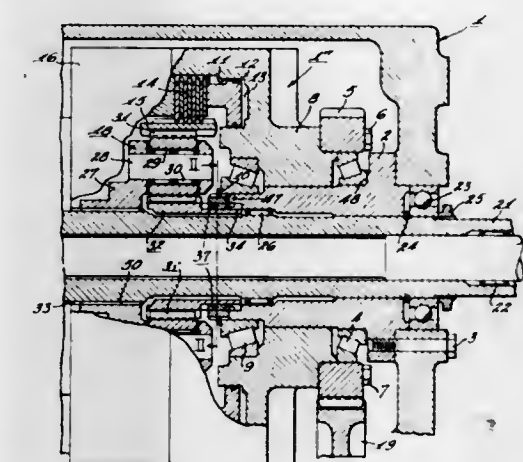
Joseph R. Hoepfl, Greenfield, and Gerardus M. Ballendux, Waukesha, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 3, 1975, Ser. No. 628,523

Int. Cl.² F16H 57/00

U.S. Cl. 74-781 R

10 Claims



1. A gear and bearing mounting in a transmission comprising, a transmission housing, a mounting sleeve connected to said housing defining a plurality of key slots, a bearing mounted externally on said sleeve, means for retaining said bearing on said sleeve, a second bearing mounted internally in said sleeve, a gear having a supporting flange defining a plurality of keyways and mounted in said sleeve, a plurality of keys mounted in said key slots of said sleeve and said keyways of said supporting flange for absorbing torque transmitted between said sleeve and said gear, fastening means holding said gear axially on said mounting sleeve, shoulders on said keys engaging said mounting sleeve for retaining said keys in said keyways and key slots.

4,008,630

FLUID PRESSURE CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

Noboru Murakami, Nagoya, and Koichiro Hirosawa, Kariya both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

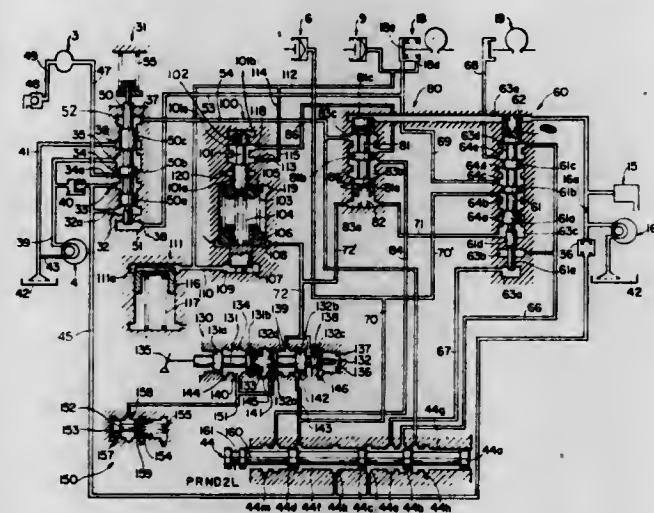
Filed Sept. 17, 1974, Ser. No. 506,884

Claims priority, application Japan, Sept. 18, 1973, 48-105668

Int. Cl.² B60K 41/18

U.S. Cl. 74-865

4 Claims



1. A fluid pressure control system for automatic fluid transmission comprising

- a fluid pressure source;
- a fluid pressure regulating valve for regulating the hydraulic fluid from said fluid pressure source to a particular line pressure;
- a plurality of frictional engaging means actuated by said line pressure from said pressure regulating valve for attaining a particular gear ratio within the gear train of said transmission interposed between an input shaft and an output shaft;
- a governor valve for governor pressure which is increased or decreased in response to the rotational speed of said output shaft;
- a manual shift valve operatively connected to said fluid pressure regulating valve for supplying said line pressure to said plurality of frictional engaging means;
- a throttle valve fluidically connected to said manual shift valve for generating a throttle pressure responsive to an engine throttle valve;
- a shift valve actuated in response to said governor pressure and said throttle pressure for automatically selectively actuating said plurality of frictional engaging means; and
- a reducing valve for supplying said throttle pressure to said shift valve when said throttle pressure is below a predetermined value and for supplying a predetermined threshold pressure to said shift valve upon kick-down operation by non-activating said throttle valve in order not to exceed said predetermined valve of throttle pressure.

4,008,631

MACHINE TOOL

Robert S. Hahn, Northboro; Bruno A. Holmstrom, West Boylston; Arthur F. St. Andre, Marlboro, and David H. Youden, Shrewsbury, all of Mass., assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Division of Ser. No. 544,266, Jan. 27, 1975, which is a continuation of Ser. No. 393,738, Sept. 4, 1973, which is a continuation of Ser. No. 184,162, Sept. 27, 1971, abandoned.

This application Nov. 6, 1975, Ser. No. 629,598

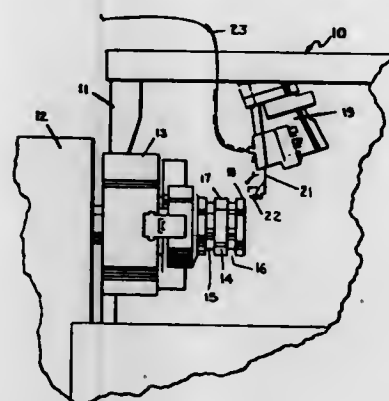
Int. Cl.² B23D 1/00; B23B 3/00; B26D 1/00

U.S. Cl. 82-1 C

1 Claim

1. A process for removing material from a workpiece, comprising the steps of:

- a. applying to the workpiece a ceramic tool having a cutting edge,
- b. advancing the cutting edge of the tool relative to the workpiece to remove the material,
- c. directing a gas flame to the cutting edge of the tool, thus providing hot gas to the said cutting edge for direct heating of the tool with only indirect heating of the workpiece, and
- d. maintaining the tool in a range of high temperatures for a period of time, said range of temperatures being independent of whether the tool is cutting or idling during the period, so that the tool does not develop cracks due to wide variations in temperature.



ing of the tool with only indirect heating of the workpiece, and

4,008,632

WATCH BAND LINK CONNECTING DEVICE

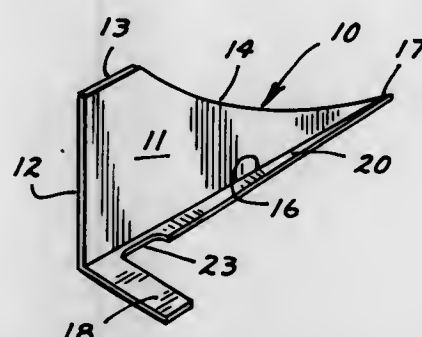
Joe W. Denney, Hays, Kans., assignor to Walter Moorhouse, Clear Lake, Minn.

Filed Nov. 17, 1975, Ser. No. 632,215

Int. Cl.² B25B 27/22; B21L 21/00

U.S. Cl. 81-3 R

4 Claims



1. A tool for use in connecting links of a link type watch-band comprising

- a body portion of substantially rigid sheet material,
- an elongated arm extending at right angles to one side of said body portion, and
- a flange in the plane of said arm extending along said body portion, said flange being wedge like of a relatively narrow width and tapering to a point at its free end.

4,008,633

MULTI SPINDLE LATHES

Harold James Gilbert, deceased, late of Coventry, England, by Olive Gilbert, executrix, and Edmund Alexander McConnell, Coventry, England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed Sept. 3, 1975, Ser. No. 610,073

Claims priority, application United Kingdom, Sept. 12, 1974, 39743/74

Int. Cl.² B23B 3/34, 3/36, 3/00

U.S. Cl. 82-3

4 Claims

1. In a multi-spindle lathe having a plurality of chucks on the work spindle, the combination comprising:

- operating means movable axially of said work spindle for opening and closing a chuck on said spindle;

4,008,635

MULTI SPINDLE LATHES

Harold James Gilbert, deceased, late of Coventry, England, by Olive Gertrude Gilbert, executrix, and Edmund Alexander McConnell, Coventry, England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

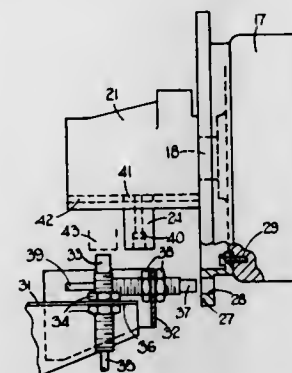
Filed Sept. 3, 1975, Ser. No. 610,072

Claims priority, application United Kingdom, Sept. 12, 1974, 39744/74

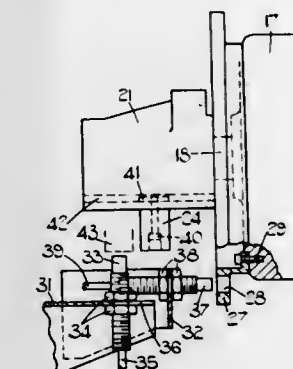
Int. Cl.² B23B 19/02, 3/34

U.S. Cl. 82-30

3 Claims



indicating means controlled by said proximity switch means for providing an indication of whether said chuck is opened or closed.



1. In a control system for an automatic lathe the combination comprising:

- a gapped ring mounted for rotation with a spindle of said lathe, said ring having a plurality of gaps arranged to follow a circular path as said ring rotates;
- a proximity probe positioned adjacent to said circular path and adapted to produce signal pulses in response to passage of said gaps, said pulses being generated without contact between said ring and said probe; and
- control means responsive to said signal pulses for inhibiting predetermined functions of said lathe so long as the time between successive ones of said signal pulses is less than a predetermined interval.

4,008,634

MULTISPINDLE AUTOMATIC LATHE

Hermann Flisch, Maiefeld, Switzerland, assignor to Eunipp AG, Zug, Switzerland

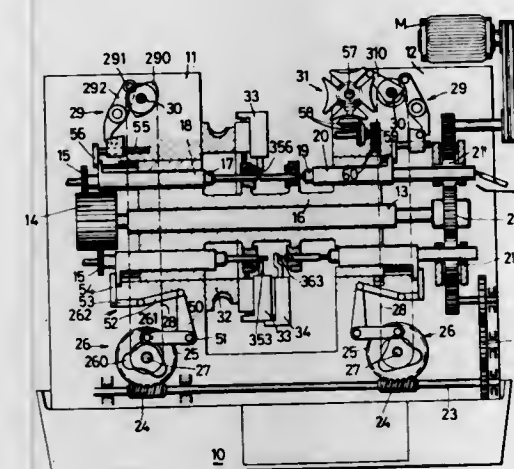
Filed Feb. 25, 1976, Ser. No. 661,167

Claims priority, application Switzerland, Mar. 14, 1975, 3274/75

Int. Cl.² B23B 9/04

U.S. Cl. 82-3

8 Claims



1. In an automatic multispinde lathe, a combination comprising a drum having an axis and a pair of opposite end portions; a pair of support means supporting said drum on said opposite end portions for indexing movement about its axis between a plurality of angularly displaced successive work stations; a plurality of spindle sleeves equal in number to said plurality of working stations mounted in each of said end portions of said drum for movement in longitudinal direction; a spindle turnably but axially immovably mounted in each of said spindle sleeves; a plurality of advancing means, one for each of said spindle sleeves; a driven shaft; transmission means between said driven shaft and said plurality of advancing means for driving all of said advancing means from said driven shaft; a plurality of tool slides; and a single tool slide carrier mounted on one of said support means and supporting said plurality of tool slides for movement in radial direction.

4,008,636

RATCHET WRENCH

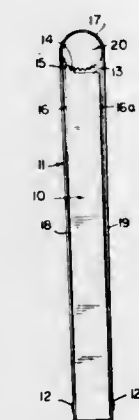
Alfred W. Wakeman, Madison Road, Durham, Conn. 06422

Filed Apr. 21, 1975, Ser. No. 570,247

Int. Cl.² B25B 13/52

U.S. Cl. 81-68

3 Claims



1. A ratchet wrench for applying unidirectional turning force on a grippable member comprising an elongated bar of rigid material terminating at one end in a projecting tooth extending transversely thereof adjacent one lateral edge, a relatively stiff elongated strap including elongated leg portions at either end thereof respectively merging into a U-shaped central portion providing an opening having a width only slightly greater than said bar at said toothed end thereof, said strap embracing said bar with the respective elongated strap leg portions extending along opposite sides of said bar,

said U-shaped central portion enclosing said bar toothed end to define a closed periphery socket for axial reception of a said grippable member, means rigidly securing said strap leg portions to said bar along the sides thereof at points spaced a substantial distance from the toothed end of said bar, said U-shaped central portion of said strap thereby being restricted to limited lateral movement with respect to the said toothed end of said bar, thereby providing a one-way ratcheting action upon a grippable member received therein.

4,008,637

APPARATUS FOR CUTTING HEMMED FABRIC PIECES

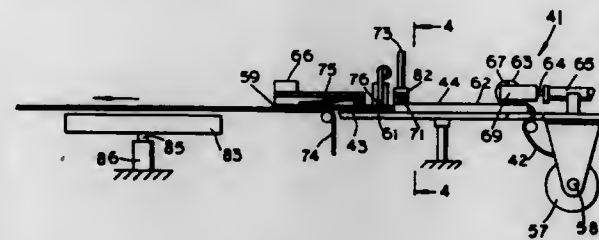
Douglas J. Crawford, Waterford; Roger LeMere, Petersburg, and Francis H. Hughes, North Troy, all of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Division of Ser. No. 344,227, March 23, 1973, Pat. No. 3,898,941. This application Apr. 23, 1975, Ser. No. 570,809

Int. Cl.² B26D 5/38

U.S. Cl. 83-155

5 Claims



1. Apparatus for sequentially feeding individual elongated pieces of liner tape of equal length to a path defined by a continuously moving conveyor, characterized by
 - a. supply means for supplying a continuous length of liner tape;
 - b. a cutting station for severing said continuous length of liner tape into said elongated pieces to be fed to said conveyor;
 - c. forward sensing means adjacent the upstream end of said conveyor for sensing the leading edge of said continuous length of liner tape and defining the forward end of said cutting station;
 - d. cutting means connected to said sensing means for cutting said continuous length of liner tape into said individual elongated pieces;
 - e. said cutting means defining the rearward end of said cutting station;
 - f. retractable liner tape advancing means for positively advancing sequentially the leading edge of said continuous length of liner tape in increments to said forward sensing means;
 - g. said advancing means including a wheel with a non-slip surface for engaging the leading edge of said continuous length of liner tape;
 - h. reversible power means connected to said advancing means for moving said advancing means;
 - i. a one-way slip clutch in said wheel preventing rotation thereof while advancing said continuous length of liner tape and allowing rotation while returning over said continuous length of liner tape; and
 - j. retractable stop means connected to said sensing means for engaging and holding the leading end of said length of liner tape in said cutting station against the reverse movement of said advancing means;
 - k. said reversible power means retracting said wheel at the same time as the leading end of said liner tape is engaged by said retractable stop means followed by activation of said cutting means.

4,008,638 DIE ASSEMBLY FOR FORMING OPENINGS IN WORKPIECES

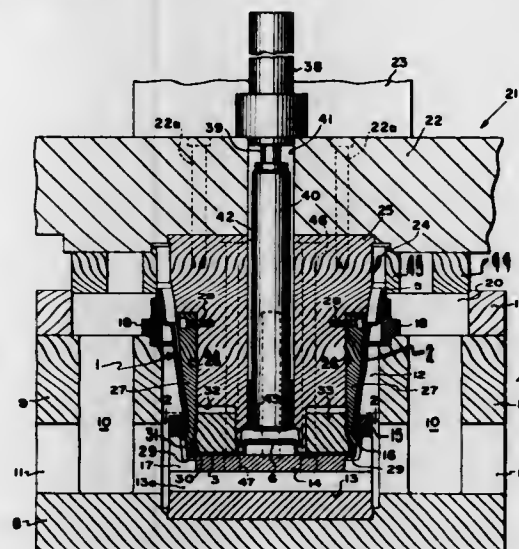
Frederick O. Miller, Saginaw, Mich., assignor to Miller Mold Company, Saginaw, Mich.

Filed Feb. 5, 1976, Ser. No. 655,499

Int. Cl.² B26F 1/02

U.S. Cl. 83-185

16 Claims



1. A die assembly for forming a bottom and side opening in a cup-shaped container, said assembly comprising a base having a cavity for supporting said container with its bottom at a predetermined level; a plug of such size as to fit within said container; means supporting said plug for movement in a direction into said cavity; a punch carried by said plug for movement with the latter in said direction beyond said level and for movement relative to said plug transversely of said direction; and deflecting means supported in the path of movement of said punch in said direction and responsive to movement of said punch in said direction beyond said level to deflect said punch transversely of said direction.

4,008,639

DEVICE FOR SEVERING A VENEER SHEET

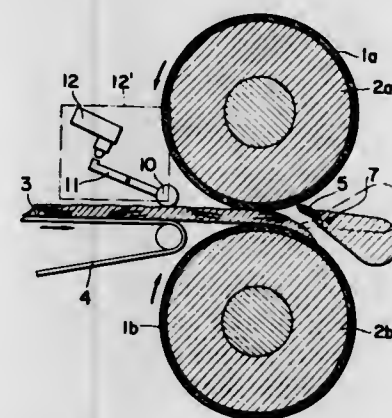
Katsuji Hasegawa, Nagoya, Japan, assignor to Meinan Machinery Works, Inc., Ohbu, Japan

Division of Ser. No. 546,605, Feb. 3, 1975. This application Jan. 26, 1976, Ser. No. 652,304

Int. Cl.² B26D 5/38

U.S. Cl. 83-371

16 Claims



1. A device for severing a veneer sheet comprising a veneer sheet feeding means continuously driven and including a pair of roller members adapted to hold a veneer sheet therebetween, a cutter member pivotally disposed on the feed-out side of the veneer sheet feeding means and having an edge portion adapted to work on the side of the fed-in veneer sheet, a means for sensing a preselected condition of said veneer sheet, a means for transmitting a signal in accordance with the sensing of the preselected condition of the veneer sheet, and an actuator for actuating in response to said signal the cutter

member to pivot and cut the veneer sheet in cooperation with a force by which the veneer sheet is fed, the severed veneer sheets being adapted to be fed out in two different directions which are located on opposite sides of the cutter member.

4,008,640

SAW CHAIN ASSEMBLY

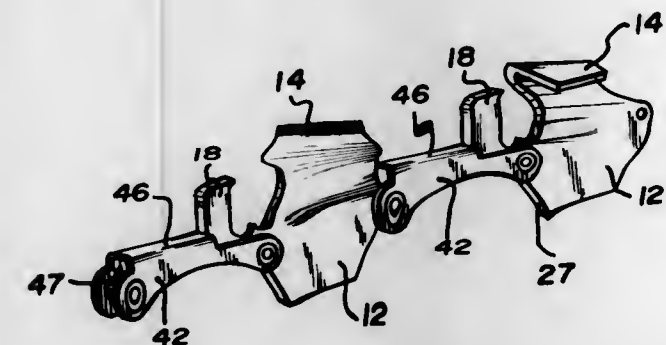
Albert E. Good, 102 High St., Ramsey, N.J. 07446

Filed Sept. 10, 1975, Ser. No. 612,189

Int. Cl.² B27B 33/14

U.S. Cl. 83-833

10 Claims



1. A saw chain assembly comprising a plurality of links and a plurality of linking members, hinging means connecting said links and linking members to form a chain, each pair of adjacent links being separated by a linking member and each pair of adjacent linking members being separated by a link, said links including cutting elements and gear elements, said gear elements being constructed and arranged in said chain to engage the drive mechanism of a powered chain saw, wherein each of said linking members comprises two substantially parallel side walls integrally connected by a bridge wall to define a channel between said side walls and extending the entire length thereof, and said hinging means includes means hingedly connecting one end of each of two adjacent links to said side walls and within said channel.

4,008,641

DEVICE FOR MODULATING A MUSICAL TONE SIGNAL TO PRODUCE A ROTATING SOUND EFFECT

Akira Takada, and Tadao Sakai, both of Osaka, Japan, assignors to Roland Corporation, Osaka, Japan

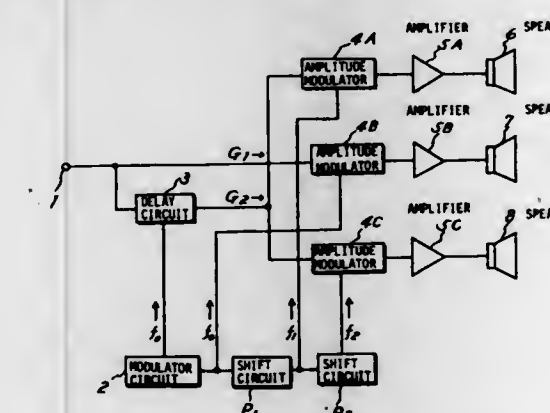
Filed Nov. 20, 1975, Ser. No. 633,909

Claims priority, application Japan, Dec. 7, 1974, 49-141046

Int. Cl.² G10H 1/02; H04M 1/00

U.S. Cl. 84-1.24

5 Claims



1. A device for modulating a musical tone signal to produce a rotating sound effect comprising an input of a musical tone signal, a first channel coupled to said input and having an amplitude modulator therein, at least two further channels each having an amplitude modulator therein, a delay circuit means coupled between said input and said further channels, a frequency modulation means coupled to said amplitude modulator in said first channel and to said delay circuit means for frequency modulating the musical tone therein, phase shift

means coupled between said frequency modulation means and the respective amplitude modulators in said further channels for shifting the phase of the musical tone signals in said channels, and coupling means coupling the outputs of said amplitude modulators and including transducer means for converting the modulated musical tone signals into sound, with the musical tone signal from said first channel being in the center of the reproduced sound and the musical tone signals from the further channels being on opposite sides of the musical tone signal from the first channel, said modulating means, amplitude modulators and phase shift means modulating the signals in the further channels so that when the volume level in one further channel is a maximum the modulated frequency is substantially a maximum, and when the volume level in the other further channel is a maximum, the modulated frequency is substantially a minimum, and when the volume levels of the signals in the further channels are about equal, the volume level and frequency of the signal in the first channel is successively a maximum and a minimum, whereby a rotating sound effect is produced.

4,008,642

FASTENING DEVICE

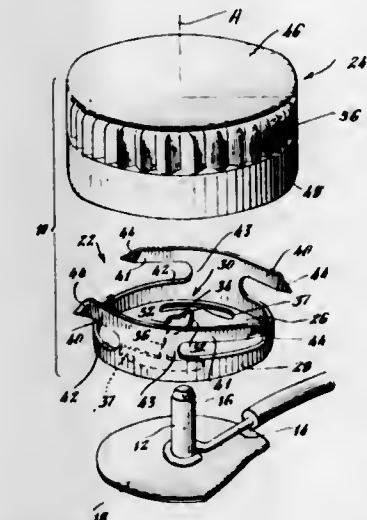
Phillip D. Becker, Southbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed Jan. 8, 1976, Ser. No. 647,615

Int. Cl.² F16B 37/14

U.S. Cl. 85-35

7 Claims



1. A fastening device, having an axis, for engaging a stud and comprising:
 - A. a sheet metal nut element including
 1. a web portion extending generally perpendicularly to the fastening device axis;
 2. means associated with said web portion for engaging a stud;
 3. a generally tubular section formed at the periphery of said web portion, extending therefrom in the direction of the fastening device axis and having at least one pair of circumferentially opposing wings which project outwardly away from the fastening device axis, each wing having its major dimension also extending in the direction of the fastening device axis, and
 - B. a one-piece cap member including
 1. a cover and
 2. a nut element embracing skirt, formed at the periphery of said cover extending therefrom in the direction of the fastening device axis, shaped and sized to fit in tight conformity about said tubular section with said wings biting into the inner wall of said skirt in circumferentially opposing directions to prevent relative rotation of said nut element and said cap in either angular direction, said nut element web portion and cap member cover being positioned at opposite margins of said device.

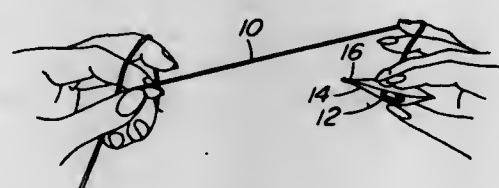
4,008,643 KNOTLESS TAT'ING

Dora M. Young, 128 Rogers Road, F.ittery, Maine 03904
Filed Nov. 24, 1975, Ser. No. 634,873

Int. Cl.² D04C 1/00

U.S. Cl. 87-10

2 Claims



1. The method of making a decorative knot stitch in tatting work with three threads and a shuttle having a bobbin thereon, comprising the steps of:

- tying together a pair of threads and winding them evenly about said bobbin,
- cutting one of said pair of threads relatively close to the shuttle,
- forming a first reversed double stitch from said threads at an even spacing on all threads,
- forming a picot from said threads,
- forming a second reversed double stitch and joining it to another part of the work adjacent thereto,
- repeating the reversed double stitches and picots,
- joining the ends to the work,
- picking up both threads and passing them through an adjacent picot, slipping the shuttle through the loop, and
- joining the first half of the last made knot stitch at the picot and one reversed double stitch.

4,008,644 CLEARING OF LAND MINES

Lutz Tilo Kayser, Am Bismarckturn 10, 7 Stuttgart 1, Germany

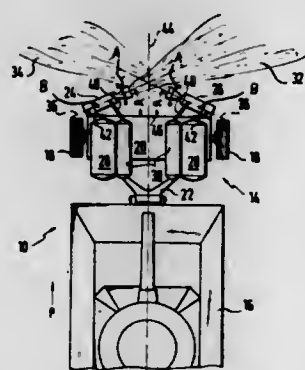
Filed Dec. 17, 1974, Ser. No. 533,676

Claims priority, application Germany, Dec. 20, 1973, 2363557

Int. Cl.² F41H 11/12

U.S. Cl. 89-1 M

21 Claims



17. An apparatus for clearing land mines, particularly anti-tank mines, comprising a pair of rocket engines each having a thrust nozzle from which a stream of high-velocity gases issues when the engine is in operation; support means for supporting said rocket engines above the surface of an area to be cleared, and for movement over said surface; and mounting means for mounting said rocket engines at spaced locations on said support means so that said thrust nozzles face towards said surface and in mutually opposite directions transverse to the direction of movement of said support means, said rocket engines being arranged on said support means so that the respective gas streams overlap and cross each other in space without physically intersecting each other and thereby impinge at least those portions of the surface lying underneath said support means, to plow the surface up and detonate or dislodge any land mines that are present.

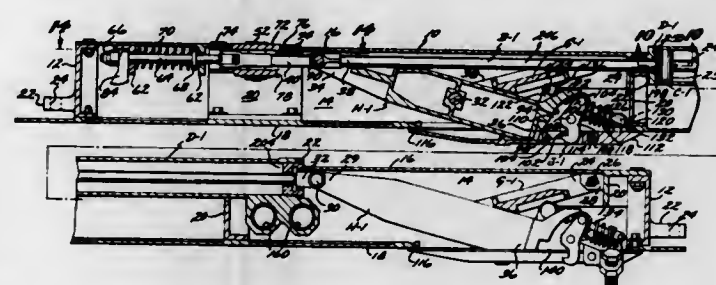
4,008,645 AIRCRAFT SUPPORTED LAUNCHABLE WEAPON RELEASE ASSEMBLY

Donald H. Herbert, 1350 9th St., San Pedro, Calif. 90732
Filed Mar. 22, 1974, Ser. No. 453,827

Int. Cl.² F41F 5/02

U.S. Cl. 89-1.5 R

11 Claims



1. In combination with an aircraft having a longitudinal axis a pressurized fluid actuated device capable of sequentially occupying first and second positions, said device when initially in said first position supporting a weapon having a pair of longitudinally spaced lugs in which axially aligned openings are defined in a triaxially restrained first position relative to said aircraft, said device when it is power actuated moving to said second position and concurrently moving said weapon outwardly relative to said aircraft in a path normal to said longitudinal axis to a second position where said weapon is released at a desired velocity in a first direction normal to said longitudinal axis and said weapon when released having a velocity in a second direction parallel to said longitudinal axis that is the same as the velocity of said aircraft, with said pressurized fluid actuated device after moving to said second position automatically returning to said first position, and said pressurized fluid actuated device upon returning to said first position having all of the components thereof occupying the same spaced relationship relative to one another that they initially did when said device was initially in said first position, said device including:

- an elongate rigid rod;
- first means for slidably supporting said rod from said aircraft parallel to said longitudinal axis;
- two longitudinally spaced sets of first and second arms, each of which arms has first and second end portions; said second end portions of said second arms having a lower camming surface of predetermined contour;
- second means for pivotally supporting said first end portions of said first arms at fixed positions relative to said aircraft, pivotally connecting said second end portions to said first arms to said second arms intermediate said first and second end portions of the latter, pivotally connecting said first end portions of said second arms to longitudinally spaced positions on said rod, with said first and second arms in each of said sets of such relative lengths that said second end portions of said second arms move in a plane normal to said longitudinal axis when said rod is moved relative to said aircraft;
- rotatable supporting means pivotally connected to said second end portions of said second arms and adapted to engage and disengage said lugs and said lower camming surface of said second end portions of said second arms responsive to pivotal movement of said second arms, wherein said lower camming surface provides restraint against release of said lugs when said device is in said restrained first position and disengagement of said rotatable supporting means from said lower camming surface provides release of said lugs when said device is in said second position;
- releasable pressurized fluid means that cooperate with said rod to reciprocate the latter to move said device from said first to said second position where said weapon is released and then return said device to said first position; and
- spring loaded spray brace means that automatically

contact said weapon to hold said weapon in a triaxially restrained position when said rotatable supporting means are caused to engage said openings in said lugs and said device is in said first position.

4,008,646 MACHINE TOOLS

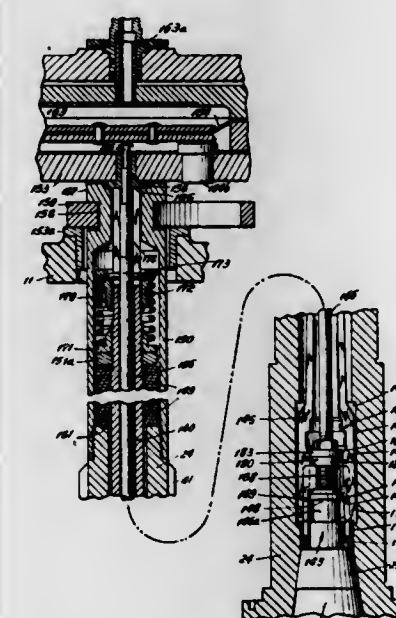
Robert Z. Hague, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 501,865, Aug. 30, 1974. This application Mar. 27, 1975, Ser. No. 562,632

Int. Cl.² B23C 5/26; B23Q 1/08

U.S. Cl. 90-11 A

24 Claims



1. A spindle unit for a quick-change machine tool having a spindle body having a tapered socket for seating a tapered shank of a toolholder which has an adapter provided with an external annular shoulder; a drawbar supported in the spindle and having hooks biased to engage said annular shoulder on said adapter; means including a push rod supported in said drawbar for movement therein independently of said drawbar; hook-locking means on said push rod for engaging said hooks to lock the latter in engagement with said annular shoulder on said adapter and thereby lock the toolholder in the spindle socket; drawbar spring means concentric with said drawbar and said spindle body and biased to apply force to the drawbar axially and, through the pressure of said hooks on said annular shoulder of the adapter, to draw the tapered shank of the toolholder in said tapered socket of the spindle body; and toolholder releasing means including a first power operated means acting on the drawbar to move it axially only sufficiently against the force of said drawbar spring means to relieve the pressure of said hooks against said annular shoulder of the adapter while said hooks remain in position to intercept the withdrawal of said annular shoulder on the adapter from said hook, and a second power operated means for operating said push rod to cause said hooks to move out of position to engage said annular shoulder on said toolholder adapter and permit withdrawal of the toolholder from the spindle socket.

4,008,648 TELESCOPIC RAM

Stanley E. Farmer; Donald M. Faust, both of Gresham, and Harry F. Weinert, Portland, all of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Nov. 11, 1975, Ser. No. 630,781

Int. Cl.² F15B 11/18

U.S. Cl. 91-168

14 Claims

1. A three-stage, fluid-actuated, extensible-contractible device for an industrial lift truck or the like, comprising

4,008,647 MACHINE TOOLS

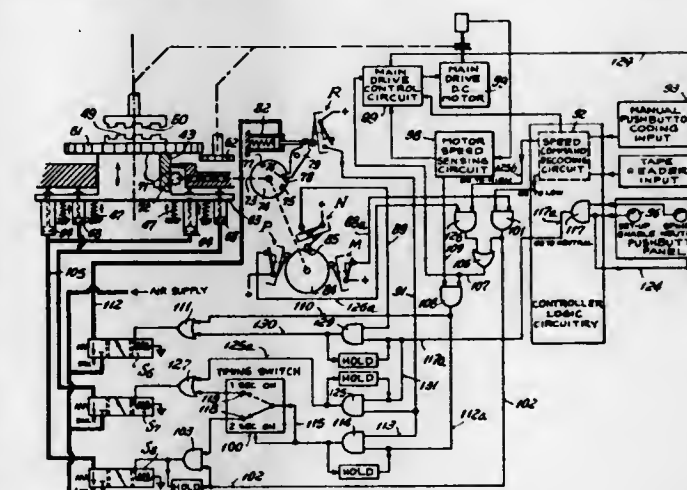
Robert Z. Hague, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 501,865, Aug. 30, 1974. This application Apr. 9, 1975, Ser. No. 566,375

Int. Cl.² B23Q 5/12, 3/00

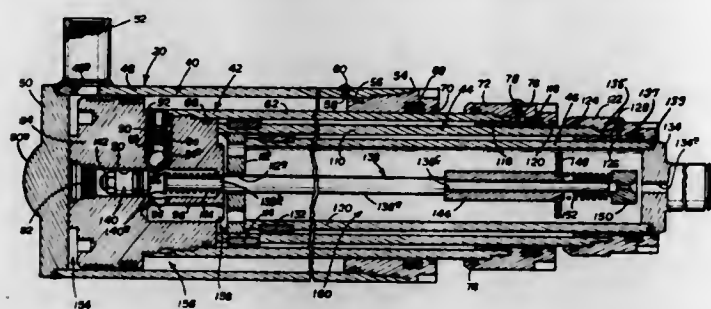
U.S. Cl. 90-11 R

11 Claims



1. A spindle unit for a machine tool having a spindle; means for mounting the spindle for rotation; means for rotating the spindle comprising a motor and change speed means between the motor and the spindle, said change speed means having a high speed position, a low speed position and a neutral position; control means; spring operated means responsive to said control means to move said change speed means to high speed position; means responsive to said control means for reducing the speed of rotation of the motor; first power operated means responsive to said control means for moving said change speed means to neutral position; second power operated means responsive to said control means for moving said change speed means to low speed position; locking means for locking said change speed means in high speed, low speed or neutral positions; means controlled by said control means and responsive to the then position of said change speed means for releasing said locking means; selectively operable means responsive to the release of said locking means for energizing said means for moving the change speed means to low speed position or neutral position, said change speed means including separable interengaging elements, and said means for moving said change speed means to low speed position including timing switch means which discontinues the energization of said second power operated means if, after the lapse of a predetermined time, said interengaging elements have not been moved into proper interengagement in low speed position, and energizing said second power operated means to move the change speed means to neutral position, said timing switch means being constructed and arranged to cause the change speed means to be again moved, after the lapse of a determinate time, back to low speed position, said successive movements between low speed position and neutral position being repeated until the interengaging elements properly engage in low speed position; and means responsive to the arrival of the change speed means in low speed position for deenergizing said first and second power operated means.

first, second, third and fourth nested, relatively reciprocable sections, said first, second and third sections being extendible from said second, third and fourth sections, respectively, port means for introducing and exhausting pressure fluid to extend and contract said device, respectively, means on said first, second and third sections defining working surface areas on which pressure fluid acts to extend said sections, said area on said first section being less than that on said second section, and said area on said second section being less than that on said third section, and



fluid-flow control means within said device for controlling the distribution of fluid therein, said control means, with pressure fluid supplied to said port means at a substantially constant rate, and in cooperation with said areas, producing, during an initial mode of extension of said device, extension of said second section from said third section to cause a certain overall extension speed for said device, and thereafter, and during a later mode of extension producing simultaneous extension of said first section from said second section and of said third section from said fourth section to maintain the overall extension speed of said device substantially constant at said certain speed.

4,008,649

APPARATUS FOR THE PREPARATION OF A CYLINDRICAL CORRUGATED ARTICLE

Yukihiko Shikaya, Tokyo, Japan, assignor to Dai Nippon Printing Company Limited, Tokyo, Japan

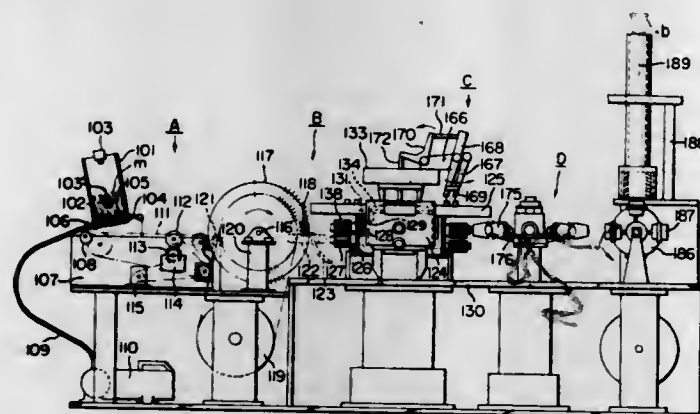
Filed Feb. 24, 1975, Ser. No. 552,359

Claims priority, application Japan, Mar. 8, 1974, 49-26872; Mar. 14, 1974, 49-29505

Int. Cl.² B31C 7/04

U.S. Cl. 93—36.2

10 Claims



1. An apparatus for manufacturing a cylindrical corrugated article, comprising:

- i. forming means comprising a pair of rotatable rolls, namely first and second forming rolls, which are rotatable in opposite directions, said rolls having interlocking corrugated surfaces, a heating member provided inside at least one of said rolls, and the corrugated surface of the first forming roll being provided with grooves formed in the circumferential direction thereof;
2. supply means for supplying a sheet material between said

pair of rolls to cause corrugation of the sheet material by pressing it with the corrugated surfaces of said first and second forming rolls as they rotate to form a corrugated cylindrical article;

3. means for rotating said rolls when the corrugated surfaces are interlocking;
4. guide means for preventing the corrugated article resulting from the corrugation of the sheet material from coiling around the first forming roll and for causing the corrugated article to coil around the circumference of the second forming roll, said guide means including ringlike guide plates which surround the circumference of the second forming roll and are slightly spaced therefrom so that the corrugated article coils around the second forming roll within the ringlike guide plates, said guide plates having fore ends disposed within the grooves of the first forming roll and facing in a direction which is opposite to the direction of rotation of said first roll so that said plates prevent the corrugated article from coiling around the first roll;
5. means for disengaging said second forming roll with the corrugated article mounted thereon from said first forming roll; and
6. means for discharging the corrugated article from the second forming roll after it has been disengaged from the first forming roll.

4,008,650

METHOD AND APPARATUS FOR FORMING EXPANSIBLE ENVELOPE

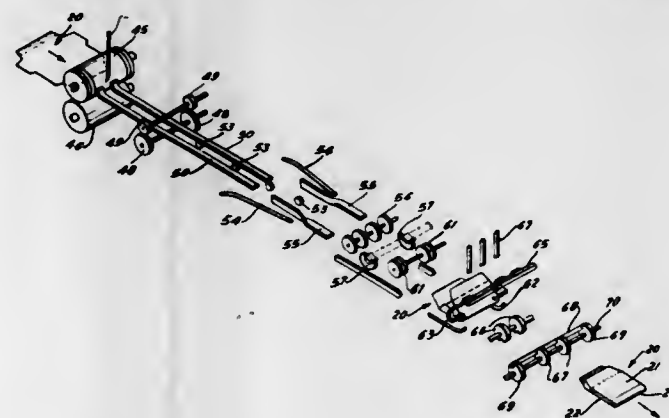
Seymour B. Alter, 31 Brionfield Drive, Great Neck, N.Y. 11020, and Eugene Turkenkopf, 1323 Taft Road, Teaneck, N.J. 07666

Filed June 11, 1975, Ser. No. 586,099

Int. Cl.² B31B 29/26

U.S. Cl. 93—62

4 Claims



1. The method of forming an expansible envelope into a substantially flat condition from a pre-cut one-piece blank of sheet material having adhesive applied to the top edge of the blank comprising:

- a. scoring the blank to define
 - i. rear, bottom and front panels interconnected along generally parallel longitudinal hinge score lines;
 - ii. gusset flaps connected to the sides of the front and rear panels along transverse hinge score lines;
 - iii. bottom gusset panels connected to the ends of the bottom panel along transverse hinge score lines and the ends of the gusset flaps adjacent the bottom panel along longitudinal hinge score lines;
 - iv. a median longitudinal hinge score line running through the bottom panel and the bottom gusset panels;
 - v. adhesive flaps connected to a gusset flap on each side of the blank along transverse hinge score lines, said adhesive flaps each having an extension at one end running to the said median longitudinal hinge line and being connected along a hinge score line to its adjacent bottom gusset panel; and
 - vi. a closure panel connected to the top of the rear panel along a longitudinal hinge score line;

- b. folding inwardly the gusset flaps, the adhesive flaps and their extensions, and the bottom gusset panels;
- c. reverse folding outwardly the adhesive flaps and their extensions over the adjacent gusset flaps;
- d. applying adhesive along the top surfaces of only the adhesive flaps with the bottom panels being free of adhesive;
- e. folding the blank along the median longitudinal hinge score line to superimpose the front and rear panels, the adhesive flaps and the gusset flaps, and the adjacent portions of bottom gusset panels, the folding of the blank along the median longitudinal hinge score line comprising turning the leading edge of the blank upward, holding the blank in the gusset area adjacent the said median score line, and moving the blank under pressing means to direct the front panel backward to superimpose the front panel over the rear panel; and

reverse folding the closure panel over the front panel.

4,008,651

METHOD AND APPARATUS FOR THE FORMATION OF TUBULAR CONTAINERS FROM BLANKS

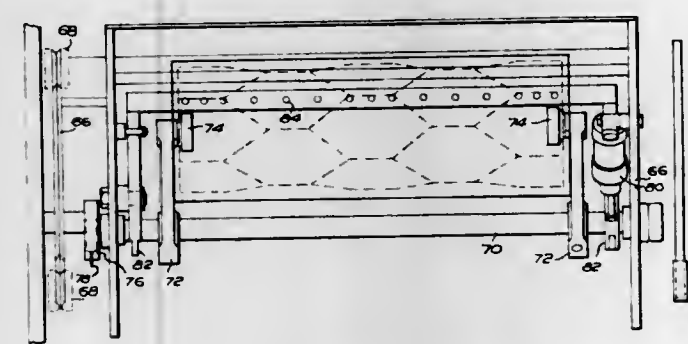
John Herbert Pain, Weybridge, England, assignor to John Waddington Limited, England

Filed May 7, 1975, Ser. No. 575,222

Int. Cl.² B31C 1/00

U.S. Cl. 93—81 R

9 Claims



1. A method of constructing a non-cylindrical tubular container from a blank creased to delineate cells, comprising the steps of

1. providing a mandrel having a non-cylindrical contoured surface conducive to initiating folding of the blank about its creases,
2. causing a first edge which is to extend lengthwise of the container to be held in fixed relationship on the mandrel,
3. wrapping the blank around the mandrel to cause the blank to fold about its creases and take a tubular shape,
4. causing a second lengthwise edge of the blank to overlap the first lengthwise edge of the blank, and
5. causing the overlapped edges to be joined together by pinching the overlapped edges together between a presser bar and the contoured surface of the mandrel.

4,008,652

VENTILATING DEVICE

Heinz Georg Baus, Ulmenweg 46, Thun, Switzerland (CH-3601)

Filed Mar. 6, 1975, Ser. No. 555,951

Claims priority, application Germany, Mar. 8, 1974, 2411053

Int. Cl.² F24F 13/10

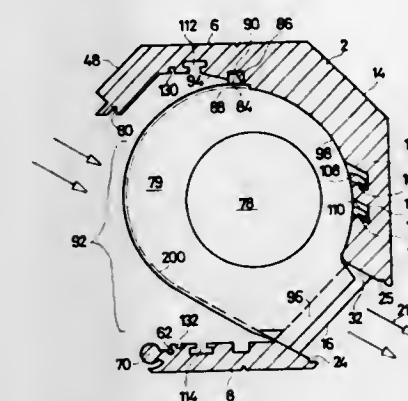
U.S. Cl. 98—39

21 Claims

1. Ventilating device comprising an outer casing formed of a casing part having a forward side formed with an opening, and a lid articulately connected to a lower forward edge of said casing part, partly defining said opening, said outer casing being installable in a window frame, said outer casing being elongated and having a substantially uniform cross section

over the entire length thereof, said casing part, in a rearward lower region thereof being formed with openings, said outer casing in closed condition of said lid and said casing part having a multi-sided outer cross section with upper and lower horizontal surfaces engageable by correspondingly wide surfaces of a window frame, with a forward vertical surface entirely and a lower forward inclined surface at least partly formed by said lid and with a lower rearward inclined surface wherein said openings are formed, including a blower motor and a pair of blower wheels, respectively at opposite axial ends of said blower motor, mounted in said outer casing and enclosed therein in an air guide casing extending in longitudinal direction of said outer casing, said air guide casing having in an upper region thereof a relatively short holding strip and being inwardly resilient in said region so as to snap said holding strip into engagement in a groove formed in the inner wall surface of said casing part, said casing part having a forwardly inclined inner wall surface extending from said snap-in groove in direction toward the lid opening.

2. Ventilating device comprising an outer casing formed of a casing part having a forward side formed with an opening, and a lid articulately connected to a lower forward edge of



said casing part, partly defining said opening, said outer casing being installable in a window frame, said outer casing being elongated and having a substantially uniform cross section over the entire length thereof, said casing part, in a rearward lower region thereof being formed with openings, said outer casing in closed condition of said lid and said casing part having an octagonal outer cross section with upper and lower horizontal surfaces engageable by correspondingly wide surfaces of a window frame, with a forward vertical surface entirely and both forward inclined surfaces at least partly formed by said lid and with a lower rearward inclined surface wherein said openings are formed, including a blower motor and a pair of blower wheels, respectively at opposite axial ends of said blower motor, mounted in said outer casing and enclosed therein in an air guide casing extending in longitudinal direction of said outer casing, said air guide casing having in an upper region thereof a relatively short holding strip and being inwardly resilient in said region so as to snap said holding strip into engagement in a groove formed in the inner wall surface of said casing part, said casing part having a forwardly inclined inner wall surface extending from said snap-in groove in direction toward the lid opening.

4,008,653

DIFFUSER

Walter A. Tatham, Tucson, Ariz., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 4, 1974, Ser. No. 529,356

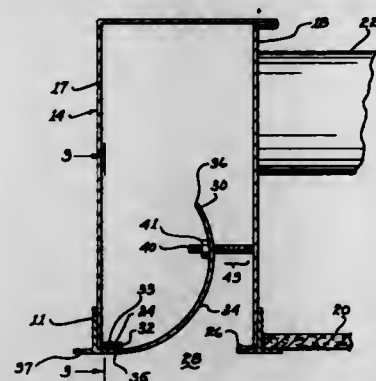
Int. Cl.² F24F 13/08

U.S. Cl. 98—40 D

4 Claims

1. A diffuser for controllably discharging air into a room through an elongated ceiling opening comprising:
a. a plenum adapted to be supported above said ceiling over said ceiling opening, said plenum including means for receiving conditioned air to be distributed to said room.
b. said plenum having an elongated opening for alignment with said elongated ceiling opening;

c. an elongated sheet mounted in said plenum, said sheet extending the length of, and being supported along, and in continuous contact with said elongated opening and having an edge positioned below said elongated opening and extending along said ceiling opening, said sheet including a continuously curved convex surface extending upwardly from said edge into said plenum;



d. means preventing air in said plenum from flowing over other than the convex surface through said elongated ceiling opening; and
e. said sheet forming a continuous air guiding surface extending from within said plenum to a position at least even with said ceiling.

4,008,654

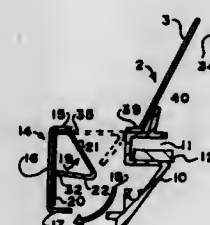
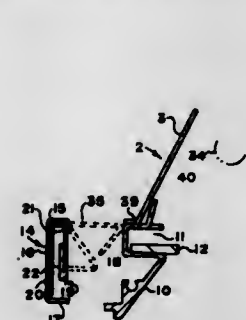
ADJUSTABLE AIR BLADE FOR AIR HANDLING LUMINAIRES

Leo G. Stahlhut, Kirkwood, and Walter J. Trantina, St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed June 4, 1975, Ser. No. 583,702
Int. Cl.² F24F 13/02

U.S. Cl. 98—40 DL

11 Claims



1. In a lighting fixture including a body, said body having a peripheral lip, said lip having a plurality of openings in it for permitting passage of air through said lip, a wall extending from said lip, said wall defining a lamp housing, said lamp housing having an open side for insertion and removal of an energizable electrical light source, and means for at least partially closing the open side of said lamp housing, said closing means lying inboard of said lip, the improvement which comprises an air blade mounted between said closing means and said lip, said air blade including a first side and a second side, said first side having at least one relief means formed in it, said relief means enabling said first side to move with respect to said second side between at least a first position and a second position, said first side adapted to close the openings in said lip in said first position, said first side and the openings in said lip being spaced from one another in said second position.

4,008,655 METHOD AND APPARATUS FOR PROTECTING A DOUBLE-SHELLED CHIMNEY STACK

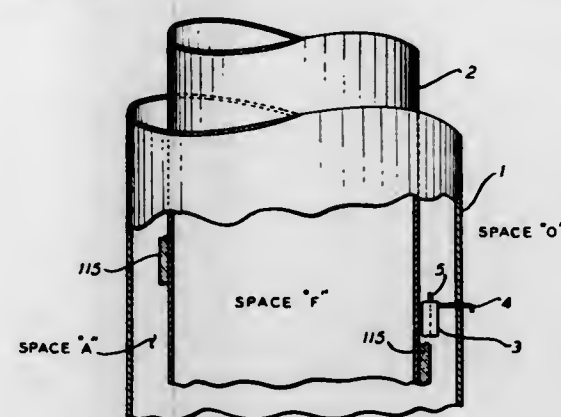
Syed A. Rahman, 329 E. Shore Trail, Sparta, N.J. 07871

Filed Nov. 17, 1975, Ser. No. 632,213

Int. Cl.² E04F 17/04

U.S. Cl. 98—46

15 Claims



1. An improved chimney stack of the type having at least one flue, through which flue gases flow, and an outer shell, for establishing an insulating space surrounding the flue, wherein the improvement comprises:

- a heat exchanger means, secured to the flue and having a first port and a second port;
- the first port extending through the outer shell and communicating with outside air;
- the second port communicating with the insulating space surrounding the flue; and
- the heat exchanger means for admitting and heating outside air, and discharging heated outside air into the insulating space surrounding the flue during cooldown of the chimney stack, thereby minimizing condensation of flue gases during cooldown of the chimney stack.

4,008,656

BREWING APPARATUS

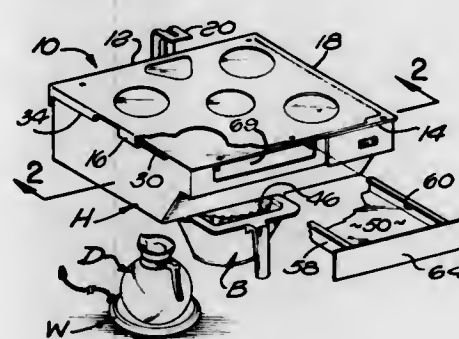
Helmut J. Gruner, Brea, Calif., assignor to Farmer Bros. Co., Torrance, Calif.

Filed Oct. 1, 1975, Ser. No. 618,712

Int. Cl.² A47J 31/00

U.S. Cl. 99—298

6 Claims



1. A brewing apparatus comprising a housing means for installation under a shelf-like member; a normally empty water receiver assembly in said housing having electrical heating means disposed therein; means for manually introducing a predetermined amount of water into said water receiver assembly including a water inlet drawer slidably mounted on said housing and having a sloping bottom from which a charge of water is cascaded into said water receiver assembly; temperature-sensitive discharge valve means supported in said receiver assembly including a snap acting bi-metallic diaphragm to discharge water at a predetermined temperature; and a seal ring engaged by the periphery of said diaphragm when

in the closed position, said seal ring defining a controlled leakage groove therein to permit a predetermined amount of water to pass prior to said water reaching that temperature at which said valve opens.

4,008,657

APPARATUS FOR ADJUSTING TEMPERATURE OF SEMIFLUID FOOD AND SUCCESSIVELY SUPPLYING THE SAME

Harukiti Yamamura, Ashiya; Takeharu Karatsu, Kobe, and Yoichi Fukuhara, Nishinomiya, all of Japan, assignors to Kawatetsu Metrological Equipment and Vending Machine Company, Ltd., Nishinomiya, Japan

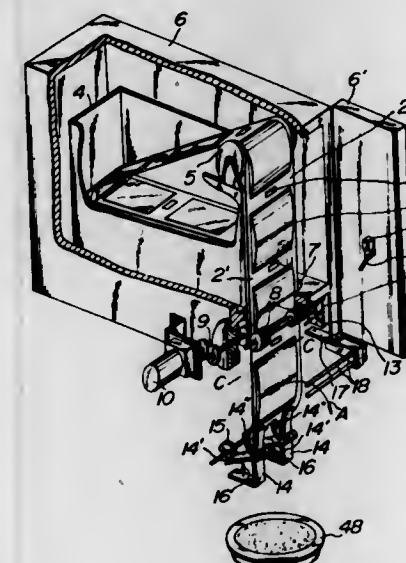
Filed June 2, 1975, Ser. No. 582,725

Claims priority, application Japan, July 17, 1974, 49-81195

Int. Cl.² B67C 9/00

U.S. Cl. 99—483

5 Claims



1. An apparatus for adjusting the temperature of semifluid food and successively supplying the same, comprising a constant temperature casing including an outer cover enclosing said casing and having a delivery opening, said casing capable of preserving a belt including a number of retort packs each containing a given amount of semifluid food at a temperature suitable for giving relish to said semifluid food, said retort packs being arranged along the length of the belt spaced inward of the edges thereof and spaced apart one from the other by a given distance, means for feeding said belt from said constant temperature casing and directing said belt in a downwardly generally vertical direction toward the delivery opening incrementally every time said semifluid food is demanded, cutter means arranged directly below the constant temperature casing in the vicinity of the delivery opening and capable of severing the belt along the upper edge portion of a retort pack, means for clamping one edge of the belt at least during the operation of said cutter means and including means for turning said opened retort pack upside down to permit gravity flow of the contents thereof, said clamping means operable to release the emptied retort pack.

4,008,658

APPARATUS FOR RECEIVING AND COMPACTING WASTE MATERIAL

Arthur J. Stock, Lakewood, and Donald E. Christofer, Willowick, both of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Filed Mar. 26, 1975, Ser. No. 562,060

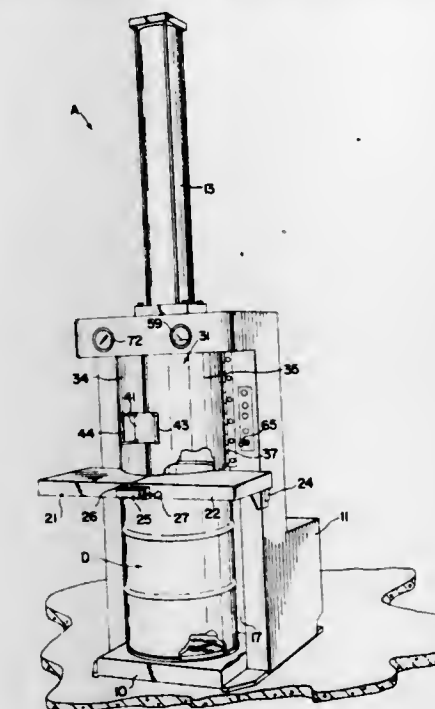
Int. Cl.² B30B 1/32, 15/04

U.S. Cl. 100—53

10 Claims

1. Apparatus for receiving and compacting waste material and for capturing particles generated during the receiving and compacting operations and subject to being dispersed in the surrounding atmosphere, comprising:

a main body for receiving and supporting a waste receptacle, and defining a loading chamber above said receptacle, means defining an enclosure movable between an operating position within said loading chamber and a retracted position outside of said loading chamber to afford access to the interior of said loading chamber, a power ram having a compacting portion reciprocable in said loading chamber and in said receptacle between a



retracted position outside of said loading chamber and an extended position inside of said receptacle, for compacting material in said receptacle, and means for expelling atmosphere from said loading chamber and receptacle and from said enclosure when it is within said loading chamber and for introducing clean replacement atmosphere to remove particles dispersed in the atmosphere in said receptacle, loading chamber and enclosure during the compacting operation.

4,008,659

FRAME FOR PRESSES AND SIMILAR MACHINES

Sten Trolle, Ystad, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Aug. 8, 1975, Ser. No. 603,017

Claims priority, application Sweden, Aug. 30, 1974, 7411039

Int. Cl.² B30B 15/04

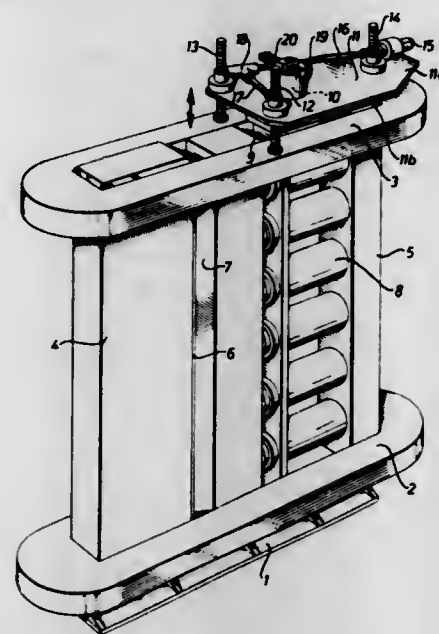
U.S. Cl. 100—214

9 Claims

1. A frame for presses, and similar machines, which in the operational state of the machine forms a closed loop and which in the passive state of the machine may be opened so as to permit or facilitate the insertion or removal of workpieces to be treated between tools carried thereby, comprising:

- a horizontal bottom frame portion;
- at least two spaced vertically extending frame parts permanently secured to said horizontal bottom frame portion and including means for carrying said tools with a work-piece receiving space therebetween;
- a horizontal top portion movable between an operative position, in which it is operatively engaged with the tops of the vertically extending frame parts, and an open position in which the opening of the space formed between said tools is accessible; and
- opening means coupled at least to said frame top portion to shift said frame top portion into its open position, and

including means for first raising said frame top portion out of engagement with the tops of said vertically extend-



ing frame parts and means for displacing said frame top portion in a generally horizontal direction.

4,008,660

MASTER LOADING AND UNLOADING APPARATUS FOR A LITHOGRAPHIC PRINTING MACHINE

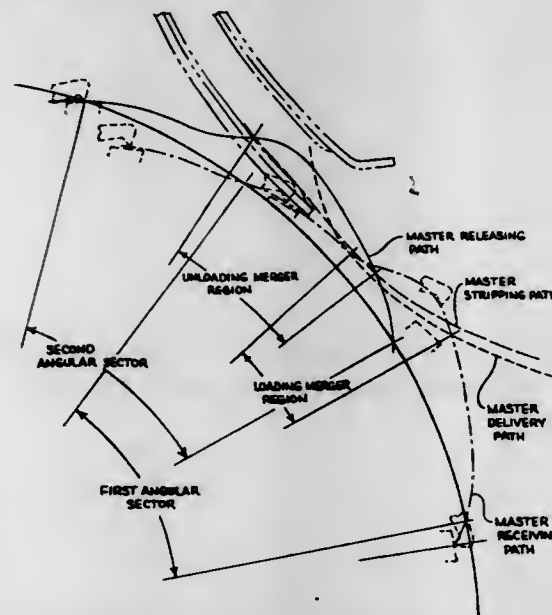
Clinton Hooper, Brookfield; Joseph F. Miclukiewicz, Trumbull; Philip Pollak, Jr., Westport, and John W. Bach, Stamford, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 8, 1975, Ser. No. 566,145

Int. Cl.² B41F 7/00, 21/04

U.S. Cl. 101-132

6 Claims



1. In a lithographic printing machine having a rotatable master cylinder for holding an imaged master of sheet materials thereon, means for applying printing fluids to the master, and means for receiving an impression from the printing fluids applied to the master; an apparatus for loading the master onto and unloading the master from the cylinder comprising:

- A. gripper means external to a cylinder for gripping an edge of a master, movable through a master delivery path into the proximity of the cylinder to deliver the master edge;
- B. gripper means mounted internally in the cylinder to rotate therewith, for gripping a master edge delivered into proximity of the cylinder and for later releasing the master edge, said internal gripper means being extendable beyond a surface of a cylinder,

describe a master receiving path that intersects the master delivery path in a loading merger region, and during a second angular sector of cylinder surface rotation to describe a master release path, the second angular sector coinciding at least in part with said first angular sector of said cylinder rotation;

- C. stripper means for unloading the master from the cylinder, movable into proximity of the cylinder to define a master stripping path that intersects the master release path in an unloading merger region;
- D. means for actuating said external gripper means to grip a master edge, deliver the master edge to and release the master edge in the loading merger region;
- E. means for selectively actuating said internal gripper means to extend beyond the cylinder surface comprising load control cam means mounted for pivoted movement between master receiving and master releasing positions, said cylinder being mounted to rotate relative to said cam means when in the master receiving and master releasing positions, and
- load control cam follower means for coupling said load control cam means to said internal gripper means, said load control cam means being shaped to actuate said internal gripper means to
- extend beyond the cylinder surface in said first angular sector when said load control cam means is in the master receiving position to grip the master edge in the loading merger region and
- extend beyond the cylinder surface in said second angular sector when said load control cam means is in said master releasing position to release the master edge in the unloading merger region; and
- F. means for moving said stripper means into the proximity of the cylinder to unload the master therefrom released in the unloading merger region.

4,008,661

PRINTING PRESS FOR USE WITH BAG-MAKING MACHINES

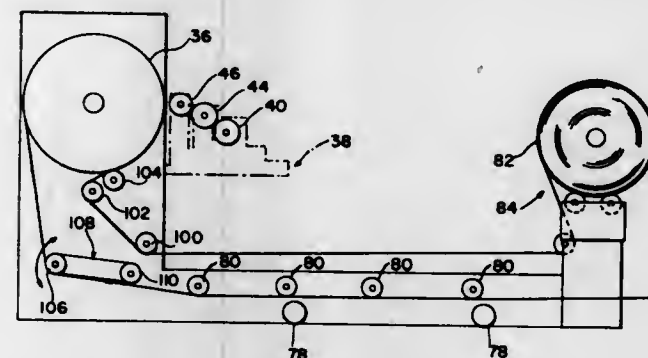
Robert D. Mathis, Metropolis, Ill., assignor to In-Line Equipment Company, Inc., Belknap, Ill.

Filed Mar. 20, 1975, Ser. No. 560,319

Int. Cl.² B41F 13/02, 5/06, 23/04

U.S. Cl. 101-181

25 Claims



- 1. A printing press for use with an adjacent machine having a demand for web from a supply, said press comprising a frame supporting a printing head thereon, means including a rotary drum backing said web at said printing head for feeding said web from said supply to said printing head and then to said machine, and means responsive to the tension of said web after it passes said drum for controlling the speed of said feeding means, and for varying the speed of said drum, to vary the rate at which said web is fed from said supply to said printing head and then to said machine in accordance with demand of said machine for said web.

4,008,662

PRINTER RIBBON DRIVE APPARATUS

Mitsubishi Sato, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

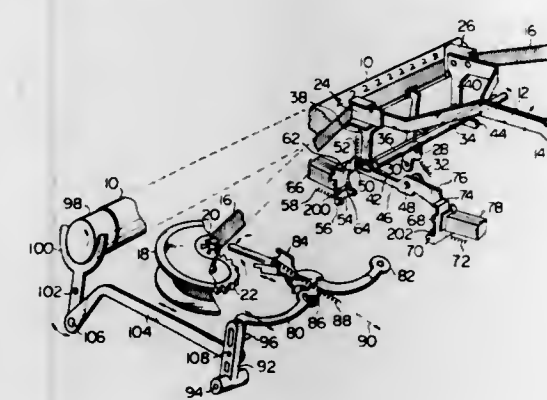
Filed Mar. 10, 1976, Ser. No. 665,644

Claims priority, application Japan, Mar. 10, 1975, 50-28080; Mar. 13, 1975, 50-29491

Int. Cl.² B41J 35/10; B41F 31/16

U.S. Cl. 101-336

11 Claims



- 1. A printer ribbon drive apparatus, comprising:
 - a rotatable type member;
 - a rockable ribbon guide;
 - a rockable setting lever connected to the ribbon guide so that rocking movement of the setting lever produces rocking movement of the ribbon guide, the setting lever and ribbon guide being rockable from a first set position through a second set position to a reset position;
 - a spring urging the setting lever and ribbon guide to the reset position;
 - a first releasable latch to hold the setting lever in the first set position;
 - a second releasable latch to hold the setting lever in the second set position;
 - a printing hammer;
 - a rotary shaft formed with a hammer actuating projection to engage with the printing hammer upon rotation of the shaft to move the printing hammer toward the type member; and
 - a setting projection formed on the shaft to engage with the ribbon guide in the reset position upon rotation of the shaft and move the ribbon guide and setting lever to the first set position;

4,008,663

DOCUMENT IMPRINTER

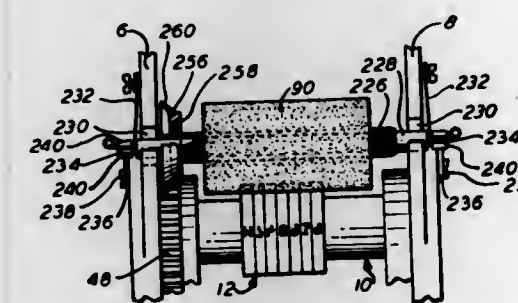
Edward C. Marshall, Upper Montclair, and Myron D. Goldman, Clifton, both of N.J., assignors to Litton Business Systems, Inc., Belleville, N.J.

Filed Nov. 11, 1974, Ser. No. 522,957

Int. Cl.² B41F 31/00

U.S. Cl. 101-349

15 Claims



- 1. In a document imprinter having printing means; a roller cooperable therewith, said roller being mounted for rotation about a longitudinal axis; and drive train means for rotating said roller about said axis, said drive train means comprising:

first and second rotary drive train members mounted for rotation at a given rotational ratio about respective first and second longitudinal axes, the distance between said first and second longitudinal axes being changeable; said drive train members peripherally engaging each other in driving-driven relationship; the periphery of one of said drive train members being substantially deformable radially inwardly in response to its engagement by said other drive train member, the amount of deformation being determined by the distance between said first and second longitudinal axes, said one drive train member being so constructed that its circumference remains substantially constant during such deformation, so that the rotational ratio of said two drive train members remains substantially unchanged irrespective of changes in the distance between said first and second longitudinal axes.

4,008,664

INK KEY CONTROL SYSTEM

James N. Crum, Stonington, and Ernest H. Treff, Groton, both of Conn., assignors to Harris-Intertype Corporation, Cleveland, Ohio

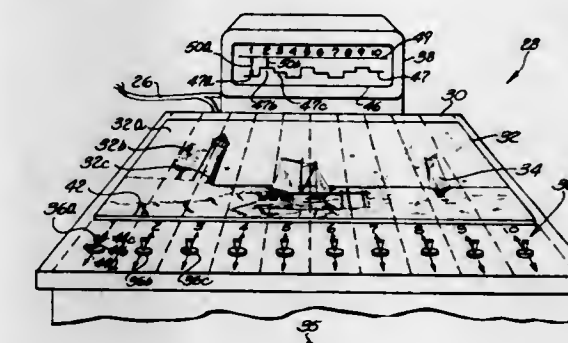
Continuation of Ser. No. 381,908, July 23, 1973, abandoned.

This application Mar. 24, 1975, Ser. No. 561,418

Int. Cl.² B41F 31/04

U.S. Cl. 101-365

2 Claims



- 1. An apparatus comprising a printing press having an ink fountain assembly, said ink fountain assembly including a blade with a longitudinally extending edge, an inker roll disposed on one side of said blade closely adjacent to said longitudinally extending edge, an ink key station disposed on a side of said ink fountain blade opposite from said inker roll, and a plurality of adjustable ink keys disposed in a generally horizontal array at said ink key station for varying ink film thickness along said roll, each of said ink keys being associated with a portion of the longitudinally extending edge of said blade and being operable in a first direction to effect movement of the associated portion of the longitudinally extending blade edge in a direction toward said inker roll and away from said ink key station to decrease the thickness of the ink film applied to the inker roll at the associated portion of the edge of said blade and being operable in a second direction to effect movement of the associated portion of the longitudinally extending edge of said blade in a direction away from the inker roll and toward said ink key station to increase the thickness of the ink film applied to the inker roll at the associated portion of the edge of said blade, an inspection table disposed at a location remote from said ink key station and having surface means for supporting stock on which an image was printed by said printing press, said surface means having a plurality of elongated areas each of which is associated with one of said ink keys and a portion of the edge of said blade and is at least partially disposed beneath an associated portion of the image on the stock supported on said table, each of said elongated areas of said surface means being arranged along a transverse axis extending perpendicular to longitudinal axes of said elongated areas in the same order as in which the associated ink keys are arranged in their horizontal array, an operator's station disposed adjacent to first end portions of

said elongated areas, display means disposed adjacent to second end portions of said elongated areas opposite from said first end portions of said elongated areas to enable said surface means to support the stock at a location intermediate said operator's station and said display means, said display means including means for displaying a unitary visual image representative of the shape of the space between the longitudinally extending edge of said blade and said inker roll as viewed by an operator at said ink key station and looking downwardly at said ink fountain, said unitary visual image including a horizontal straight line representative of the outer surface of the inker roll and a plurality of line portions disposed in a generally horizontally extending array beneath said straight line, each of said line portions being associated with one of said ink keys and being spaced downwardly from said straight line by a distance which is a function of the distance which the portion of the longitudinally extending edge of said blade associated with said one ink key is spaced apart from the surface of said inker roll, said line portions being arranged in said generally horizontal array in the same order as in which the associated ink keys are arranged in their horizontal array, and control means for effecting operation of said ink keys to vary the spacing between the longitudinally extending edge of said blade and said inker roll and for simultaneously therewith effecting activation of said display means to vary the spacing between said line portions and said straight line, said control means including a plurality of switches disposed at said operator's station in a longitudinal array extending generally parallel to said transverse axis of said elongated areas, each of said switches being associated with one of said ink keys, one of said elongated areas and one of said line portions, said switches being arranged in said longitudinal array in the same order as in which the associated ink keys are arranged in their horizontal array, each of said switches being movable in opposite directions from an initial position, and circuit means connected with each of said ink keys, said switches and said display means for effecting operation of one of said ink keys in the first direction to reduce the spacing between the associated portion of the edge of said blade and said inker roll and for simultaneously therewith effecting upward movement of the associated one of said line portions toward said straight line in response to movement of the associated one of said switches in one direction from its initial position, said circuit means being operable to effect operation of one of said ink keys in the second direction to increase the spacing between the associated portion of the edge of said blade and said inker roll and for simultaneously therewith effecting downward movement of the associated one of said line portions away from said straight line in response to movement of the associated one of said switches from said initial position in a direction opposite from said one direction.

4,008,665

TRAINING AMMUNITION

Heinz Gawlick; Rudolf Stahlmann, and Ernst Jensen, all of Furth, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Aug. 28, 1974, Ser. No. 501,357

Claims priority, application Germany, Sept. 6, 1973, 2344939

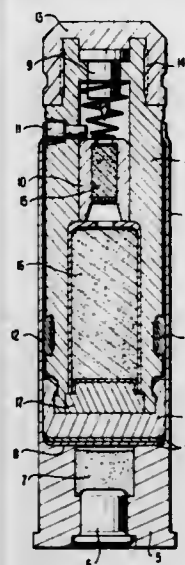
Int. Cl.² F42B 9/20

U.S. Cl. 102-41

35 Claims

1. Training ammunition comprising a projectile disposed in a cartridge case for impingement on a target, said projectile having a rear portion with an axially extending recess and charge means disposed therein, cover cap means for obtaining a substantially uniform and complete seal between a training projectile utilizing small amounts of propellant charge relative to corresponding live ammunition and a barrel means through which it is fired to thereby aid the external ballistics of said projectile, said cover cap means extending over the rear por-

tion of said projectile in a formfitting manner, and obturation means disposed proximate to said cover cap means, said cover



4,008,666

PERCUSSION IGNITER

Paul Beermann, Lendringes, and Wilhelm Grosse-Benne, Menden, both of Germany, assignors to Hagenuk & Co. GmbH, Menden-Lendringes, Germany

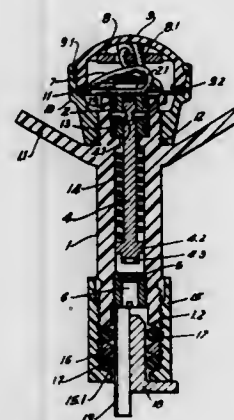
Filed Feb. 25, 1975, Ser. No. 552,783

Claims priority, application Germany, Feb. 26, 1974, 7406694

Int. Cl.² F42C 15/00

U.S. Cl. 102-70 R

9 Claims



1. A watertight and corrosion-resistant percussion igniter comprising a housing; a percussion cap in said housing; a firing pin mounted in said housing for displacement between a retracted position remote from, and an extended position at, said percussion cap and having one end portion adapted to impact the latter in said extended position and another end portion formed with a depression; a biasing spring urging said firing pin toward said extended position; a one-piece holding member mounted in said housing so as to contact the same at a circumferential interface and for displacement between a holding position and a releasing position, said holding member surrounding at least said other end portion of said firing pin in said retracted position of the latter and having at least one transverse hole that opens at said interface; a retaining member received in said hole and engaging in said depression in said holding position of said holding member, and disengaging said firing pin for displacement toward said extended position thereof in said releasing position of said holding member; and means for sealing said interface both in said holding and said releasing position of said holding member, including a first sealing ring at said interface to one side from said retaining member and preventing fluids from penetrating through said

interface toward said retaining member and said percussion cap in said holding position of said holding member, and a second sealing ring at said interface to the other side from said retaining member and preventing fluids from penetrating through said interface toward said percussion cap in said releasing position of said holding member.

4,008,667

CONTROLLED RANGE BULLET

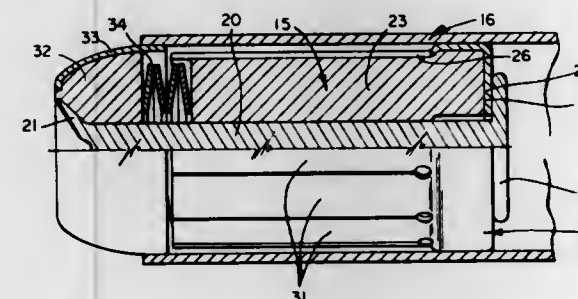
Lance G. Look, Traverse City, Mich., assignor to The L.O.M. Corporation, Traverse City, Mich.

Filed Dec. 13, 1973, Ser. No. 424,461

Int. Cl.² F42B 13/00, 13/32

U.S. Cl. 102-88

1 Claim



1. In a controlled range bullet: an elongated retainer; first and second stop plates respectively disposed on opposite ends of said retainer; a cylindrically shaped, elongated body surrounding and slidably mounted on said retainer; a brake mounted on the body for movement therewith, the brake having a wall and a base, the base being engaged with one end of said body and the wall surrounding the periphery of said body and providing for the body to be fitted inside of a casing and the wall being formed with a plurality of slits each slit terminating in an enlarged hole the holes being located adjacent to said base, the portion of the wall between each pair of adjacent slits forming a brake arm with the root of the arm formed by the area between the holes of the pair of adjacent slits and when the bullet is fired from the muzzle of a gun which causes the bullet to spin, the centrifugal force acting on each arm developing a moment at the root of the arm whereby each arm rotates outwardly about its root and extends generally radially of the body the effect of the arm being to act as a rotary aerodynamic brake; an annular shaped nose surrounding and mounted on said retainer; a nose cup mounted on said nose; an annular compression spring surrounding said retainer and extending between the nose and body, the spring, when the bullet is in the unfired condition, operating to cause the nose to engage said first stop plate and the body to engage said second stop plate and the engagement of the nose with the first stop plate causing the nose cup to be spaced from said arms in a direction to avoid interference with said rotation of the arms; and upon being fired from the muzzle of a gun which imparts rotation to the bullet, the bullet functioning as follows: a. the explosive forces acting on the body and the retainer causing the body and the retainer to relatively move in a direction so that the spring is compressed and wherein the nose cup overlies said arms and prevents said arm rotation; and b. when the effect of the explosive forces is sufficiently dissipated, the force of the spring acting on the body and the retainer causing the body and retainer to relatively move in a direction wherein the nose cup is spaced from the arms to avoid interference with said arm rotation.

4,008,668

ELECTRIC CIRCUIT FOR SELF-PROPELLING TROLLEYS IN STORAGE INSTALLATIONS

Alain Goussard, Louviers, France, assignor to Construction Mills-K, France

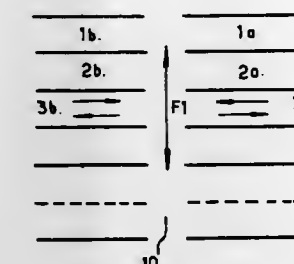
Filed Apr. 21, 1975, Ser. No. 570,329

Claims priority, application France, Feb. 20, 1975, 75.05265

Int. Cl.² B60M 1/00

U.S. Cl. 104-88

5 Claims



1. A system of remote control and power supply circuits for a self-propelling electric trolley supplied by means of a cable and having its own automatic operating means, which has to perform a certain number of operations whilst moving relative to a fixed or movable reference station, and said trolley being equipped with pick-off elements and end of travel detectors, as well as translation and load-manipulating motors of the three-phase type and sensitive to the order of connecting the phases, whereby the said system has: on the reference station: a fixed power supply circuit supplied with three-phased current and a fixed control circuit for said fixed power supply, said fixed control circuit being supplied with single-phase current, and, on the trolley a mobile supply and control circuit for three-phased electric motors, wherein said fixed power supply circuit comprises a time lag contact (STT1, FIG. 3) in series with one of the phases in order that, when the three phase power is applied, one of the phases is energized with a delay with respect to the energizing of the two other phases, wherein said fixed control circuit comprises a relay (STT, FIG. 4) which is energized when the three phase power is applied and which controls said time lag contact, and wherein said movable circuit comprises a control memory relay (53 or 54, FIG. 5) supplied by the two simultaneously energized phases and motor control relays (55, 56, MC) supplied by the time lagged phase and one of the two other phases.

4,008,669

RESILIENTLY BIASED TIE-DOWN ANCHOR

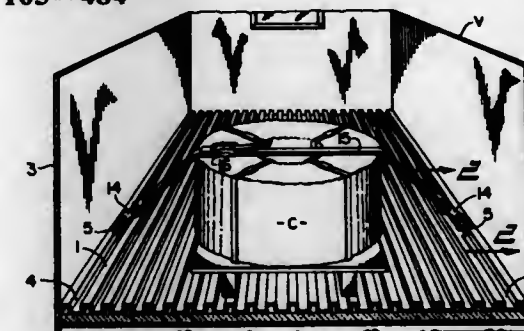
Robert Earl Sumrell, 2069 State Road W., Warren, Ohio 44481

Filed Nov. 28, 1975, Ser. No. 635,847

Int. Cl.² B60P 7/04, 7/12; B61D 17/10; 45/00

U.S. Cl. 105-484

15 Claims



1. A cargo tie-down apparatus for a refrigerated van and the like having a longitudinally grooved floor supported by transverse flanged beams therebeneath, said apparatus comprising

a flexible strap assembly positioned over cargo on said floor and having downwardly extending end portions secured to anchoring means on said floor; at least one of said anchoring means comprising an eye bolt having an eye at its upper end and having a shank extending downwardly through a hole in a floor groove and through the flanges of one of said beams; and eye bolt retaining means to permit limited vertical movement of said eye bolt from a lowered position in said floor groove to an elevated position whereat one end portion of said strap assembly is engaged with said eye.

4,008,670

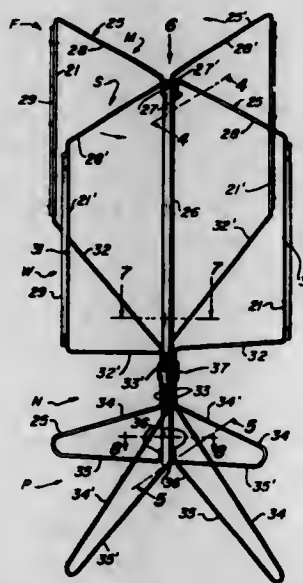
FOLDABLE SAMPLE DISPLAY TABLE

Raymond C. Price, 756 S. Jason St., Denver, Colo. 80225
Filed May 21, 1975, Ser. No. 579,464

Int. Cl.² A47B 41/04

U.S. Cl. 108—28

5 Claims



1. A foldable display rack of the type having two peripheral frame sections of similar size and shape foldable along a vertical axis generally centrally of said two sections comprising:
 - a. the first of said two sections being rod-formed including straight opposed portions rigidly depending radially from a first position on said central axis, normal portions depending from the ends of said straight opposed portions forming parallel sides arranged to be vertical in use for hanging displays therefrom, inwardly directed portions extending from the opposed ends of said sides terminating at a second position on said central axis spaced from said first position, and outwardly directed opposed feet portions depending from said second position on said central axis including intumed portions depending from said feet portions terminating at a third position on said central axis;
 - b. bearing means mounted at each said first, second and third positions on said central axis;
 - c. the first section being rigidly secured to each said bearing means forming a generally planar peripheral frame section; and
 - d. the second of said two sections being formed of two opposed portions, each formed of the shape of approximately one-half of said first sections, and each one-half portion being pivotally mounted in all said bearing means by axially extending portions, so that each of the opposed portions of said second section pivot from a normal position to said first section to a generally parallel, adjacent position to said first section but on opposed sides thereof.
2. A foldable display rack according to claim 1 being further characterized by a removable table top, and means cooperative with said table top and said straight opposed sections in open position for temporarily securing said table top thereon.

4,008,671

TROLLEY WITH FOLDING SHELVES

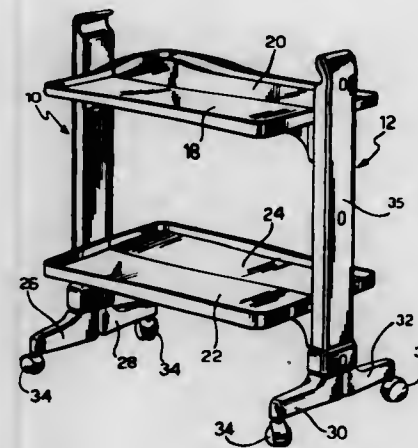
Giovanni Baldini, Turin, Italy, assignor to Carrar & Matta S.p.A., Turin, Italy

Filed Jan. 20, 1976, Ser. No. 650,646

Claims priority, application Italy, Feb. 7, 1975, 67331/75
Int. Cl.² A47B 3/00

U.S. Cl. 108—113

7 Claims



1. A trolley of the type having folding shelves, comprising:
 - a. a pair of hollow uprights;
 - b. means rigidly interconnecting said hollow uprights;
 - c. at least two shelves extending between said two uprights, each of said shelves being constituted by a pair of half-shelves;
 - d. pivot means for pivoting each half-shelf of a pair to said uprights, independently of the other half-shelf of the pair, for turning movement about an axis substantially coincident with that edge of the half-shelf adjacent the other half-shelf of the pair between a first position of said half-shelf in which the plane of said half-shelf is substantially perpendicular to the plane defined by said two uprights and a second position in which the plane of said half-shelf is substantially parallel to said plane defined by said two uprights;
 - e. two support feet located at the lower end of respective uprights, each of said feet being constituted by a pair of arms;
 - f. means for pivotally connecting each arm of a pair of said arms to said uprights, independently of the other arm of the pair, for movement about respective axes substantially parallel to the associated upright between a first position of each said arm in which it extends substantially perpendicular to said plane defined by said two uprights and a second position of each said arm in which it extends substantially parallel to said plane defined by said uprights; and
 - g. a connecting mechanism interconnecting all of said half-shelves and said arms on each side of the trolley, said connecting mechanisms being housed in said hollow uprights and operating to transmit movement from any one of said half-shelves on each side of the trolley to said arms on the same side of the trolley, whereby, when any one of said half-shelves is moved from its first position to its second position, said arms are caused by said connecting mechanism to turn from their first to their second positions, and correspondingly, when any one of said half-shelves is moved from its second to its first position, said arms are caused by said connecting mechanism to turn from the second to their first positions.

4,008,672

WORK GUIDING AND TRIMMING APPARATUS FOR SEWING MACHINES

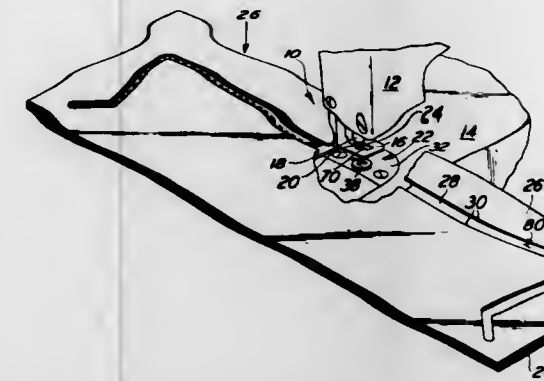
Nicholas Cianciotti, Punxsutawney, Pa., assignor to Queen Casuals, Inc., Philadelphia, Pa.

Filed May 5, 1975, Ser. No. 574,434

Int. Cl.² D05B 21/00; D05C 9/04; D05B 37/00

U.S. Cl. 112—121.12

16 Claims



1. For use with a work holder having a guide slot thereon, sewing and trimming apparatus comprising work guiding means affixed to and projecting upwardly with respect to the bed of a sewing machine and adapted to guidingly engage the guide slot of the holder, reciprocating trimming means operatively coupled to said sewing machine and juxtaposed to said work guiding means, a reciprocating needle operatively coupled to the sewing machine and adjacent to said trimming means, said trimming means and said needle being so positioned as to be adapted to extend into and through the guide slot of the holder when said work guiding means is guidingly engaged with the holder, and a cutting edge on said work guiding means, said trimming means cooperating with said cutting edge to trim fabric simultaneously with sewing thereof adjacent to the zone of stitch formation.

4,008,673

BUOYANCY CONTROL SYSTEM FOR SUBMERSIBLE VESSELS

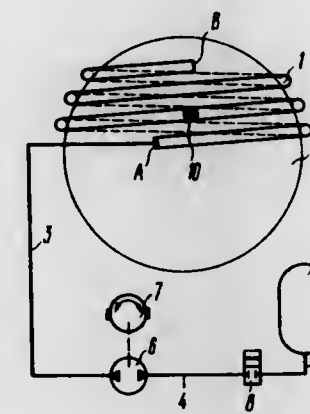
Jury Sergeevich Sverchikov, Bolshevistsky pereulok 13/3, kv. 7; Nadezhda Nikolaevna Balashova, Novoslobodskaya ulitsa, 50/52, kv. 27; Viktor Mikhailovich Popel, ulitsa Karla Marxa, 20 korpus 2, kv. 100, and Viktor Petrovich Shmatok, Amurskaya ulitsa, 76, korpus 3, kv. 10, all of Moscow, U.S.S.R.

Filed Aug. 7, 1975, Ser. No. 602,743

Int. Cl.² B63G 8/00

U.S. Cl. 114—16 E

2 Claims



1. A buoyancy control system for submersible vessel, comprising a reservoir filled with a ballast liquid and secured to the hull of a submersible vessel, an outboard pipe fastened to the exterior of said hull and open at one end to the sea water normally surrounding the vessel, the other end of said pipe communicating with said reservoir, a piston movably mounted within said pipe and separating the ballast liquid from sea

water entering said pipe, and a pump for transferring said ballast liquid from said reservoir to said pipe and back to said reservoir.

4,008,674

CATAMARAN VESSEL

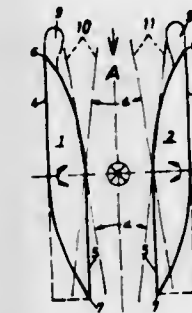
Leopold Nitzki, and Jurgen Alsen, both of Bremen, Germany, assignors to Aktiengesellschaft "Weser", Bremen, Germany
Filed Feb. 12, 1975, Ser. No. 549,391

Claims priority, application Germany, Feb. 16, 1974,
2407498

Int. Cl.² B63B 1/10

U.S. Cl. 114—61

8 Claims



1. An oceangoing catamaran, comprising a pair of spaced-apart hulls each having a longitudinal axis, a forward hull portion and a rearward hull portion, each hull being asymmetrical relative to its longitudinal axis, and the forward portion of each hull being straight at one side and curved at the opposite side in the region of the waterline, the straight sides of the respective forward portions being inclined relative to each other at an angle other than zero and defining an open-ended channel between each other, and the rearward portion of each hull being straight at said opposite side and curved at said one side; and a bridge structure connecting said hulls with one another.

4,008,675

SHIP OF THE TYPE FACILITATING VEHICLE TRANSPORT

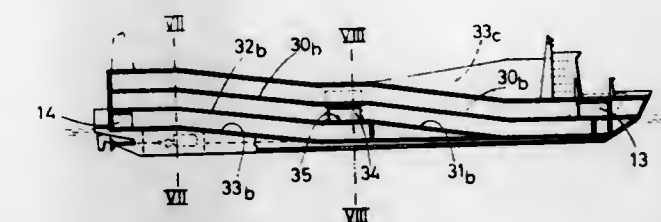
Anders Johansson, Bohus-Bjorko, Sweden, assignor to Salen & Wicander Terminalsystem AB, Goteborg, Sweden

Filed Aug. 27, 1975, Ser. No. 608,251

Claims priority, application Sweden, Sept. 2, 1974, 7411064
Int. Cl.² B63B 11/02

U.S. Cl. 114—70

3 Claims



1. A ship of the "Ro-Ro" type having a hull enclosing a cargo carrying portion including two superimposed cargo receiving decks and further having first and second lobbies located forward of, and astern of said cargo carrying portion, respectively, said lobbies being located at about the same level, a ramp at each of said lobbies for providing communication between the ship and a shore based cargo storing area, means for fitting said cargo receiving decks within the hull so one deck will communicate with the forward lobby only and the other deck will communicate with the astern lobby only, bulkhead means for dividing the cargo carrying portion longitudinally at each deck into at least two compartments located side by side, transverse bulkhead means for closing the end of each compartment remote from the pertaining lobby to form

each compartment into a straight, blind alley being supported by a portion of the pertaining deck, and means for supporting said deck portions so they in sidewardly adjacent compartments emanating from the same lobby will be inclined in opposite directions in relation to a horizontal plane, and further so superimposed deck portions emanating from different lobbies will also be inclined in opposite directions.

4,008,676

WATER CRAFT HAVING SEA OPENING WITH CONNECTING CONDUIT

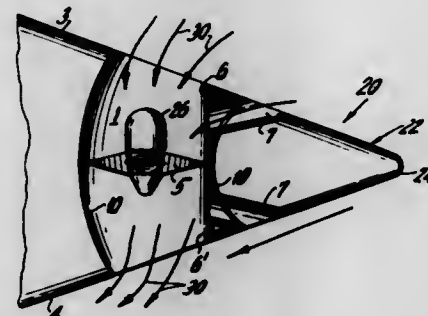
Joachim Emil Brix, Hamburg, Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Germany
Division of Ser. No. 529,542, Dec. 4, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,329

Claims priority, application Germany, Dec. 5, 1973, 2360479

Int. Cl.² B63H 25/46

U.S. Cl. 114—151

2 Claims



1. A water craft having a hull with a bow and a stern, a throughgoing curved duct extending completely through said hull adjacent said bow and curved along its length rearwardly toward the stern from each side of said bow and terminating in a duct opening at each side of said hull located below the water line, propulsion means in said duct located centrally between the ends thereof for forcing sea water through said curved duct in a selected direction, and a conduit extending from each side of said hull below the water line directly into said curved duct at respective spaced locations from the curved duct openings and each said conduit having a conduit inlet opening below the water line located forwardly of the corresponding duct opening in a direction towards said bow, said conduits being substantially straight to provide a pressure equalizing flow through said conduits and into said curved duct to reduce turbulent flow in said curved duct adjacent each duct opening and to promote a pressure equalization and smooth flow through said curved duct.

4,008,677

RETRACTIBLE RUDDER

David Hazard Wordell, Sr., R.F.D. 1 (Salem), Oakdale, Conn. 06370

Filed Oct. 2, 1975, Ser. No. 618,750

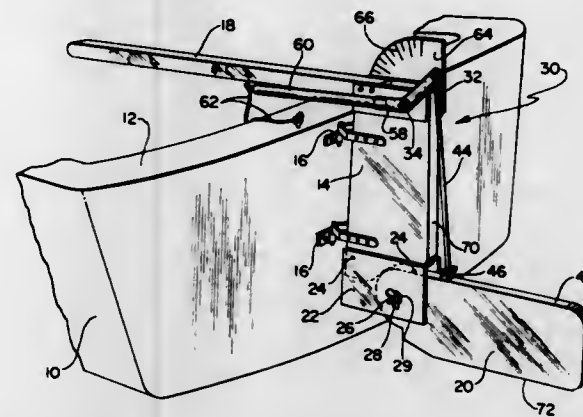
Int. Cl.² B63H 25/06

U.S. Cl. 114—162

10 Claims

1. In combination with a rudder stock secured against vertical movement and mounted for yaw movement adjacent the stern of a vessel, the improvement comprising:
a rudder blade pivotally mounted on a lower portion of said rudder stock;
pivot means mounting said rudder blade for movement about an axis transverse to the plane of said rudder stock for movement between a retracted and an extended position;
operative means mounted on said rudder stock and rigidly connected to said rudder blade for moving said rudder blade between said retracted and extended positions;
first stop means defining said retracted position and second stop means defining said extended position; and

fastening means associated with said pivot means for releasably fixing said rudder blade in any one of an infinite



number of positions intermediate said retracted and extended positions.

4,008,678

SHIP MOORING SYSTEM

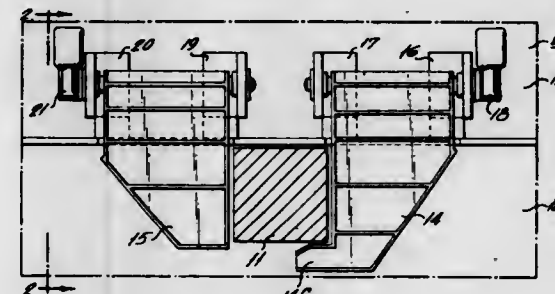
John Lawlor, Sewell, N.J., assignor to Sun Shipbuilding and Dry Dock Co., Chester, Pa.

Filed Oct. 20, 1975, Ser. No. 623,703

Int. Cl.² B63B 21/00

U.S. Cl. 114—230

3 Claims



1. A ship mooring apparatus for roll-on/roll-off ships comprising in combination:

1. a pair of vertical posts spaced apart on a dock,
2. a ship to be docked fitted with two pairs of extendable post-engaging devices, one of said pairs mounted on the bow section of said ship and the second of said pairs mounted on the stern section of said ship, said devices being spaced apart a distance equal to the distance between said posts, and means to separately extend said devices to enable engagement with said posts to prevent horizontal movement, but permit vertical movement of said ship.

4,008,679

MOTORBOAT PROVIDED WITH POWER OPERATED RETRACTABLE WHEELS FOR LANDING ON BEACHES

Stefano Bozzano, 38/8 Via Perniciaro, Mele (Genoa), Italy

Filed May 27, 1975, Ser. No. 580,785

Claims priority, application Italy, June 3, 1974, 12827/74

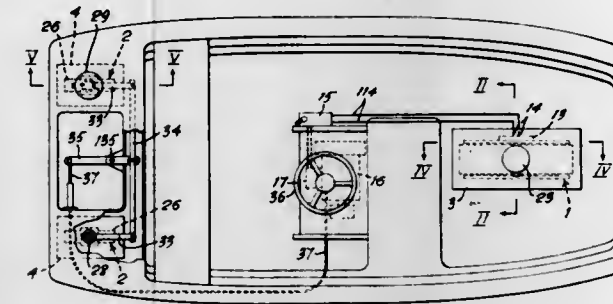
Int. Cl.² B60F 3/00

U.S. Cl. 115—1 A

1 Claim

1. A motorboat provided with power operated retractable wheels for landing on beaches comprising a hull provided on its bottom with a triangular array of three recesses, one of said recesses being located at the bow end of said boat, and the other recesses being aligned with each other at the stern end of said boat, an extendable and retractable landing gear mounted in each recess, an endless track wheel mounted on the landing gear in the bow recess and fixed to rotate in a plane parallel to the keel of said boat, means for driving said track wheel to propel said boat on the ground, first hydraulic means for extending and retracting said landing gear in said bow recess, a wheel mounted on each of the landing gears in

the stern recesses to pivot steerably about a vertical axis, second hydraulic means for extending and retracting said landing gears in said stern recesses, and steering means interconnecting the wheels in said stern recesses for conjoint pivoting, and shutter means pivotally mounted adjacent each recess



and being adapted to span said recess, and articulated link means operatively interconnecting said shutter means with the associated landing gears in the respective recesses to conjointly open and close said recesses each time said landing gears are extended from and retracted into their recesses.

4,008,680

PIVOTAL MOUNT ASSEMBLY FOR TROLLING MOTORS

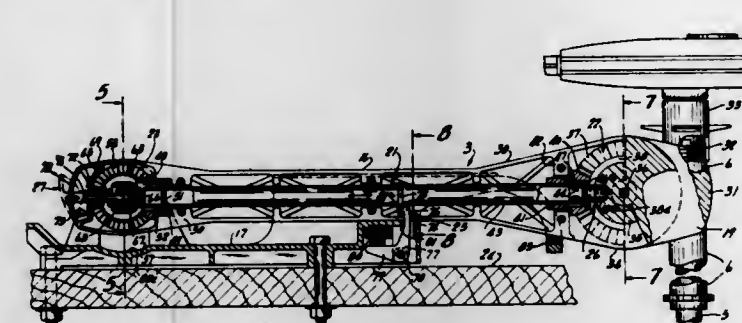
Charles F. Alexander, Jr., Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 4, 1975, Ser. No. 610,414

Int. Cl.² B63H 21/26

U.S. Cl. 115—18 E

11 Claims



1. In an electric trolling motor apparatus having an electric trolling motor for propulsion of a watercraft, a mounting bracket means adapted to be secured to the watercraft and having a pivotally mounted arm means, a gear train means mounted on said arm means and having a control gear means coupled to said mounting bracket means and a driven gear means rigidly connected to the control gear means by a gear and shaft means, a motor support means connected to said driven gear means, said gear train means establishing rotation of the motor support means and said electric trolling motor in response to the pivoting of the arm means between a lowered propulsion position and a raised transport position.

4,008,681

BUTTER DISPENSER

Patrick Steven Johnson, Apt. K-4 1617 Lebanon Road, Nashville, Tenn. 37210

Filed June 19, 1975, Ser. No. 588,281

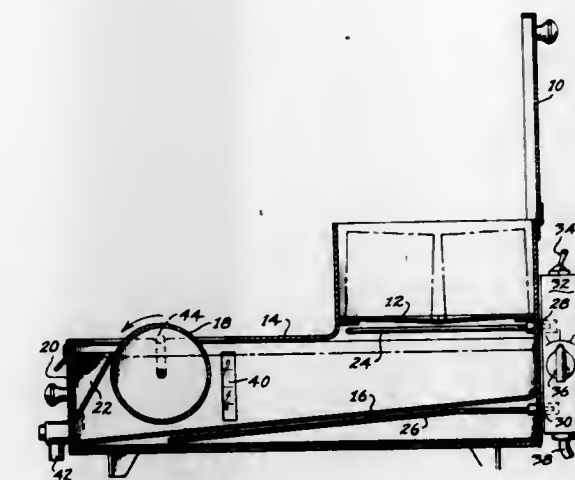
Int. Cl.² B05C 1/02, 11/10

U.S. Cl. 118—5

10 Claims

1. A butter dispenser comprising a three-dimensional L-shaped enclosed frame, the upright arm of said L having an openable top and a heatable grate below said top, the other arm of said L having a basin fitted therein as a drawer, said basin having at least one roller at least partly submerged therein along the other arm of said L and held in position by

handles adapted for removing same, said roller being rotatable clockwise and counterclockwise along the direction of protrusion of said other arm of said L, and means for heating said basin and said grate.



4,008,682

ARROW PAPER TAPE DISPENSER

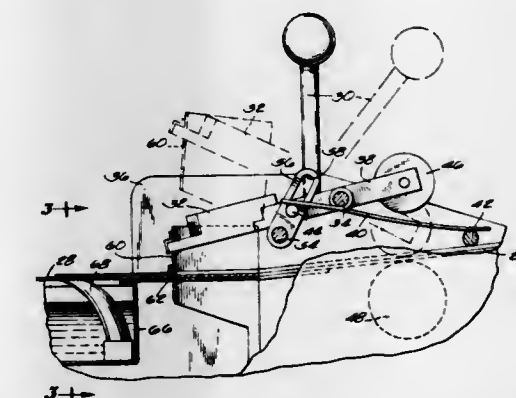
Robert T. Meyer, 415 St. Francis Drive, Green Bay, Wis. 54301

Filed Apr. 17, 1975, Ser. No. 568,949

Int. Cl.² B05C 1/06

U.S. Cl. 118—41

2 Claims



1. In a tape dispenser including means for storing a supply of gummed package sealing tape, a cutting mechanism for cutting said tape, and a moistener for moistening the gummed surface of said tape as it is drawn out of said tape dispenser, the improvement comprising a pair of V-shaped cutting blades in said cutting mechanism for making successive V-shaped cuts across the entire width of said tape to produce an arrow-shaped length of tape, said moistener comprising interrupting means for moistening said gummed surface generally while leaving a dry area at the V-shaped tip so that the tip portion of said gummed surface will not stick to a surface against which it is pressed. Whereby said tape can be subsequently stripped from a carton surface to permit a box to which the tape is glued to be easily opened, said moistener comprising a moistening brush and a source of moisture therefor, and said interrupting means comprising a mask over the central portion of said brush to prevent the central portion of the gummed surface of said tape from becoming moistened, said mask including a V-shaped strip which divides said moistening brush into two spaced apart portions, said V-shaped strip being located between said brush and the gummed surface of said tape in the central portion thereof.

4,008,683

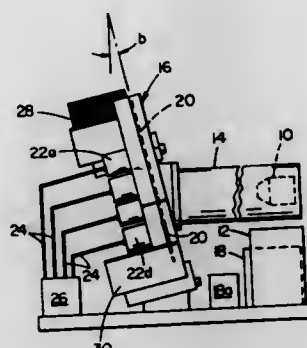
MACHINE FOR TREATING WAFER-FORM ITEMS

Peter H. Rose, Rockport, Mass., assignor to Varian Associates, Palo Alto, Calif.

Continuation-in-part of Ser. No. 379,346, July 16, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,862 Int. Cl.² C23C 13/08

U.S. Cl. 118—49.1

9 Claims



1. In a machine for treating discrete wafer-form items in a vacuum, the machine including a target station for exposing a succession of said wafer-form items to a treatment beam and a lock system for introducing and removing said items relative to the target station, the improvement wherein said lock system and target station are defined by successive portions of an elongated slot-shaped channel disposed with its axis at an elevation to the horizontal through which said items proceed edgewise while aligned by surfaces of said channel, said channel having an elongated cross-section throughout its length larger in each dimension than the cross-section of said wafer-form items thereby enabling unconstrained edgewise gravity movement of said wafer-form items to successive positions along said channel while providing a small channel volume to be evacuated, a plurality of spaced apart elongated seal members movable between open and closed positions and each sized in said closed position to span the slot-shaped channel for sealing one part of said channel from another, said seal members arranged to define entry and exit locks, said target station located therebetween, and means for opening and closing said seal members in sequence to permit the movement of an item along said channel successively past a first seal member into said entry lock, thence past a second seal member to the target station, thence past a third seal member into said exit lock, thence past a fourth seal member out of said machine.

4,008,684

DEVICE FOR APPLYING A LAYER OF A VISCOUS SUBSTANCE

Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Jan. 12, 1976, Ser. No. 648,286

Claims priority, application Netherlands, Jan. 10, 1975, 7500344

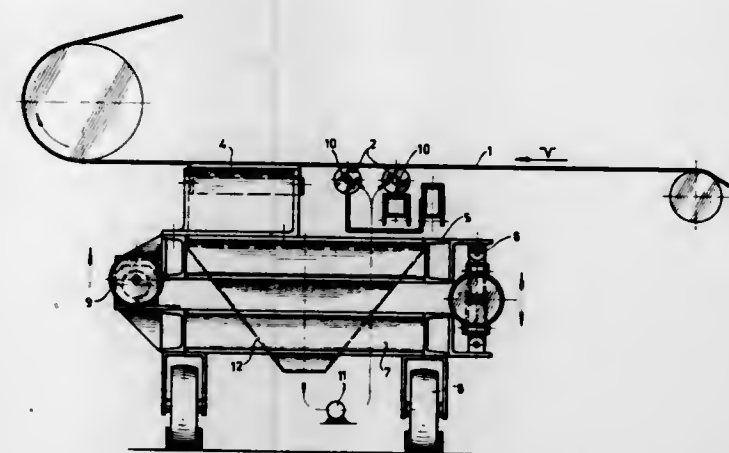
Int. Cl.² B05C 11/04, 3/18

U.S. Cl. 118—123

4 Claims

1. A device for applying a layer of viscous substance to a traveling belt comprising means for applying viscous substance to a surface of a traveling belt, a squeegee blade adjacent said surface of the belt and spaced from said applying

means in the direction of travel of said belt to smooth the applied substance to obtain a uniform layer thereof, said blade



having a curved shape across said belt, the curved blade having a convex side directed in the direction of travel of the belt.

4,008,685

ELECTROSTATIC FLUIDIZED BED BUILD CONTROL

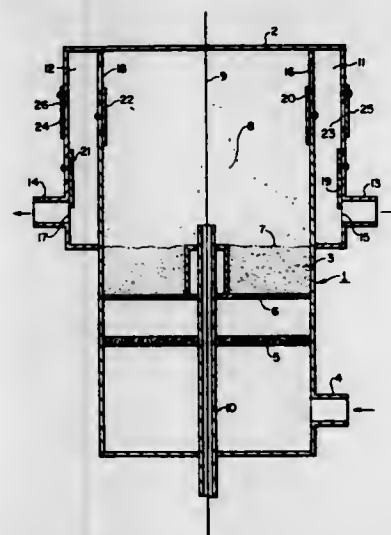
Robert E. Pierce, Abingdon, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1976, Ser. No. 678,579

Int. Cl.² B05B 5/02

U.S. Cl. 118—629

5 Claims



1. In an enclosed electrostatic fluidized bed for coating a vertically moving elongated member by means of a cloud of charged particles, where said electrostatic fluidized bed has two opposing vacuum chambers on its sides for drawing air from the inside of said electrostatic fluidized bed around said cloud for the purpose of controlling the position of said cloud, the improvement comprising venting means leading from each vacuum chamber to the atmosphere, each venting means being provided with adjustable means for controlling the degree of venting.

4,008,686

DEVELOPING DEVICE FOR USE IN ELECTROPHOTOGRAPHY

Hiroshi Katakura, Hachioji, and Keitaro Yamashita, Kamisato, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 16, 1975, Ser. No. 578,266

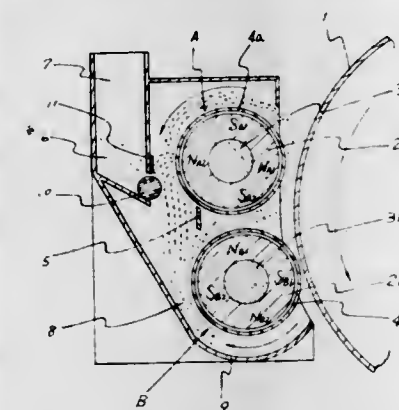
Claims priority, application Japan, May 21, 1974, 49-56864 Int. Cl.² B05B 5/02

U.S. Cl. 118—651

7 Claims

1. A developing device for use in electrophotography wherein a toner is applied to an electrostatic latent image supported on the surface of a member to make the image visible, comprising a rotatable member bearing an electro-

static latent image thereon; a first magnetic roll disposed adjacent to the member which comprises a rotational tube of non-magnetic material and a cylindrical fixed magnet body located in the tube and having more than two magnetic poles spaced from each other wherein one of the poles is located adjacent the surface of said member, said pole serving as a developing pole; a second magnet roll disposed adjacent to the member and adjacent to the first magnet roll, and a developer storing chamber, said second magnet roll comprising a rotational tube of non-magnetic material and a cylindrical fixed magnet body located in the tube and having more than two magnetic poles longitudinally arranged thereon wherein one of the poles is located adjacent to the surface of said member, another of said poles is located adjacent to the first magnet



roll and another of said poles being immersed in said developer storing chamber; the tubes of the first and second magnet rolls being rotated such that the surfaces of said tubes move in the same direction with respect to each other at the point at which said tubes are adjacent to each other, the surface of said member being translated in the same direction as the tube of said second magnet roll at the location where the tube of the second magnet roll and the surface of said member are adjacent to each other, the developer being carried from the developer storing chamber to the portion of the first magnet roll opposite said member, the carrier particles adhered on the member being removed from said surface by the magnetic pole of the second magnet roll adjacent the surface of said member.

4,008,687

SLEEPING NOOK FOR HOUSE PET

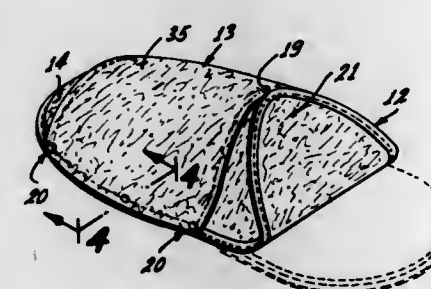
Francis Jackson Keys, 9532 Cortada, El Monte, Calif. 91733

Filed Sept. 17, 1975, Ser. No. 614,134

Int. Cl.² A01K 1/02

U.S. Cl. 119—1

4 Claims



1. A domestic animal shelter generally in the shape of an oversized slipper comprising: a flexible elongated sole-like base forming a cushion and having a covering of fabric material thereon, said sole-like base having a heel end and a toe end, a vamp-like hood provided on substantially the toe end half portion of said sole-like base, said vamp-like hood sloping downwardly from an entrance opening on one end thereof toward a vent opening on the toe end thereof, said vamp-like hood including a wall of fabric material

having opposite sides attached adjacent opposite sides respectively on the sole-like base, and a resilient support member provided beneath said wall of fabric material, the bowing of which holds the wall of the vamp-like hood in its erect position thereby providing a nook into which an animal can burrow, and

fastener elements on the heel end of said sole-like base and on the upper end of the entrance opening of the vamp-like hood,

whereby the heel end half portion of the sole-like base can be urged upwardly and bent back such that its heel end can be releaseably attached by said fastener elements to the upper end of the vamp-like hood to provide for covering the entrance opening while leaving vent openings on the sides thereof.

4,008,688

PET BED

Dimitri P. Nicholas, c/o The Orr Felt Company 750 S. Main St., Plaquemine, Ohio 45356

Filed Dec. 17, 1975, Ser. No. 641,542

Int. Cl.² A01K 29/00

U.S. Cl. 119—1

5 Claims



1. A pet bed having insecticidal properties comprising a relatively impervious bottom sheet-like layer and an upper relatively porous fabric-like covering joined marginally with said bottom layer and being unattached to said bottom layer inwardly of the margins thereof, said covering having a non-woven batting at the upper surface thereof intimately joined to a woven fabric base providing a porosity to permit the passage of powder insecticide therethrough, and a quantity of powdered insecticide received between said covering and said bottom layer so that said powder can penetrate through said covering and come into contact with a pet lying or resting on said upper surface thereof.

4,008,689

WASTE COLLECTION AND CONVERSION SYSTEM

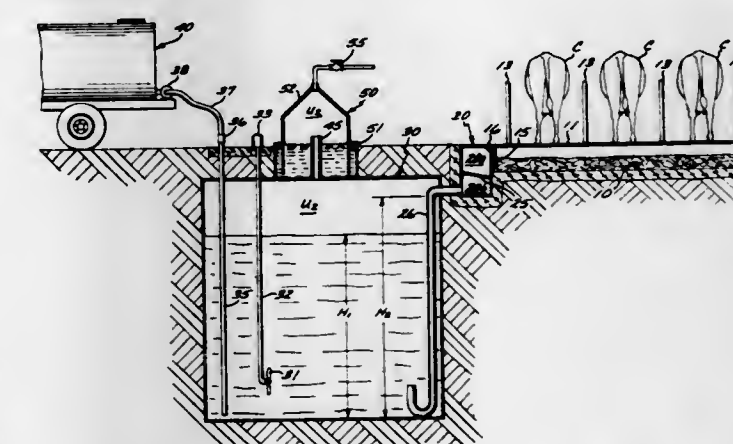
Teo Albers, 18007 Arline Ave., Artesia, Calif. 90701

Filed July 25, 1975, Ser. No. 591,776

Int. Cl.² A01K 1/00

U.S. Cl. 119—28

3 Claims



1. A waste collection system adapted to collect animal waste for fermentation, comprising: a trough formed in the ground surface of an animal-retaining enclosure closed at one end and including a vertically adjustable baffle at the other end; a spring-loaded flapper valve disposed on the distal side of

said baffle closing a cavity arranged below the bottom surface of said trough;
a fermentation tank disposed below said cavity;
transfer means connecting said tank to said cavity;
gas-accumulating means disposed above said tank for collecting the ullage gases therefrom; and
said accumulating means includes a liquid-filled ring disposed on the upper surface of said tank, an inverted dome having the opening thereof immersed in said liquid-filled ring and a vent connecting the ullage in said tank with the ullage in said dome.

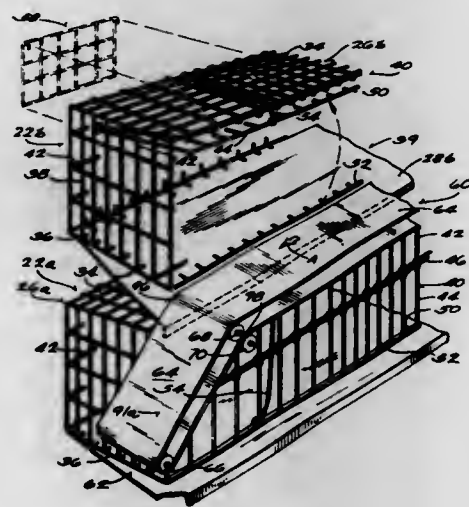
4,008,690

POULTRY CAGE SYSTEM WITH POULTRY REMOVAL
Robert L. van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 504,968
Int. Cl.² A01K 29/00

U.S. Cl. 119—82

19 Claims



1. A poultry cage system comprising, in combination:
a plurality of poultry cages arranged in a row, each of said cages having means defining an access opening through which poultry confined therein can be removed, said cages including cover means movable selectively between a first position relative said opening wherein said cover means covers said opening to prevent movement of poultry therethrough and a second position wherein said cover means is removed from said opening to permit access therethrough, and a conveyor means fixably positionable along and extending the length of said row adjacent said openings for conveying poultry urged out of said cages through said openings wherein at least two tiers of cages are arranged in rows spaced vertically by a support frame, said conveyor means being supported by said support frame and movable vertically to permit selective transportation of poultry from either of said rows of cages.

15. A system of poultry cages arranged in vertically spaced tiers, each tier comprising a pair of spaced inwardly facing rows of cages, the front facing panel of each cage including means defining an access opening and removable cover means for inserting or removing poultry therefrom, and conveyor means positionable adjacent said access opening for conveying poultry in said cages to a central collection point, said conveyor means being movable vertically in said spacing defined between said tiered rows of cages, said cages are supported by a support frame and said cages are suspended by a sub-frame movable vertically relative said support frame, said conveyor means is an endless driven belt extending the length of said tiers, said sub-frame comprising a plurality of spaced yokes suspended by a pulley cable means whereby said conveyor means is raised or lowered by said pulley cable means to a desired level, and wherein said yoke includes a catch means associated therewith and operable

with a stop on said support frame to prevent accidental lowering of said conveyor means.

4,008,691
SUPPORT SYSTEM

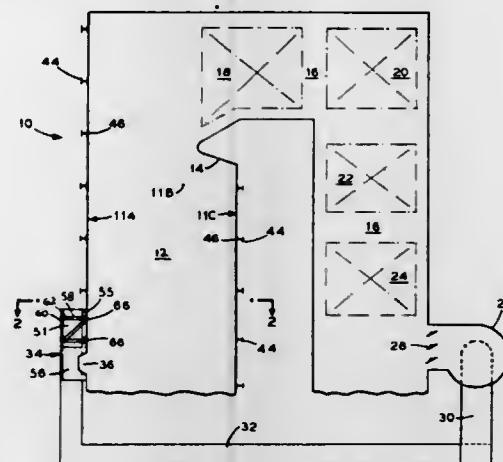
Edward Wells Kreider, Wadsworth, and Thomas Paul Hoosic, Clinton, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,858

Int. Cl.² F22B 37/36, 37/24

U.S. Cl. 122—494

4 Claims



1. In a fluid heating unit having upright walls defining a chamber therebetween for the flow of heating gases, structural members disposed outside the chamber and connected to said walls for lateral support and reinforcement thereof, at least one plenum extending along the width of one of the walls and communicating with said chamber, the plenum being attached to said wall, ducts supplying heated gases to opposite ends of the plenum, said ducts being connected to fixed supports and including end sections extending from the supports for connection to said plenum ends, plate means abutting the plenum ends and being rigidly connected to adjoining structural members to transmit end section and plenum thermal expansion stresses thereto.

4,008,692

VEHICLE-MOUNTED GASEOUS FUEL GENERATOR
Hiroshi Shinohara, Okazaki; Kunihiro Masunaga, Toyota; Shigeo Murakami, Okazaki, and Kazuhiko Ishiguro, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

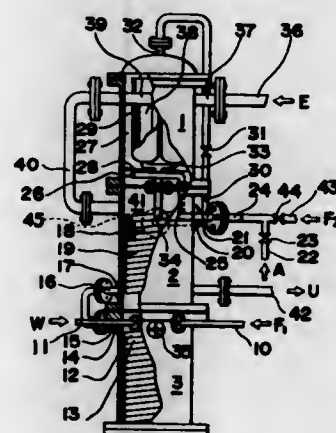
Filed Nov. 4, 1974, Ser. No. 520,936

Claims priority, application Japan, Nov. 6, 1973, 48-124680

Int. Cl.² F02B 43/00

U.S. Cl. 123—3

4 Claims



1. A gaseous fuel generator for mounting on a vehicle provided with a supply of liquid hydrocarbon, a supply of water and an internal combustion engine equipped with a carburetor and discharging an exhaust gas, said generator comprising

a primary heat exchanger (3) holding separate coiled pipes (12, 13) for separately receiving and heating liquid hydrocarbon and water provided by said supplies,
a secondary heat-exchanger (2) holding separate coiled pipes connected to the coiled pipes (12, 13) of said primary heat exchanger to receive hydrocarbon and water respectively therefrom, means for conducting the exhaust gas from said engine to said secondary heat exchanger (2) to heat and vaporize said hydrocarbon and water,
a reaction-reforming chamber (1) comprising an outer partial oxidation chamber (27) containing an outer catalyzer layer connected to receive hydrocarbon vaporized in said secondary heating chamber and air and partially oxidize said vaporized hydrocarbon, and an inner steam-reforming catalyzer layer (29) connected to receive both said partially oxidized hydrocarbon from said outer chamber and vaporized water from said secondary heating chamber, and transform them into an inflammable gas, and
means (34, 35) for collecting said inflammable gas and transmitting it through said primary heat exchanger to said carburetor.

4,008,693

ROTARY ENGINE

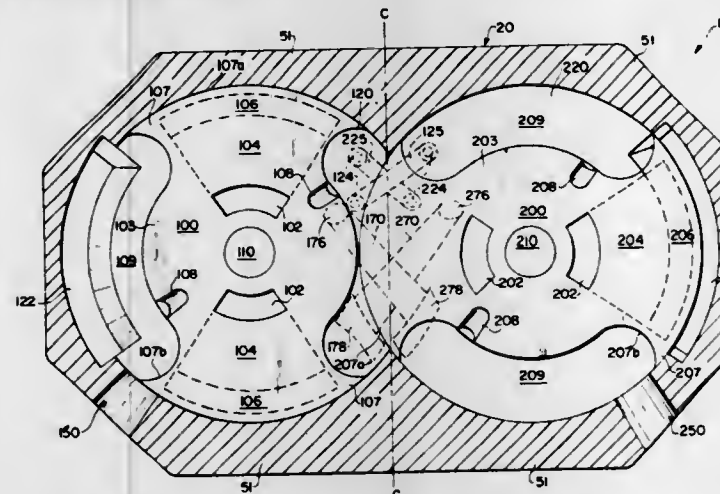
Everett Dale Rea, and Terry Gene Rea, both of 1928 Cardinal Drive, Sioux Falls, S. Dak. 57105

Filed Aug. 26, 1975, Ser. No. 607,996

Int. Cl.² F02B 53/00

U.S. Cl. 123—8.25

7 Claims



1. A rotary combustion engine comprising an engine block, said engine block having therein at least first and second adjoining rotor chambers and first and second peripheral holding chambers communicating with said first and second rotor chambers, respectively, and air intake means communicating with said first and second rotor chambers, at least first and second rotors disposed in said first and second rotor chambers, respectively, said rotors having at least two spaced lobes defining voids therebetween, said rotor chambers being configured such that each of the lobes of said rotors meshes with a corresponding void of the other rotor, each of said lobes having an air intake passageway there-through, the air intake passageways of said first rotor communicating with said first holding chamber when at least a portion of said air intake passageways is in relative alignment with at least a portion of said first holding chamber, and the air intake passageways of said second rotor communicating with said second holding chamber when at least a portion of said air intake passageways is in relative alignment with at least a portion of said second holding chamber, said air intake passageways constituting means for providing a supercharging effect when said rotors are rotated.

4,008,694
ROTARY CYCLING VALVE FOR INTERNAL COMBUSTION ENGINES

Walter Monn, Via Codeborgo 16, 6500 Bellinzona, Switzerland

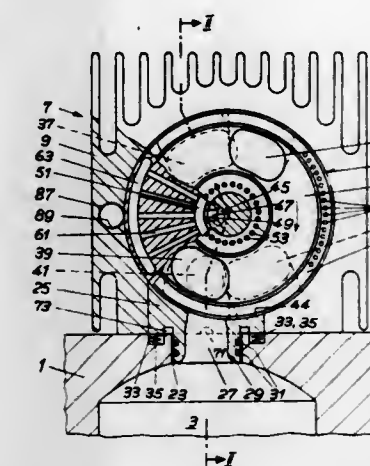
Filed Jan. 22, 1975, Ser. No. 543,141

Claims priority, application Switzerland, Jan. 30, 1974, 1231/74; Germany, Nov. 14, 1974, 2454006

Int. Cl.² F01P 1/08

U.S. Cl. 123—41.4

20 Claims



1. A rotary cycling valve for internal combustion engines, comprising a valve housing having suction and exhaust ports; a circular rotary valve body within said housing having internal passages adapted to selectively connect said suction and exhaust ports with the working space of an engine cylinder; and a cooling system operatively associated with said housing and valve body and connected with an engine related source of subatmospheric pressure; said cooling system comprising cooling chambers within said valve body and cooling medium circulating channels leading from radially inner to radially outer portions of said valve body, said internal passages of said valve body providing inlet and outlet openings, respectively, on its periphery and outlet and inlet openings, respectively, on one and the other of its side faces, and wherein a drive shaft of said valve body has an axial cooling air conducting bore in communication with radial cooling air admitting bores thereof.

4,008,695

COOLED INTEGRAL VALVE CHEST FOR AN INTERNAL COMBUSTION ENGINE AND METHOD FOR MAKING SAME

Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Jan. 13, 1975, Ser. No. 540,502

Claims priority, application France, Jan. 29, 1974, 74.02900

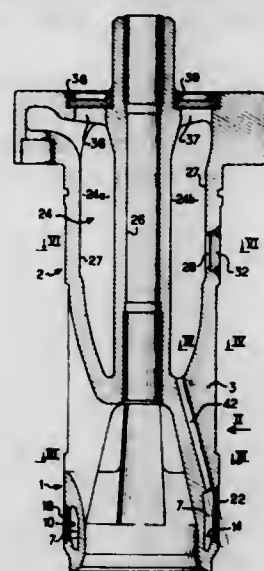
Int. Cl.² F01P 3/12

U.S. Cl. 123—41.76

11 Claims

5. An overhead valve chest capable of being removably fitted as an insert in a cylinder head of an internal combustion engine, said chest being integrally cast in one piece and adapted to accommodate one single valve, and comprising: a cage portion having several depending arms; an annular valve seat portion interconnecting said arms endwise, said valve seat portion being formed with an endless annular valve seat cooling chamber surrounding the center line axis of said valve chest; and a valve stem guide portion formed with and surrounded by an annular cooling chamber; at least one duct formed in at least one of said arms and extending between said valve seat cooling chamber and said valve stem guide cooling chamber, said duct opening into said chambers with its opposite ends, respectively, to provide a permanent communication.

tion between said chambers; the radially outer wall of at least one of said cooling chamber being formed with at least one



hole extending therethrough and a welded plug closing off said hole.

4,008,696

CARBURETOR FOR OPTIMUM CONTROL OF AN AIR-FUEL MIXTURE SUPPLY TO THE ENGINE DURING DECELERATION

Takashi Hisatomi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

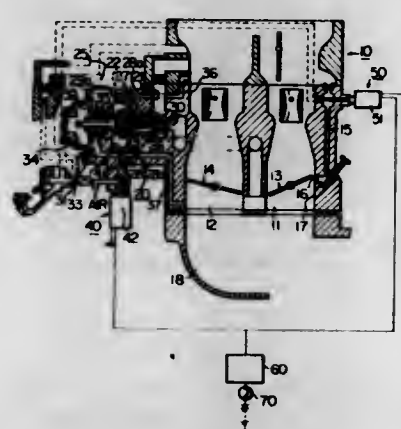
Filed Mar. 13, 1975, Ser. No. 557,946

Claims priority, application Japan, Mar. 19, 1974, 49-31143

Int. Cl.² F02D 31/00

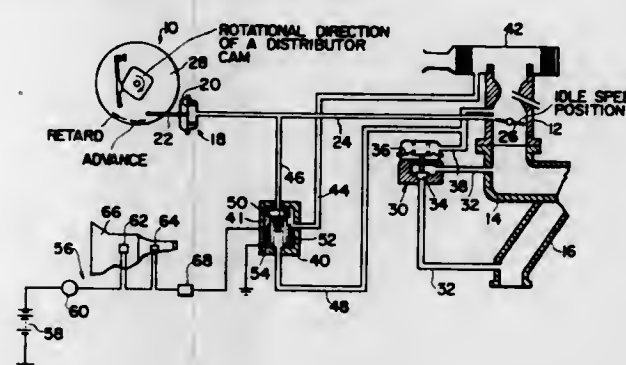
U.S. Cl. 123-97 B

5 Claims



1. An improved carburetor with a slow fuel supply system for use with an internal combustion engine having an intake manifold, the carburetor comprising electric control means connected with a source of electric power and sensitive to the condition of the engine acting as a brake at an engine speed above a predetermined value and producing an electric signal indicating said condition, a solenoid-operated valve disposed in the slow fuel supply system and operatively connected with the control means to block the supply of fuel upon receiving said electric signal, a by-pass mixture supply passageway communicating between a source of mixture supply and the intake manifold for supplying the intake manifold with additional mixture, a diaphragm-operated valve assembly disposed in said passageway and operable by the intake manifold vacuum to open and close said passageway, and solenoid-operated means for actuating the diaphragm-operated valve assembly, said solenoid-operated means being operatively connected with said control means for feeding, upon receiving said electric signal, the diaphragm-operated valve assembly with the air cancelling the manifold vacuum causing said valve to close the passageway.

4,008,697
INTERNAL COMBUSTION ENGINE
Mitsutaka Konno, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 13, 1975, Ser. No. 577,025
Claims priority, application Japan, July 19, 1974, 49-85910[U]
Int. Cl.² F02P 5/04; F02M 25/06
U.S. Cl. 123-117 A 2 Claims

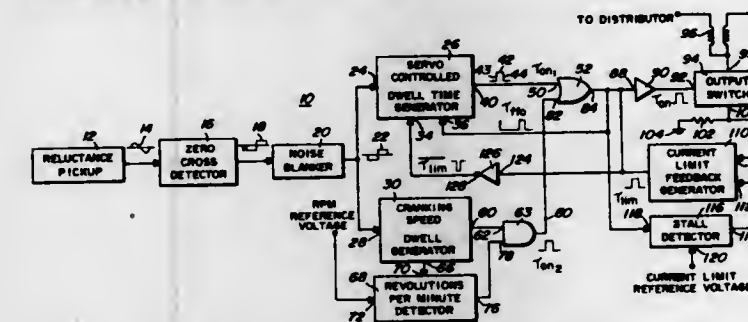


1. An engine spark timing and exhaust gas recirculation control comprising, in combination:
a carburetor induction passage having a throttle valve rotatably mounted therein and adapted to be connected to an intake manifold of the engine, a spark port in the induction passage located above an idle speed position of said throttle valve and an exhaust gas recirculation port located in the induction passage above and axially spaced from said spark port;
a vacuum actuated engine spark timing advance unit for advancing the engine spark timing in response to the vacuum applied thereto;
a vacuum actuated exhaust gas recirculation control valve adapted for controlling the flow of the exhaust gas back from an exhaust manifold of the engine to said intake manifold in response to the vacuum applied thereto;
a first conduit means connecting said spark port to said vacuum actuated engine timing advance unit;
a second conduit means connecting the exhaust gas recirculation port to the vacuum actuated exhaust gas recirculation control valve;
an electro-magnetically operated valve means having a chamber which is open to the atmosphere through an engine cleaner, a first port opening to the chamber, a second port opening to the chamber, a valve member movable between the first and second ports, a spring means biasing said valve member toward the first port to close the same, and a solenoid means urging the valve member toward the second port, when energized, to close the same;
a first branch conduit means connecting the first conduit means to the first port;
a second branch conduit means connecting the second conduit means to the second port; and
means for energizing the solenoid means during a predetermined engine operating condition.

4,008,698
HIGH ENERGY ADAPTIVE IGNITION SYSTEM
Todd Henry Gartner, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 28, 1975, Ser. No. 608,435
Int. Cl.² F02P 1/00
U.S. Cl. 123-117 R 8 Claims

1. An ignition system for an internal combustion engine comprising an ignition coil having primary and secondary windings, the secondary winding providing a high voltage spark suitable for engine firing, the primary winding series connected between a bias supply and an electronic switch, the switch operable to conductively couple or nonconductively

decouple the primary to a reference terminal dependent on signals at a switch control terminal, a sensor operably coupled to the engine producing a periodic output voltage in synchronism to the engine cycle, a controlled pulse generator, having first and second inputs, synchronized to the sensor signal and coupling to the control terminal of the electronic switch, the generator providing a pulse having a leading edge suitable for activating the switch to a conductive state and a trailing edge suitable for activating the switch to a nonconductive state, the trailing edge synchronized to occur at a predetermined engine



position, the leading edge predeterminedly controlled by either of said two pulse generator inputs, the first generator input being a current limit generator input which couples to means for generating a first control signal representative of the time during each engine cycle that the coil primary carries a minimum predetermined current, and the second generator input being a coil off time generator input which couples to a means for generating a second control signal representative of the time during each engine cycle that the switch and coil are in a nonconductive state.

EXTENDED THROTTLE BORE MULTI-STAGE CARBURETOR

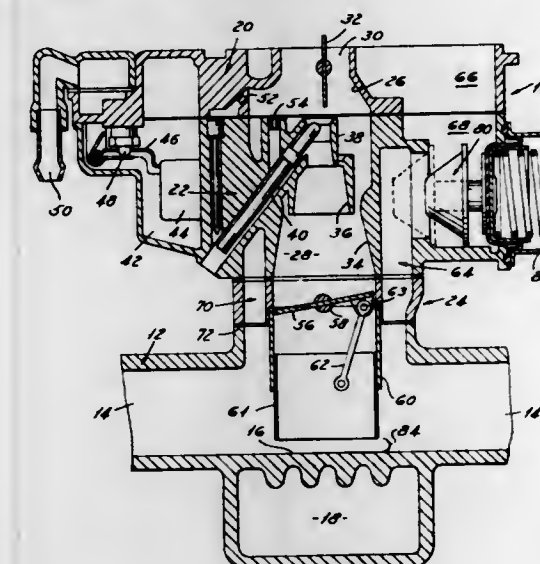
Paul E. Braun, and Melvin F. Sterner, both of Bloomfield Hills, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 5, 1976, Ser. No. 674,010

Int. Cl.² F02M 31/08

U.S. Cl. 123-122 AB

7 Claims



1. In combination, a dual stage carburetor having primary stage and secondary stage induction passages each having an air inlet at its upper end and a discharge opening at the other lower end, an engine intake manifold extending essentially at right angles to the axis of the passages and having an engine exhaust gas heated floor portion directly beneath and aligned with the lower discharge ends of the primary and secondary induction passages for the splash of fuel against the floor portion to warm the fuel and aid in the vaporization thereof, the primary induction passage having a fuel metering venturi receiving fuel therein for induction of fuel into the manifold, the primary passage discharge end extending into the intake manifold into close proximity to the floor portion but spaced

therefrom so as to vaporize the fuel mixture discharged there-against while permitting a controlled flow of mixture out of the space between the primary passage and floor portion towards the engine cylinders, the discharge end of the secondary induction passage being concentric with and surrounding a lower portion of the primary passage and terminating adjacent the inlet to the intake manifold so as to discharge air into the manifold in a manner bypassing the flow restriction caused by the extension of the primary passage into close proximity to the floor portion, and control means controlling flow of air through the secondary passage.

FUEL FEED DEVICE FOR INTERNAL COMBUSTION ENGINE

Michel Pierlot, Le Pecq, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., France

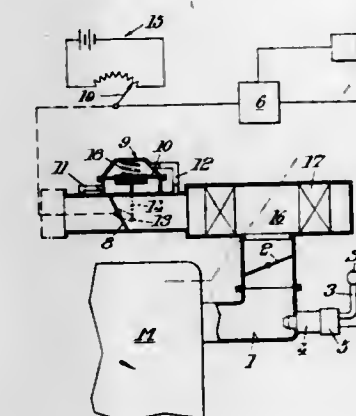
Filed June 17, 1974, Ser. No. 480,251

Claims priority, application France, Aug. 1, 1973, 73.28200
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² F02M 39/00

U.S. Cl. 123-139 AW

5 Claims



1. A fuel feed apparatus for internal combustion engines, comprising: an intake pipe; a main throttle member located in said intake pipe; an auxiliary throttle member located in said intake pipe upstream of said main throttle member; means for progressively opening said auxiliary throttle member proportionally as the flow rate of air in said intake pipe increases; a source of fuel under pressure; a fuel supply circuit coupled to said fuel source and said intake pipe and opening into said pipe downstream of said main throttle member, said supply circuit including at least one solenoid valve for controlling the supply of fuel from said source into said pipe; a metering system coupled to said solenoid valve and to said auxiliary throttle member for providing energizing signals to said solenoid valve, the duration of said signals in a given time period varying proportionally with the amount of opening of said auxiliary throttle member; a chamber located in said intake pipe downstream of said auxiliary throttle member and upstream of said main throttle member; and an air filter located in said chamber wherein air flowing through said chamber circulates across said filter.

MAGNETIC CIRCUIT APPARATUS FOR AN ELECTRONIC IGNITION SYSTEM OF A COMBUSTION ENGINE

Hugh C. Webber, Detroit, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed Dec. 31, 1975, Ser. No. 645,801

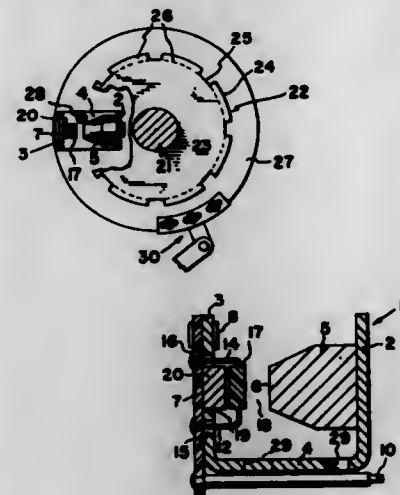
Int. Cl.² F02P 1/00

U.S. Cl. 123-148 E

15 Claims

1. Magnetic circuit apparatus for an electronic ignition system of a combustion engine comprising magnetically permeable frame means; first magnet means carried by said frame

means for establishing with the latter a magnetic flux path; second magnet means carried by said frame means in confronting relation with but spaced from said first magnet means; and pulse generating means interposed between said first and second magnet means in said flux path and spaced



from said first magnet means by a gap of sufficient width to enable magnetically permeable means to pass between said pulse generating means and said first magnet means, said pulse generating means being responsive to changes in the density of the magnetic flux to which it is subjected to generate an electrical pulse.

4,008,702

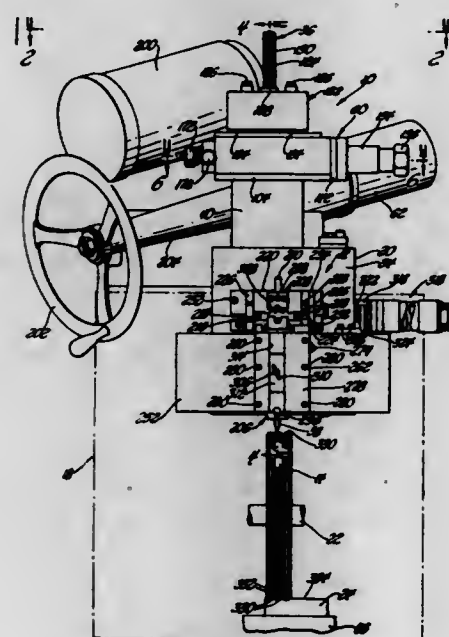
GRINDING MACHINE AND DRESSER THEREFOR
Marvin R. Anderson, Grosse Pointe Shores, and Harald N. Jungesjo, Rochester, both of Mich., assignors to Anderson-Cook, Incorporated, St. Clair Shores, Mich.

Filed Mar. 19, 1975, Ser. No. 559,945

Int. Cl.² B24B 53/08

U.S. Cl. 125-11 PH

6 Claims



1. A dresser for use with a grinding machine including a grinding wheel rotatable about a horizontal axis and having a toothed profile for grinding a toothed configuration in a workpiece, the dresser comprising: a support plate mounted above the grinding wheel; a template holder; a horizontal slideway mounting the template holder on the support plate so as to support a template with the toothed configuration of the grinding wheel profile in an upwardly facing direction that is oriented radially with respect to the grinding wheel; means for adjusting the horizontal position of the template holder along the slideway; a first linear antifriction bearing extending hori-

zontally and including a central bearing member fixed to the support plate, a pair of vertically spaced bearing members positioned above and below the central bearing member, and anti-friction elements supporting the vertically spaced bearing members on the central bearing member; a second linear antifriction bearing extending vertically and including a vertically extending bearing housing of a hollow rectangular cross-section defining horizontally spaced bearing portions that oppose each other, a vertically extending bearing member received within the vertically extending bearing housing, and antifriction elements mounting the vertically extending bearing member for vertical movement along the bearing portions of the housing in a vertical direction that is radial with respect to the grinding wheel axis at a location below the template holder in an aligned relationship therewith; said vertically extending bearing member of the second bearing including an integral upper end providing a template follower holder and an integral lower end providing a tool holder; said template follower and tool holders including vertical openings in said integral bearing member ends; said openings being aligned with each other along a vertical line oriented radially with respect to the grinding wheel axis; and a hydraulic actuator mounted on the support plate and connected to the vertically spaced bearing members of the horizontally extending first antifriction bearing so as to move the vertically extending second antifriction bearing horizontally such that a template follower and tool supported by the holders thereof respectively engage a mounted template on the template holder and the toothed profile of the grinding wheel to dress the grinding wheel in a precise manner.

4,008,703

FIREPLACE HEATING SYSTEM

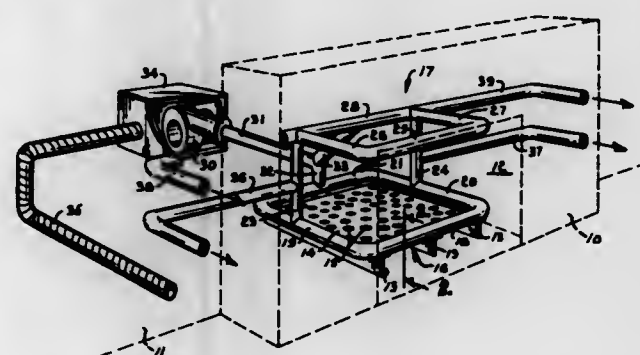
Tommy L. Allgood, 2035 Arizona, Joplin, Mo. 64801

Filed Apr. 17, 1975, Ser. No. 569,005

Int. Cl.² F24H 3/08

U.S. Cl. 126-121

8 Claims



7. A heating system for delivering heat from a fireplace to an area remote from the fireplace, comprising:

a lower tier of heat conductive conduits adapted to be installed in the fireplace and interconnected to present an endless loop configuration providing a first closed path for accommodating a flow of air, said first path having an inlet and an outlet;

an upper tier of heat conductive conduits interconnected to present an endless loop configuration providing a second closed path for accommodating a flow of air, said second path having an inlet and an outlet;

means supporting said upper tier of conduits at an elevated position above said first tier;

fan means located exteriorly of the fireplace in communication with the inlets to said first and second paths, said fan means operable to force air into each path for circulation therein; and

air distributing means extending from the outlets of said first and second paths to said remote area to deliver heated air thereto.

4,008,704

UNIVERSALLY ADJUSTABLE FORCED AIR FIREPLACE HEATER

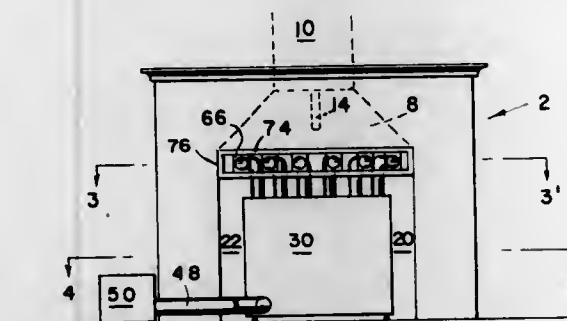
Henry W. Petrie, 5212 Pommeroy Drive, Fairfax, Va. 22030

Filed June 10, 1975, Ser. No. 585,656

Int. Cl.² F24B 7/02

U.S. Cl. 126-121

12 Claims



1. A heat exchanger for placement in the firebox of an existing fireplace and increasing the heat output thereof, comprising:

a substantially vertical plenum located in the rear portion of said firebox, with a front surface approximately as wide as said firebox, a top surface having a plurality of forced air egress ports, and a forced air ingress port in the lower portion thereof;

a forced air blower connected to said ingress port for driving ambient air into said plenum;

a plurality of heat exchanger tubes, each tube having a first end connected to one of said plurality of egress ports and extending forwardly from said plenum across the throat of said fireplace with the second end thereof directing said forced air out of said tube and past the lintel of said fireplace and into the ambient;

each said heat exchanger tube further comprising:

a pivotal mounting of each said tubes on respective ones of said egress ports of said plenum, providing for angular motion of said tube about a substantially vertical axis;

said forced air in said plenum being heated by conduction and radiation through said front surface of said plenum and said forced air being further heated in said heat exchanger tubes from the combustion gases in the throat of said fireplace, so as to enhance the heating efficiency of the fireplace;

whereby said forced air may be directed out of said tube in a selected direction and access to the throat of the fireplace is permitted for adjustment of the damper or maintenance.

4,008,705

FREESTANDING-FIREPLACE AND STOVE HEAT SHIELD

James H. Robertson, 11811 Cedar Lane, Kingsville, Md. 21087

Filed June 17, 1975, Ser. No. 587,650

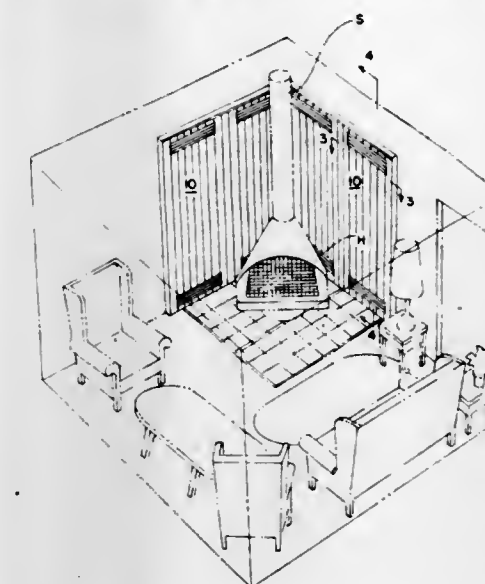
Int. Cl.² F24B 7/00

U.S. Cl. 126-121

11 Claims

1. A stove and fireplace shield for installation over a building structure vertical wall or the like in spaced relation with a freestanding stove or fireplace or the like comprising: a face panel having an intake aperture therein at the bottom and an exit aperture therein spaced downward from the top, a plurality of metallic core panels, covered by the face panel means for holding the face panel in proximate parallel-spaced relation to a said vertical wall with the plurality of core panels in proximate generally parallel-spaced relation therebetween forming a panel assembly with a plurality of vertical air passages layered over said wall and leading from proximate the intake aperture to the exit aperture: means for closing the ends of said panel assembly, a top cap for closing the top of

said panel assembly, all said plurality of core panels being laterally corrugated, the corrugations in all said core panel substantially corresponding in lateral location, and the intake



4,008,706

FIREPLACE FURNACE

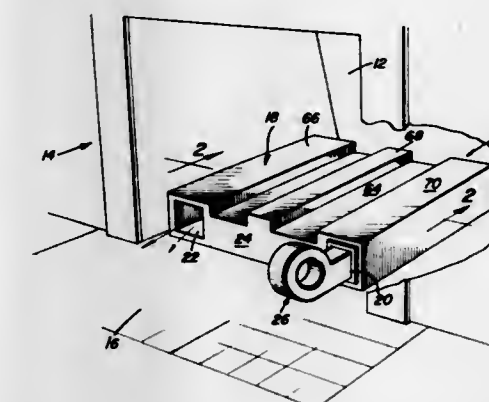
John M. Buanno, Paradise Point Road, Mayfield, N.Y. 12117

Filed June 27, 1975, Ser. No. 590,861

Int. Cl.² F24B 7/02

U.S. Cl. 126-121

9 Claims



1. A fireplace furnace, comprising, in combination:

a. a housing having a wall provided with an inlet and outlet, the inlet and outlet spaced from one another on the wall common to the inlet and outlet; and

b. baffle means arranged within the housing for deflecting air flowing from the inlet to the outlet along a tortuous path within the housing, the baffle means including a pair of spaced, substantially parallel plates disposed extending into the housing from adjacent the inlet and outlet, the plates being spaced from one another and disposed between, the inlet and outlet, the the housing walls including a top wall and a bottom area perpendicular to the wall common to the inlet and outlet with the plates extending from the bottom area to the top wall of the housing, and the baffle means further including a plurality of separate arcuate members disposed extending between the top wall and the bottom area of the housing, two of the arcuate members being arranged opposite of and opening concavely toward respective ones of the inlet and outlet of the housing, and another of the arcuate members being arranged between the plates of the baffle means, and between at least one of the arcuate members, and arranged opening concavely toward the plane of the two of the arcuate members.

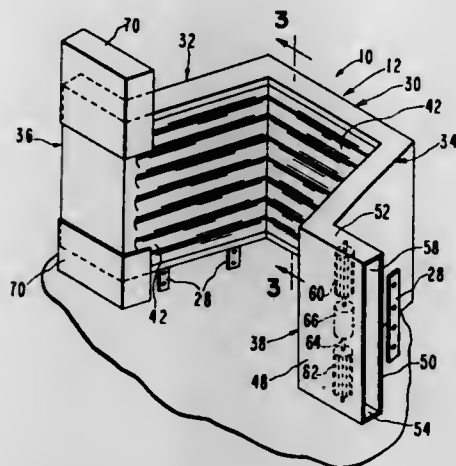
4,008,707

REMOVABLE FIREPLACE HEATER

Robert N. Bartlett, 77 Walnut Ave., Atherton, Calif. 94025
Continuation of Ser. No. 432,020, Jan. 9, 1974, abandoned.
This application Feb. 27, 1975, Ser. No. 553,770
Int. Cl.² F24B 7/00

U.S. Cl. 126—131

2 Claims



1. A portable air heater for heating air with heat generated in a fireplace comprising: a hollow body having a first section and a pair of second sections rigidly and airtightly secured to respective ends of the first section, each section having a fluid passage therethrough, the second sections being in fluid communication with ends of the first section and extending laterally therefrom, the sections being constructed of a heat conductive material and defining outer surfaces for placement adjacent walls of the fireplace and inner surfaces for partially surrounding a fire in the fireplace, the height of the fluid passages of the sections being sufficient to extend throughout at least a major portion of the height of the fireplace, a hollow extension for each second section, respectively, the extensions being rigidly and airtightly secured to and extending laterally from respective second sections and projecting in opposite directions with respect to each other, each extension having a fluid passage and outer end provided with an opening, the height of the fluid passage of each extension and its opening being substantially equal to the height of the fluid passage of the adjacent section, the extensions, second sections and the first section defining an unobstructed, horizontal fluid passage extending from the outer end of one extension to the outer end of the other extension, elongated fan means disposed in one extension adjacent to and extending longitudinally of the opening thereof for inducing a flow of air through said one extension and the interior of the body to the opening in the other extension so that air in said flow is heated and the heated air is directed into the space adjacent to the fireplace.

4,008,708

SOLAR ENERGY COLLECTOR

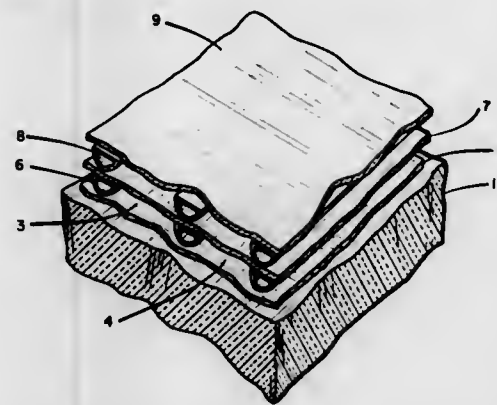
Robert W. Hagarty, Cambridge, Canada, assignor to Dow Corning Corporation, Midland, Mich.
Filed Sept. 29, 1975, Ser. No. 617,553
Int. Cl.² F24J 3/02

U.S. Cl. 126—270

4 Claims

1. A solar energy collector comprising a first sheet of flexible material, a plurality of extruded flexible spacer members adhered to the bottom of said first sheet in substantially parallel spaced relationship, and a second sheet of flexible material adhered to the bottoms of said spacer members, whereby said spacer members and said sheets define a plurality of parallel fluid paths for passage of heat absorbing fluid therethrough to transmit heat from said collector; and further comprising a second plurality of extruded flexi-

ble spacer members adhered to the top of said first sheet in substantially parallel spaced relationship, and



a third sheet of solar energy transmitting material adhered to the tops of said second plurality of spacer members.

4,008,709

UNDERGROUND STORAGE SYSTEM FOR HEATING AND COOLING SYSTEMS

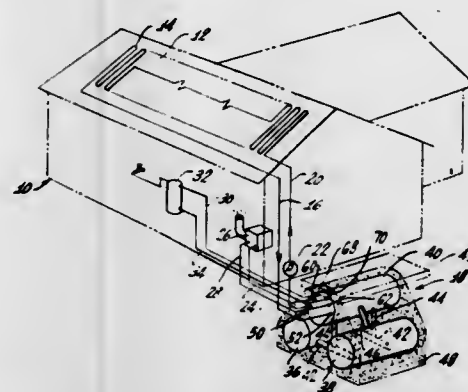
Douglas M. Jardine, 4705 Brady Place, Colorado Springs, Colo. 80915

Filed Mar. 17, 1975, Ser. No. 558,672

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

18 Claims



5. A system for the storage and retrieval of thermal energy derived from an external source, said system comprising: a metal storage container disposed below the surface of the earth; a heat transfer tank disposed below the surface of the earth and spaced vertically from said storage container; a passageway interconnecting said storage container and said heat transfer tank; a heat transfer fluid in said container and said tank, and freely circulating therebetween through said passageway; heat exchange means in said tank and coupled with the external source of thermal energy, said heat exchange means functioning to exchange thermal energy with said heat exchange fluid in said tank; and an envelope of tightly packed, non-coherent, particulate material surrounding said container, said particulate material being substantially chemically and electrolytically inert with respect to said container and having a coefficient of thermal conductivity at least as great as that of the surrounding earth to enhance the transfer of thermal energy between said container and the surrounding earth.

14. A thermal energy storage and retrieval system intended primarily for use in connection with a solar heater, said system comprising:

a thermal energy storage container;
a pair of heat exchange tanks, said tanks and said container being disposed below the surface of the earth in spaced apart relationship with said tanks being disposed in gener-

ally the same horizontal plane and vertically spaced from the horizontal plane of said container;
at least one laterally extending conduit interconnecting said tanks for fluid communication therebetween and a vertically extending conduit communicating between said laterally extending conduit and said container;
at least one riser extending between each of said tanks and said container for fluid communication therebetween;
a heat exchange coil disposed in each of said tanks and coupled with a solar heat exchanger for the transfer of thermal energy between said solar heat exchanger and said heat exchange coils;
a heat exchange medium contained in each of said tanks and said container for receiving thermal energy from said solar heater and for storing said thermal energy in said container, said medium freely circulating through said conduits and said risers, and between said tanks and said container in response to temperature differentials in said tanks and said container;
an envelope of tightly packed, non-coherent material surrounding said tanks and said container to effect a corrosion-resistant barrier therebetween and to aid in the transfer of thermal energy between at least said container and the surrounding earth, thereby to utilize the surrounding earth for the storage and retrieval of thermal energy.

4,008,710

BLOOD PUMP

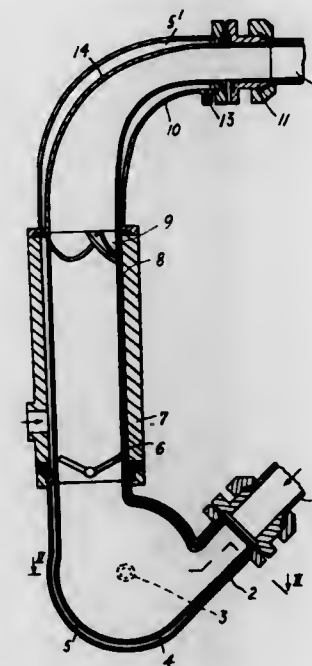
Horst Chmiel, No. 15, Brunnstrasse, 51 Aachen-Laurensberg, Germany

Filed Jan. 28, 1975, Ser. No. 545,000

Int. Cl.² A61M 1/03

U.S. Cl. 128—1 D

9 Claims



1. A blood pump comprising:
a. rigid outer wall means defining a squeeze pump being operated by a pumping medium and having a flexible pumping tube, an entry side and an exit side, entry side connection means and exit side connection means, and
b. valve means for controlling the flow of blood through said pump,
c. said entry side connection means including an atrium and a diaphragm means,
d. said atrium being defined by said outer wall means and said diaphragm means forming an internal lining within the atrium,
e. said lining diaphragm being separated from the rigid outer wall means by said pumping medium,
f. said atrium is substantially circular in cross-section, and
g. said entry side connection means includes means for

directing the flow of blood tangentially into said atrium.

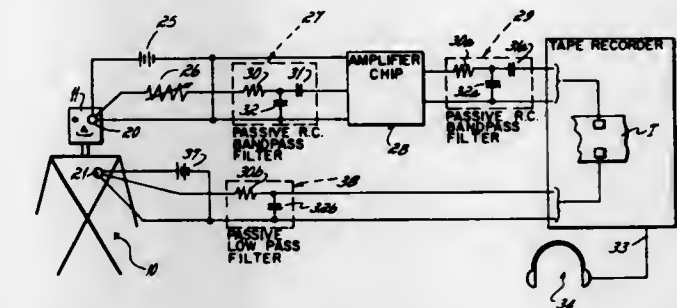
4,008,711

METHOD AND APPARATUS FOR NON-INVASIVE DETECTION OF INTRACRANIAL ANEURYSMS

Charles P. Olinger, and Jacob F. Wasserman, both of Cincinnati, Ohio, assignors to Charles P. Olinger, Cincinnati, Ohio
Filed June 30, 1975, Ser. No. 591,332
Int. Cl.² A61B 7/04

U.S. Cl. 128—2 K

26 Claims



1. A method for the non-invasive detection of the probable existence of intracranial aneurysms in humans comprising the steps of:
monitoring sound waves emanating from an external predetermined area of the head,
converting the monitored sound waves into an electrical signal, and
analyzing the electrical signal to determine the existence of a sound having a constant frequency within the approximate range of 200 Hz. to 800 Hz., said constant frequency sound being indicative of the probable existence of an aneurysm.

4,008,712

METHOD FOR MONITORING BODY CHARACTERISTICS

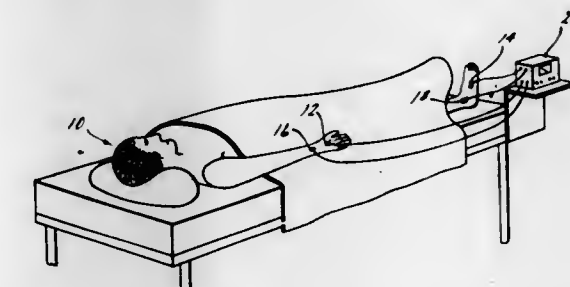
Jan Nyboer, Grosse Pointe, Mich., assignor to J. M. Richards Laboratories, Grosse Pointe Park, Mich.

Filed Nov. 14, 1975, Ser. No. 632,038

Int. Cl.² A61B 5/05

U.S. Cl. 128—2.1 Z

13 Claims



1. In a method of dialysis of a patient in which there is an established selected electrical characteristic having a normal magnitude indicative of a normal body fluid condition and which electrical characteristic changes in response to dialysis, the steps comprising: attaching a first pair of electrodes to the patient, attaching a second pair of electrodes to the patient, supplying an electrical signal to said first pair of electrodes, operating on said electrical signal via said second pair of electrodes to provide an indication of the measured magnitude of the selected electrical characteristic of the patient, performing dialysis on the patient, monitoring the change in magnitude of the selected electrical characteristic as a result of dialysis on the patient and comparing the change in magnitude of the selected electrical characteristic as measured on the patient with said normal magnitude whereby an indication of the effectiveness of the dialysis can be determined.

4,008,713

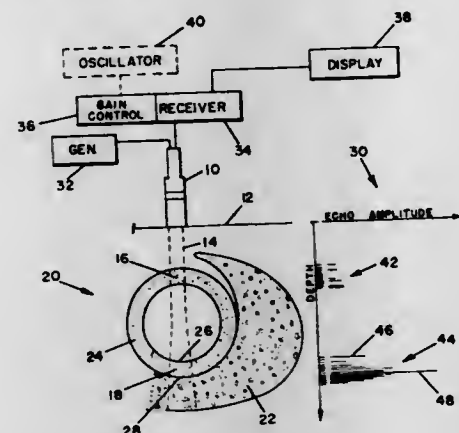
ULTRASONIC DIAGNOSTIC TECHNIQUE UTILIZING SWITCHED GAIN SIGNAL PROCESSING

James M. Griffith, and Walter L. Henry, both of Bethesda, Md., assignors to The United States of America, Washington, D.C.

Filed Sept. 18, 1975, Ser. No. 614,668
Int. Cl.² A61B 10/00

U.S. Cl. 128-2.05 Z

8 Claims



1. A technique for measuring the wall thickness of a cardiac structure, which comprises the steps of: transmitting an ultrasonic signal towards the wall of the cardiac structure of interest; receiving ultrasonic echo signals reflected from said wall by means of a gain-variable receiver; switching the gain of said receiver repeatedly from a first value to a second value; and recording the output from said receiver.

4,008,714

BRAIN WAVE CORRELATION SYSTEM AND METHOD OF DELIVERING A RECORDED PROGRAM OF MATERIAL EDUCATIONAL IN CONTENT

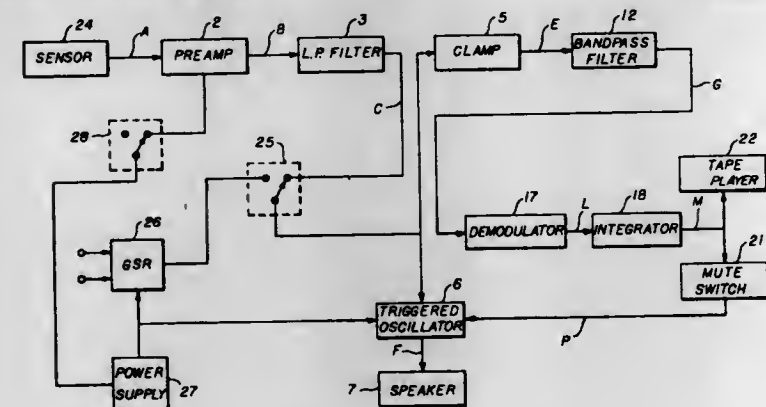
Jose R. Silva, and John M. Narrace, both of P.O. Box 1149, Laredo, Tex. 78040

Continuation of Ser. No. 490,262, July 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 334,743, Feb. 22, 1973, Pat. No. 3,875,930. This application Feb. 4, 1976, Ser. No. 655,666

Int. Cl.² A61B 5/04

U.S. Cl. 128-2.1 B

11 Claims



1. A method of presenting educational material to a human subject comprising:

monitoring the level of concentration of the human subject, determining that said subject has attained a preselected level of enhanced capacity for concentration, suppressing said determining step once said preselected level has been attained and coincident therewith, presenting a preselected program of educational material to said subject.

4,008,715

MASSAGING AND RELAXING DEVICE

Brunhilde Brodbeck, 1440 Poplar Ave., Memphis, Tenn. 38104

Division of Ser. No. 511,981, Oct. 4, 1974, Pat. No. 3,934,579. This application Dec. 2, 1975, Ser. No. 637,021

Int. Cl.² A61H 15/00

U.S. Cl. 128-57

4 Claims



1. A massaging and relaxing device for stimulating and relaxing various parts of the body comprising a pair of spaced coaxial hand grips, a disk on the inside of each hand grip, means mounting said disks for free rotation with respect to said hand grips about a common axis, a plurality of rows of beads extending between said disks, each row being closely adjacent the other, and yieldable mounting means for said beads mounted at their ends on said disks and mounting said beads for free rotation with respect thereto and for flexible movement toward and from each other and flexing to conform said beads to the parts of the body between said hand grips and supporting said beads for rotation in an orbital path with sufficient flexibility to accommodate certain rows of beads to frictionally engage each other upon pressure on said hand grips to increase the massaging action of said beads.

4,008,716

GAS DISPENSING ASSEMBLY

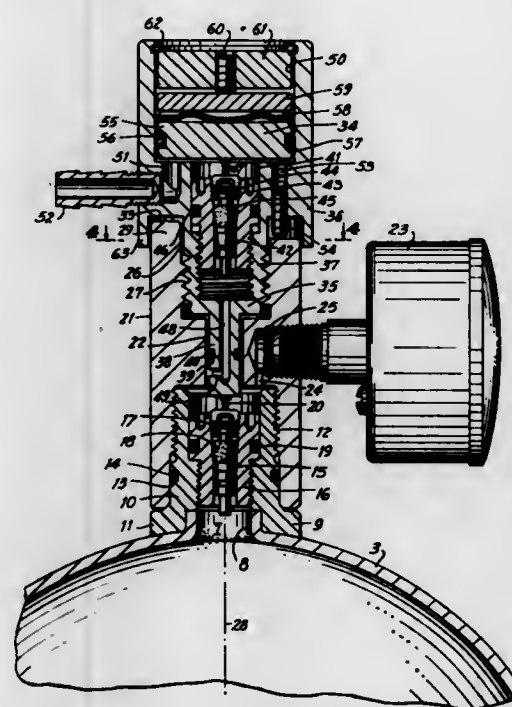
William R. Amlong, Miami, Fla., assignor to Safety Laboratories, Inc., Miami, Fla.

Filed Jan. 9, 1975, Ser. No. 539,876

Int. Cl.² A61M 16/00

U.S. Cl. 128-203

10 Claims



1. A self-contained oxygen dispensing assembly for use in combination with an interchangeable high pressure oxygen supply vessel having an outlet demand valve comprising: a housing defining an inlet passage, having first and second ends and an outlet passage, said first end of said inlet passage having screw means suitable for attachment of said inlet passage to a said interchangeable high pressure oxygen supply vessel

for the supply of oxygen to said inlet passage, said vessel having an outlet demand valve; a supply control means operable to open said outlet demand valve, when said first end of said inlet passage is connected to said vessel, to control oxygen flow from said vessel to said inlet passage; an inlet regulator valve disposed in said inlet passage adjacent said second end to control gas flow from said vessel through said inlet passage; a resiliently biased regulator disposed in said housing at said second end of said inlet passage and including a pressure regulator chamber, said second end of said inlet passage terminating in said pressure regulation chamber, said regulator including means for providing cooperation between said inlet regulator valve and said spring biased regulator for controlling flow of high pressure oxygen from said inlet passage whereby the pressure in said chamber is regulated to a desired pressure, said outlet passage extending from said chamber; and a face mask connected to said outlet passage; wherein said supply control means comprises a member supported in and extending in a sealed manner through said inlet passage to said first end for movement, relative to said first end thereof, to open said outlet demand valve, and said housing is comprised of a connector part which defines said first end of said inlet passage, a regulator housing part connected to said connector part for rotation relative thereto, said regulator housing part cooperating with said member to move said member in response to said relative rotation, said relative rotation being between a position in which said member cooperates with said outlet demand valve to open said outlet demand valve and a position in which said member permits said outlet demand valve to close, and means to restrict said relative rotation to rotation between said positions.

4,008,717

SYSTEM FOR CONTINUOUS WITHDRAWAL AND ANALYSIS OF BLOOD

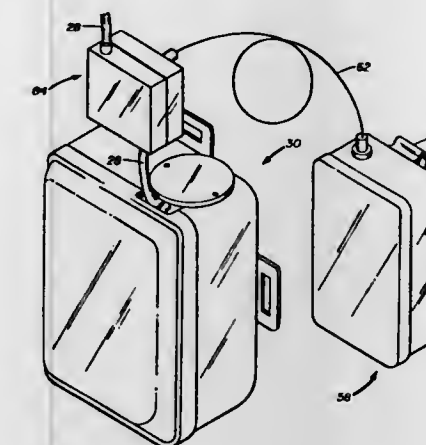
Allen A. Kowarski, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 587,724, June 17, 1975, which is a division of Ser. No. 323,985, Jan. 15, 1973, Pat. No. 3,908,657. This application Mar. 5, 1976, Ser. No. 664,178

Int. Cl.² A61B 5/00; A61M 1/00

U.S. Cl. 128-214 R

14 Claims



1. A system for continuously withdrawing blood from a subject and determining in vivo concentration of biological materials in the blood, comprising,

means insertable into a vein of a subject for providing a passageway for blood being withdrawn from the subject, means engaging only an extra-corporal section of said passageway-providing means for controlling the withdrawing of the blood slowly from the vein at a predetermined constant rate and for a predetermined extended period, means connected to an extra-corporal section of said passageway-providing means for causing diffusion of a diffusible substance of the blood into an amount of diluent, and means for detecting and measuring the concentration of said diffused substance whereby said means responds by the generation of electrical energy in relation to the concentration of the diffused substance, and

wherein all blood engaging portions of the system are non-thrombogenic.

4,008,718

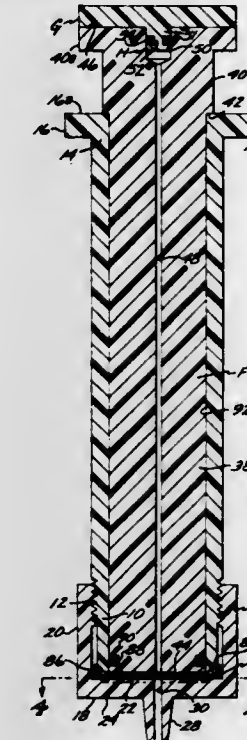
Isadore Pitesky, 4001 Linden Ave., Long Beach, Calif. 90807

Filed Feb. 26, 1976, Ser. No. 661,835

Int. Cl.² A61M 5/00

U.S. Cl. 128-218 R

10 Claims



1. A portable hand-operated device capable of being manipulated by a hand of a user to dispose a quantity of a liquid therein, which quantity of liquid may contain particles of solid material and have an air bubble situated thereabove, and thereafter discharge a desired metered quantity of said liquid free of air and said particles of foreign material therefrom into a desired container or through a hypodermic needle that includes a head in which a tapered recess is defined, said devices including:

- a. an elongate cylindrical barrel that has a first end portion on which external threads are defined, and a second end portion that includes an outwardly extending flange that may be engaged by the fore finger and middle finger of said hand;
- b. a cup that includes a circular web that has an internally threaded cylindrical side wall extending from the periphery thereof, said web including first and second sides; said first side having a plurality of spaced grooves defined therein; said cup including a tapered first protuberance that extends outwardly from said second side, with said first protuberance having a longitudinal first bore therein that is in communication with said grooves, said first protuberance capable of removably and sealingly engaging said tapered recess in said hypodermic needle head to support said hypodermic needle from said cup, and said internally threaded side wall engaging said external threads to removably support said cup on said barrel;
- c. a flat circular filter assembly that includes a screen that rests on said first side and a filter membrane mounted on said screen, said screen and membrane of such diameters as to extend under said first end portion of said barrel, said screen cooperating with said grooves to define a plurality of passages through which said liquid that has been filtered may flow to said first bore;
- d. a first resilient sealing ring in said cup that is deformed by pressure contact with the extremity of said first end portion to seal with an outer circumferential portion of said membrane;
- e. an elongate ram having first and second longitudinally aligned portions that at their junctions define a circular body shoulder, said first portions of such diameter as to

slidably engage the interior of said barrel, said first portion having a first free end surface and said second portion a second free end surface, a longitudinal second bore in said ram that extends between said first end and a cavity that extends inwardly in said ram surface from said second free end surface thereof, said body shoulder acting as a stop when it engages the outer extremity of said second portion of said barrel to prevent said first free end surface of said ram pressure contacting said membrane when said ram is moved inwardly in said barrel, and a circumferential groove in said first portion of said ram adjacent said first free end surface thereof;

- f. a second resilient sealing ring mounted in said groove and in slidable sealing contact with the interior of said barrel, with said second longitudinal bore and cavity allowing air from said air bubble to escape to the ambient atmosphere when said ram is moved towards said cup, and the expulsion of all air from said bubble being signaled when liquid from said barrel starts to discharge into said cavity;
- g. a plate that may removably overlie said second free end of said ram; and
- h. first means that project from said plate and removably engage said cavity and seal with the latter after said air from said air bubble has been discharged from liquid in said barrel, with said plate capable of being engaged by the thumb of said hand of said user as said fore finger and middle finger engage said flange to permit said first free end of said ram to be moved towards said cup to force liquid in said barrel through said membrane, with said liquid flowing through said membrane discharging into said passages to flow therefrom into said first longitudinal passage.

4,008,719

OSMOTIC SYSTEM HAVING LAMINAR ARRANGEMENT FOR PROGRAMMING DELIVERY OF ACTIVE AGENT
Felix Theeuwes, Los Altos, and Atul D. Ayer, Belmont, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

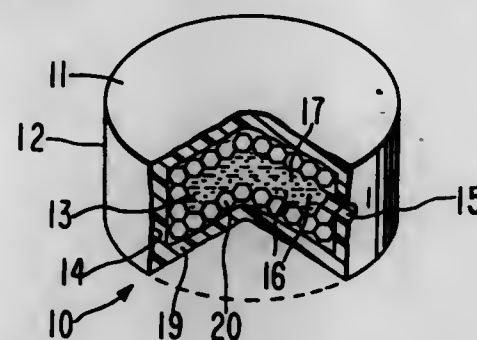
Filed Feb. 2, 1976, Ser. No. 654,195

The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.² A61M 31/00

U.S. Cl. 128—260

63 Claims



1. An osmotic system for dispensing an active agent to an environment of use, said system comprising:

- a. a shaped wall comprising a pair of laminae which laminae comprises an exterior lamina consisting of a multiplicity of materials blended to form a lamina that is permeable to the passage of an external fluid and which lamina maintains its physical and chemical integrity in the environment of use, and an interior lamina consisting of a multiplicity of materials blended to form a lamina that is permeable to the passage of an external fluid, substantially impermeable to the passage of agent and which lamina maintains its physical and chemical integrity in the presence of agent, said wall surrounding, with the interior lamina facing;
- b. a compartment containing an active agent that is soluble in the fluid and exhibits an osmotic pressure gradient across the wall against the fluid;
- c. a passageway in the wall communicating with the compartment and the exterior of the device for dispensing agent from the device; and

d. wherein in operation when the device is in the environment of use, fluid from the environment is continuously imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby continuously dissolving agent which is dispensed through the passageway at a controlled and continuous rate over a prolonged period of time.

4,008,720

BLADE WITH IRRIGATION TUBES

Paul Brinckmann, Rinscheweg 11, 44 Munster; Joachim-Ulrich Krenz, Lindenstr 24, 4401 Roxel, and Werner Ruck, Am Edelkamp 15, 4401 Hohenholte, all of Germany

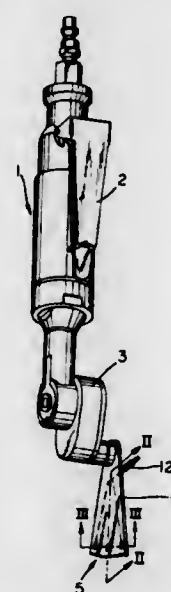
Filed June 2, 1975, Ser. No. 582,633

Claims priority, application Germany, June 8, 1974, 2427716

Int. Cl.² A61B 17/14; B26D 7/08

U.S. Cl. 128—317

7 Claims



1. In a bone saw having a housing, a saw blade movably supported on said housing for oscillating movement, the blade being of a thin and substantially planar sheetlike material having opposed substantially flat side surfaces, the blade having thereon, outer arcuate peripheral edge portion having saw teeth formed thereon, and drive means connected to said blade at a location spaced radially inwardly a substantial distance from said teeth for causing oscillatory movement of said blade about a pivot axis, comprising the improvement wherein said blade has a plurality of elongated distributing channels formed therein for guiding a fluid cooling medium therethrough, said channels extending inwardly of said blade from said saw teeth toward said pivot axis, said distributing channels each having an inner end thereof disposed more closely adjacent said pivot axis and an outer end thereof disposed more closely adjacent said teeth, a supply channel formed in said blade and communicating with said one end of each of said distributing channels, said supply channel being adapted for connection to a source of said cooling medium, said blade having a plurality of openings extending axially therethrough from one side surface of said blade to the other side surface thereof, said openings being disposed closely adjacent but spaced radially inwardly a small distance from said saw teeth, each said distributing channel having said other end thereof in open communication with one of said openings, diverter means fixedly associated with said blade and disposed adjacent the radially outer edge of each said opening for deflecting the cooling medium discharged from said other end of said distributing channels sidewardly in opposite directions so that said cooling medium flows outwardly through opposite ends of each said opening and then flows along the opposite side surfaces of said blade and along the opposite sides of said saw teeth.

4,008,721

TAPE ELECTRODE FOR TRANSMITTING ELECTRICAL SIGNALS THROUGH THE SKIN

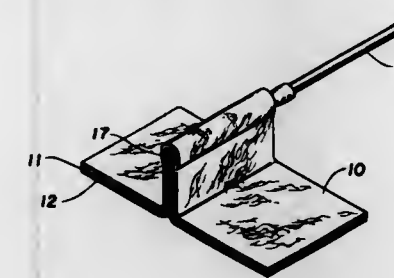
Charles V. Burton, Wayzata, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 14, 1975, Ser. No. 567,612

Int. Cl.² A61N 1/04

U.S. Cl. 128—418

11 Claims



7. A tape electrode for prolonged adhesion to the epidermal layer of skin of a human, and re-adherable should it loosen in use without removal by application of a non-aqueous solvent to the adhesive free side thereof comprising: A highly porous flexible tape substrate; and an electrically conductive coating on one surface of said substrate, said conductive coating including a mixture of skin compatible metal particles blended into a water insoluble, and at least partially volatile organic solvent soluble, low-tack adhesive matrix in an amount sufficient to provide electrical continuity between the metal particles, and to produce a coating that is essentially tack free, said adhesive matrix being an acrylic copolymer and said coating being less than 5 mils in thickness, said thickness of said adhesive matrix coating being such that water vapor generated at the surface of the skin readily permeates through said coating layer and tape substrate.

4,008,722

SHAKER FOR HARVESTER-THRESHER

Wilhelm Jakobi, Bogenweiler, Germany, assignor to Maschinenfabrik Fahr Aktiengesellschaft Gottmadingen, Gottmadingen, Germany

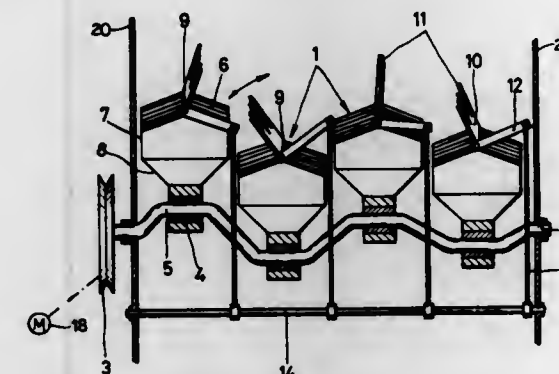
Filed May 19, 1975, Ser. No. 578,943

Claims priority, application Germany, May 20, 1974, 2424520

Int. Cl.² A01F 12/30

U.S. Cl. 130—26

13 Claims



1. In a harvesting machine wherein grain-carrying stalks are shaken to separate the grain from the stalks by a plurality of parallel horizontally elongated and vertically reciprocating shaking elements, the improvement comprising:

- a flat plate extending above, all across and parallel to each of said shaking elements,
- means on each of said elements defining a pivot axis for the respective plate parallel to the respective element, and
- operating means for oscillating said plates back and forth pivotally about their respective axes as said shaking elements reciprocate vertically.

4,008,723

SMOKING MIXTURE

James Borthwick, Glasgow, and James Forrester Morman, Troon, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 125,872, March 18, 1971, Pat. No.

3,885,574. This application Mar. 11, 1975, Ser. No. 557,255
Claims priority, application United Kingdom, Mar. 23, 1970, 13860/70

Int. Cl.² A24B 15/00

U.S. Cl. 131—2

13 Claims

1. A smoking mixture in fabricated form comprising

a. as smoke producing fuel a solid combustible tobacco substitute material which material is non-toxic on pyrolysis and is selected from the group consisting of carbohydrates selected from the group consisting of cellulose, sucrose, glucose or an alginate and aldol condensation products prepared by acid- or base- catalysed condensation of a compound of the formula



or a precursor thereof wherein R¹ and R² which may be the same or different each represents a hydrogen atom or an alkyl, hydroxyalkyl or formyl group;

- b. a harmless filler, and
- c. sufficient binder to enable the mixture to be fabricated, said filler being harmless on pyrolysis and present in a proportion of 40 to 65% by weight of the mixture and being selected from salts wherein the anion comprises formate, oxalate, citrate, tartrate, silicate, carbonate, chloride, sulphate, phosphate, borate, oxide, dioxide or aluminate and the cation comprises sodium, potassium, calcium, magnesium, iron or titanium, the combination of cations and anions in the filler being selected to impart a burning rate correlated to a puff number of 8-12 of a machine-made standard Class B British cigarette containing 1.1 g tobacco, where each puff is of 25 ml volume in two seconds, followed by a 58 second rest or smouldering period and where the 70 mm cigarette is smoked to a butt length of 20 mm.

4,008,724

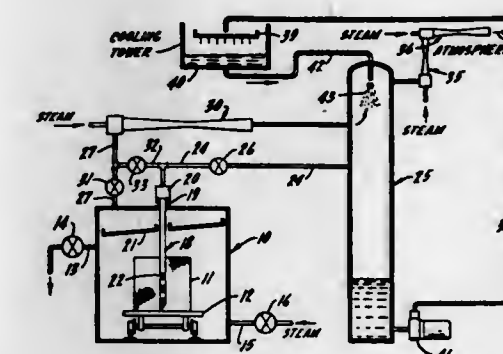
METHOD AND APPARATUS FOR TREATING TOBACCO
Leonard T. DeCoursey, R.R. No. 3, Hardinsburg, Ky. 40143

Division of Ser. No. 426,112, Dec. 19, 1973, Pat. No.

3,931,825. This application Nov. 18, 1975, Ser. No. 633,164
Int. Cl.² A24B 3/12

U.S. Cl. 131—133 A

3 Claims



1. Apparatus for moistening tobacco, said apparatus including, in combination,

a gas-tight chamber of a size large enough to receive a mass of tobacco to be moistened,

an evacuation probe associated with the chamber and movable from a retracted position in which it is out of contact with the mass of tobacco to be moistened in the chamber to an extended position in which it penetrates said mass of tobacco,

said probe being connected to first vacuum means,

said first vacuum means being effective to lower the absolute pressure in said chamber from atmospheric down to about, but not substantially less than 1 inch Hg absolute, but, in any event, to an absolute pressure greater than the flash point of the tobacco being moistened,

second vacuum means,

said second vacuum means including a steam ejector and condensing means therefore and being effective to lower the absolute pressure in the chamber from a maximum of about 2-3 inches Hg absolute down to an absolute pressure of about 0.2 inch Hg absolute, but, in any event, to an absolute pressure less than the flash point of the tobacco being moistened,

first valve and conduit means operable, during an initial evacuation, to connect the chamber to said first vacuum means and to at least partially by pass connection of said chamber to said second vacuum means,

second valve and conduit means, operable after the aforesaid maximum absolute pressure of about 2-3 inches Hg absolute is reached, to connect said second vacuum means and said first vacuum means to said chamber wherein tobacco within said chamber is subjected to the combined effects of the first and second vacuum means, and thereby said tobacco is subjected to an absolute pressure below its flash point,

means for thereafter admitting steam to the chamber while evacuating only through said probe at a rate which causes the absolute pressure in the chamber to increase from a level less than the flash point of the tobacco to a maximum upper level which corresponds to the temperature at which the tobacco can be deleteriously affected by the temperature which corresponds thereto,

said second valve and conduit means being operable to disconnect said second vacuum means from said evacuation system prior to the aforesaid maximum absolute pressure thereof is reached, and after attachment of the minimum effective absolute pressure of the first vacuum means is reached,

means for thereafter subjecting said tobacco to a substantially constant pressure while simultaneously steaming into the chamber while evacuating only through the probe,

means for thereafter lowering the absolute pressure to which the tobacco is subjected to a level within the capacity of the first vacuum means by evacuating solely through the probe, and

means for thereafter controllably increasing the absolute pressure to which the tobacco is subjected to atmospheric.

4,008,725

SMOKER'S PIPE CONSTRUCTION

Francisco Blanco, 501 N.E. 69th St., Miami, Fla. 33138

Filed Aug. 11, 1975, Ser. No. 603,768

Int. Cl.² A24F 3/02, 9/02

U.S. Cl. 131-184 A

2 Claims



1. In a smoker's pipe, the combination comprising, a tobacco bowl portion, a pipe shank portion integrally formed with and extending outwardly of said bowl portion, a bottom plate member within said bowl portion and serving as a grate for supporting tobacco to be burned in said bowl portion when

the pipe is being smoked, said bottom plate having peripheral edge portions in close proximity to inner wall portions of said tobacco bowl portion, and manually controllable means for rockably and rotatively supporting said bottom plate with respect to said pipe bowl portion to scrape away the charred remnants and ash of consumed tobacco after a smoking session, said manually controllable bottom plate supporting means comprising a control pin extending laterally outwardly of one side of said bowl portion, means journalling said control pin for rotative movement with respect to said bowl portion, handle means at the outer end of said control pin, means for securing said bottom plate member with respect to said control pin for movement in unison therewith, said bottom plate member being substantially circular in shape, said bottom plate member securing means comprising a flat support plate portion integrally formed with an axially downwardly-extending sleeve portion, said sleeve portion having a transversely-extending through bore through which said control pin is received, and a jam screw threadably engaged within said sleeve portion and in abutment with a sidewall portion of said control pin.

4,008,726

TRI-COMB WAVER

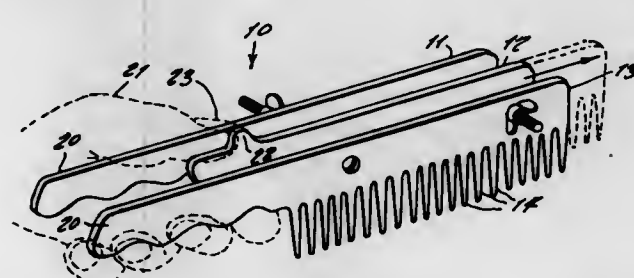
Domenico M. DiGiuseppe, 400 So. Main Street, Mechanicville, N.Y. 12118

Filed Oct. 10, 1975, Ser. No. 621,288

Int. Cl.² A45D 2/44

U.S. Cl. 132-9

3 Claims



1. An improved comb waver of the type containing a plurality of spaced apart combs wherein the improvement comprises:

means for adjusting the space between the combs, and means for moving at least one of said combs longitudinally without thereby adjusting the space between the combs, whereby waves of varying tightness can be created through coordinated adjustment of the spacing between combs and longitudinal movement of at least one comb.

4,008,727

INTERPROXIMAL SPACE TOOTH CLEANER

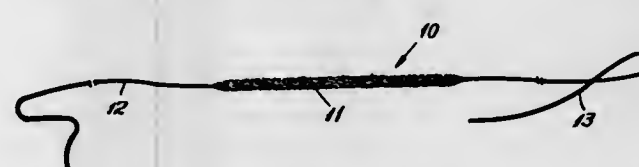
Thomas F. Thornton, 221 Mill Road, New Canaan, Conn. 06840

Filed May 19, 1975, Ser. No. 578,880

Int. Cl.² A61C 15/00

U.S. Cl. 132-89

1 Claim



1. A teeth cleaner for passage through interproximal space formed between adjacent teeth comprising an elongate flexible string portion and an elongate brush portion secured to the string portion, said brush portion being of spongy elastic material formed to have a cross-sectional extent normally substantially larger than the cross-section extent of the string portion and formed of a plurality of textured, commingled filaments that have been permanently deformed and crinkled, in which

the string portion is formed of a plurality of essentially straight filaments that are unitary with the filaments of the brush part, in which the string portion has two parts, one at each end of the brush portion with both string parts each having an extent that is sufficient to enable grasping thereof by a user and in which there is a hardened covering on at least one of the string portions with the hardened covering being thicker on at least an end extent of the one of the string parts than on the remainder of the string portion with the hardened covering having sufficient thickness to cause the string part extent to be essentially rigid to enable a user to push on the extent.

4,008,728

DENTAL FLOSS HOLDERS

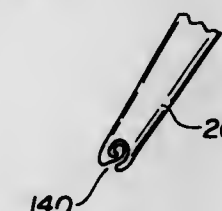
Nicolas S. Sanchez, Vancouver, Canada, assignor to The Raymond Lee Organization, Inc., a part interest

Filed May 27, 1975, Ser. No. 580,807

Int. Cl.² A61C 15/00

U.S. Cl. 132-92 R

4 Claims



1. A dental floss holder comprising: an elongated member with forward and rearward ends and lying in a plane;

first and second like prongs integral at one rearward end with the forward end of the member, the prongs being opposed and extending forwardly, downwardly and outwardly to form a V in a single plane that intersects the plane in which the member lies, each prong having a spiral slot in its forward end;

a hollow, cylindrical reservoir extending rearwardly of the member and bearing a hole through which dental floss can be withdrawn from the interior of the reservoir;

two like opposed outwardly extending post each having a vertical slot and each being attached to the member at points forwardly of the reservoir; and

a spool of dental floss located in the reservoir, with the floss passing out of the hole in the reservoir, passing through the slot in each post and being wrapped around each post and passing through the holes in the prongs and extending between the prongs intermediate the wrapped portions.

4,008,729

SOLVENT ARTICLE CLEANER

George Chizinsky, 9 Lombard St., South Portland, Maine 04106

Continuation-in-part of Ser. No. 276,229, July 28, 1972, abandoned. This application Oct. 23, 1973, Ser. No. 408,802

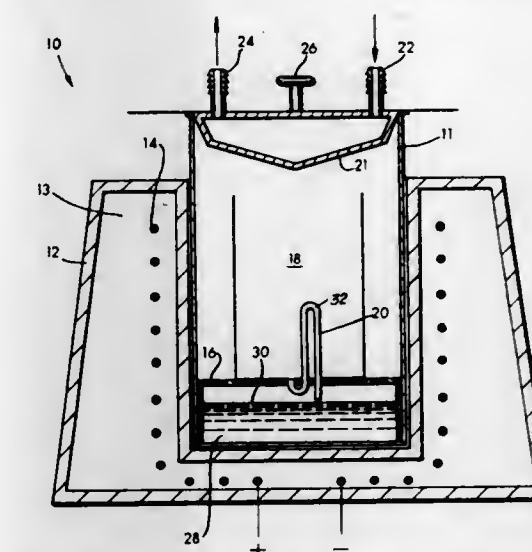
Int. Cl.² A47J 31/10; B01D 11/02; B08B 3/08

U.S. Cl. 134-107

7 Claims

1. An apparatus for cleaning articles comprising, a container for volatile liquid solvent, a condensate collector open at the top thereof situated within said container above the liquid level of said solvent, a broad-surfaced liquid cooled condenser mounted in the upper portion of said container above the condensate collector; common heating means including a heating jacket which surrounds said container below said condenser and at least the lower part of the within collector for heating the solvent container and the within collector sufficiently to heat the solvent in the container to boiling, the solvent vapors bathing said articles and liquifying on said condenser and flowing onto said articles in said collector and accumulating therein and sufficiently to heat the liquid in said

collector to boiling to vigorously wash components from said articles and means for automatically drawing off said solvent



and components from said articles and collector when the condensed solvent has reached a predetermined level.

4,008,730

AIRCRAFT SHELTER AND RIGGING

Ronald Keklak, 637 Church St., Amston, Conn. 06231, and Hubert H. Loewenhardt, 20 Robin St., Pawcatuck, Conn. 02891

Filed Oct. 20, 1975, Ser. No. 624,303

Int. Cl.² E04B 1/342, 1/347; E04H 6/44

U.S. Cl. 135-5 R

9 Claims



1. An aircraft shelter comprising a pair of fixed upstanding wing tip posts and a single tail post arranged in a triangular array with the single tail post extending for a substantial distance above ground level, a generally horizontal boom disposed substantially midway between said wing tip posts and having its rear end attached to the tail post at an intermediate elevation on the tail post, cross arms on the wing tip posts near the elevation of said boom and substantially parallel to the boom, a single cross arm on said tail post near the elevation of said boom and substantially at right angles thereto, rope suspension means for said boom on said tail post and stabilizing the forward end of the boom, generally horizontal rope rigging interconnecting said boom with the cross arms of the wing tip posts, additional generally horizontal rigging connected with the cross arm of the tail post and the first-named rigging, and fabric aircraft wing and tail area coverings secured to said riggings, said boom underlying said fabric coverings.

4,008,731

COUNTERBALANCE VALVE

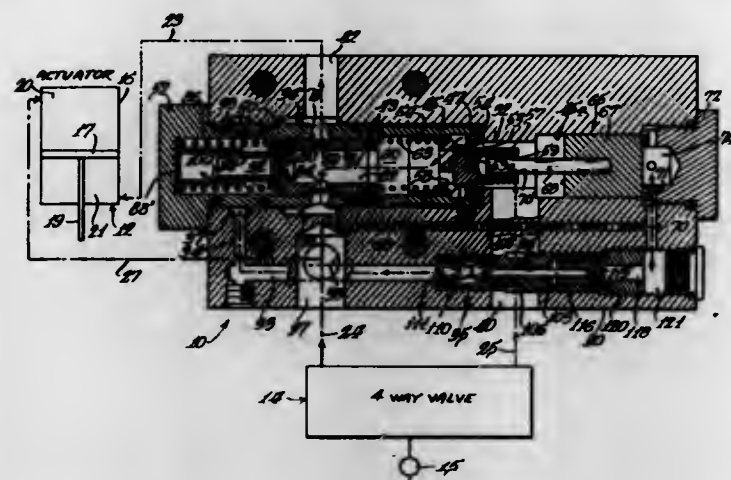
Sherwin D. Katz, Skokie, Ill., assignor to I-T-E Imperial Corporation, Chicago, Ill.

Filed Mar. 8, 1971, Ser. No. 121,784

Int. Cl.² F15B 13/042; G05D 7/00

U.S. Cl. 137-106

10 Claims



1. A counterbalance holding valve assembly comprising: passage means defining a fluid flow path, a check valve member in said passage means for blocking flow in one direction therein, pilot-operated means for opening said valve member, valve means in said passage means for maintaining the pressure drop across the valve member substantially constant, and means responsive to the pressure drop across the valve member for controlling said valve means.

4,008,732

DIVERTER VALVE

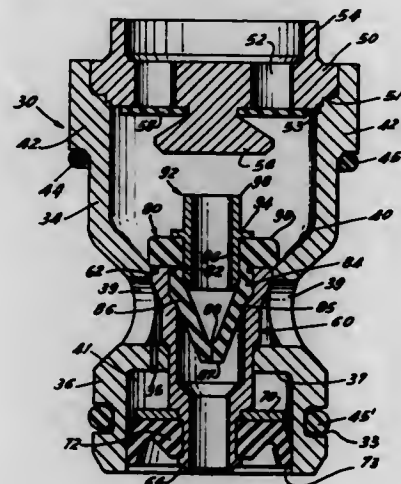
Barry S. Fichter, Louisville, Ky., and Lane Scot Duncan, Lakewood, Ohio, assignors to American Standard, Inc., New York, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,946

Int. Cl.² F16K 11/06, 31/383

U.S. Cl. 137-119

16 Claims



1. A diverter valve assembly having a housing open at both ends and valve elements therein for mounting in fluid communication between a fluid inlet and a pair of outlet openings to conduct fluid through one outlet of the pair in a non-diverted mode and the other outlet of the pair in a diverted mode out of a diverter conduit, comprising:

a first cup-shaped tubular chamber, a second cut-shaped tubular chamber and an interconnecting conduit between said first and second chambers at the cup portions thereof forming said housing;
said interconnecting conduit having a smaller diameter than said first and second tubular chambers;
said conduit further having at least one port confined to the wall thereof for conducting fluid from said first chamber to said one outlet of said pair of openings in the non-diverted mode;

a tapered tubular member positioned in said interconnecting conduit and adapted to reciprocate in said conduit when said other outlet of said pair of outlets is opened and closed;

a sealing and backflow preventing valve means coupled to one end of said tapered tubular member and which is positioned at the cup portion of said first chamber to divert fluid through said tubular member by flowing the fluid through the opening in said valve means in only the diverted direction when said other outlet of said pair of outlets is opened and simultaneously sealing said valve means at the cup portion of said first chamber in the diverted mode;

piston means coupled to said tubular member at the end thereof opposite to the end coupled to said sealing and backflow preventing means; and said piston means being disposed in said second chamber below the port so that when said other outlet is opened, fluid entering said first chamber exerts a fluid pressure against said sealing and backflow preventing valve means to shift said tubular member from an open, non-diverted position to a sealing closed, diverted position in said first chamber whereby fluid flows through the tubular member in the diverted flow mode and out of the diverter conduit.

4,008,733

FILLING VALVES FOR PRESSURE FUELING DEVICES

Jacques Courant, Epinay-sur-Seine; Robert Gonnert, Unieux, and Marc Thore, Buc, all of France, assignors to Zenith Aviation, France

Filed Mar. 26, 1974, Ser. No. 454,833

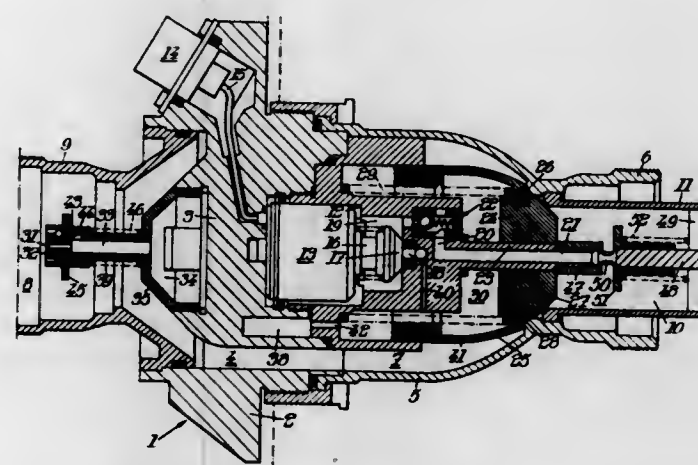
Claims priority, application France, Apr. 17, 1973, 73.13879

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² F16K 21/00, 31/42

U.S. Cl. 137-220

4 Claims



2. A filling valve for a pressure refueling device comprising: a hollow body; an annular passage in said body between upstream connection means and downstream connection means; a movable closure unit co-operating with a seat in said passage; means in said body for axially guiding said closure unit and co-operating with said closure unit for limiting an outer chamber forming part of the annular passage and an inner chamber communicating with the upstream connection means; control means for opening and closing communication of said inner chamber and a discharge duct; the pressure of the fuel acting on that surface of the closure unit which limits the outer chamber tending to move the closure member away from its seat, and the pressure of the fuel acting on that surface of the closure unit which limits the inner chamber tending to move the closure unit into its seat, and the resulting force exerted on the closure unit in the opening direction being greater than the force exerted in the closing direction when communication with the discharge duct is fully opened by the

control means and conversely when communication with the discharge duct is fully closed by the control means; and means responsive to the flow rate of fuel across the valve for increasing the ratio between the fuel pressure in the inner chamber and the fuel pressure in the outer chamber as the flow rate increases, wherein said inner chamber communicates with said upstream connection means through port means having a cross-sectional flow area which is controlled by said flow rate responsive means and with said downstream connection means through said control means and said discharge duct.

4,008,734

PRESSURE RELIEF SYSTEM

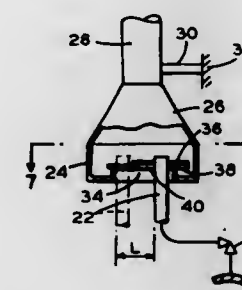
Nobuo Shimono, and Hideki Marubayashi, both of Kure, Japan, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,859

Int. Cl.² F16L 27/00

U.S. Cl. 137-314

5 Claims



1. In combination with a pressurized vapor containment, means for heating the vapor, said containment being free to move in response to thermal expansion and contraction, a pressure relief valve connected to said containment to release vapor therefrom, a vent pipe connected to said valve to receive the released vapor, a fixed exhaust pipe communicating with said vent pipe to dispose of the vapor being discharged therefrom, and a fixed annular drip pan surrounding the vent pipe and communicating with the exhaust pipe to collect condensate drippings, the pan having an opening sized to allow for relative vent pipe movement occasioned by containment movement, the drip pan opening being covered by upper and lower annular plates surrounding the vent pipe, the lower plate being slidably interposed between said drip pan and upper plate, the lower plate having an opening sized to allow for an initial movement of the vent pipe, and said lower plate being movable to accommodate the remainder of said vent pipe movement.

4,008,735

PRESSURE REDUCING FIRE VALVE

William S. Thompson, Elkhart, Ind., assignor to Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 403,928, Oct. 5, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,342

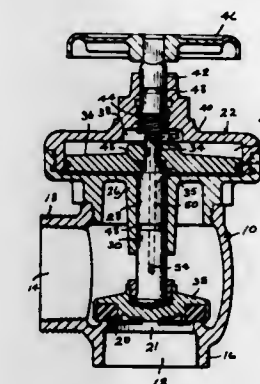
Int. Cl.² F16K 31/14

U.S. Cl. 137-495

5 Claims

1. A pressure regulating fire valve comprising a body having an inlet chamber associated with a valve inlet and an outlet chamber associated with a valve outlet, a valve seat in said body separating said inlet and outlet chambers and defining a passage between said chambers, a housing connected to said body, said housing positioned above said valve seat and having a chamber formed therein, a valve stem extending from said housing chamber and having a lower end terminating in said outlet chamber, a valve part carried by said valve stem at its lower end engageable with said valve seat, means guiding said valve stem for vertical shiftable movement wherein said valve part is shifted within said outlet chamber into and out of sealing engagement with said valve seat, piston means slidably housed within said housing chamber, said piston means car-

ried by said valve stem and serving to vertically shift said valve stem and said valve part toward said valve seat, said piston means and valve part each having a selected fluid contact area, handle means rotatable between open and closed positions, said handle means contacting said valve stem and urging said valve part into sealing engagement with said valve seat when in its said closed position, said handle means being spaced from said valve stem when in its said open position with said stem being freely shiftable within said guide means for said vertical movement, means placing said outlet chamber



and housing chamber above said piston means in flow communication wherein fluid pressure acting upon said piston means during fluid flow through said valve seat passage in conjunction with the relative fluid contacting areas of said piston means and valve part causes said valve part to be urged by said piston means toward said valve seat thereby creating a selected fluid pressure differential within said inlet and outlet chambers, said piston means and valve part constituting free-floating means for sealing said valve seat at cessation of fluid flow from said inlet chamber into said outlet chamber to prevent fluid back-flow through the valve.

4,008,736

VALVE ARRANGEMENT FOR DISTRIBUTING FLUIDS

Brigitte Wittmann-Liebold, Meisenstrasse 17; Horst Graf-funder, Lutzesteiner Weg 52, both of 1000 Berlin 33, and Heinz Kohls, Bautzener Strasse 4, 1000 Berlin 62, all of Germany

Filed Mar. 10, 1975, Ser. No. 556,855

Claims priority, application Germany, Mar. 21, 1974, 2413703

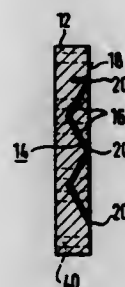
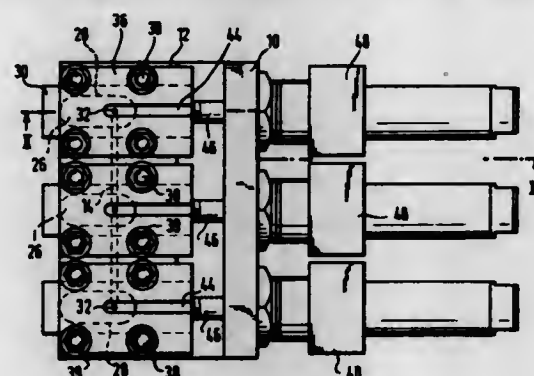
Int. Cl.² F16K 19/00

U.S. Cl. 137-606

4 Claims

1. A valve arrangement adapted to selectively distribute fluids from a plurality of supply vessels to a receiving vessel comprising in combination at least two supply conduits, each of said supply conduits being connectable to a supply vessel, a common elongated conduit formed in a block, said block having at least one substantially flat surface, said elongated conduit having an output end connectable to a receiving vessel, said elongated conduit further including at least two further openings along the length thereof, said further openings being defined by the intersection at said surface of said block of portions of said conduit upstream and downstream of each said further opening, and at least two valve means, each

said valve means being disposed at said surface of said block between a supply conduit and a further opening for selectively



placing said respective supply conduits in fluid communication with the output end of said elongated conduit.

4,008,737

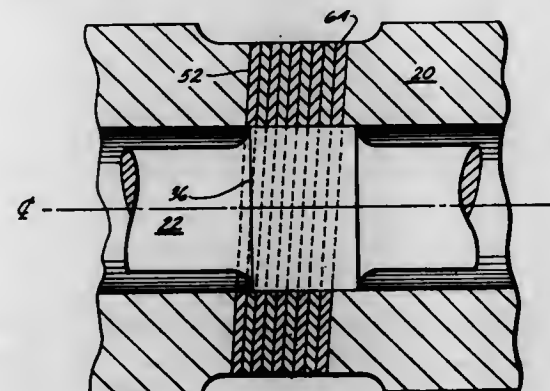
MULTI-PATH VALVE STRUCTURE WITH MEANS PROVIDING SMOOTH FLOW PATTERNS

Matthew L. Kluczynski, Chatsworth, and Myri E. Orme, Canoga Park, both of Calif., assignors to The Bendix Corporation, North Hollywood, Calif.

Filed Aug. 26, 1974, Ser. No. 500,440
Int. Cl.² F16K 47/08; F15B 13/04

U.S. Cl. 137-625.3

8 Claims



1. In a flow control valve wherein a spool valve member including at least one land is movable within a sleeve to open and close fluid passageways in said valve, a rigid structure forming part of said sleeve for dividing the flow entering and leaving said passageways into a plurality of streams comprising a stack of laminar disks having abutting faces and internal edge surfaces adjacent said pool member, said disks including a first group having a pattern of openings therethrough including a pattern of slots affording entry into said stack, a first subgroup of said group being radially oriented in a desired position and a second subgroup of said group being radially displaced from said subgroup such that the openings therein overlap but do not directly register with openings in said first subgroup, a second group of disks having a pattern of orifices there-through interposed between members of said first and second subgroups, said orifices individually being of sub-

stantially smaller area than said openings and providing communication between members of said first and second subgroups, and
a third group of imperforate disks positioned between selected pairs of disks of said first group for confining flow to generally radial flow patterns across said stack, one of said land and said stack of disks being canted relative to the other such that as said land moves past said stack, slots arranged around the inside circumferential edge of any of said disks are progressively uncovered.

4,008,738

LIQUID DISPENSING NOZZLE ASSEMBLY AND METHOD OF USING SAME

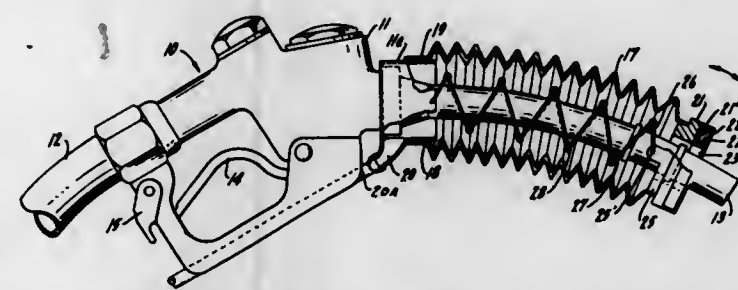
Peter P. Moskovich, Gary, Ind., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 26, 1974, Ser. No. 536,533

Int. Cl.² B65B 31/06

U.S. Cl. 141-5

42 Claims



1. A liquid-dispensing nozzle assembly for delivery of liquid from a liquid source to a liquid receiver having a receiver inlet, said assembly being provided with means to reduce escape of vapor during delivery of liquid to said receiver inlet from said source, said nozzle assembly comprising:

- a liquid dispensing nozzle having a nozzle inlet, a nozzle housing and an elongated discharge spout adapted for insertion into said receiver inlet;
- a flexible vapor collector surrounding, in spaced relation thereto and forming a chamber therearound, the upper portion of said spout nearest said nozzle housing, said chamber being in fluid communication with said receiver inlet during said liquid delivery, one end of said vapor collector being attached to said nozzle housing;
- a face means located adjacent to and carried by the second end of said vapor collector away from said end attached to said housing for forming a surface seal against the outer surface of said receiver inlet, provided that said spout extends beyond said second end of said vapor collector during said liquid dispensing; and
- at least two spring members located in spaced relation therearound said spout and acting to extend said vapor collector means, each of said spring members having one end attached to a different point of said face means so that said face means has substantially free rotational movement transverse to the axis of said spout.

4,008,739

DROP CENTER TANK

Doug Hurst, Montreal West, Canada, and Erling Mowatt-Larssen, Warren, Ohio, assignors to General American Transportation Corporation, Chicago, Ill.

Filed Feb. 24, 1975, Ser. No. 552,651

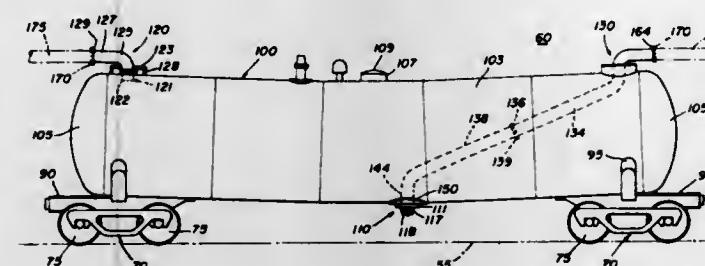
Int. Cl.² B65B 31/00; F17D 1/00

U.S. Cl. 141-35

11 Claims

1. A railway tank car for interconnection in fluid communication with associated like tank cars by flexible connecting conduits for accommodating consecutive loading, transporting and unloading of expandable liquid ladings, said tank car comprising a wheeled chassis structure provided with chassis coupling means for coupling to the chassis of associated like cars, a tank mounted on said chassis structure, said tank hav-

ing the bottom thereof sloping downwardly from both ends, a lading vent conduit and a lading eduction conduit respectively coupled to said tank adjacent to the opposite ends thereof and being in fluid communication therewith, each of said lading conduits extending through the top of said tank and having an outer end extending outwardly from said tank adjacent to the top thereof and terminating inboard of the associated tank car end, the inner end of said vent conduit terminating a predetermined distance below the top of said tank, filling of said tank to a level above the inner end of said vent conduit causing compression of gas trapped above said liquid lading to a pressure at which occurs outflow of liquid lading through said vent conduit at the same rate as the inflow of liquid lading through said eduction conduit thereby to provide in said tank above the liquid lading a free vapor space, said eduction conduit extending diagonally downwardly in said tank and terminating closely adjacent to the bottom of said tank to facilitate empty-



ing of said tank through said eduction conduit, a loading and unloading assembly mounted on the bottom of said tank at the center thereof for connection to a source of lading for loading said tank and for connection to an outlet pipe for unloading said tank, the sloping bottom facilitating complete draining without external piping, and conduit coupling means on each of said lading conduits for coupling to an adjacent end of an associated flexible connecting conduit to place said tank in fluid communication with the tanks of adjacent-like tank cars, whereby said tank may be connected by associated flexible connecting conduits to associated-like tanks in a series through which expandable liquid lading may flow to accommodate consecutive loading to a predetermined level, transporting thereof while automatically providing a free vapor space at the top of said tank above the liquid lading, and substantially complete unloading thereof through said eduction conduit.

4,008,740

DISPENSING APPARATUS FOR FILLING DRINKING CONTAINERS

Robert W. Chermack, 14424 Spring Lake Road, Hopkins, Minn. 55343

Filed Sept. 3, 1974, Ser. No. 502,974

Int. Cl.² B65B 1/04; B02C 13/20

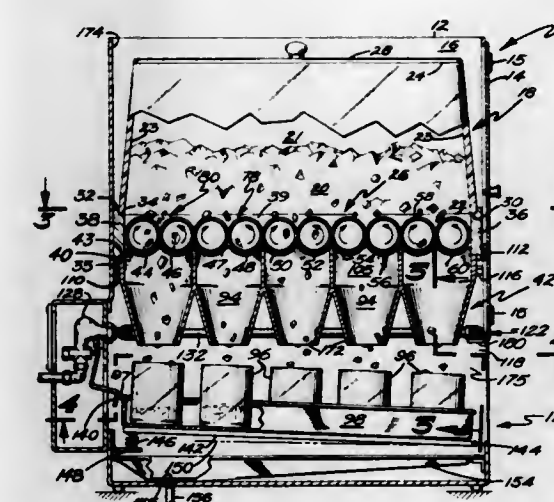
U.S. Cl. 141-100

5 Claims

1. A dispensing apparatus usable with an ice supply for filling a plurality of drinking containers positioned in adjacent, predetermined locations on a tray, comprising:

- a storage hopper capable of storing the supply of ice in its interior and having a discharge opening at the bottom of said hopper for discharging ice from within the hopper interior;
- gate means positioned in blocking relationship with said discharge opening of said hopper, said gate means including a multiplicity of adjacent, rigid, elongated members; each said elongated member having a longitudinal axis and being disposed in side-by-side relationship with the remaining elongated members with said longitudinal axes of said members being parallel to one another and spaced apart from one another, the distances between said axes being fixed;
- each said elongated member including an ice retaining web and each said web having a pair of spaced apart longitudinal cutting edges;

each said elongated member being mounted for rotation about its said longitudinal axis and swingable between a closed position, wherein said longitudinal edges of said adjacent elongated members are positioned closely adjacent each other and said webs define a barrier across said discharge opening obstructing ice flow past said members, and a discharge position wherein said longitudinal edges of said elongated member are spaced from said longitudinal edges of the adjacent said elongated members to define discharge slots between adjacent elongated members with the distance separating said longitudinal edges of adjacent elongated members being greater when said elongated members are in discharge position than when in closed position whereby ice may pass through said discharge slots of said gate means; wherein each said



longitudinal cutting edge of said elongated member is positioned to swing within said hopper and against the ice supply during rotation of said elongated members so as to loosen ice from the ice supply to cause ice discharge from said hopper and through said gate means

gate operating means mechanically connected to said elongated members to simultaneously rotate all said elongated members about their axes between said closed and discharge positions; and

delivery means positioned below said gate means and positionable above a tray and plurality of drinking containers on the tray, said delivery means including a plurality of generally upright chutes, each of said chutes having an inlet below said gate means to receive ice from said hopper and an outlet terminating over a container.

4,008,741

CARPENTER'S TOOL

Frederick W. Holstein, 1331 Howe St., Racine, Wis. 53403

Division of Ser. No. 601,313, July 31, 1975. This application

May 20, 1976, Ser. No. 688,158

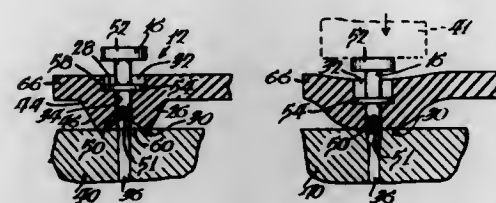
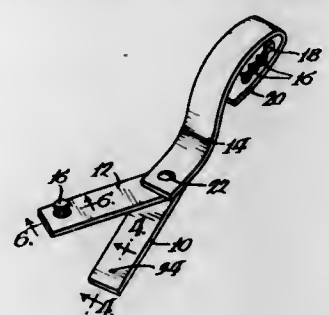
Int. Cl.² B25C 3/00

U.S. Cl. 145-46

3 Claims

1. A nail set tool for limiting the travel of a nail set toward a workpiece when a hammer blow is applied, said tool having a resilient flexible body with an upper surface for receiving the impact force of a hammer blow, a lower surface for bearing engagement with the workpiece during the application of the blow, means defining a recess at the upper surface of said body, and an elongate hole extending between the recess and said body lower surface for guiding the nail set during the application of the blow, said nail set having an elongate shank extending into the hole with a nail-engaging end located adjacent the lower surface, a head attached to and having a transverse dimension greater than that of the shank and projecting above the upper surface for striking engagement with a hammer, and a boss attached to the shank between the head and the end of the shank and positioned in said recess with an under surface thereof engaged with a bottom of said recess.

resilient means on said body engaging said boss to hold the nail set on said body and said boss against the bottom of said



recess and said flexible body being compressed to resiliently oppose the impact force applied to the nail set through the engagement of the boss with the upper surface.

4,008,742

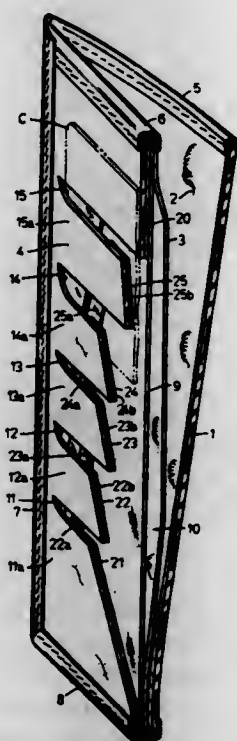
FLEXIBLE RECEPTACLE WITH CREDIT CARD HOLDER
Paul L. Lemler, West Bend, Wis., assignor to Amity Leather Products Company, West Bend, Wis.

Filed Mar. 24, 1976, Ser. No. 669,875

Int. Cl.² A45C 1/06

U.S. Cl. 150—35

3 Claims



1. A flexible receptacle including a credit card holder for holding a series of credit cards in shingled, overlapping relationship, said credit card holder comprising an outer flexible wall securable to said flexible receptacle and having a series of generally parallel slits which form individual strips in said outer flexible wall, an inner flexible liner comprising a single flexible sheet of single thickness having a periphery and having a plurality of similarly shaped slits therethrough, means for securing said periphery to said outer flexible liner, said slits each including spaced apart side slits and an upper slit joining

the spaced apart side slits, so as to form a series of similarly shaped nested flaps each having a free upper edge which can be displaced from the plane of said flexible sheet and said nested flaps each being connected to said flexible sheet at opposite sides, and said flexible sheet being aligned with said outer flexible wall so that said flaps of said liner are located adjacent to said strips in said outer flexible wall, the upper edge of each of said flaps being aligned with one of said parallel slits in said outer flexible wall and whereby individual pockets are formed between said outer flexible wall and said liner to receive credit cards through said parallel slits in said outer flexible wall for resting between said flaps and said liner and for arrangement in shingled overlapping relationship, and means for securing said flaps to said outer flexible wall.

4,008,743

PNEUMATIC TIRE WITH PUNCTURE RESISTANCE
INTERNAL SAFETY STRUCTURE

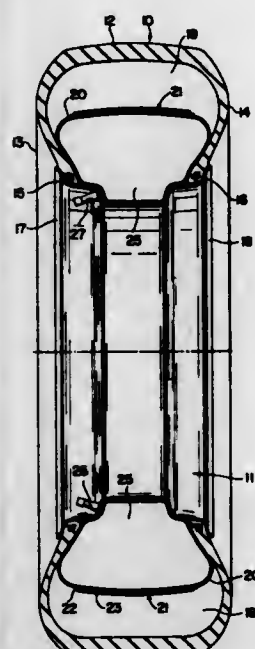
John Alan Welch, Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Aug. 27, 1975, Ser. No. 608,134

Int. Cl.² B60C 17/02, 17/04, 5/08

U.S. Cl. 152—158

3 Claims



1. A pneumatic tire adapted for mounting on a vehicle wheel rim to define therewithin an annular pressure chamber, comprising:

a toroidal expandable internal safety structure located within said pressure chamber and adapted when said pressure chamber is pressurized to normal tire inflation pressure, to be compressed to a toroidal form of reduced radius and volume within said pressure chamber, and a circumferential radially expandable reinforcing belt having one or more plies, surrounding said safety structure and secured thereto in a relatively narrow central circumferential zone to avoid restraint of said safety structure when said safety structure expands, the plies of the belt also joined to each other in a relatively narrow circumferential zone to avoid restraint of the safety structure when said safety structure expands whereby in the event of deflation of said pressure chamber, said safety structure and reinforcing belt expands to accommodate operation of said vehicle with said tire in a partially supported condition.

4,008,744

TIRE FAILURE INDICATOR

Nicolaos George Botsis; Panayotis Nicolas Korobilis, both of Athens; Ioannis Constantin Miras, Attica, and George Michael Eriparelis, Athens, all of Greece, assignors to Lamir Ltd., Greece

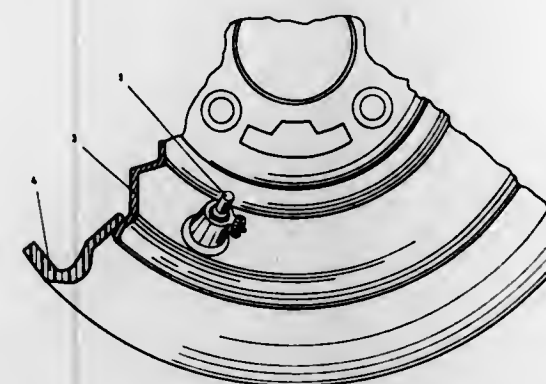
Filed Mar. 14, 1975, Ser. No. 558,562

Claims priority, application Greece, Mar. 14, 1974, 50156; June 7, 1974, 50384; Aug. 22, 1974, 51062; Oct. 5, 1974, 50950

Int. Cl.² B60C 29/00, 23/02

U.S. Cl. 152—427

10 Claims



1. A tire failure indicator for use in a wheel rim opening, a tire valve extending through the opening, said indicator including a housing means constructed and arranged to be disposed about said opening in surrounding relation to the tire valve, first sealing means for sealing said housing means to the valve and second sealing means for sealing said housing means to the rim in surrounding relation to the opening, the height of said housing means above the rim being less than that of the valve so that the valve extends outwardly of the housing means, and pressure responsive means coupled to said housing means for indicating a pressure rise therein resulting from leakage of air from said rim and through said opening.

4,008,745

PANELED DOOR CONSTRUCTION

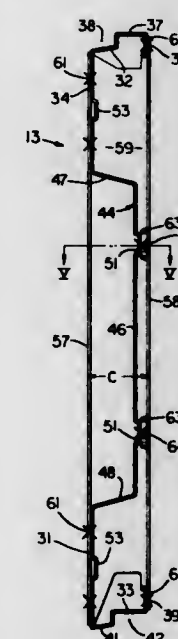
Morris W. Bailey, Fort Worth, Tex., assignor to Overhead Door Corporation, Dallas, Tex.

Filed Feb. 21, 1975, Ser. No. 551,894

Int. Cl.² E06B 3/12

U.S. Cl. 160—229 R

4 Claims



1. In a multipanel door having a plurality of horizontally elongated and substantially rectangular panels having their adjacent horizontally extending edges hingedly connected to permit movement of said door between a closed substantially vertical position and an open substantially horizontal position,

each panel including a horizontally elongated one-piece section member formed from a thin sheetlike material and having a generally channel-shaped cross section when viewed in a plane perpendicular to said horizontal direction, said section member having opposed leg portions of rather short length interconnected by a web portion which has a width several times greater than the length of said leg portions, said leg portions each having a shouldered recess formed therein so that the opposed leg portions of adjacent section members interfit one with the other, comprising the improvement wherein said web portions includes a stiffening portion formed centrally thereof and extending longitudinally throughout the length of said section member, said stiffening portion being of a generally channel-shaped cross section which opens outwardly in a direction opposite to said channel-shaped section member, said web portion also includes a pair of substantially planar portions which are spaced from one another and disposed adjacent the opposite longitudinally extending edges of said section member, said planar portions being spaced apart and interconnected by said channel-shaped stiffening portion, the channel-shaped stiffening portion including relatively short leg parts which are connected to the adjacent edges of the planar portions and project inwardly into said section member, said leg parts being interconnected by a substantially planar web part which has a width which is several times greater than the length of said leg parts, the width of said web parts also being greater than the width of said planar portions, said web part being disposed substantially parallel to said planar portions but spaced both transversely and laterally therefrom, said web part being disposed between but spaced from first and second parallel planes, said first plane being defined by said planar portions and said second plane being defined by the longitudinally extending free edges of said leg portions, said web part being positioned more closely adjacent said second plane so that said channel-shaped stiffening portion has a depth which is at least approximately 70% of the depth of the panel, each panel also including a pair of end stiles fixedly connected to the opposite end edges of the section member, said end stiles extending in a direction perpendicular to said horizontal direction, each said panel further including at least one intermediate stile which is disposed between and substantially parallel to said end stiles, said intermediate stile being disposed adjacent the open side of said section member and fixedly interconnected thereto, said planar portions and said planar web part each having a channel-like rib formed therein and extending longitudinally therealong, said ribs projecting rearwardly of said section member toward said second plane, and said stiles all having means thereon directly fixedly interconnected to the rib of said planar web part.

4,008,746

OPENABLE GATE END FOR WIRE TRACTION GATE
Felix B. Romberg, P.O. Box 218, Holland, Tex. 77001

Division of Ser. No. 459,810, April 10, 1975, Pat. No.

3,977,457, which is a continuation-in-part of Ser. No. 270,308, July 10, 1973, Pat. No. 3,825,053. This application Feb. 12, 1976, Ser. No. 657,578

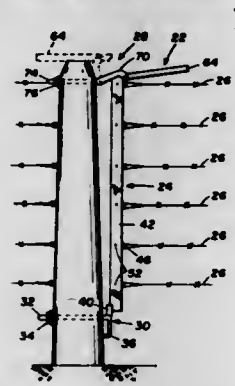
Int. Cl.² E06B 3/80

U.S. Cl. 160—328

6 Claims

1. For use at the openable end of a wire traction gate in conjunction with a gate post and the wire barrier of the gate: a standard for supporting one end of said wire barrier and positionable adjacent said post in an upright position, said standard comprising an open sided shaft with a pair of broad parallel side walls and a narrow connecting wall, a pivot block replacing said narrow connecting wall at the upper end of said shaft, said pivot block being secured to each of said broad side walls and bridging the space therebetween, means for connecting the lower end of said standard to said post with the standard oriented so the side with the narrow connecting wall and pivot block faces said post,

a traction lever defining an endwise facing socket at one end for receiving and pivoting about said pivot block between the broad side walls of said standard, a pair of traction links, means for connecting one of the ends of said traction links with said post for pivotal movement in a vertical plane,



the other ends of said pair of traction links being connected, one on each side, with said traction lever at its fulcrum for pivotal movement of said traction lever from an up-ended position on said pivot block to an over center terminal position in toggle action forcing said pivot block and therewith said standard toward said post.

4,008,747

METHOD FOR LOCATING INSERT IN CAST IRON

Melvin W. Devers, Bay City, and William L. Felske, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

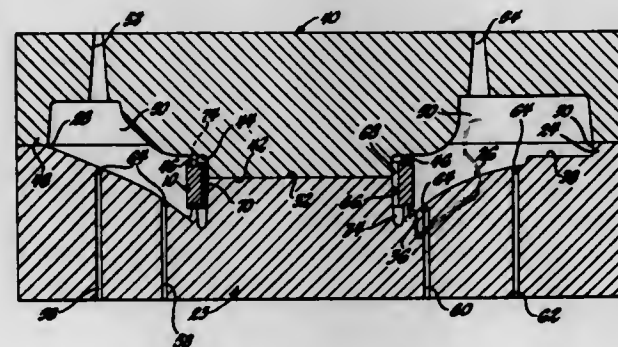
Division of Ser. No. 520,498, Nov. 4, 1974, Pat. No. 3,928,963.

This application Sept. 15, 1975, Ser. No. 613,473

Int. Cl.² B22D 19/00

U.S. Cl. 164-9

2 Claims



1. A method for manufacturing a cast metal member with containment ring comprising: the steps of preforming a metal ring to have spaced apart parallel side walls each including an annular groove formed continuously circumferentially therearound, forming a core box having a planar extent including a first reference surface therein surrounded by a plurality of circumferentially spaced upstanding posts, centering the metal ring to locate the posts on said core box in alignment with one groove on one side of said ring to provide a three point location of said ring with respect to said reference surface therein, forming a core box cover having a second reference surface thereon surrounded by a plurality of circumferentially spaced posts thereon each located radially outwardly of said second reference surface and being located within the other groove of said ring when the cover is placed on said core box, directing core sand into said core box for forming a sand core continuously around the inside and outside diameter of said ring for thermally insulating the exposed surfaces of said ring, withdrawing said posts to form a plurality of holes directed into either side of said core each in communication with one of said grooves, placing the core into a mold box, directing molten metal into the mold to fill the holes formed in

the sand core around said metal ring whereupon solidification of the cast metal will form an in situ plurality of integral posts between the cast metal and the ring to locate the ring internally thereof.

4,008,748

METHOD OF INSERTING CORES IN A SAND MOLD

Marius Gunnergaard, Lyngby, Denmark, assignor to Dansk Industri Syndikat A/S, Herley, Denmark

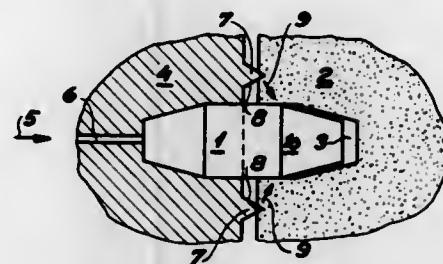
Filed Oct. 20, 1975, Ser. No. 623,995

Claims priority, application Denmark, Oct. 23, 1974, 5554/74

Int. Cl.² B22C 9/10

U.S. Cl. 164-30

8 Claims



1. A method of inserting a core having a print in a sand mold provided with a cavity corresponding to the print comprising the steps of inserting the core in the cavity of the sand mold and compressing the sand of the sand mold with an element which produces a recess in a region adjacent to the cavity during said core inserting step.

4,008,749

METHOD FOR LOW-PRESSURE CASTING IN A SAND MOLD

Rio Bellocchi, and Michel Degois, both of Pont-a-Mousson, France, assignors to Pont-A-Mousson S.A., Nancy, France

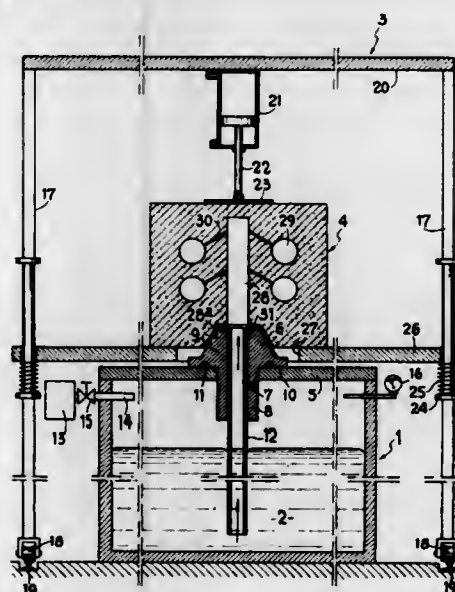
Filed Dec. 19, 1975, Ser. No. 642,631

Claims priority, application France, Dec. 24, 1974, 74.42713

Int. Cl.² B22D 17/06

U.S. Cl. 164-66

17 Claims



1. A method for low-pressure casting in a sand mould of in particular a metal having a high melting point, comprising providing a blind sand mould defining a main runner which has an open base portion, a mould cavity and a secondary runner whose cross-sectional area is much less than the cross-sectional area of the main runner, said secondary runner extending from a point of the main runner to the mould cavity; applying a pasty thermosetting refractory coating on the sur-

face of the base portion of the main runner; connecting said base portion to a mating upper end of a metal nozzle and a refractory supply pipe which has a cross-sectional area in the neighbourhood of the cross-sectional area of the main runner and partly extends into a fluidtight vessel containing the liquid metal, the lower end of the pipe being immersed in the metal whereby the pasty coating is crushed and hardened into a sealing element; applying a gas pressure exceeding atmospheric pressure on the free surface of the metal contained in the vessel so as to fill the mould cavity with metal under pressure; maintaining the gas pressure until the metal in the secondary runner has solidified; bringing the gas pressure back to atmospheric pressure; and disconnecting said base portion from said mating upper end with said sealing element adhering to said base portion.

4,008,750

CONTINUOUS CASTING OF METALS

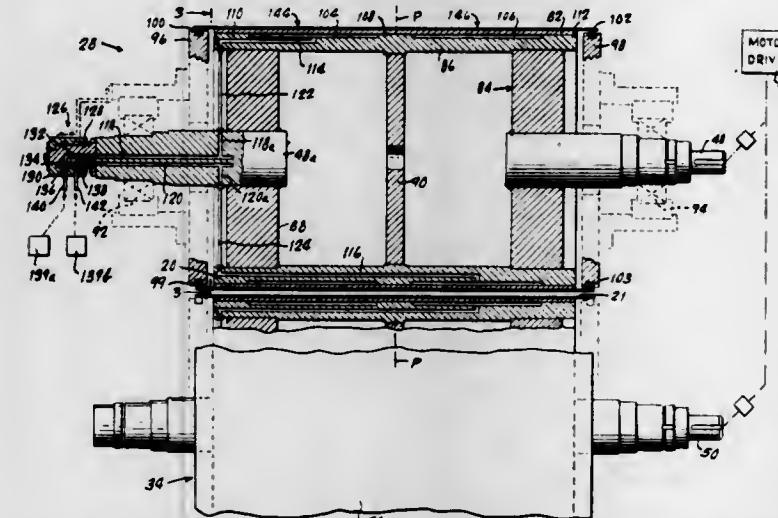
Olive Giuseppe Sivillotti, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 15, 1975, Ser. No. 568,311

Int. Cl.² B22D 11/06

U.S. Cl. 164-87

15 Claims



1. In apparatus for the continuous casting of metal in strip form comprising a pair of moving surfaces which define a mold space between them and continuously travel through return paths to said mold space, at least one of said surfaces being a belt, the combination, with said belt, of a pulley device which carries said belt under tension through a change of direction in its return path while steering the belt against sideways displacement, said device comprising:

- a pulley including outer, belt-supporting structure, capable of withstanding the elevated temperature conditions encountered in a casting operation, for engaging said belt in at least two surface zones respectively located on opposite sides of the median plane of the pulley and variable in circumference at least at one of said zones; and
- means controllable to effect variation in the circumference of said structure at said one zone relative to the circumference of said structure at the other of said zones while said pulley is carrying the travelling belt, for adjusting the transverse profile of the outer surface of the pulley to keep the belt in a desired path on the pulley;
- said structure being variable in circumference by said controllable means for altering the radius of said pulley at said one zone through an arc of contact of said pulley with said belt while said pulley is carrying said belt under tension.

13. In procedure for continuously casting metal in strip form between a pair of moving belts which define a mold space between them and continuously travel through return paths to said mold space, a method of steering one of the belts, comprising continuously advancing the belt through a change of direction over a pulley which is arranged with a belt-carrying surface that can be circumferentially expanded separately

at two zones, at least, respectively near the edges of the belt path over the pulley, sensing a tendency of the belt to move laterally on the pulley, and adjusting the lateral contour of said surface through an arc of contact of said pulley with said belt while said pulley is carrying said belt under tension by differentially subjecting said zones to expanding force, for counteracting said tendency of the belt.

4,008,751

CASING FOR A MACHINE FOR CENTRIFUGALLY CASTING PIPES IN A ROTARY MOLD

Pierre Henri Marie Fort, Nancy, and Michel Pierrel, Pont-a-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

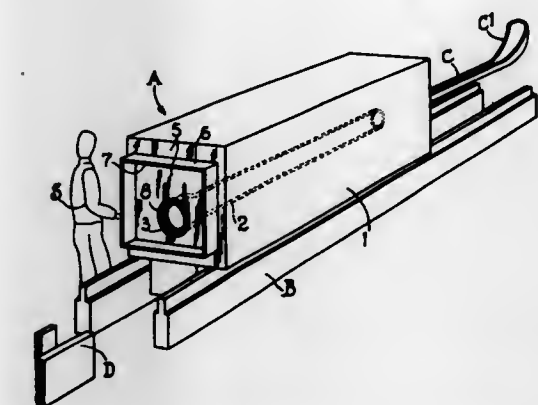
Filed Feb. 24, 1975, Ser. No. 552,452

Claims priority, application France, Mar. 21, 1974, 74.09744

Int. Cl.² B22D 13/10

U.S. Cl. 164-153

9 Claims



1. The combination of a machine for centrifugally casting a pipe in a rotary mold which is rotatable about an axis and has a socket-forming end portion, and a structure for shielding the mould and protecting against projections of molten metal from the socket-forming end portion of the mould, said structure consisting of a combination of a casing axially fixed with respect to the mould and having a transverse end portion adjacent the socket-forming end portion and defining a permanently open opening which is larger than the socket forming end portion and affords direct access to the socket-forming end portion of the mould, and a screen which is fixed against rotation about said axis and is separate from the rotary mould and axially projects outwardly from the transverse end portion of the casing and extends at least partly around said opening and allows unhindered access to said opening axially of the casing and is capable of receiving at least tangential projections of molten metal from the socket-forming end portion of the mould.

4,008,752

PLANT FOR THE ELECTROSLAG MELTING OF SHAPED CASTINGS

Volf Iudovich Rabinovich, ulitsa Gagarina, 74, kv. 27; Jury Nikolaevich Kriger, ulitsa Oktyabrskaya, 38, kv. 59; Oleg Stepanovich Karpov, ulitsa Gagarina, 19, kv. 4; Viktor Evgenievich Sapunov, ulitsa Gagarina, 60, kv. 10; Vladimir Alexeevich Karpov, ulitsa Gagarina, 43, kv. 39, and Vladimir Yakovlevich Kovenya, ulitsa Gagarina, 84, kv. 12, all of Chekhov Moskovskoi oblasti, U.S.S.R.

Filed Apr. 18, 1975, Ser. No. 569,375

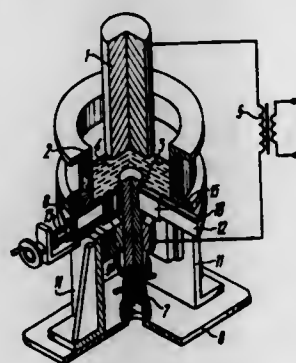
Int. Cl.² B22D 27/02

U.S. Cl. 164-252

3 Claims

1. In a plant for the electroslag melting of shaped castings by electroslag remelting of consumable electrodes in a cooled mold mounted on a base plate having an aperture through which a member to be fused in the course of melting is inserted, the improvement being in that the base plate is of a composite construction split along vertical planes, and that

the molding part of the base plate comprises at least three sections, resilient members connected to each of said sections for forcing the sections against each other and against the member being fused; said mold adapted to accommodate a consumable electrode connected to a power source; means for



the vertical movement of the member being fused said means adapted to insert the member into the slag bath through the aperture in said base plate; and current-carrying jaws movable in the horizontal plane, said jaws being connected to means adapted to urge them against the member being fused and having electric contact with said power source.

4,008,753

CONTINUOUS CASTING MACHINE OF THE WHEEL AND BAND TYPE

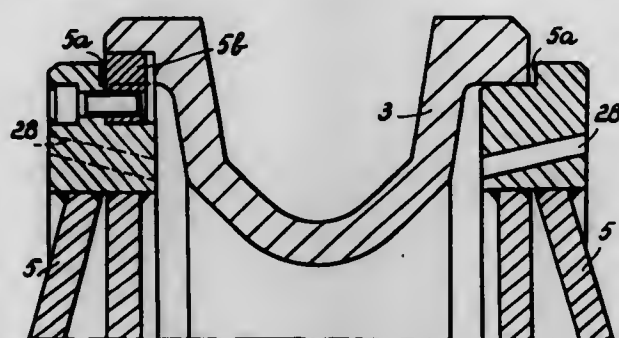
Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy (20122)
Filed Oct. 21, 1974, Ser. No. 516,839

Claims priority, application Italy, Oct. 22, 1973, 30388/73; July 4, 1974, 24812/74

Int. Cl.² B22D 11/06

U.S. Cl. 164—278

9 Claims



1. A continuous casting machine of the type comprising a casting wheel rotatable around a substantially horizontal axis, a peripheral casting ring on said casting wheel, a band covering said casting ring through an arc of said casting wheel, a stationary cooling device arranged internally of said casting wheel for cooling said casting ring and a driving shaft for said casting wheel, wherein said casting wheel comprises two support flanges arranged in spaced relationship and having lateral surfaces facing each other and provided with outer peripheral support surfaces, at least one of said support flanges being connected for rotation with said driving shaft, and wherein said casting ring is spaced from each of said lateral surfaces of said support flanges by an extent greater than maximum axial thermal expansion of said casting ring and comprises outwardly extending peripheral edge flanges each having an outer end portion resting on a corresponding one of said outer peripheral support surfaces freely slideable thereon and freely separable perpendicularly therefrom under thermal expansion of said casting ring, the machine further comprising means between said at least one of said support flanges and the corresponding peripheral edge flange of said casting ring allowing free displacement of said corresponding peripheral edge flange in a direction substantially parallel to the axis of said casting wheel and in a direction substantially radially thereto under thermal expansion and causing torque transmission from said at least one of said support flanges to said casting ring.

4,008,754 PROCESS FOR THE CONSERVATION OF ISOLATED ORGANS AND THE LIKE

Jürgen Kraushaar, Launsbach, and Rolf Voss, Giessen, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Aug. 6, 1975, Ser. No. 602,420

Int. Cl.² F25B 13/00

U.S. Cl. 165—2

12 Claims

1. In a process for conserving isolated organs by the use of low temperatures, characterized in that the organs are rinsed with an inert gas until they are free of water and blood, then the vascular systems for the organs are filled at a slight excess pressure with the inert gas with the vascular openings being closed, the organs then being inserted into a gas tight container having an inert gas atmosphere with a pressure greater than atmospheric being in the container, then the organs in the container are cooled at excess pressure in its inert gas atmosphere to a temperature below -100°C , and finally the organs are stored in the container at this temperature.

4,008,755

LEAK INDICATING APPARATUS FOR A CLOSED COOLING SYSTEM OF AN ELECTRIC MACHINE

Detlef Vandamme, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

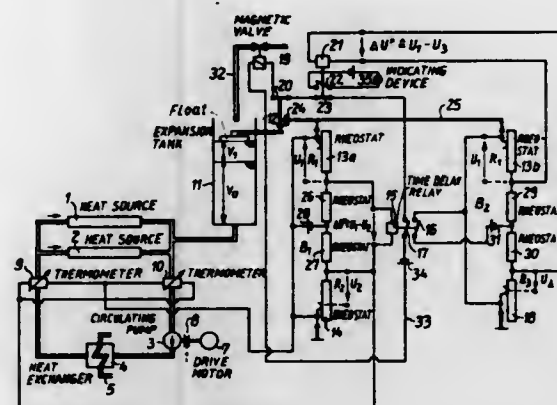
Continuation-in-part of Ser. No. 431,162, Jan. 7, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 605,537

Claims priority, application Germany, Jan. 24, 1973, 2303941

Int. Cl.² H02K 9/24

U.S. Cl. 165—11

6 Claims



1. Leak indicating apparatus for the closed liquid coolant circulation circuit for cooling parts of an electrical machine, the liquid coolant changing in volume with changes in temperature in correspondence to a predetermined temperature-volume proportionality, the circulation circuit having an expansion tank wherein the level of the coolant can freely change and a circulation pump having rotating parts with slide ring seals through which the coolant may leak, the expansion tank being disposed at the highest elevation of the circulation circuit, and a coolant supply line for supplying replenishing coolant to the expansion tank, the leak indicating apparatus comprising:

a level measuring device including: level sensing means for monitoring the level of the coolant in the expansion tank and for providing a level-dependent electrical signal indicative of the level of said coolant in said expansion tank;

alarm circuit means for providing a warning signal when there is a deviation from the normal volume-temperature proportionality;

temperature sensing means for detecting the average temperature of the coolant and for translating said average temperature into a temperature-dependent electrical signal;

first comparison circuit means for comparing said level-dependent signal with said temperature-dependent signal;

adjustable means for providing a fine-leak loss signal indicative of the fine-leak quantity permissible in a given time interval;

second comparison circuit means for comparing said level-dependent signal to said fine-leak loss signal;

a time-delay actuator having first and second working contacts and having a time delay corresponding to said time interval, said time-delay actuator being connected to said first comparison means for becoming energized when said level-dependent electrical signal is greater than said temperature-dependent electrical signal thereby actuating said working contacts after said time delay has run out, said first working contact being connected into said second comparison circuit means for energizing the same when said first working contact is actuated;

a valve circuit including: an electromagnetic valve disposed in the coolant supply line for opening and closing said line, and a normally-closed contact;

said second working contact of said time-delay actuator being connected into said valve circuit for closing said valve circuit through said normally-closed contact for energizing said valve to open said supply line when said second working contact is actuated;

said level measuring device further including: means for actuating said normally-closed contact when the level of coolant in said expansion tank has reached an upper limit value; and,

actuation means having a working contact and being connected to said second comparison circuit means for becoming energized when said level-dependent signal is greater than said fine-leak loss signal thereby actuating said last-mentioned working contact, said contact of said actuation means being connected into said alarm circuit means for energizing the same when said actuation means becomes energized whereby said warning signal is provided.

4,008,756

APPARATUS FOR AIR CONDITIONING EMPLOYING VARIABLE TERMINAL BOX

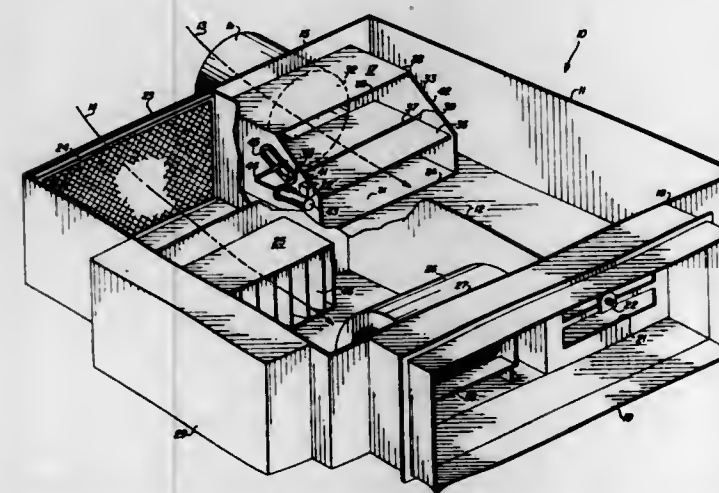
Jerrold L. Hufford, Phoenix, Ariz., assignor to Armer Construction Company, Phoenix, Ariz.

Filed Dec. 17, 1975, Ser. No. 641,755

Int. Cl.² F25B 29/00

U.S. Cl. 165—26

9 Claims



4. Apparatus for air conditioning an enclosure comprising: a variable volume terminal box,

said box comprising first and second air flow channels, each of said channels being isolated from the other and each comprising an input port and an output port,

said input port of said first channel being connectable to a source of cool air under pressure and said output port of said first channel being connectable to a plenum opening into the enclosure,

said input port of said second channel being connectable to

a source of heated air and said output port of said second channel being connectable to said plenum,

damping means arranged in said first channel for controlling air flow through said first channel,

first conduit means for connecting the air space of the enclosure to said source of cool air to provide a first closed air flow passageway,

an air flow sensor mounted in said output port of said first channel,

a heating element mounted in said second channel,

an electric blower mounted in said output port of said second channel,

second conduit means for connecting the enclosure to said source of heated air to provide a second closed air flow passageway,

a thermostat for mounting in the enclosure,

means actuated by said thermostat upon a first predetermined reduction in temperature in the enclosure for actuating said damping means to reduce the flow of air through said first channel and upon a second reduction in temperature energizing said electric blower to cause air flow from said source of heated air through said second channel to the enclosure, and

means for energizing said heating element to heat the air flow through said second channel upon predetermined further drop of temperature in the enclosure.

4,008,757

INDUSTRIAL TECHNIQUE

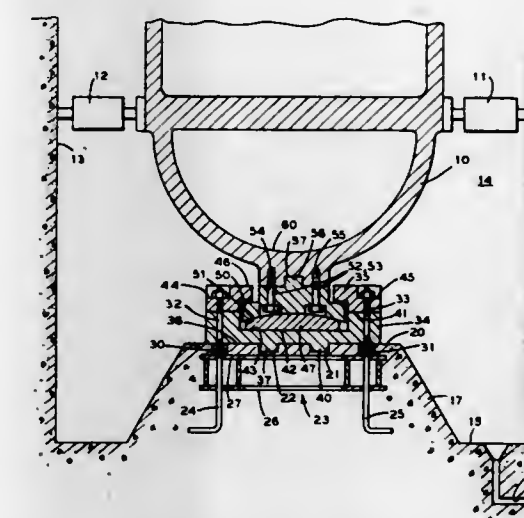
Larry Green Weatherford, Jr., Mount Vernon, Ind., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,318

Int. Cl.² F28F 9/00

U.S. Cl. 165—67

4 Claims



1. A heat-exchanger support comprising a reinforced concrete foundation, anchor bolts embedded within said foundation for transferring vertical loads from the heat exchanger to the foundation, a box spar embedded within said foundation for cooling said reinforced concrete, a base plate resting on said foundation, said base plate having bores formed therein, each of said bores being in alignment with said anchor bolts, said base plate having a generally centrally disposed cylindrical bore that terminates in a base, a lubricated plate member in said cylindrical bore, resting on said base and having a diameter that is smaller than the diameter of said cylindrical bore, said lubricated plate also having a convex surface, an annular shear ring having bores formed in alignment with said respective anchor bolts, said shear ring being superimposed on said base plate and having an inner diameter that is smaller than said lubricated plate diameter in order to overhang a peripheral margin of said lubricated plate, a support block having a concave surface in contact with said lubricated plate convex surface, said support block having a diameter that is greater than said lubricated plate diameter and less than said

cylindrical bore diameter in order to partially underlie said shear ring, and means connecting said support block to the heat exchanger.

4,008,758

INTERMITTENT ENERGY INPUT SALT BATH CHEMICAL PROCESSOR

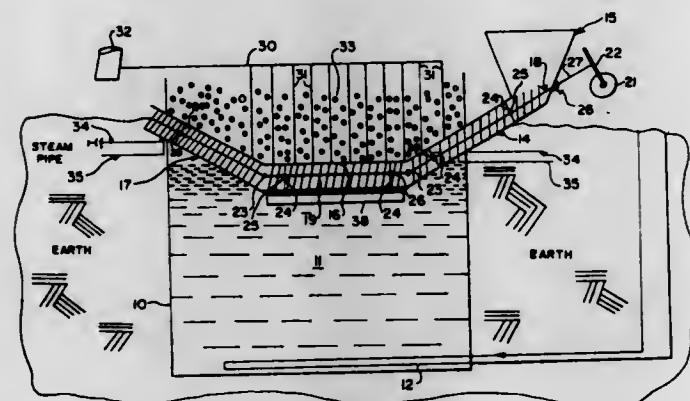
Talbot A. Chubb, 5023 N. 38th St., Arlington, Va. 22207

Filed Apr. 17, 1975, Ser. No. 568,972

Int. Cl.² F28D 19/00; F28G 1/08

U.S. Cl. 165-94

5 Claims



1. A heat-transfer, heat reservoir, chemical processor which comprises:

- a salt or salt eutectic reservoir;
- means in the bottom of said reservoir for heating a salt eutectic within said reservoir;
- a pipe-like chamber through which materials to be processed in said reservoir are transmitted;
- means for transmitting said material through said pipe-like chamber;
- means for withdrawing heat from said salt or salt eutectic in said reservoir and transmitting heat to said materials transmitted through said pipe-like chamber;
- a mechanical means for removing salt deposits from said heat-withdrawal means; and
- output means connected with said pipe-like chamber for receiving gaseous products of reaction from said materials processed.

4,008,759

OIL WELL TOOL WITH PACKING MEANS

Henry Wayne Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 31, 1975, Ser. No. 627,632

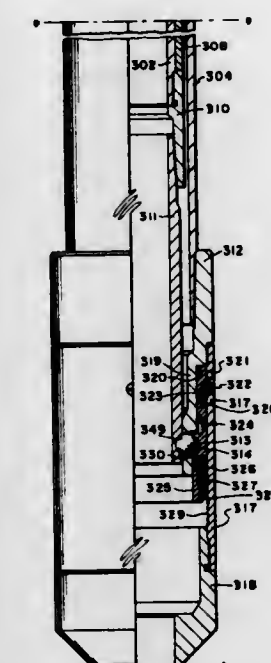
Int. Cl.² E21B 33/12, 17/02

U.S. Cl. 166-120

8 Claims

1. An oil well packer assembly for use on a tubing string, said packer assembly comprising:
- hydraulic packer means including well gripping means and elastomeric well bore sealing means; and,

hydraulically releasable thermal expansion joint means



sealably and slidably attaching said packer means to a tubing string.

4,008,760

CIRCULATING VALVE

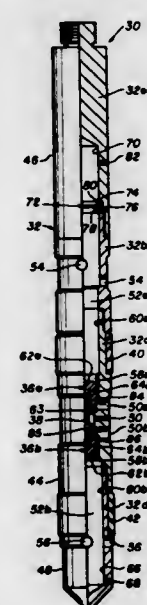
Edward E. DeMoss, Garland, Tex., assignor to Teledyne, Inc., Garland, Tex.

Filed Feb. 25, 1976, Ser. No. 661,250

Int. Cl.² F04F 1/08; E21B 43/12

U.S. Cl. 166-321

20 Claims



1. A circulating valve for use in a well comprising:
- valve housing means;
 - two spaced seal means around said valve housing means defining a seal area and an upper and lower end section of said valve housing means;
 - circulating port means in said valve housing means between said spaced seal means;
 - passage means extending through said valve housing means communicating between said circulating port means and said upper end section;
 - valve plug means initially maintained in said passage means blocking flow through said passage means;
 - frangible drawbar means releasably maintaining said valve plug means in said initial position;
 - upper pocket means in said valve housing means in which said valve plug means is received after said frangible drawbar means breaks; and

retainer means to retain said valve plug means in said upper pocket means.

4,008,761

METHOD FOR INDUCTION HEATING OF UNDERGROUND HYDROCARBON DEPOSITS USING A QUASI-TOROIDAL CONDUCTOR ENVELOPE

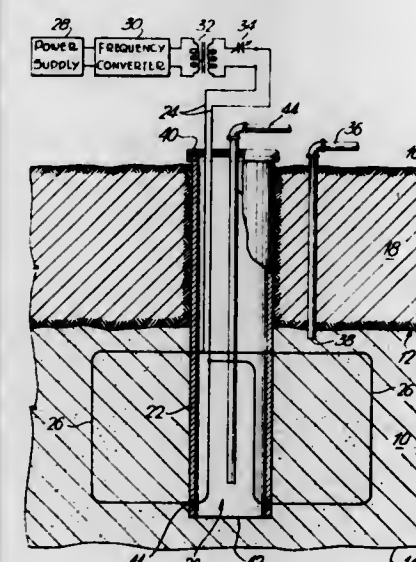
Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed Feb. 3, 1976, Ser. No. 654,747

Int. Cl.² E21B 43/24

U.S. Cl. 166-248

8 Claims



1. A method of heating hydrocarbons in situ in a selected portion of an underground hydrocarbon deposit such as bituminous and or oil shale, comprising forming a quasi-toroidal conductor arrangement in the deposit substantially to envelope the said selected portion, and applying alternating current of selected voltage, amperage and frequency to the conductor arrangement to heat the selected portion by induction heating to a selected temperature.

4,008,762

EXTRACTION OF HYDROCARBONS IN SITU FROM UNDERGROUND HYDROCARBON DEPOSITS

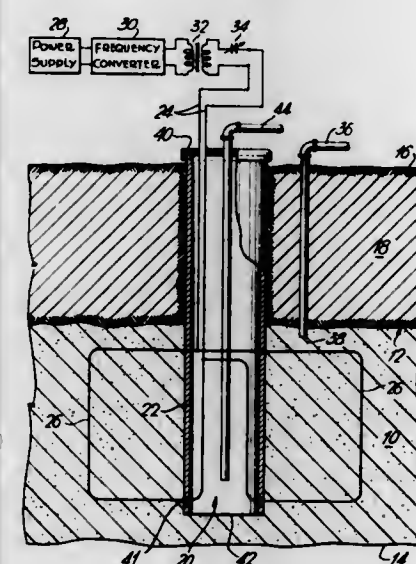
Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed Feb. 26, 1976, Ser. No. 661,770

Int. Cl.² E21B 43/24

U.S. Cl. 166-248

11 Claims



1. A method of extracting hydrocarbons in situ from a selected portion of an underground hydrocarbon deposit such as oil shale, comprising forming a quasi-toroidal conductor arrangement in the deposit substantially to envelope the said selected portion,

applying alternating current of selected voltage, amperage and frequency to the conductor arrangement to heat the selected portion by induction heating to a temperature sufficient to vaporize a portion of at least one of the hydrocarbon constituents thereof, and extracting a portion of at least one released hydrocarbon constituent of the deposit by means of a conduit extending from the deposit in the vicinity of the selected portion thereof to the earth's surface.

4,008,763

WELL TREATMENT METHOD

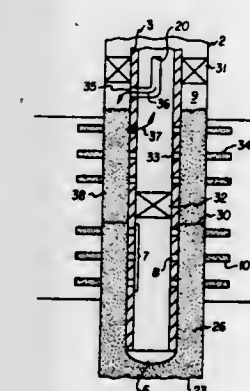
Clovis Carroll Lowe, Jr., Lafayette, La., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 20, 1976, Ser. No. 688,274

Int. Cl.² E21B 47/10

U.S. Cl. 166-253

7 Claims



1. In a gravel packing method in a well wherein a plurality of packs are emplaced, the improvement comprising incorporating in each pack a tracer material which is unique to that particular pack, and analyzing fluid thereafter produced from said well to determine if any and if so which pack is leaking solid particles into said well.

4,008,764

CARRIER GAS VAPORIZED SOLVENT OIL RECOVERY METHOD

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

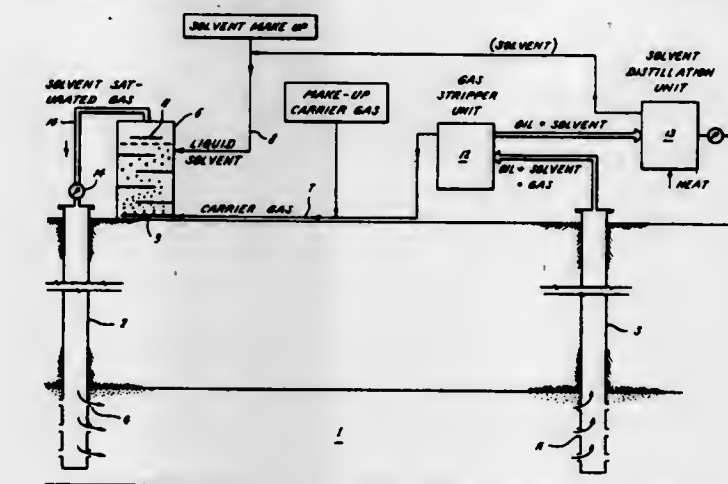
Continuation of Ser. No. 449,136, March 7, 1974, abandoned.

This application July 11, 1975, Ser. No. 594,983

Int. Cl.² E21B 43/22, 43/24

U.S. Cl. 166-266

21 Claims



1. A method for recovering viscous petroleum including bitumen from subterranean, viscous petroleum-containing formations including tar sand deposits, the formation being

penetrated by at least one production well and by at least one injection well, both wells being in fluid communication with the formation, comprising:

- passing an inert carrier gas which is gaseous at formation temperature and pressure through a solvent for petroleum which is liquid at formation temperature and pressure to vaporize the solvent thereby forming a gaseous mixture of the solvent and carrier gas;
- introducing the gaseous mixture of carrier gas and solvent into the formation via the injection well; and
- recovering a produced fluid comprising formation petroleum, having solvent absorbed therein and the carrier gas from the production well.

4,008,765

METHOD OF RECOVERING VISCOUS PETROLEUM FROM THICK TAR SAND

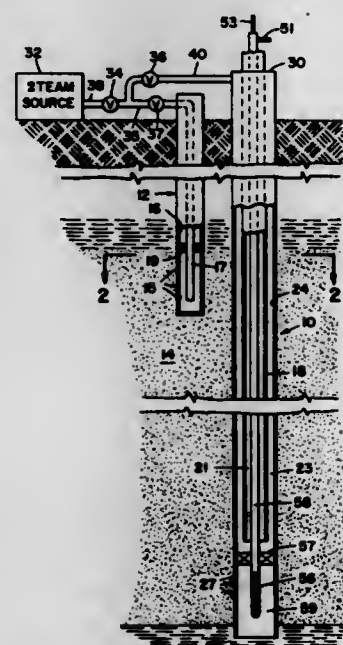
Donald J. Anderson, Newport Beach, Calif.; Peter Pisio, and Charles F. Kirkvold, both of Calgary, Canada, assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 22, 1975, Ser. No. 643,580

Int. Cl.² E21B 43/24

U.S. Cl. 166-272

5 Claims



1. A method of assisting the recovery of viscous petroleum from a petroleum-containing formation comprising the steps of forming a substantially vertical well through a petroleum-containing formation, said formation having an initial low potential for fluid injecting, inserting a casing string having a production opening near its lower portion into said vertical well, providing a production flow line from a position adjacent said production opening into the earth's surface, packing off the space between the interior of said casing string and the exterior of said production flow line, extending a tubular member into said vertical well between the interior of said casing string and the exterior of said production flow line from the earth's surface to a position above said packoff means to form a closed-loop flow path from the earth's surface to said packoff means and back to the earth's surface, circulating a hot fluid through said closed-loop flow path to heat the viscous petroleum in said formation adjacent at least a portion of said vertical well to form a potential passageway for fluid flow through said formation and injecting a drive fluid into the upper portion of said formation into said potential passageway to promote flow of petroleum to the production opening near the bottom of said casing string of said vertical well.

4,008,766 OIL RECOVERY BY WATERFLOODING EMPLOYING A BIOPOLYMER-SURFACTANT SYSTEM

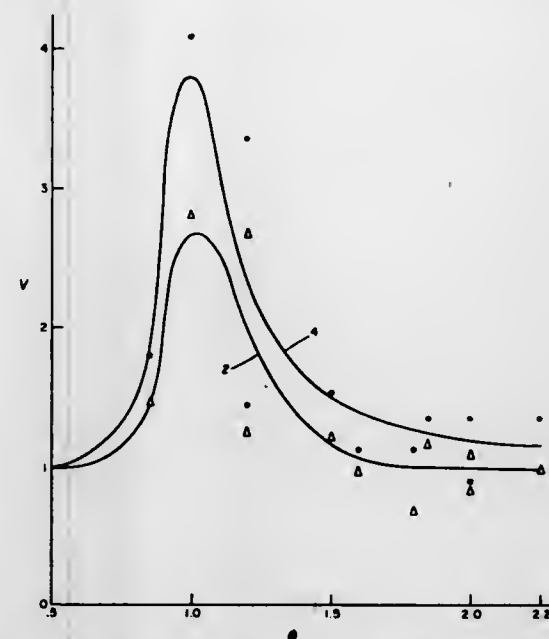
Joseph George Savins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,473

Int. Cl.² E21B 43/22

U.S. Cl. 166-273

11 Claims



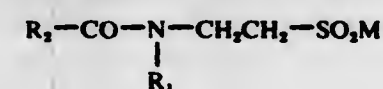
1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

- introducing into said reservoir via said injection system a thickened aqueous liquid containing a water dispersible polysaccharide produced by action of bacteria of the genus *Xanthomonas* on a carbohydrate and a multifunctional surfactant system comprising a nonionic surfactant characterized by the formula:



wherein

R is an aliphatic group or an aliphatic substituted aryl group and
n is a number equal to or greater than 3, and
an anionic surfactant characterized by the formula:



wherein

- R₁ is a methyl or ethyl group,
R₂ is an aliphatic group containing 12 to 20 carbon atoms, and
M is an alkali metal or ammonium ion,
- introducing into said reservoir via said injection system an aqueous flooding medium to displace reservoir oil to said production system, and
 - recovering oil from said production system.

4,008,767 OIL RECOVERY BY LOW TENSION WATERFLOODING

Jerry M. Waite, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,785

Int. Cl.² E21B 43/22

U.S. Cl. 166-273

4 Claims

1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems and in which the rock material of said reservoir contains calcium sulfate in an amount of at least 0.5 weight percent of said rock material, the method comprising:

- introducing into said reservoir via said injection system a low tension slug comprising an aqueous medium containing an agent effective to reduce the interfacial tension between said aqueous medium and said reservoir oil, said low tension slug containing a salt additive selected from the group consisting of alkali metal and ammonium sulfates in a concentration of at least 0.2 weight percent to suppress the solubilization of said calcium sulfate into said low tension slug by the common-ion effect,
- thereafter introducing into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and
- recovering oil from said production system.

4,008,768

OIL RECOVERY BY WATERFLOODING EMPLOYING MULTICOMPONENT SURFACTANT SYSTEMS

Silvia C. Birk, Fort Worth, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,289

Int. Cl.² E21B 43/22

U.S. Cl. 166-274

21 Claims

1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

- introducing into said reservoir via said injection system an aqueous solution of a multifunctional surfactant system comprising a surface-active amide linked sulfonate anionic group and a surface-active polyethylene oxide non-ionic group,
- introducing into said reservoir via said injection system an aqueous flooding medium to displace reservoir oil to said production system, and
- recovering oil from said production system.

4,008,769

OIL RECOVERY BY MICROEMULSION INJECTION

Harry L. Chang, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,236

Int. Cl.² E21B 43/22

U.S. Cl. 166-274

15 Claims

1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

- contacting a petroleum oil with an aqueous solution of an alkaline agent to extract neutralized organic acids from said oil in said aqueous medium,
- separating from a portion of said oil, a mixture of oil and the resulting aqueous solution of neutralized organic acids, said mixture containing oil in an amount within the range of 0.5-50 percent by volume,
- adding to said mixture a co-surfactant having mutual solubility for oil and water in an amount sufficient to form a water external microemulsion,
- injecting said microemulsion into said reservoir via said injection system,
- thereafter injecting into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system and,
- recovering oil from said production system.

4,008,770

SCRAPER ASSEMBLY FOR GROUND TILLAGE IMPLEMENT DISCS

James A. Boone; Dennis L. Lewallen, both of Quinter, and Harold G. Walker, WaKeeney, all of Kans., assignors to Harold G. Walker, WaKeeney, Kans., a part interest

Filed Apr. 10, 1975, Ser. No. 566,725

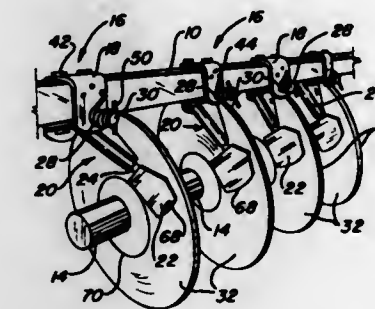
Int. Cl.² A01B 15/16

U.S. Cl. 172-566

6 Claims

1. A scraper assembly for cleaning the discs of disc-type

ground tillage implements which comprises: bracket means connectable to the implement frame alongside one of the discs carried thereby, said bracket means including shaft-mounting means on the underside thereof adapted to receive a shaft for rotational movement about a substantially horizontally disposed axis; means defining a hanger subassembly having a horizontally disposed leg and a vertically disposed leg, the horizontally disposed leg comprising a first shaft mounted for pivotal movement in the shaft-mounting means of the bracket means and the vertically disposed leg comprising a tubular member open at the lower end thereof hanging down from the first shaft for pendulous movement toward and away from an adjacent implement disc alongside thereof upon rotational movement of said shaft; a scraper blade shaped to scrape the concave surface of an implement disc free of mud and the like when pressed thereagainst; a second shaft depending from the



scraper blade mounted for rotational movement within the tubular leg of the hanger subassembly; connecting means detachably mounting the second shaft within the tubular member of the hanger subassembly for limited rotational movement relative thereto, said connecting means including a retaining pin carried by one of said second shaft and tubular members and an oversize pin-receiving opening positioned to receive said pin in the other of said members; biasing means connected between the bracket means and first shaft operative to continuously urge the scraper blade against the concave surface of a disc alongside thereof; and, means comprising a thrust bearing located in the tubular element of the hanger means in engagement with the upper end of the second shaft housed therein, said bearing cooperating with said first and second shafts upon engagement therebetween to relieve the thrust load upon said retaining pin when the scraper blade is under load against the scraper disc.

4,008,771

TWO-WAY BULLDOZER MECHANISM

Uchida Tomio, Sagami-hara, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

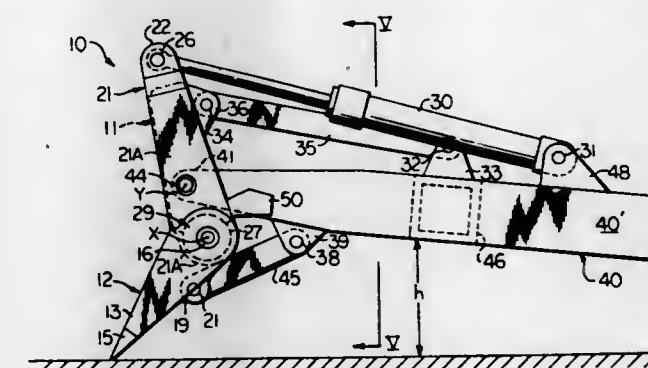
Filed July 30, 1975, Ser. No. 600,748

Claims priority, application Japan, Aug. 21, 1974, 49-95074

Int. Cl.² E02F 3/76

U.S. Cl. 172-806

10 Claims



5. A two-way bulldozer mechanism mounted on a forwardly extending push frame of an earthmoving vehicle, said push frame having a pair of laterally spaced push arms, said bulldozer mechanism comprising:

a reversible blade assembly having an upper blade portion,

a lower blade portion and a central hinge connection pivotally connecting such blade portions together to permit their relative angular adjustment about said hinge connection;

elongated lever means having opposite ends and a central pivot connection spaced intermediate said ends for pivotally mounting said lever means to said push frame;

means pivotally mounting one end of said lever means to said blade assembly in coaxial relation to said hinge connection so that said hinge connection is movable in an arcuate path about the central pivot connection of said lever means;

motor means operatively connected for pivoting said lever means about its pivot connection between a first angular position wherein said hinge connection is disposed rearwardly of said pivot connection and a second position wherein said hinge connection is forwardly thereof; and linkage means pivotally interconnected between said blade assembly and said frame for individually positioning said upper and lower blade portions thereof in a predetermined pushing mode when said lever means is in its first position and in an opposite pulling mode when said lever means is in its second position, said linkage means including a pair of upper links individually interconnected between respective ones of said push arms and said upper blade portion, and a pair of lower links individually interconnected between such push arms and said lower blade portion.

4,008,772

TIGHTENING SYSTEM

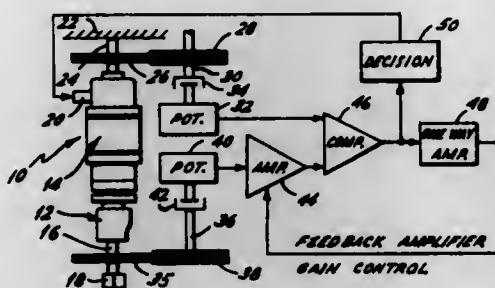
John T. Boys, Christchurch, New Zealand, assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 19, 1975, Ser. No. 579,108

Int. Cl.² B23Q 5/06

U.S. Cl. 173-12

16 Claims



1. A tightening system for tightening an assembly including a fastener member until a yield point is detected, said system comprising:

first means for developing a first signal representative of a first tightening characteristic of the assembly and second means for developing a second signal representative of a second tightening characteristic of the assembly;

third means responsive to said first and second signals for determining when the value of said first signal is greater than the value of said second signal and for modifying said second signal by increasing the total value of said second signal until it corresponds to the value of said first signal, and for developing a decision-making signal when the rate of increase of said first signal decreases with respect to said modified second signal; and

control means responsive to said decision-making signal for developing a control signal when the yield point of the assembly is reached.

4,008,773

TIGHTENING SYSTEM

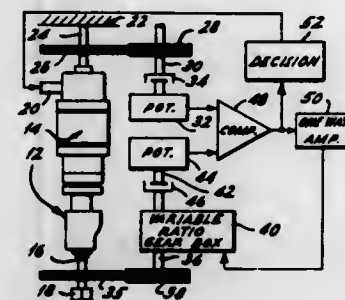
Paul W. Wallace, Warrington, Pa., and John T. Boys, Christchurch, New Zealand, assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 19, 1975, Ser. No. 579,109

Int. Cl.² B23Q 5/06

U.S. Cl. 173-12

18 Claims



1. A tightening system for tightening an assembly including a fastener member until a yield point is detected, said system comprising:

first means for developing a first signal representative of a first tightening characteristic of the assembly and second means for developing a second signal representative of a second tightening characteristic of the assembly;

third means responsive to said first and second signals for determining when said first signal is greater than said second signal and for modifying said second signal by increasing increments of said second signal to correspond to said first signal, and for developing a decision-making signal when the rate of increase of said first signal decreases, with respect to said modified second signal; and control means responsive to said decision-making signal for developing a control signal when the yield point of the assembly is reached.

4,008,774

HYDRAULICALLY POWERED DRILL PRESS

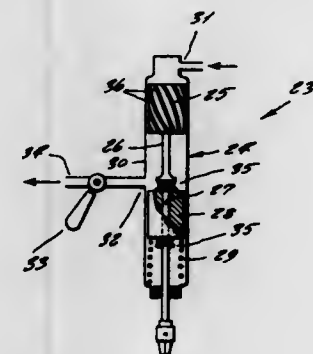
Martin B. Milano; David A. Rutherford, both c/o George Spector, 3615 Woolworth Building, 233 Broadway, New York, N.Y. 10007, and George Spector, 3615 Woolworth Building, 233 Broadway, New York, N.Y. 10007

Filed Oct. 22, 1974, Ser. No. 516,971

Int. Cl.² B23B 39/00, 45/04

U.S. Cl. 173-153

2 Claims



1. A hydraulically powered drill press comprising a hydraulically powered turbine motor having a rotor and depending shaft affixed thereto, having front and rear ends including means for delivering hydraulic fluid to power the rotor, in combination with a housing encompassing the shaft and rotor including a drill chuck mounted on the front end of said shaft, wherein said housing further includes piston means for forcing the chuck and work axially together, wherein the housing includes inlet and outlet ports spaced axially, said rotor being therebetween and wherein the said piston means is axially

affixed to the shaft at a location between said outlet port, and said chuck wherein the shaft, rotor and piston means are slidably mounted in the housing for axial movement relative to the housing, including bearings to permit rotation of said shaft relative to said piston means, said piston means sealingly engaging the housing to provide differential pressure on said piston thereby facing the shaft axially forward towards the work.

4,008,775

METHOD OF USING A POROUS Fe_3O_4 DRILLING MUD ADDITIVE

Irwin Fox, Ballwin, Mo., assignor to Ironite Products Company, Madison, Ill.

Continuation-in-part of Ser. No. 374,555, June 28, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 666,193

Int. Cl.² C09K 7/04

U.S. Cl. 175-64

3 Claims

1. A method of scavenging hydrogen sulfide from drilling mud, which comprises the following steps:

- adding to drilling mud porous iron oxide particles having an ideal composition of substantially Fe_3O_4 and having a surface area at least 10 times as great as magnetite particles of equal size, the greater part of which particles are no longer than 60 microns, in a quantity sufficient to react such hydrogen sulfide as may be encountered;
- circulating the drilling mud down the interior of the drill pipe, through the drill bit and up the annular space between the drill pipe and the formation wall to the surface;
- entraining in the circulating drilling mud such hydrogen sulfide as may be encountered; and
- reacting the entrained hydrogen sulfide with the said porous iron oxide particles under the pressure there present to form a stable pyrite FeS_2 .

4,008,776

ELECTRONIC WEIGHING SCALE

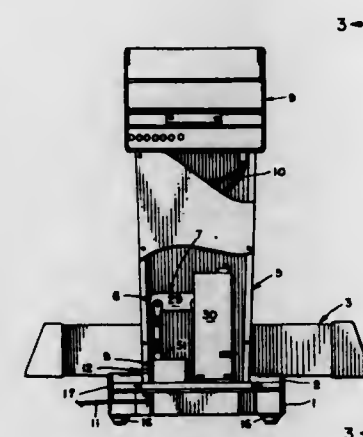
Walter P. Kushmuk, Niles, Ill., assignor to Continental Scale Corporation, Bridgeview, Ill.

Filed Sept. 4, 1975, Ser. No. 610,143

Int. Cl.² G01G 3/14, 21/28; H01R 13/70

U.S. Cl. 177-210 R

4 Claims



frame, said frame non-caster wheel means comprising a pair of wheels on opposite sides of said frame, means for selectively and independently powering each of said pair of wheels, said means for selectively powering said frame non-caster wheel means comprising at least one electric motor, a source of electric current connected to said motor with circuit interrupting means interposed therebetween, and power transfer means between said motor and said frame non-caster wheel means whereby upon the connection of electric current to said motor, the carriage will be self propelled.

4,008,779

POWER STEERING CONTROL SYSTEM FOR INDUSTRIAL TRUCKS

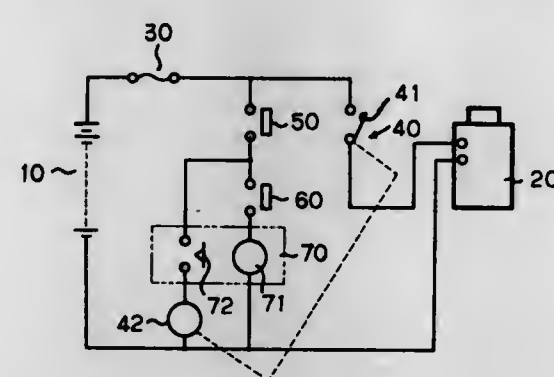
Akibumi Shinoda, Handa, and Hiroyuki Yoshino, Ohbu, both of Japan, assignors to Kabushiki Kaisha Toyota Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 8, 1975, Ser. No. 638,402

Claims priority, application Japan, Dec. 24, 1974, 49-1576 Int. Cl.² B62D 5/04

U.S. Cl. 180—79.1

3 Claims



1. An electrically operated power steering control system for an industrial truck comprising an accelerator pedal, battery means, electric motor means for operating said power steering control system, circuit means interconnecting said battery means and said electric motor means, switch means in said circuit operable in response to the depression of said accelerator pedal for closing said circuit means to operate said electric motor means and time delay means to delay the opening of said circuit means after the release of said accelerator pedal.

4,008,780

DEVICE FOR TENSIONING SAFETY BELTS IN VEHICLES

Hellmut Bendler, Nurnberg; Heinz Gawlick, Furth, and Egon Flach, Cologne-Riehl, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

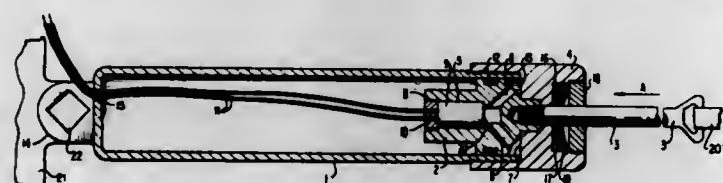
Filed Nov. 2, 1973, Ser. No. 411,930

Claims priority, application Germany, Nov. 2, 1972, 2253657

Int. Cl.² B60R 21/10

U.S. Cl. 180—82 C

16 Claims



1. Device for tensioning safety belts in vehicles in which one end of the safety belt is securable to the vehicle and the other end of the belt is securable to the tensioning device, said device comprising cylinder means, piston means having piston rod means extending from one side thereof, said piston means and said piston rod means being arranged for displacement

within said cylinder means, said piston means being provided with centrally disposed recess means for receiving an electrically ignitable propellant charge cartridge and at least two symmetrically disposed discharge ducts in said piston means connected with said recess means and directed outwardly from said recess means toward the adjacent end wall of said cylinder means at said piston rod means side of said piston means such that upon ignition of the cartridge propellant gases are generated which flow through said discharge ducts into said cylinder means at said piston rod means side of said piston means and against the adjacent end wall of said cylinder means for causing said piston means and said piston rod means to be displaced into said cylinder means to effect a tensioning of the safety belt.

4,008,781

AUTOMATIC VEHICLE-SPEED ADJUSTING DEVICE

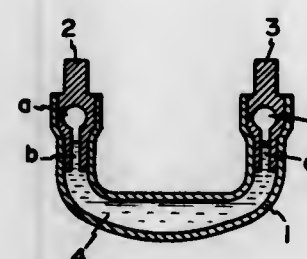
Tsurunosuke Ochiai, 3169, Kumanohara, Karatsu, Saga, Japan

Filed Oct. 28, 1975, Ser. No. 626,593

Int. Cl.² B60K 31/00

U.S. Cl. 180—104

6 Claims



1. A device for controlling the speed of a vehicle as the latter negotiates a curve comprising a U-shaped tube having two legs joined to a cross over, said U-shaped tube being disposed in said vehicle with its two legs substantially vertically disposed and with the general plane of the U-shaped tube being disposed generally transversely of the longitudinal axis of the vehicle, terminal elements secured in an air-tight manner in the legs of said U-shaped tube, mercury disposed in said U-shaped tube such as to normally contact said terminal elements when the vehicle is moving in a straight path, said terminal elements have vertical internal passages with the lower ends of said internal passages leading to said mercury in said U-shaped tube, said terminal elements have upper closed ends, and enlarged air-chambers in said terminal elements leading from the upper ends of said internal passages, said mercury being movable in said U-shaped tube so as to break contact with one of said terminal elements when the vehicle negotiates a curve and subjects the mercury to centrifugal force.

4,008,782

RETURN DEVICE FOR STEERING MECHANISM

Roger Chanal, Saint-Etienne, France, assignor to Etat Français representé par le Délégué Ministeriel pour l'Armement, Paris, France

Filed Mar. 27, 1975, Ser. No. 562,560

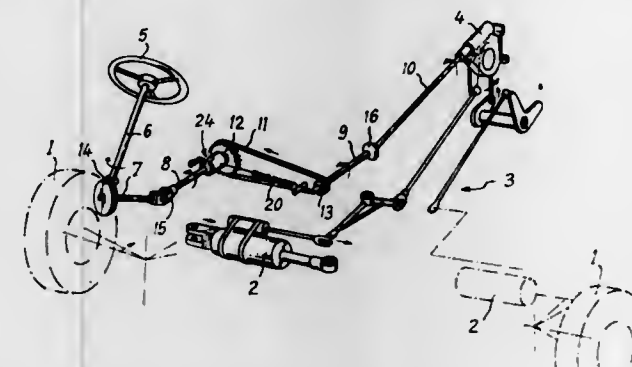
Claims priority, application France, Apr. 1, 1974, 74.12347 Int. Cl.² B62D 5/06

U.S. Cl. 180—132

15 Claims

1. A return device for a hydraulic steering mechanism of a vehicle, the steering mechanism including a steering wheel rotatable with a steering column connected by a line of rotatable shafts to a pair of guide wheels laterally pivotable from a straight-ahead position for controlling the direction of travel of the vehicle, comprising return means for automatically returning the guide wheels to a straight-ahead position after they have been laterally pivoted, the return means including a drum mounted on one of the shafts for rotation therewith; first

resilient means engaging the drum in such a manner that the first resilient means is stressed selectively, depending upon the direction in which the guide wheels are laterally pivoted, by the rotation of the drum when the guide wheels are initially pivoted laterally from a straight-ahead position for providing a resistance to further lateral pivoting of the guide wheels away from a straight-ahead position and a return force to return the



guide wheels to a straight-ahead position; and second resilient means connected to the drum in such a manner that the second resilient means is tensioned by the rotation of the drum for providing, after the first resilient means is stressed by the rotation of the drum, a resistance to further lateral pivoting of the guide wheels away from a straight-ahead position and a return force to return the guide wheels to a straight-ahead position.

4,008,783

HYDRAULICALLY POWERED STEERING SYSTEM FOR A VEHICLE HAVING MULTIPLE STEERABLE WHEELS

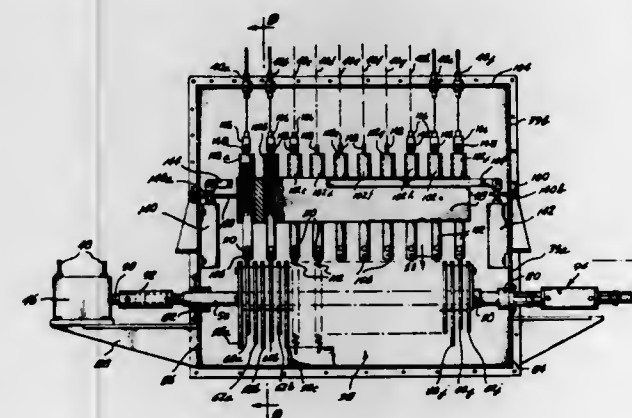
Hans H. Herrmann, and Karl H. Herrmann, both of Seattle, Wash., assignors to CTEC Corporation, Bellevue, Wash.

Filed June 19, 1975, Ser. No. 588,421

Int. Cl.² B62D 5/06

U.S. Cl. 180—140

10 Claims



1. In a steering system for a wheeled vehicle including a vehicle frame, a steerable wheel supporting member mounted for rotation about an axis on said frame, a reversible motor means for varying the angular position of said steerable member relative to said frame to steer a wheel supported by said member, a servomechanism operably coupled to said motor means and having a control member for controlling said motor means, an improvement for actuating said control member comprising:

- a first cam and a second cam, each of said cams having a predetermined shape and a rotational axis,
- coupling means for interconnecting said cams and for mounting said cams for rotation about their respective rotational axes,
- an operator controlled steering means operably connected to said coupling means for rotating said cams responsive to a command from an operator,
- follower means for contacting said first cam and for converting the rotational movement of said first cam into

linear movement, said follower means being coupled to actuate the control member of said servomechanism to control said motor means, said follower means including

- a first member having a channel therein and first means mounting said first member for reciprocating movement in a radial direction relative to the rotational axes of said cams, said channel being oriented generally parallel to the direction of reciprocation of said first member,
- a second member mounted for reciprocating movement in the channel of said first member,
- a cam follower having an end thereof contacting the cam surface of one of said cams, said cam follower being connected to said second member,
- second means biasing said follower means toward said cam surface, and
- third means for biasing said second member toward said cam surface relative to the position of said first member, and

means for relatively axially shifting said first and second cams and said follower means so that said follower means is shifted relative to said first cam and is positioned to contact said second cam and to convert rotational movement of said second cam into linear movement to actuate said control member and control said motor means.

4,008,784

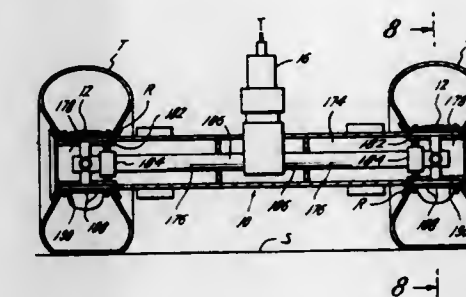
SEISMIC SIGNAL SOURCE

Marvin G. Bays, Houston, Tex., assignor to Seiscom Delta Inc. Filed June 12, 1975, Ser. No. 586,147

Int. Cl.² G01V 1/14

U.S. Cl. 181—114

21 Claims



1. In a tracked seismic exploration vehicle movable over land surfaces in response to tracks of such vehicle being driven by a drive wheel in the tracks with the vehicle and tracks supported by idler wheels in the tracks, the improvements comprising:

- signal means for forming a seismic signal in a compressible medium, said signal means mounted with the tracked seismic exploration vehicle; and
- conduit means mounted with the tracked seismic exploration vehicle for transferring the compressible medium seismic signal from said signal means to a substantially non-compressible fluid within a fluid-filled tire mounted with at least one of the idler wheels for coupling the seismic signal from said signal means through said idler wheel and said fluid-filled tire to the land surface.

4,008,785

TRANSPORT DEVICE FOR MOVEMENT OF AN OPERATOR UP AND DOWN A UTILITY POLE

Fernando Mugnaini, Via Gramsci 73, Colle Val D'Elsa, Siena, Italy

Filed Mar. 5, 1976, Ser. No. 664,413

Int. Cl.² A63B 27/00

U.S. Cl. 182—133

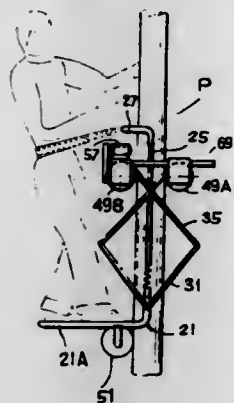
11 Claims

1. A transport device for an operator along a supporting pole comprising

- a frame including a footboard for an operator and two upright stem members adapted to flank the pole, a support roller carried by said frame;

two linkages on opposite sides of the frame each including a first pair of X linked rods having an intermediate pivot slidable along a respective stem and a second pair of symmetrical rods pivotally engaged with a fixed pin on such stem;

a pair of drive rollers with parallel axes supported by said



two linkages such that the weight of the device and of the operator on the footboard urges the drive rollers towards one another and engages them with pressure against the pole;

and operating means acting on the drive rollers to provide relative movement between said rollers and the pole to move the device up and down the pole.

4,008,786

SUPPORT FOR ELONGATED WOODEN PLANKS AND THE LIKE

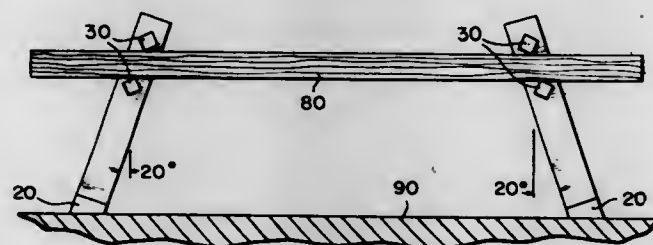
Joseph M. Canavan, Hermiston, Oreg., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Sept. 15, 1975, Ser. No. 613,109

Int. Cl.² F16M 11/00

U.S. Cl. 182-186

3 Claims



1. A support for an elongated wooden plank, comprising: two like, hollow elongated, opposed and upwardly and symmetrically inwardly extending legs;
- two like flexible protective tips, each located in the bottom end of a corresponding leg;
- two horizontally elongated parallel bars which are hollow and square in cross-section, extending between the legs; and
- two like, elongated locking pins, each pin being located inside a corresponding leg and extending through aligned holes in each of the bars to secure the bars to the leg.

4,008,787

LUBRICATION SYSTEM

James A. Whitt, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 407,636, Oct. 18, 1973, Pat. No.

3,907,690, which is a continuation-in-part of Ser. Nos.

292,550, Sept. 27, 1972, abandoned, and Ser. No. 292,664,

Sept. 27, 1972, abandoned. This application Jan. 24, 1975,

Ser. No. 543,835

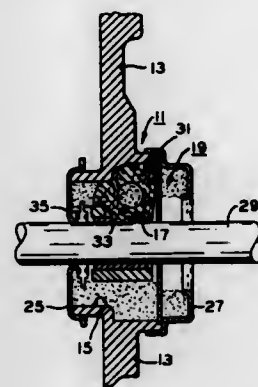
Int. Cl.² F16N 13/22

U.S. Cl. 184-12

23 Claims

2. In a lubrication system for an apparatus, the apparatus having a lubricant cavity with a bearing assembly disposed

therein and also having means for feeding a liquid lubricant supplied thereto to the bearing assembly with the feeding means disposed in the lubricant cavity in association with the bearing assembly; said lubrication system comprising means disposed within said lubricant cavity in interfacing relation with said feeding means for storing said liquid lubricant and



for releasing it to effect the supply thereof to said feeding means, said storing and releasing means comprising a mixture of said liquid lubricant, a particulate mass of synthetic fibers, and a particulate mass of discrete non-fibrous, multi-digitated, resilient-type foam particles and wherein said particulate mass of said foam particles is generally saturated with said liquid lubricant.

4,008,788

LUBRICATION SYSTEM INCLUDING LUBRICANT-STORING DISCRETE FOAM PARTICLES

James A. Whitt, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 407,635, Oct. 18, 1973, Pat. No.

3,894,956, which is a continuation-in-part of Ser. No. 292,664,

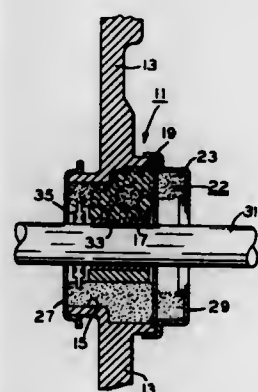
Sept. 27, 1972, abandoned. This application Jan. 24, 1975,

Ser. No. 543,834

Int. Cl.² F16N 13/22

U.S. Cl. 184-12

30 Claims



1. In a lubrication system for an apparatus having a bearing assembly in a lubricant cavity therefor; said lubrication system comprising means in said lubricant cavity for storing a liquid lubricant and for releasing it to effect a supply thereof to said bearing assembly, said storing and releasing means comprising a particulate mass of discrete, non-fibrous, multi-digitated, resilient-type foam particles generally saturated with said liquid lubricant.

4,008,789

MULTI-BRAKE SHOE MEANS FOR A MULTI-BRAKING SURFACE BRAKED ASSEMBLY

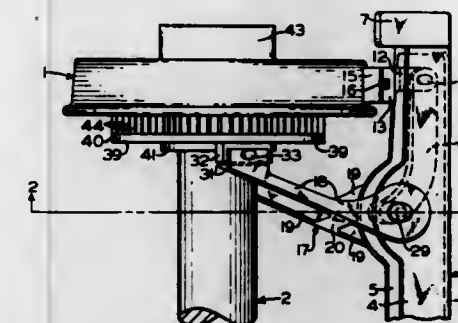
Quentin T. Clemmons, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 17, 1975, Ser. No. 587,740

Int. Cl.² F16D 63/00

U.S. Cl. 188-70 R

12 Claims



1. Multi-brake shoe means for transmitting braking forces to multi-braking surface formed at substantially right angles to each other on an element to be braked, said multi-brake shoe means comprising:

- a. a member movable toward and away from the multi-braking surfaces on the element to be braked,
- b. a plurality of braking elements each having a braking face via which a braking force is transmitted to a corresponding braking surface when moved into braking engagement therewith, and, wherein the improvement comprises:
- c. a single rigid means rockably mounted on said movable member and having said plurality of braking elements so rockably mounted on and carried by said means so as to enable said plurality of braking elements to transmit braking forces to their corresponding braking surfaces notwithstanding the rate of wear of certain of said braking elements exceeding the rate of wear of certain other of said braking elements.

4,008,790

CAMERA AND LENS CASE

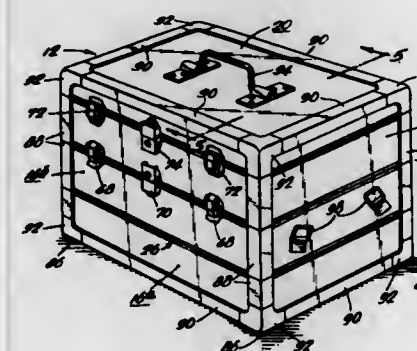
Harrison Eiteljorg, II, 142 Grays Lane, Haverford, Pa. 19041

Filed Aug. 26, 1975, Ser. No. 607,943

Int. Cl.² A45C 11/38

U.S. Cl. 190-44

3 Claims



1. A camera and lens case comprising a box-like structure including front, rear, side and bottom panel members defining a lower compartment, front, rear, side and bottom panel members defining an upper compartment, the lower edge of the rear panel member of said upper compartment being hingedly connected to the upper edge of the rear panel of said lower compartment to permit the 180° rotation of said upper compartment into an inverted position, said bottom panel member of said upper compartment being hingedly attached to the lower edge of the front panel member of said upper compartment, means for selectively securing the rear edge of said upper compartment bottom panel member to the lower edge of the rear panel member of said upper compartment, said upper compartment bottom panel member being adapted

for opening upwardly to provide access to said upper compartment when said upper compartment is rotated into the inverted position, a lid pivotally attached to the upper edge of the rear panel member of said upper compartment, means for selectively locking said lid in a closed position with respect to said upper compartment to form the top closure means thereof, means for locking said upper compartment in a closed position with respect to said lower compartment to form the top closure means thereof, said front, rear and side panel members of said lower compartment being divisible along a joint lying in a plane parallel with said bottom panel member thereof to form upper and lower sections of said lower compartment, an insert section adapted for insertion between said divisible lower compartment sections to extend the depth of said lower compartment, and means for selectively and demountably securing together said upper and lower or said upper, insert and lower section of said lower compartment.

4,008,791

TAKEUP REEL FOR COMBINED HOSE AND CABLE

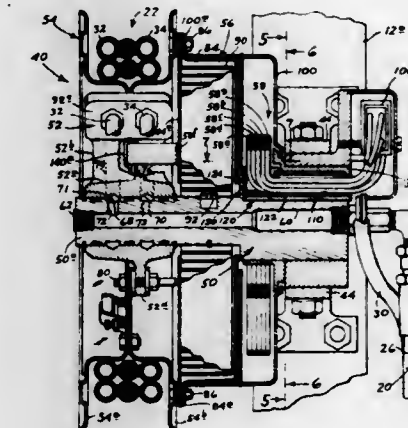
Hooshang Shafii-Kahany, Portland, and Larry D. McCart, Lake Oswego, both of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Sept. 8, 1975, Ser. No. 610,931

Int. Cl.² H02G 11/00

U.S. Cl. 191-12.2 R

5 Claims



1. A takeup reel for combined hydraulic hose and electrical cable, such cable being of the kind including multiple conductive elements, said reel comprising: a rotary storage portion for taking up and paying out such hose and cable, a mounting member mounting the storage portion for rotation thereon and accommodating attachment of the reel to an external structure, means accommodating a fluid connection between hose stored on said storage portion and a supply of hydraulic fluid external to said reel, and means accommodating a brushless electrical connection between cable stored on said storage portion and a supply of electrical energy external to said reel, said means comprising an interface cable including a different conductive element for each conductive element in cable stored on said storage portion, with the interface cable having a coiled portion with elements therein joined in substantial side-by-side contiguity and coiled about said mounting member, and a generally straight portion extending from said coiled portion along a line generally paralleling the rotary axis of said storage portion, and with the elements in said straight portion taking the form of a loose, nonjoined bundle, and strain relief means attached to said interface cable at the region of joiner of said coiled and straight portions, said strain relief means being mounted on said mounting member for limited rotation about an axis substantially paralleling the rotational axis of said storage portion.

4,008,792

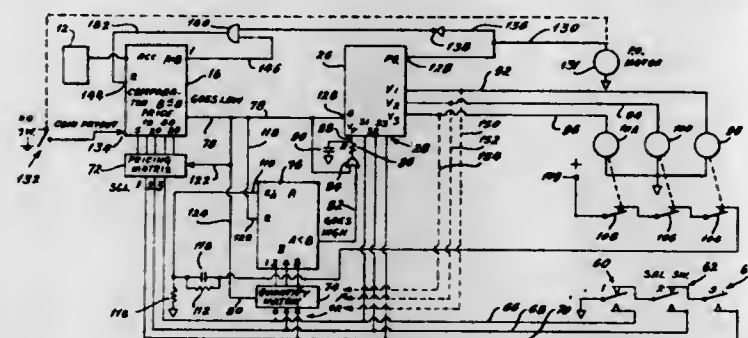
VEND CONTROL CIRCUITS CAPABLE OF VENDING DIFFERENT QUANTITIES AT DIFFERENT PRICES

Joseph L. Levasseur, St. Louis, and Larry D. Lee, Kirkwood, both of Mo., assignors to H. R. Electronics Company, High Ridge, Mo.

Filed Aug. 20, 1975, Ser. No. 606,173
Int. Cl.² G07F 5/22

U.S. Cl. 194-1 N

15 Claims



1. A vend control circuit comprising a coin unit for receiving the deposit of coins and for producing output signals to represent the value of each coin deposited, a vendor control system operatively connected to the coin unit including means for producing a vend signal to initiate a vend function whenever the amount entered therein from the coin unit at least equals the total amount of a selected vend, vend producing means operatively connected to the vendor control system and responsive to signals produced thereby, customer actuable means including means operable to select different quantities of articles at a selectable unit vend price including means to establish the vend price and the quantity of articles to be vended, entry means having a first input operatively connected to the means to establish the quantity of articles to be vended and a second input, said vending producing means including means for generating an output signal for each article that is vended, means connecting the vend producing means to the second input of the entry means, and means to terminate a vending operation when the number of articles vended corresponds to the quantity of articles selected by the customer to be vended.

4,008,793

TYPEWRITING MACHINE

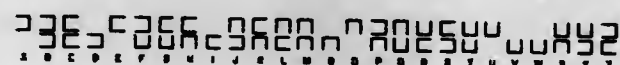
Vittorio Terracina, Vicolo Andrea Doria No. 7, 00187 Rome, Italy

Filed Sept. 7, 1972, Ser. No. 286,944

Claims priority, application Italy, Sept. 8, 1971, 52755/71
Int. Cl.² B41J 1/00

U.S. Cl. 197-1 A

8 Claims



1. A typewriter having a character associated with each of the alphabet letters and numerals thereof, said characters each being formed of the same sign oriented in one of four positions along coordinate horizontal and vertical axes and being located in one of two adjacent horizontal rows thereby being associated with several of said letters, said sign being also located in each of said rows one above the other thereby being associated with the remainder of said letters and said numerals, said sign having a right-angled and U-shaped configuration with three legs of equal length.

4,008,794

TYPE CARRIER PRINT DEFLECTION BLOCKING MEANS FOR A SINGLE-ELEMENT PRINTER

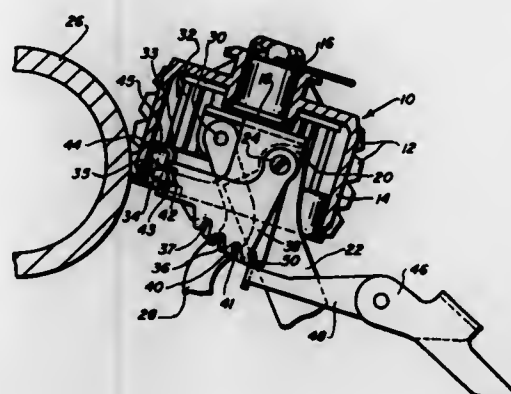
Herbert Decker, Lauf, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed Nov. 10, 1975, Ser. No. 630,270
Claims priority, application Germany, Jan. 16, 1975, 2501577

U.S. Cl. 197-55

Int. Cl.² B41J 1/60

7 Claims



1. In a single element printer comprising a hollow inverted cup-shaped type carrier having type characters on its outer periphery located in rows and columns, a platen, a tilt bridge axially supporting said type carrier for rotational movement to position a selected column of type characters opposite said platen, said tilt member having detent teeth thereon, support means pivotally supporting said tilt bridge for tilting movement about a tilt axis to position a selected row of type characters opposite said platen; said support means being movable from a rest position to a printing position to impact a selected type character against said platen, said type carrier on impact experiencing deformation with lower portions tending to move tangentially relative to said platen and support member, said type carrier having a blocking surface located in a radial plane, a blocking arm freely pivotally supported on said tilt axis having a radially extending abutment located opposite the platen and proximately beneath and spaced from said blocking surface for arresting tangential movement of said typehead relative to said platen and relative to said support member on impact of a selected type character against said platen, means on said tilt bridge and said blocking arm for supporting said blocking arm spaced from said blocking surface, said blocking arm having teeth which extend between the detent teeth on said tilt bridge, and tilt detent means movable into engagement with detent teeth on said tilt bridge and teeth of said blocking arm for moving said blocking arm and its abutment into engagement with said blocking surface and for finally tiltably positioning said tilt bridge.

4,008,795

REMOVABLE CARTRIDGE FOR THE INKED RIBBON FOR TYPEWRITERS, CALCULATING MACHINES OR OTHER OFFICE MACHINES

Sergio Garberi, and Lorenzo Bertino, both of Ivrea (Turin), Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Ivrea), Italy

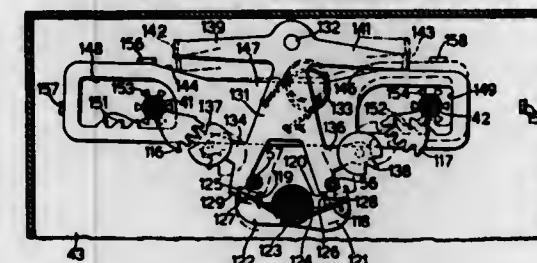
Division of Ser. No. 299,379, Oct. 20, 1972, Pat. No. 3,889,795. This application June 4, 1975, Ser. No. 583,693
Int. Cl.² B41J 33/512

U.S. Cl. 197-161

8 Claims

1. A ribbon feed mechanism for an inked ribbon for a print-

ing machine comprising: two spools carrying said ribbon, a pair of sensing elements for sensing the amount of said ribbon on said spools, a feed element, a reversal member positionable in a first and a second position, means supported by said reversal member and driven by said feed element to drive said ribbon spools in one direction and in the opposite direction according to said first and said second position of said reversal member, respectively, a reversal spring having one end connected to said reversal member and the other end positionable between a first location and a second location, said reversal spring biasing said reversal member from said first position towards said second position in said first location of said other end and from said second position towards said first position in said second location of said other end, two latches, each said latch positionable between an engaging position and a



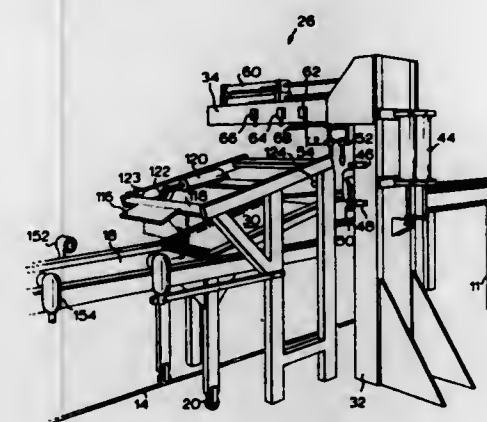
releasing position for restraining and releasing respectively said reversal member in said first and second positions thereof against the action of said reversal spring, means connecting each of said latches with one of said sensing elements for moving said latches from said engaging position to said releasing position in order to disengage said reversal member therefrom when the ribbon on the corresponding spool has reached a quantity such as to require reversal of the ribbon feed, whereby said reversal spring moves said reversal member from said first position to said second position and vice-versa, and a reload element responsive to said movement of said reversal member, said reload element driven by said feed element for repositioning said other end of said reversal spring from said first location to said second location, and vice-versa, to respectively bias said reversal member from said second position to said first position, and vice-versa.

4,008,796

CONTROL METHOD FOR FEEDING ITEMS ON A CONVEYORNorman N. Ayton, Willowdale, Canada, assignor to General Concrete of Canada Limited, Hamilton, Canada
Division of Ser. No. 454,792, March 26, 1974, Pat. No. 3,928,114. This application Dec. 3, 1975, Ser. No. 637,199
Int. Cl.² B65G 47/26

U.S. Cl. 198-460

1 Claim



1. In a conveying system comprising a first longitudinally extending conveyor means having a conveying surface for conveying items longitudinally of said first conveyor means and a discharge end, said first conveyor means having a sub-

stantially fixed position, said first conveyor means also having an openable gate means at said discharge end for controlling the discharge of items from said first conveyor means; a second longitudinally extending conveyor means having a conveying surface for conveying items longitudinally of said second conveyor means and a discharge end and being situated adjacent said first conveyor means to receive items from said discharge end of said first conveyor means, said second conveyor means being mounted for reciprocal movement longitudinally thereof and longitudinally of said first conveyor means to provide a variable portion of said second conveyor means vertically below said first conveyor means; and first and second item sensing means located in longitudinally spaced relation adjacent said second conveyor means in fixed position relative to said first conveyor means spaced from and downstream of said discharge end of said first conveyor means with said first item sensing means being spaced a distance from said discharge end of said first conveyor means which is greater than said second item sensing means;

a control method for controlling the feed of items from said discharge end of said first conveyor means onto the conveying surface of said second conveyor means during longitudinal movement of said second conveyor means relative to said first conveyor means comprising feeding items from said discharge end of said first conveyor means onto said conveying surface of said second conveyor means by selective actuation of said gate means while said latter conveying surface is in motion to convey said fed items towards the discharge end of said second conveyor means whereby a plurality of items are situated in longitudinally spaced-apart relation on said conveying surface of said second conveyor means, sensing a first item fed from said discharge end of said first conveyor means and located on said conveying surface of said second conveyor means by said first sensing means, and opening said gate means in response to said sensing to allow another of said items to pass from said discharge end of said first conveyor means onto said conveying surface of said second conveyor means; said sensing said another of said items located on said conveying surface of said second conveyor means by said second sensing means, and closing said gate means in response to said latter sensing, whereby said selective actuation of said gate means is achieved and said feed of items from said discharge end of said first conveyor means onto said conveying surface of said second conveyor means is controlled in response to said longitudinal movement of said second conveyor means to maintain said items spaced apart substantially the same distance on said conveying surface of said second conveyor means irrespective of the relative longitudinal positions of the discharge ends of said first and second conveyor means and the portion of said second conveyor means located vertically below said first conveyor means.

4,008,797

MINING MACHINE CONVEYOR WITH DEFLECTIBLE BOOM

Robert C. Nelson, Bluefield, W. Va., assignor to West Virginia Armature Co., Inc., Bluefield, W. Va.

Filed Aug. 14, 1975, Ser. No. 604,558

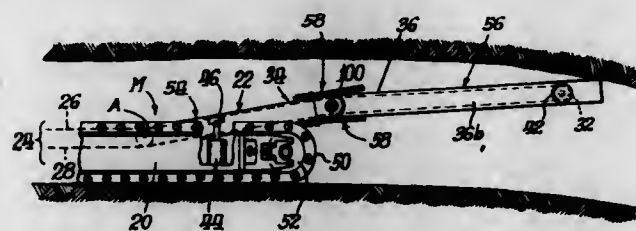
Int. Cl.² B65G 21/12

U.S. Cl. 198-318

6 Claims

1. In a mobile mining machine, a frame, an endless conveyor element trained for orbital movement along a boom extending from one end of said frame, a main pivotal connection between said frame and said boom and means for tiltably adjusting the height of said boom about said main pivotal connection, the improvement comprising: said boom comprising a main section connected to said frame by said main pivotal connection, and an end section connected to said main section by a supplemental pivoted connection;

spring means carried by said boom at said supplemental pivoted connection biasing said end section toward a normal working position aligned with said main section but enabling vertical tilting movement of said end section to a raised or lowered non-aligned position relative to said



main section in response to an abnormal vertical force against said end section sufficient to overcome the bias of said spring means, said spring means being effective to tiltably return said end section upwardly or downwardly to said normal working positions aligned with said main section upon release of said abnormal vertical force.

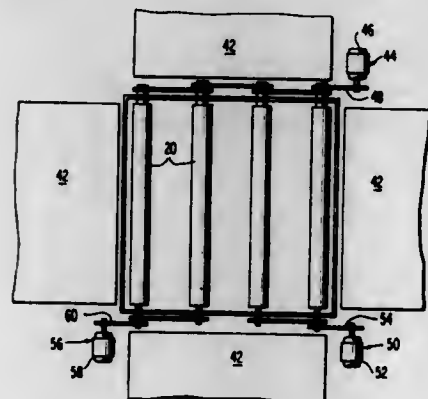
4,008,798 TURNTABLE

Bert Krivec, Waukesha, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Sept. 12, 1975, Ser. No. 612,961
Int. Cl.² B65G 47/24, 13/02

U.S. Cl. 198-411

4 Claims



1. A turntable comprising:

- a. a plurality of transfer roller assemblies mounted in planar array, each of said transfer roller assemblies comprising:
 - i. a hollow cylindrical roller having a plurality of spaced apertures in the surface thereof and
 - ii. a plurality of stub rollers mounted in said hollow cylindrical roller such that their axes of rotation are not parallel to the axis of rotation of said hollow cylindrical roller and a portion of the surface of each of said stub rollers protrudes through a corresponding one of said plurality of spaced apertures in said hollow cylindrical roller;
- b. first means for rotating said hollow cylindrical rollers in a first subset of adjacent ones of said transfer roller assemblies in a selected direction;
- c. second means for rotating said hollow cylindrical rollers in a second subset of adjacent ones of said transfer roller assemblies in a selected direction;
- d. third means for rotating said stub rollers in said first subset of said transfer roller assemblies in a selected direction;
- e. fourth means for rotating said stub rollers in said second subset of said transfer roller assemblies in a selected direction; and
- f. fifth means for controlling said first, second, third, and fourth means so that the direction in which said third means causes the stub rollers in said first subset of said transfer roller assemblies to rotate is independent of the direction in which said fourth means causes the stub

rollers in said second subset of said transfer roller assemblies to rotate and so that an object positioned upon said plurality of transfer roller assemblies can be caused to rotate and/or translate with respect to said plurality of transfer roller assemblies.

4,008,799

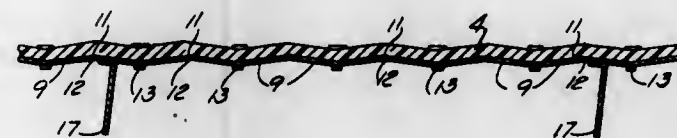
CONVEYOR BELT WEAR PROTECTION

William T. Barrett, Waukesha, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Sept. 8, 1975, Ser. No. 611,495
Int. Cl.² B65G 15/42

U.S. Cl. 198-698

2 Claims



1. A wear protected conveyor belt comprising, in combination, an elongated belt having a longitudinal axis, a plurality of plates, means connecting said plates to a surface of said belt with said plates aligned longitudinally on and covering a generally continuous length of said belt, said plates being spaced inwardly from the longitudinal edges of said belt so that said plates cover the central area of said belt and leave an area of said belt adjacent the longitudinal edges thereof exposed, said plates also having a bowed configuration in a plane generally normal to said belt surface and parallel to said longitudinal belt axis and said plates having opposite plate edges, and means defining a cleat attached to a plurality of said plates at points spaced along said longitudinal axis, said cleats projecting laterally from said plates and relative to said belt and also extending generally normal to said longitudinal axis.

4,008,800

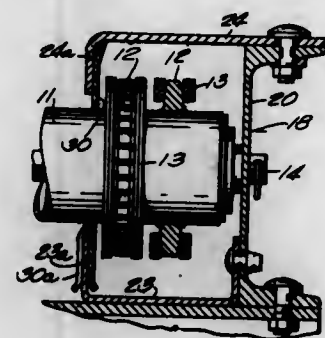
CHAIN DRIVEN ROLLER CONVEYOR WITH CLOSURE PLATES

Emil John Forsyth, Danville, Ky., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 26, 1975, Ser. No. 635,565
Int. Cl.² B65G 13/11

U.S. Cl. 198-782

8 Claims



1. In a power driven roller conveyor, in combination, spaced parallel side frames; a series of rollers mounted between said side frames; power means for driving said rollers disposed along one set of ends of the rollers; a plurality of spaced support means associated with said side frames for receiving and supporting the axes of said rollers, said support means spaced a distance S apart along the side frames; spaced members projecting from one of said side frames over and below said drive means and the one set of ends of the rollers;

and a plurality of removable abutting plates positioned against the ends of said spaced members and enclosing the drive means, at least a portion of the abutting plates having holes through which the rollers may extend, the width of said abutting plates being a multiple of S thereby permitting changes in the center-to-center spacing of the roller in multiples of S.

4,008,801

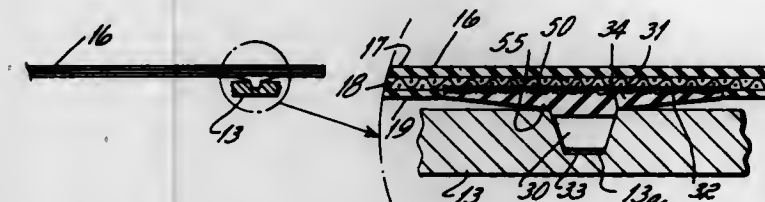
GUIDE FOR CONVEYOR BELT

James E. Reilly, Bromley; Frank A. Klaene, and Michael E. Dunn, both of Fort Mitchell, all of Ky., assignors to F. N. Shepard & Company, Cincinnati, Ohio

Filed June 19, 1975, Ser. No. 588,521
Int. Cl.² B65G 15/46

U.S. Cl. 198-841

13 Claims



1. A guide for a conveyor belt having at least one outer surface, said guide comprising an elongated rib, an elongated base web integral with said rib and having a width greater than said rib, said rib extending outwardly from said base, said base web having a first thickness near its juncture with said rib and a thinner second thickness near its respective edges, and an elongated fabric backing secured to a side of said base web opposite said rib, said guide being attached to said conveyor belt, edges of said guide lying in the plane of said conveyor belt's outer surface, and said base web, at its juncture with said rib, lying outwardly of the plane of said outer surface to provide a predetermined wear area adjacent said rib.

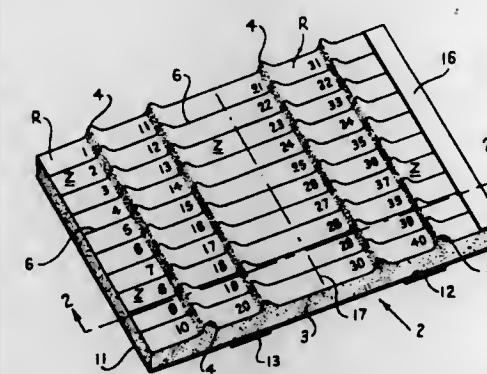
4,008,802

SURGICAL NEEDLE RETAINING AND INVENTORY PAD, AND ACCOUNTING METHOD

Samuel L. Freltag, Oakland, Calif., assignor to Acura-Med, San Leandro, Calif.

Filed May 19, 1975, Ser. No. 578,714
Int. Cl.² A61L 17/02

U.S. Cl. 206-63.3



1. A surgical needle retaining and inventory pad comprising a base sheet having at least three parallel rows of consecutively numbered needle receiving zones on a face thereof, and at least two spaced apart continuous ridges of resilient flexible material projecting upright from said face adjacent each zone into which a surgical needle can be inserted and retained, said ridges being integral with said base sheet and parallel to each other, the consecutively numbered zones being defined by the ridges and by lines on said face of the base sheet extending

transversely with respect to said ridges, said base sheet being permanently bonded to a relatively stiff backing sheet which has a line of weakness along which the pad can be folded.

4,008,803

PACKAGE FOR TWO REACTIVE INGREDIENTS OF A DESIRED MIX IN A SINGLE PACK

F. Charles Smith, 9 Glenview Road, Strathmore, Victoria, Australia (3041)

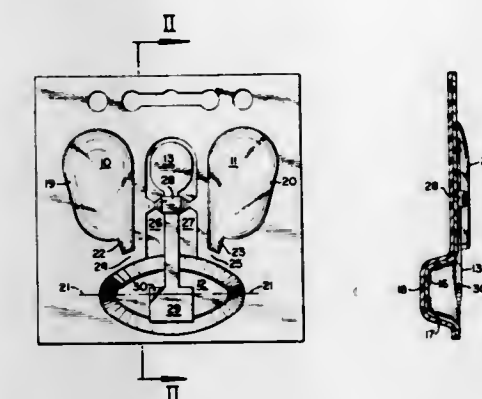
Filed Nov. 7, 1973, Ser. No. 413,578

Claims priority, application Australia, Nov. 8, 1972, 1150/72

Int. Cl.² B65D 25/08

U.S. Cl. 206-220

1 Claim



1. A package comprising two strips of thermo-plastic material sealed in face-to-face relation, one of said strips having two cut-out apertures in its central portion separated by a band integral with the material of said strip and a preformed cavity projecting downwardly from the plane of the strip adjacent one of the apertures, said strip also having a preformed sac projecting upwardly from the plane of the strip on each side of said central portion, a quantity of resin in one of said sacs and a quantity of hardener in the other of said sacs, said second strip having a preformed cavity projecting downwardly and mating with said first cavity to form a mixing bowl, each said sac having a projection adjacent said mixing bowl, a flat spatula extending along said cut-out apertures, said spatula underlying said band and overlying said bowl and having a sharpened point for rupturing said projections to permit extrusion of the contents of said sacs into said mixing bowl.

4,008,804

BATHTUB CONTAINER AND METHOD

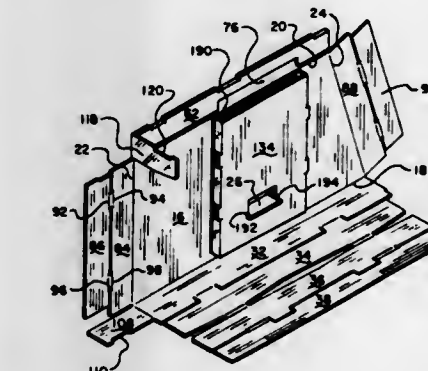
Lewis D. Poggiali, Owosso, Mich., assignor to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 428,800, Dec. 27, 1973, Pat. No. 3,957,158. This application Oct. 9, 1975, Ser. No. 621,101

Int. Cl.² B65D 85/30, 85/64

U.S. Cl. 206-320

2 Claims



1. A two-piece paperboard end cap for a wrap-around bathtub package, the combination comprising
 - a. a four sided planar member having top and bottom edges and front and rear side edges,

- b. a plurality of cushion members, one for each of said edges, with each cushion member formed with at least a pair of roll-up members that are perpendicularly disposed to said planar member at its corresponding edge,
- c. a support member positioned in juxtaposition to said planar member and between said cushion members,
- d. the cushion member at said top edge having a recess in one of said roll-up members receiving an end of said support member whereby the end of said support member is disposed adjacent the other of said roll-up members, and
- e. fixing means operatively connecting said planar member and said support member whereby said support member is fixedly attached to said planar member.

4,008,805

APPARATUS AND METHOD FOR SORTING OBJECTS ACCORDING TO LENGTH

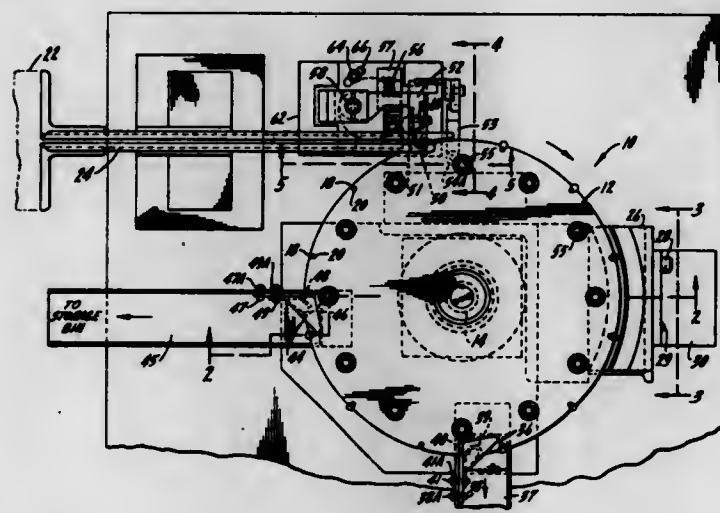
Paul Goerke, 14126 Dearborn, Riverdale, Ill. 60627, and Waldemar S. Dyhringer, 257 E. 143rd St., Dolton, Ill. 60619

Filed June 9, 1975, Ser. No. 585,357

Int. Cl.² B07C 1/10

U.S. Cl. 209-73

13 Claims



1. A apparatus to segregate elongated objects according to length comprising:
- a rotatable disc;
 - object inlet means located adjacent to the periphery of said disc to supply elongated objects to said disc;
 - at least one magnetic means at or near the periphery of said disc so that, as said disc rotates, said magnetic means picks up and hold at least one elongated object from said object inlet means, said magnetic means holding said elongated objects in a substantially vertical position relative to the rotation of said disc;
 - substantially stationary leveling means located below said disc to contact said elongated objects being held by said magnetic means below said disc and to provide a substantially constant predetermined length below said disc of said elongated objects being held by said magnetic means as said disc rotates past said leveling means; and
 - a plurality of exit means to remove and recover said elongated objects from said magnetic means as said disc rotates, each such exit means comprising removal means at least partially located at a predetermined height above said disc for removing said elongated objects from said magnetic means and a collection means for storing said elongated objects thus removed, provided that the predetermined height above said disc of each succeeding removal means decreases.

4,008,806

SORTER FOR YARN-LIKE MATERIALS

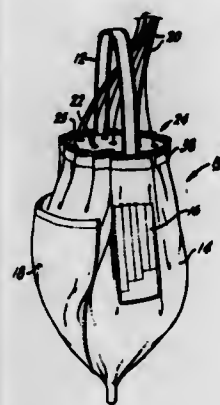
Consuelo R. de Páez, and Stephen A. Páez, both of Pittsburg, Calif., assignors to Consuelo R. de Páez, Pittsburg, Calif.

Filed Dec. 16, 1974, Ser. No. 533,023

Int. Cl.² B07C 7/00

U.S. Cl. 209-122

10 Claims



1. A device for the sorting, storage and transportation of yarn-like material, such as cord, thread, line and the like, tools and other paraphernalia comprising:
- a. a bag containing a plurality of elongated yarn-like material skeins including means for holding the skeins, said holding means mounted about the skeins intermediate the ends thereof for fixedly securing the same against a portion of the interior of said bag, said holding means permitting access to and relative movement of the free ends of the skeins,
 - b. means for sorting the free ends of said yarn-like material including a sorting member disposed in a portion of the body of said bag and having a plurality of openings for separating and guiding the free ends of the skeins from the interior to the exterior of said bag, the skeins being readily available to the user.

4,008,807

DISPLAY DEVICE PARTICULARLY SUITABLE FOR SHOES

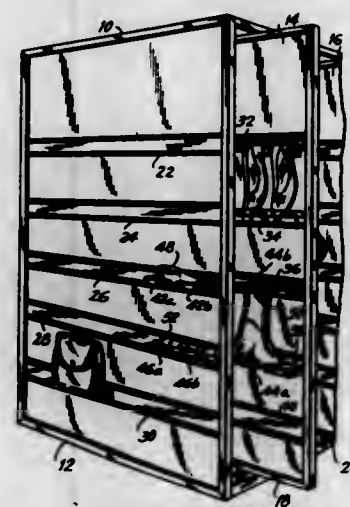
Geoff Phillips, 2 W. 45th St., New York, N.Y. 10036

Continuation-in-part of Ser. No. 553,172, Feb. 26, 1975, abandoned. This application June 2, 1975, Ser. No. 582,701

Int. Cl.² A47F 7/08

U.S. Cl. 211-34

13 Claims



1. An article display comprising cooperating article support sections adapted for supporting an article there-between and means for holding said sections in adjustably spaced relation, said means including two arrays of horizontal guides arranged in parallel horizontal planes and a panel wedged between said arrays, said sections being adjustably located in said guides, each of said sections including a flange adapted to ride in one

of said guides, a base extending horizontally from said flange and lateral and front lips on said base to define a box-like structure therewith.

4,008,808

RAZOR SAFETY RACK

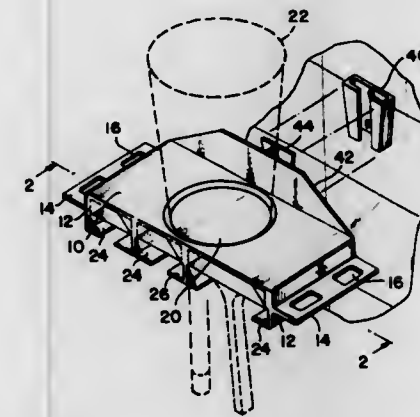
Jack D. Ramsay, Duluth, Minn., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Dec. 29, 1975, Ser. No. 644,738

Int. Cl.² A47B 81/02; A47F 5/08

U.S. Cl. 211-65

3 Claims



1. A holder for a plurality of safety razors and other bathroom articles comprising:
- a horizontally elongated housing having a plurality of recesses underneath a shelf, some of said recesses receiving safety razors of the double-edge type and at least one recess receiving razors of single-edge type;
 - two horizontal, opposed flanges, each flange being located on a corresponding end of the shelf and bearing a plurality of holes through which toothbrush handles may be placed;
 - a spring-loaded plate located in the said one recess for receiving single edged razors;
 - catch means located in the said some recesses for pressing against the head of double edge razors placed therein to retain the razors removably in the recesses and thereby prevent them from being accidentally dislodged therefrom; and
 - mounting means detachable securing the housing to a vertical wall.

4,008,809

COLUMN-TYPE DISPLAY STAND FOR FLAT PARALLELIPIPEDIC ARTICLES

Amilcare Dogliotti, Nelve (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy

Filed July 14, 1975, Ser. No. 595,635

Claims priority, application Italy, Nov. 20, 1974, 53612/74[U]

Int. Cl.² A47F 5/04, 7/03

U.S. Cl. 211-71

4 Claims

1. A column-type display stand for flat parallelipiped articles comprising a lower supporting base and an upper display column mounted thereon, said column comprising two lateral zig-zag shaped sides disposed in parallel vertical planes and a plurality of interconnected transverse plates connected between the two sides and being alternately inclined in opposite directions so as to define with said sides a plurality of rectangular chambers alternately inclined in opposite directions and rib means on the plates defining at least one of said chambers to define the spaces for the articles, said chamber having said rib means being located adjacent to the lower supporting base and having dimensions smaller than the other chambers in said column and container means having external dimensions substantially identical to the internal dimensions of said other chambers and adapted to fit snugly therein, said container



and rib means on the longer walls of each elongated compartment to define the spaces for the articles.

4,008,810

EQUIPMENT FOR MIXING SHAKEN DRINKS

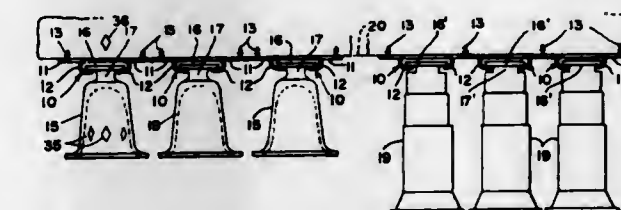
William James Merz, 220 W. Rittenhouse Square, Philadelphia, Pa. 19103

Division of Ser. No. 527,630, Nov. 27, 1974, Pat. No. 3,985,346. This application Oct. 15, 1975, Ser. No. 622,632

Int. Cl.² A47G 29/00

U.S. Cl. 211-71

3 Claims



1. An array of bar accessories for use in preparing shaken drinks, comprising a shaker shell having a pedestal with a base flange connected to the shell by a neck portion having two parallel sides, a plurality of slide racks each comprising a hanger rail of C-section adapted to be mounted on the underside of a bar, and each having mounting means along its lengths, said racks receiving and supporting the shell flanges, said shaker shell having an oval lip at its open end and said necks cooperating with said racks to maintain their parallel sides parallel to the long axis of the oval lips of said shells.

4,008,811

UNCOUPLING DEVICE FOR CENTRAL BUFFER COUPLINGS ON RAILROAD VEHICLES

Kuno Nell, Zorneding, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed June 18, 1975, Ser. No. 587,865

Claims priority, application Germany, June 19, 1974, 2429365

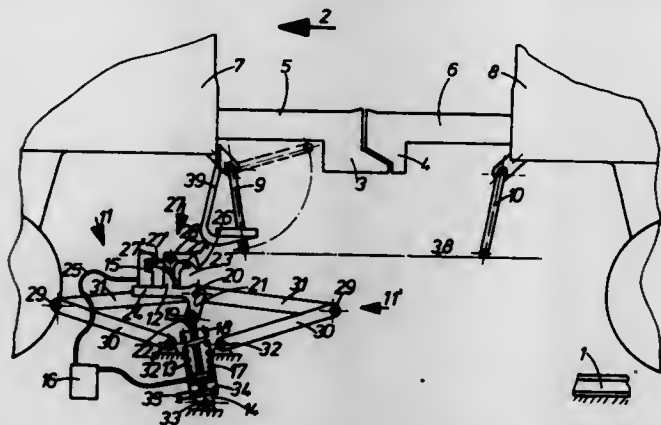
Int. Cl.² B61G 7/04

U.S. Cl. 213-211

12 Claims

1. An uncoupling device for a central buffer coupling on a railroad vehicle having an uncoupling lever pivotable about a horizontal axis transverse to the longitudinal axis of the vehicle, and comprising an operating mechanism adjacent the rails upon which the railroad vehicle is positioned and having one portion thereof pivotally mounted about a horizontal axis transverse to the longitudinal axis of the vehicle and movable

between an inoperative position and an uncoupling lever engaging position, a hook pivotally mounted on another portion of said operating mechanism to engage the uncoupling lever, drive means connected to said operating mechanism for



moving said operating mechanism between said inoperative and engaging positions, and switch means responsive to the engaging of the uncoupling lever within said hook for initiating movement of said operating mechanism from the engaging position to an uncoupling position.

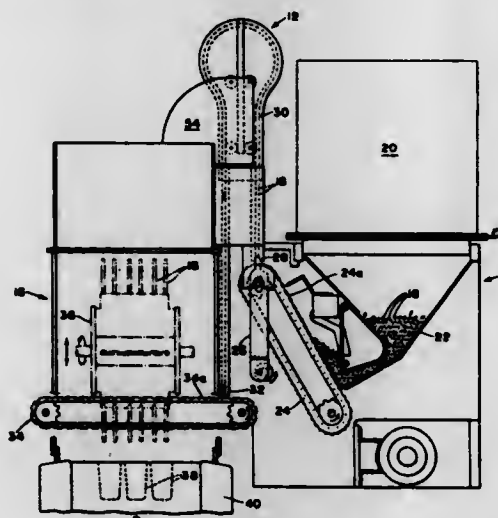
4,008,812

STICK STORAGE APPARATUS WITH AUTOMATIC REJECT SYSTEM FOR MISALIGNED STICKS
Meredith Stuart, Rogers, Ark., assignor to Forster Mfg. Co., Inc., Wilton, Maine

Filed Sept. 15, 1975, Ser. No. 613,353
Int. Cl.² B65G 37/30

U.S. Cl. 214-6 BA

9 Claims



1. Apparatus for storing flat, elongated sticks in an aligned, face-to-face relationship, comprising, in combination, a guideway having a first substantially vertical section with a stick input formed at its lower end, a second substantially vertical section with a stick output formed at its lower end, and a curved upper section connecting the upper ends of said vertical sections, each of said guideway sections being spaced from the ends and side edges of said sticks a sufficient distance to maintain said aligned face-to-face relationship while allowing said sticks to advance within said guideway from said input means to said output means in a direction generally normal to the face of each of said sticks,

said upper section being movable vertically with respect to said first and second sections to store a varying number of sticks in said guideway while maintaining a substantially constant inter-stick pressure, means for retaining said sticks in said first vertical section against the influence of gravity, and means for sensing the approximate number of sticks stored in said guideway.

4,008,813 CONVEYING DEVICE FOR CODE SORTING POSTAL ITEMS

Carolus Pieter Leersnijder, Heemstede, Netherlands, assignor to Staat der Nederlanden, Posten, Telegrafie en Telefonie, The Hague, Netherlands

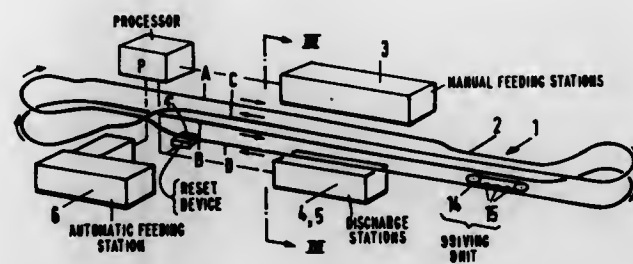
Filed Feb. 6, 1975, Ser. No. 547,389

Claims priority, application Netherlands, Feb. 8, 1974, 7401774

Int. Cl.² B65G 43/00

U.S. Cl. 214-11 R

5 Claims



1. A device for code sorting postal items, comprising:
 - A. an endless cable main conveyor,
 - B. carriers mounted at right angles to and on said main conveyor cable,
 - C. rails along said main conveyor for guiding said carriers,
 - D. at least one means for engaging said carriers for driving said cable,
 - E. a plurality of cassettes having wide top edges for cooperating with and being removably mounted in said carriers, said cassettes being mounted at right angles to the direction of movement of said main conveyor, and each cassette being capable of transporting one postal item in an upright position,
 - F. at least one feeding station along said main conveyor where postal items are fed to said cassettes,
 - G. means at said feeding station for transferring and recording in a processor coded information relative to the destination of said postal items,
 - H. a plurality of discharged positions along said main conveyor into which postal items are discharged from said cassettes in accordance with the coded information recorded in said processor,
 - I. endless belt means coupled to said main conveyor for removing cassettes from said main conveyor before they pass said feeding station, said endless belt means having catches engageable with an empty cassette for withdrawing it from said main conveyor, and
 - J. a second belt conveyor also coupled to said main conveyor and running parallel to it at the same speed of said main conveyor for supporting a removed cassette and moving it toward said feeding station.

4,008,814

CRANE WITH A GRIPPING DEVICE FOR HANDLING SLABS

Leopold Kral, Am Flutgraben 64, 5000 Cologne 80; Klaus-Günter Finke, Birkenweg 16, 4019 Monheim, and Theo Webers, Friedrich-List-Str. 5, 403 Ratingen, all of Germany

Filed Jan. 31, 1975, Ser. No. 545,979

Claims priority, application Germany, Feb. 6, 1974, 2405601

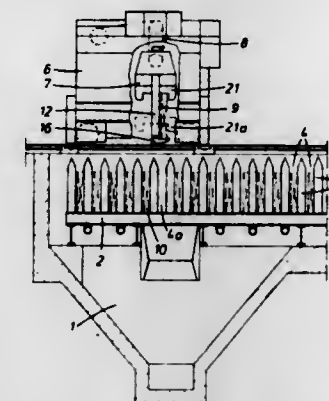
Int. Cl.² B65G 47/00

U.S. Cl. 214-16 B

7 Claims

1. A gripping device for handling slabs to be deposited side by side in storage means, the device comprising:
 - a. a mobile crane at least part of which is disposed over the storage means and which is displaceable in a direction transverse to slabs stored therein;
 - b. a bridge structure vertically displaceable relative to said mobile crane;

- c. at least two gripper means carried by said bridge structure and disposed at spaced locations with respect to the stored slabs, both gripper means being disposed in a plane substantially parallel to the planes of the slabs;
- d. each gripper means including a vertical support rod which can be lowered into the storage means, each vertical support rod having at least one controllable load support member at the lower end thereof for selectively engaging under or releasing the slabs;
- e. vertical guide rod means coupled with said bridge structure and profiled holder means mounted on said guide



rod means for free vertical movement relative to said bridge structure between a low end position defined by an abutment on said guide rod and a high end position defined by the height of the slab being handled, the storage means including a plurality of compartments for holding slabs in generally parallel array, the profiled holder means being of such dimension as to extend transversely over two adjacent compartments whereby said holder means prevents tilting of the slabs when supported by said gripper means and whereby, upon lowering of said bridge structure, said profiled holder means engages an upper end of the slabs to be handled.

4,008,815

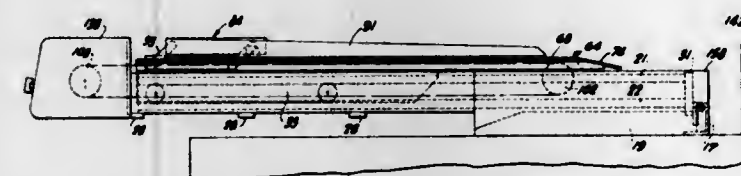
REACTOR LOADING APPARATUS
Robert Walter Fisk, Sunnyvale, Calif., assignor to Applied Materials, Inc., Palo Alto, Calif.

Filed Apr. 14, 1975, Ser. No. 567,634

Int. Cl.² B65G 49/00

U.S. Cl. 214-17 C

13 Claims



1. In apparatus for transporting an object into or out of a chamber having an opening of limited height through which the object can pass:
 - A. a base mounted in a predetermined position outside the chamber;
 - B. an axially elongated framework mounted on the base generally in alignment with the opening in the chamber;
 - C. a first carriage mounted on the framework and movable between advanced and retracted axial positions;
 - D. a second carriage mounted on the first carriage and movable axially between advanced and retracted positions relative to the first carriage for receiving the object and carrying the same between a position outside the chamber in which the first and second carriages are both in their retracted positions and a position inside the chamber in which both carriages are in their advanced position; and
 - E. an axially extending fork assembly mounted on the second carriage for engaging the object to carry the same;

- F. the framework being pivotally mounted to the base to permit movement of the fork assembly between raised and lowered positions when the second carriage is in a predetermined position.

4,008,816

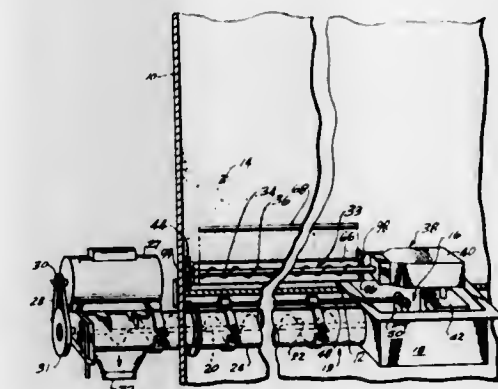
GRAIN BIN SWEEP AUGER WITH TORQUE ARM
Leonard E. Harrison, Clay Center, Kans., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed May 16, 1975, Ser. No. 578,271

Int. Cl.² B65G 65/30

U.S. Cl. 214-17 DA

12 Claims



1. In a grain storage bin having a floor with a central grain discharge opening in it, apparatus for unloading grain from the bin comprising:
 - an elongated sweep auger located in the bin and extending radially from the vicinity of the discharge opening to the outer wall of the bin;
 - means for rotating the sweep auger about its longitudinal axis and for permitting angular travel of the auger around the interior of the storage bin to pull grain toward the discharge opening;
 - an elongated grain-deflecting shield extending generally parallel to the auger along substantially the entire length thereof;
 - means for attaching the shield in a fixed position spaced closely from the auger on the side thereof remote from the direction of angular travel of the auger, the shield being mounted so that a generally concavely curved face of the shield faces toward the auger so the shield cooperates with the auger during use to channel grain toward the discharge opening during axial rotation of the auger, said shield attachment means including a pair of rigid support bracket means spaced apart along the length of the auger;
 - a rigid, elongated stiffening member extending along a side of the shield opposite the auger;
 - means for attaching the stiffening member in a fixed position spaced closely from the shield along a substantial portion of the length thereof to stiffen the shield longitudinally and torsionally and to stiffen the auger longitudinally, said stiffening member attachment means including a pair of rigid support bracket means for rigidly affixing the opposite end portions of the stiffening member in said fixed position and for engaging the opposite end portions of the shield, and means for rigidly attaching the stiffening member support bracket means and the opposite end portions of the shield to the shield support bracket means; and
 - means for releasably attaching the stiffening member and the shield to the shield support bracket means to permit adjusting the vertical elevation of the shield and stiffening member above the bin floor relative to the position of the sweep auger.

4,008,817

SAW BLADE HANDLING DEVICE

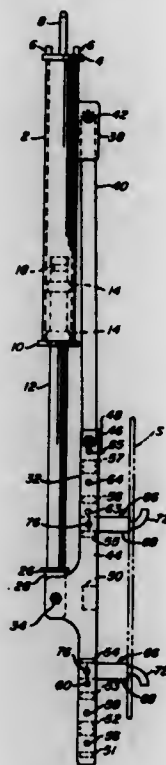
Robert L. Johnson, Calumet City, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1972, Ser. No. 227,477

Int. Cl.² B66C 1/00

U.S. Cl. 214-147 R

6 Claims



1. A handling device for a saw blade and the like having a pair of diametrically opposed holes therein, said device comprising a vertical cylinder, lifting means at the top of said cylinder, a lifting rod slidably mounted in said cylinder with its lower end extending below the bottom of said cylinder, a saw blade support, means pivotally connecting said support intermediate its length to the lower end of said rod for movement between horizontal and vertical positions, and a link having its upper end pivotally mounted on the outside of said cylinder and its lower end pivotally connected to the upper end of said saw blade support, said saw blade support having a pair of lugs extending generally normal therefrom one on each side of the pivot connection to said rod and adapted to engage in said diametrically opposed holes in the saw blade, including means for selectively mounting said lugs on said support various distances from the pivot connection to said rod, said lifting rod being movable between upper and lower positions, means limiting downward movement of said rod, and means for locking said rod in its upper position with said saw blade support being in its horizontal position.

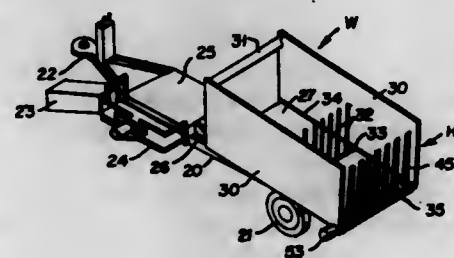
4,008,818

HAYSTACKING AND RELOADING TAILGATE APPARATUS

Allan B. Neely, Jr., 12991 E. Nevada, Aurora, Colo. 80012
Continuation-in-part of Ser. No. 275,479, July 7, 1972. This application Apr. 11, 1975, Ser. No. 567,139Int. Cl.² B60P 1/28

U.S. Cl. 214-505

7 Claims



1. A haystack loading and unloading apparatus adapted to be mounted at the end of a hay wagon or the like, to load and

unload an upstanding stack of hay bales thereon and therefrom, and comprising, in combination therewith:

- a transverse, horizontally disposed array of longitudinally extended arms in spaced parallelism and cantilevered from the hay wagon to support the stack of hay bales;
- means to support the arms with the stack of hay bales thereon including a transverse array of longitudinally axised sleeves carried on the wagon with the base portion of each arm being slidably fitted into a sleeve and with the arm being cantilevered therefrom; and
- means at the base of the arms to longitudinally reciprocate the arms within the sleeves, with adjacent arms reciprocating in different directions, whereby to facilitate moving the arms under or from a haystack.

4,008,819

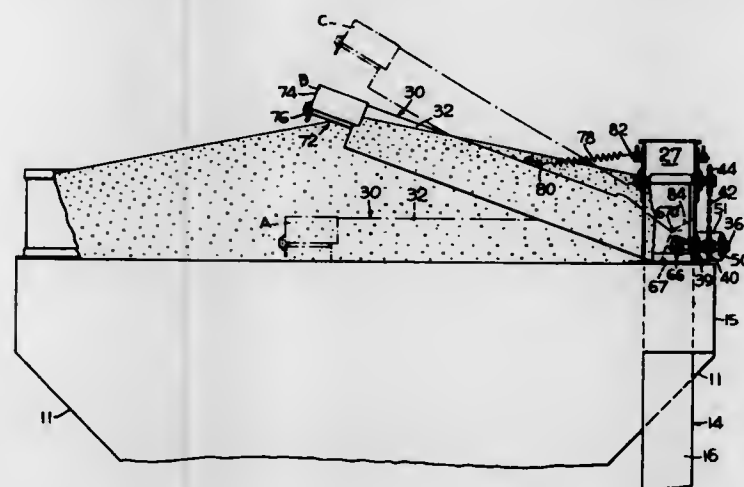
Roger D. Hanaway, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 26, 1975, Ser. No. 617,097

Int. Cl.² B60P 1/40

U.S. Cl. 214-522

12 Claims



1. In combination, a grain storage tank means adapted to be mounted on an agricultural combine, an elevating conveyor adapted to deliver grain to an upper portion of said storage tank means, a grain conveyor positioned contiguous but beneath the upper end of said storage tank means, said grain conveyor being adapted to receive grain discharged by said elevating conveyor and to convey grain thus received to a substantially downwardly directed discharge outlet of said grain conveyor in overlying relation to the interior of said storage tank means, said grain conveyor being adapted to be connected to a drive means including a universal connecting means whereby said grain conveyor remains connected in driven relation to said drive means at changing angular positions of said grain conveyor relative to the horizontal plane, support means supporting said grain conveyor for pivotal movement about a horizontal axis coincident with the center of said universal connecting means whereby at least the discharge end of said grain conveyor rides on the upper surface of the loaded grain in said storage tank means when the level of grain in said storage tank means exceeds a predetermined level, and means defining a path excluding said universal connecting means for passage of grain from contiguous the upper end of said elevating conveyor to the intake of said grain conveyor.

4,008,820

PLASTICS MATERIAL CLOSURE MEMBER FOR A CONTAINER

Joseph Ruetz, Jurastrasse 41, 2502 Biel, Switzerland
Filed Dec. 10, 1975, Ser. No. 639,415

Claims priority, application Switzerland, Dec. 16, 1974, 16725/74

Int. Cl.² B65D 41/18

U.S. Cl. 215-256

10 Claims

1. A closure member made of plastic material for a con-

4,008,822

NON-ROTATABLE FLAME GUARD ASSEMBLY

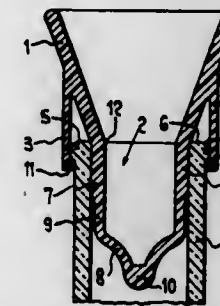
William Michael Carroll, Milwaukee, Wis., assignor to Koller Die & Tool Company, Milwaukee, Wis.

Filed Nov. 24, 1975, Ser. No. 634,495

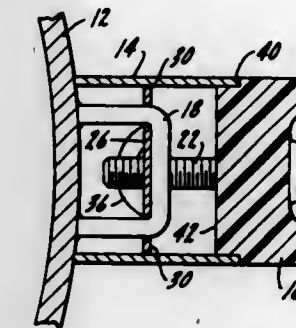
Int. Cl.² B65D 25/28

U.S. Cl. 220-94 R

7 Claims



portion, said centering member having a side wall offset from and parallel to said sealing wall, and a curved bottom wall extending outwardly and upwardly from a center point to said side wall, and wherein said wall member of said gripping portion, said centering member and said sealing wall are laterally deformable.



1. In a cooking utensil having a vessel and a handle attached thereto, an improved interconnecting means comprising:

- a tapered tubular, non-annular flame guard having contoured ends mating with the vessel and the handle;
- a locking plate having a stamped thread therein and a non-annular circumference engaging the interior walls of said tubular flame guard;
- a bracket mounted on the vessel and having an aperture therein, said bracket having a shape to permit insertion of said locking plate between the bracket and the vessel; and
- a bolt passing through said handle, said tubular member, and said aperture for threaded engagement with said stamped thread.

4,008,821

NECKED-IN CAN BODY AND APPARATUS FOR MAKING SAME

George W. Thompson, Orland Park, and John T. Hilgenbrink, Oak Lawn, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

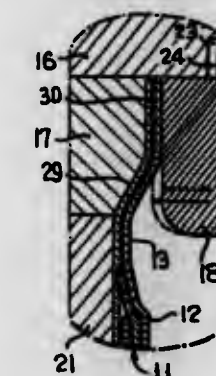
Division of Ser. No. 77,617, Oct. 2, 1970, Pat. No. 3,690,279.

This application Aug. 3, 1972, Ser. No. 277,609

Int. Cl.² B65D 7/42

U.S. Cl. 220-67

8 Claims



5. A substantially tubular metal can body comprising a substantially cylindrical central section and at least one necked-in terminal section, said necked-in terminal section having an annular portion providing an abrupt and substantial reduction in diameter of said tubular can body, said tubular can body further including a side seam extending along said tubular body including said necked-in section, said side seam including a soldered interlocking portion extending along said cylindrical central section and at least one lap portion extending throughout said at least one necked-in terminal section and into said cylindrical central section, said necked-in terminal section being of an external diameter substantially less than the external diameter of said cylindrical central section whereby a can end double seamed to said necked-in terminal section including the normal protruding double seam will be recessed within an axial projection of said cylindrical central section, said lap portion extending along the surface of said annular portion so as to extend substantially radially and axially beyond said necked-in terminal section.

4,008,823

CONTAINER WITH ATTACHED PULL TAB OPENER

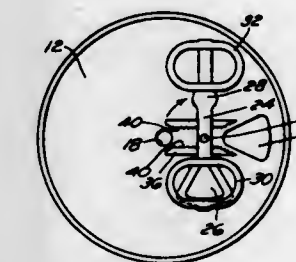
Richard E. Tarro, 425 Broadway, Providence, R.I. 02914

Filed Aug. 11, 1975, Ser. No. 603,590

Int. Cl.² B65D 41/32

U.S. Cl. 220-269

10 Claims



1. A pull tab opener device for a container having a metal top comprising a scored portion outlining the opening, said scored portion being of a generally oval shape aligning axially with a radius of the top, said scored portion having an enlarged end adjacent the outer perimeter of the top and a small end at the inner end, a pull tab attached to said scored portion adjacent the outer edge thereof on the enlarged end, said pull tab having a portion bent over the edge of the container to extend below the edge, said bent portion snapping over the edge of the container to releasably retain said tab in open or closed position, and means for pivotally attaching the inner small end of said scored portion to the metal top of the container.

4,008,824

CONTAINER CLOSURE HAVING TEAR-AWAY CONSTRUCTION

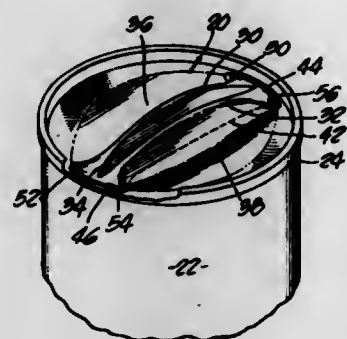
Charles Simon Remoux, 14 Rue d'Orchampt, Paris 18eme, France

Filed Apr. 2, 1975, Ser. No. 564,491

Claims priority, application United Kingdom, Apr. 9, 1974, 15693/74

Int. Cl.² B65D 41/32

U.S. Cl. 220-270



1. A closure for a container comprising: a generally circular metal member having an outer peripheral edge adapted to be secured and sealed around the peripheral opening of a generally cylindrical container; means defining a continuous line of weakness enclosing a portion of the upper surface of said member which extends substantially diametrically across a major portion of said closure; and a pair of substantially parallel, substantially diametrically extending upstanding ridges within said portion of said member which is enclosed by said line of weakness; said upstanding ridges being integrally formed in said member; said upstanding ridges being spaced from one another to define a generally diametrically extending space therebetween; said upstanding ridges being adapted to be squeezed towards one another to tear a portion of said member along a portion of said line of weakness and thereafter, to be pulled to tear the entire portion of said member enclosed by said line of weakness from the remainder of said member to form an opening therein through which the contents of a container to which said member is connected may be removed; and means defining a depressed area in said metal member adjacent the outwardly facing surface of each of said upstanding ridges for accommodating the thumb and forefinger of a user to facilitate squeezing said upstanding ridges toward one another.

4,008,825

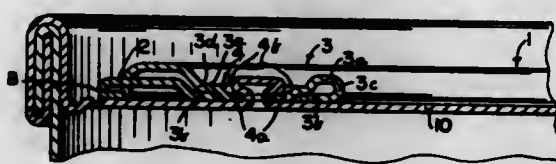
ABUSE RESISTANT PULL TAB

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed May 10, 1976, Ser. No. 684,686

Int. Cl.² B65D 41/32

U.S. Cl. 220-273



1. An improved thin sheet metal pull tab having fracturing means adapted for fracturing a score line of an end closure, grasping means adapted for grasping and lifting of said pull tab, and attachment means integral with said fracturing means and said grasping means, said attachment means comprising a first panel member and a reinforcing panel member, said first panel member being adapted for attaching said pull tab to the end panel of an end closure, said reinforcing panel member being integrally formed in said pull tab and disposed in back-relation to said first panel member to strengthen and

rigidify the same, said grasping means comprising an aperture-defining edge member and said reinforcing panel member being formed of material displaced to form the aperture.

4,008,826

PLANTING MACHINE FOR POTATOES AND OTHER TUBERS

Francis Carrée, Loudeac, France, assignor to Societe Jeantil & Cie, Mordelles, France

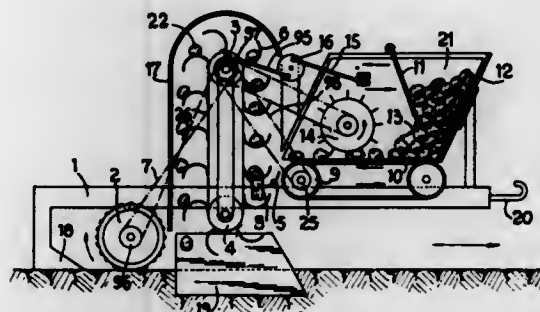
Filed Aug. 20, 1975, Ser. No. 606,226

Claims priority, application France, June 25, 1975, 75.19865

Int. Cl.² A01C 9/02

U.S. Cl. 221-13

14 Claims



1. A planting machine for tubers such as potatoes comprising a hopper for containing tubers to be planted, a movable conveyor which forms a transverse bottom of the hopper and extends outside the hopper and is movable in a given direction, means for driving the conveyor in said given direction, tuber distributing means for receiving the tubers from the conveyor and distributing the tubers one by one to the furrow to be sown, and regulating means for restricting the supply of tubers from the conveyor to the distributing means to solely one tuber at a time, the regulating means comprising a rotary structure mounted above the conveyor and defining with the conveyor a gap which is capable of allowing the passage of only one row of tubers, means for driving the periphery of the rotary structure adjacent the conveyor in a direction opposed to the direction of movement of the conveyor, a fork-shaped collector cup mounted at an end of the conveyor for receiving only one tuber from the conveyor at a time, means responsive to the presence of said one tuber in the cup and operative for stopping the movement of the conveyor when said one tuber is in the cup and allowing the movement of the conveyor when the collector cup is empty, the distributing means comprising movable cups for respectively passing through the fork-shaped collector cup and taking up a tuber received in the collector cup and depositing the tuber into the furrow, and means for driving the movable cups.

4,008,827

CONTAINER FOR VENDING MACHINES

Paul Appelbaum, Roswell, N. Mex., and Cecil J. Rhodes, Mesa, Ariz., assignors to Cartridge Vending Systems, Inc., Roswell, N. Mex.

Filed Dec. 3, 1975, Ser. No. 637,109

Int. Cl.² B65H 1/00

U.S. Cl. 221-197

10 Claims

1. An electro-mechanical interlock for a cartridge insertable into a vending machine and adapted to enclose vended articles for dispensing from said vending machine, said interlock comprising:

door means connected to said cartridge container for pivotal movement between open and closed positions to control the removal of said articles from said container, said door means including latch means attached thereto for pivotal movement therewith;

electrical terminal means mounted in said vending machine for providing a source of electrical power;

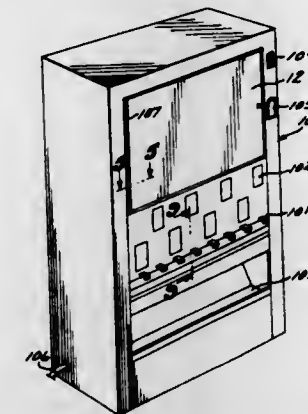
electrical contact means mounted on said container for

contacting said terminal means upon insertion of said container into said vending machine;

a first spring attached to said container and engaging said latch means when said door means is in said closed position to maintain said door means in said closed position;

a second spring attached to said container and normally located out of engagement with said latch means, said second spring being adapted to be urged into engagement with when said door means is in said open position to maintain said door means in said open position;

of said stack, a pair of cam levers pivoted about a transverse axis relative to said stack and arranged on opposite sides of the latter respectively, to upwardly engage and displace said wedge means upon operative actuation thereof, and said actuating links are constructed and arranged to engage said cam levers and to operatively pivot the same.



urging means movable into said container, for urging said second spring into said engagement with said latch means, upon insertion of said container into said vending machine; and

solenoid means connected to said contact means to derive electrical power therefrom and operative for pivoting said door to said open position and for concurrently urging said first spring out of said engagement with said latch means, said solenoid means being operative upon contact between said contact means and said terminal means.

4,008,828

NEWSPAPER VENDING MACHINE

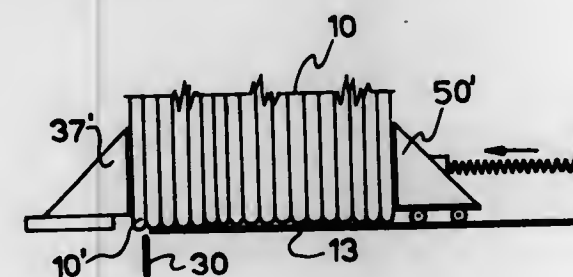
Jean-Marie Branchaud, 3655 Papineau St., Apt. 403, Montreal, Quebec, Canada

Filed Sept. 29, 1975, Ser. No. 617,535

Int. Cl.² B65H 1/02

U.S. Cl. 221-241

9 Claims



1. In a newspaper vending machine, the combination comprising a support for carrying a stack of newspapers resting edgewise thereon, a first and a second movable abutment means arranged to engage the opposite ends of said stack respectively, a separating wedge means displaceable edgewise upwardly into separating position between the one newspaper against said first movable abutment means and the remainder of said stack, an actuating mechanism operatively connected to said separating wedge means and constructed and arranged to displace the latter into said separating position, a handle connected to said actuating mechanism and arranged to actuate the latter and said separating wedge means, and link means connected to said actuating mechanism and to said first movable abutment means and arranged to increase the spacing of the latter from said separating wedge means and to release said one newspaper for access thereto and wherein said actuating mechanism includes a pair of actuating links extending along opposite sides of said stack respectively and rigidly secured to said handle for displacement therewith lengthwise

4,008,829

RATIO CONTROLLED MIXING OF LIQUIDS

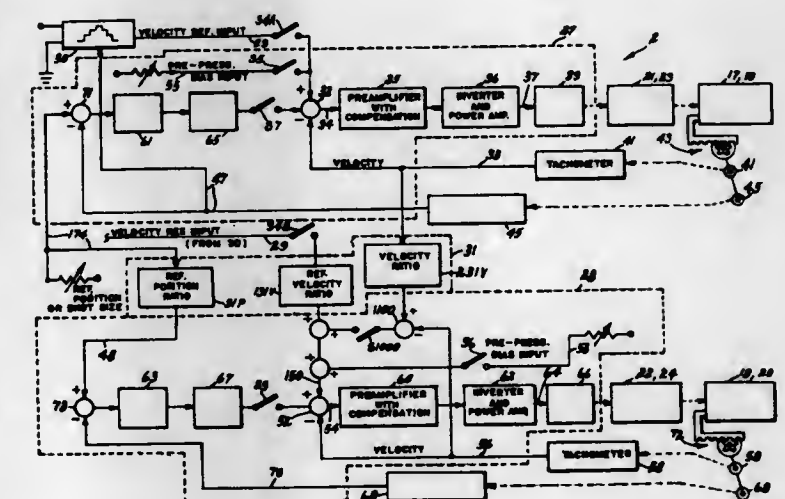
Rangasami Sarat Chandra, Davenport, Iowa, and Kirby Lee Stone, Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 501,743, Aug. 29, 1974, Pat. No. 3,908,862. This application Aug. 13, 1975, Ser. No. 604,342

Int. Cl.² B67D 5/08

U.S. Cl. 222-63

8 Claims



1. Apparatus for feeding liquids in a preselected ratio from at least two separate sources each having an automatic control system arranged in a velocity coupled master and slave relationship comprising:

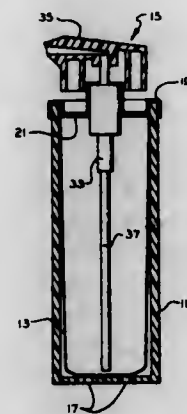
- a first and second positive displacement liquid feed means;
- a first and second means for measuring the velocity at which, respectively, each of said first and second liquid feed means dispenses its respective liquid;
- first and second velocity feedback control system means, for automatically controlling said first and second liquid feed means, respectively, by feeding back signals from, respectively, said first and second velocity measuring means to a control summing junction means in each respective control system for producing a control signal;
- velocity ratio control means for receiving an input signal from said first velocity measuring means and in response thereto producing as an output signal a ratioed master velocity signal that has a preselected ratio to its corresponding said input signal; and
- velocity signal summing means for receiving and summing said ratioed master velocity signal and said slave velocity signal from said second feedback control system means to produce a feedback error signal; and
- means to conduct said feedback error signal to the afore-said control summing junction means in said second feedback control system means, whereby said slave velocity signal is summed twice to produce a slave control signal for controlling the velocity at which said second or slave liquid feed means is operated.

4,008,830 LIQUID DISPENSER USING A NON VENTED PUMP AND A COLLAPSIBLE PLASTIC BAG

Philip Meshberg, 85 Old Oaks Road, Fairfield, Conn. 06430
Continuation-in-part of Ser. No. 387,247, Aug. 10, 1973,
abandoned. This application Mar. 20, 1975, Ser. No. 560,301
Int. Cl.² B65D 35/28

U.S. Cl. 222-95

10 Claims



1. A product dispenser which permits dispensing semi-liquid and viscous products without placing the product in a pressurized container comprising:

- a rigid outer hollow container open on one end having at least one perforation therein;
- a thin flexible bag incapable of self-support supported by and within said container with its open end extending over the edges of said outer container;
- a cover having mounted therein a non-vented pump and containing an annular recess matched to said container press fitted over said outer container to seal said bag to itself and to said container, placing said pump in sealing relation with said bag, said pump comprising a cylinder having a pumping piston therein in engagement with the sides of the cylinder, a reciprocating valve stem normally projecting from said cover and having a dispensing means on the end thereof, said stem having means thereon for operating said piston and means for controlling the flow of material to and from said cylinder, said stem in a normal position connecting the cylinder to the inside of said bag, initial movement of the stem inwardly from a normal position closing off the cylinder from the bag and connecting the dispensing means to the cylinder and continual movement of the stem causing the piston to move in the cylinder and force the material therein through the dispensing means, said stem maintaining said cylinder closed off from the inside of said bag until said stem reaches a position which is almost its normal position and
- a dip tube extending to the bottom of said bag having an uneven end to prevent the bag from stopping the end of said tube and having grooved sides to permit the product to flow along it to the open end without being stopped by the bag collapsing around said tube whereby prior to sealing said bag may be filled with the material to be dispensed and whereby the air pressure admitted through said perforation exerts a pressure on the outer wall of said bag causing the product to fill the pump cylinder each time the pump is operated and the cylinder emptied as said flexible bag is collapsed by said same air pressure.

4,008,831

SAFETY RESERVOIR FOR HYDROCARBONS AND DANGEROUS LIQUIDS

Jacques Vidiles, 24, Boulevard Maillot, 92 Neuilly, France
Continuation of Ser. No. 415,616, Nov. 14, 1973, abandoned.
This application Aug. 6, 1975, Ser. No. 602,424

Claims priority, application France, Nov. 20, 1972,
72.41182

Int. Cl.² B65D 35/28, 35/56

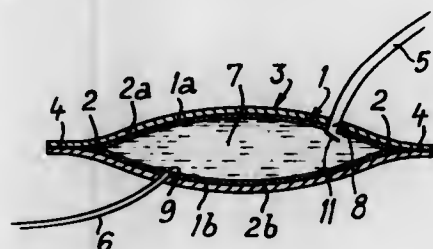
U.S. Cl. 222-95

16 Claims

- A vehicle fuel tank comprising

an expandable flexible reservoir having two stretchable elastomeric walls which are impermeable to said fuel and are disposed in face to face contact when the reservoir is empty, said walls being bonded together in face to face contact around the peripheral edges thereof in a fluid impermeable seal.

a rigid housing enclosing a chamber having a shape and dimensions corresponding substantially to the shape and dimensions of the said reservoir when expanded by fuel contained therein without stretching of the walls, said



housing being divided into two parts having overlapping peripheral edges which are joined by a means which permits separation of the two parts in response to an impact blow on the housing,
said reservoir being disposed completely in the chamber and substantially unattached to the housing.

4,008,832

THREE DRINK GRAVITY DISPENSER FOR COOL BEVERAGES

Joseph John Rodth, Barkhemstead, Conn., assignor to The Coca-Cola Co., Atlanta, Ga.

Filed Oct. 28, 1975, Ser. No. 626,400

Int. Cl.² B67D 5/56

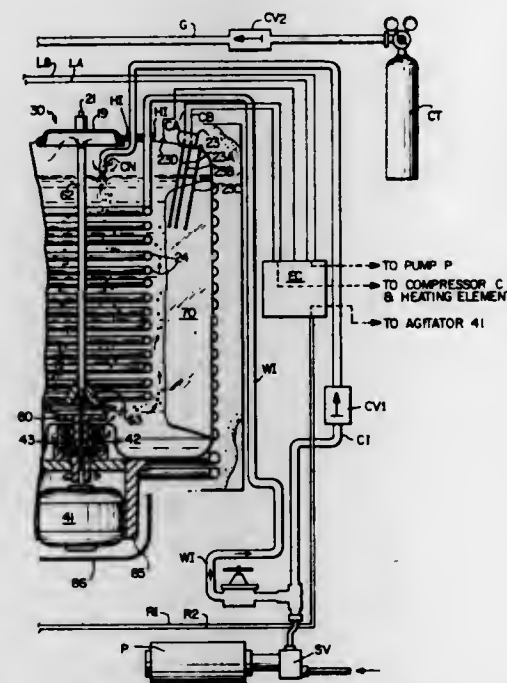
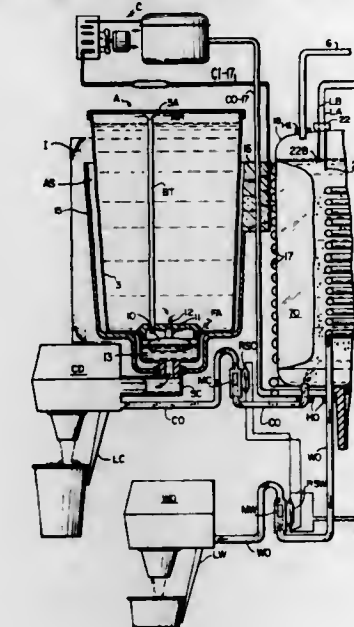
U.S. Cl. 222-129.1

14 Claims

1. An apparatus for dispensing cool beverages comprising in combination:

- dispensing valve means for dispensing said cool beverages when said valve means is open;
- receptacle means containing a flavor concentrate to be supplied to said dispensing valve means;
- closed tank means for storing water to be supplied to said dispensing valve means;
- means for cooling said water in said tank means;
- agitator means for circulating said water in said storage tank in response to the energization thereof; and
- means for intermittently energizing said agitator means, including control means for sensing the opening of said dispensing valve means and energizing said agitator means in response thereto and time delay means for

de-energizing said agitator means a predetermined period of time after the closing of said dispenser valve means;



whereby freeze-ups in said storage tank are substantially precluded.

4,008,833

CHEMICAL APPLICATOR

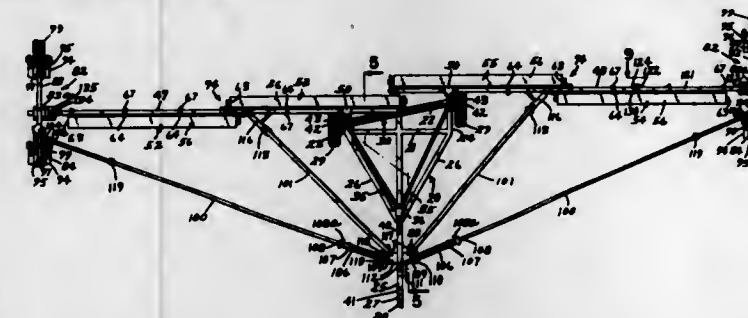
Ebenhard S. Gandrud, 528 Gandrud Road, and Dale E. Gandrud, 640 Cardinal Drive, both of Owatonna, Minn. 55060

Filed Mar. 15, 1976, Ser. No. 666,885

Int. Cl.² A01C 15/00

U.S. Cl. 222-178

12 Claims



1. An applicator for granular material comprising:

- a rigid frame having means for connection to a draft vehicle;
- a pair of laterally spaced wheels supporting said frame;
- a pair of elongated rigid support members each having inner and outer ends;
- means pivotally mounting said support members near their inner ends to said frame for swinging movements on horizontal axes, and for other swinging movements on vertical axes between operative positions wherein said

members extend outwardly from opposite sides of said frame transversely of the direction of movement of said frame, and inoperative transport positions generally normal to said operative positions and in trailing relationship to said frame;

- outer support means for supporting the outer ends of said support members in the operative and transport positions of said support members;
- locking means for releasably locking said support members in both said positions of swinging movement on said vertical axes while permitting free swinging movement of said support members on said horizontal axes;
- and elongated hopper means on each of said support members, said hopper means having inner ends arranged to be disposed in overlapping relationship when said support members are moved to said operative positions thereof.

4,008,834

TIP SEAL FOR A DISPENSING VALVE

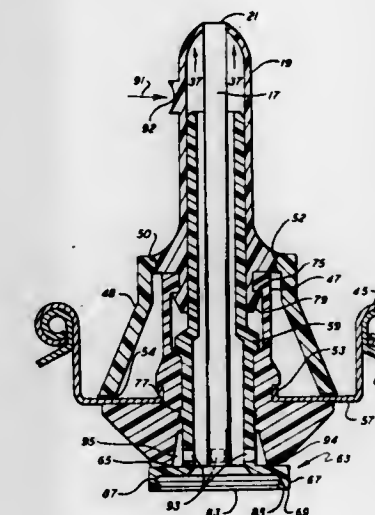
Edward J. Towns, Normandy Heights Road, Convent Station, N.J. 07961

Continuation-in-part of Ser. No. 426,351, Dec. 19, 1973,
abandoned. This application July 18, 1975, Ser. No. 597,247

Int. Cl.² B65D 83/00

U.S. Cl. 222-402.23

23 Claims



1. A tip seal for a dispensing container comprising:

- a body having a hollow central portion with means in the bottom part of said hollow central portion for engaging the outlet of a container;
- an inner elongated stem rigidly coupled to said body and extending at least partially within said central portion and projecting out of said body;
- an outer stem slidably mounted over the upper portion of said body, said outer stem having an opening matching the end of said inner stem; and
- a stretchable cylindrical member engaging the outside of the bottom portion of said body and the outside of said outer stem, said stretchable member having a stretchable portion of reduced diameter between its point of attachment with said body and its point of attachment with said outer stem, holding said outer stem in a position where its opening is covered by the end of said inner stem when said container is in a non-dispensing state and permitting separation of said outer and inner stems when dispensing through the action of pressure on the inside of said outer stem stretching said portions of reduced diameter to unseat said inner stem from said outer stem.

4,008,835

ANTITHEFT LOCKING STRAP FOR CLOTHING

Daniel A. Budzik, 211 May St., Elmhurst, Ill. 60126

Filed Nov. 5, 1975, Ser. No. 629,101

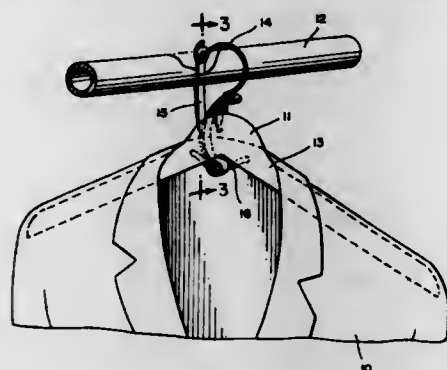
Int. Cl.² A47J 51/095; E05B 69/00

U.S. Cl. 223-85

4 Claims

1. In combination, a clothes hanger having a hook supported by a hanger rack, an article of clothing supported by

the hanger and having a loop-providing opening therein, and an elongated anti-theft locking strap, the locking strap having a first end portion which is provided with an opening through which the end of the hanger hook is inserted, an intermediate portion, a second end portion which is inserted through the



loop of the clothing and around the hook of the hanger, and means for releasably securing the second end portion to the intermediate portion whereby both ends of the strap are secured to the hanger hook and the locking strap prevents removal of the hanger from the rack and removal of the coat from the hanger.

4,008,836

YARN THREADER AND METHOD OF THREADING A NEEDLE

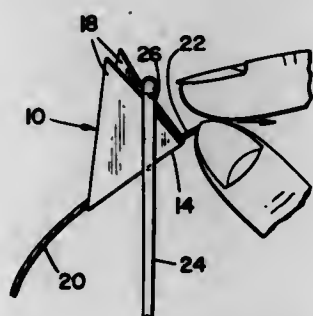
Gwendolyn Marie Herzstein, 219 Vidal Drive, San Francisco, Calif. 94132

Filed Jan. 15, 1976, Ser. No. 649,296

Int. Cl.² D05B 87/02

U.S. Cl. 223-99

5 Claims



1. A yarn threader comprising a flat, stiff foldable generally planar member having a thickness sufficiently thin to permit its doubled thickness together with a thickness of yarn to be inserted in the eye of a needle when the end of the yarn is enfolded within the member, the member being folded along a crease, the folded member having transverse dimensions large relative to a needle eye, the folded member forming a projecting point at an end of said crease which will enter a needle eye sufficiently while enfolding the yarn end disposed within the folded member proximate the crease so that the yarn end may be grasped and the member removed from the eye thus leaving the needle threaded.

4,008,837

RUG NEEDLE

Susan A. Hall, Napa, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 10, 1976, Ser. No. 665,497

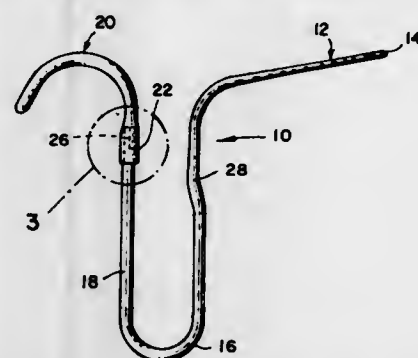
Int. Cl.² D05B 85/00

U.S. Cl. 223-102

8 Claims

1. A needle comprising:
a first straight portion formed from a single length of rod or wire, substantially defining a first plane and having two ends, one of said ends being formed with a hook, an open-ended looped handgripping portion integral with said first straight portion and terminating in a second straight portion having said second end, a longitudinal saddle portion restable on the index finger of an operator terminating in a third substantially straight portion and substantially defining a second plane, and means for

variably attaching said third straight portion to said second straight portion for said planes to subtend a selectable angle with one another, said saddle portion being



disposed at a higher elevation than said first straight portion, attached thereto and having a length smaller than the length of said first straight portion.

4,008,838

LADDER RACK

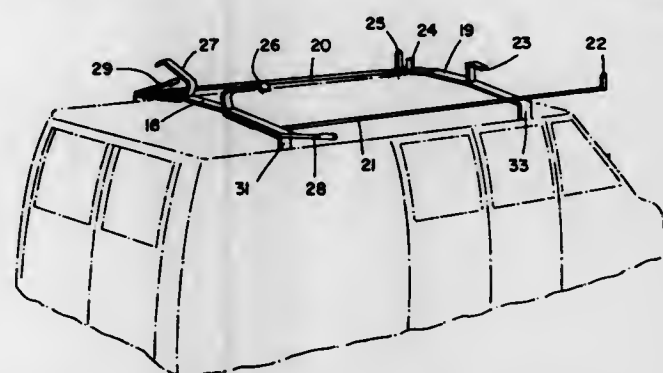
Richard R. Correll, 320 Escobar Road, Portola Valley, Calif. 94025

Filed May 30, 1975, Ser. No. 582,483

Int. Cl.² B60M 9/04

U.S. Cl. 224-42.1 F

5 Claims



5. A ladder rack for a van-type vehicle comprising:
a frame adapted to overlie the roof of the vehicle and including fore and aft transverse members adapted to support a pair of ladders in a side-by-side relationship;
means for mounting the frame to the roof of the vehicle;
a pair of hook members each having a pivot end pivotally attached to one of the transverse members intermediate the positions of the two ladders, said hook members each including an intermediate downwardly concave portion adapted to project outwardly over the inside rails of the respective ladders when the hook members are pivoted downwardly about their pivot ends, and an opposite free end adapted to project downwardly between the rails of the respective ladders when the hook members are pivoted downwardly; and

means for actuating each of the hook members, said actuating means each comprising a lever pivotally attached to an end of said one transverse member, a rod generally parallel to the transverse member and having one end connected to the lever proximate said end of the transverse member and another end slidably connected to the pivot end of the hook member, a spring having one end connected to the hook member and another end connected to the rod, and means for maintaining the lever in an over center position so that movement of the lever in one direction toward the over center position pivots the associated hook member downwardly from an upwardly raised release position to a ladder holding position with the intermediate portion of the hook member against one of the rails of the associated ladder and further movement of the lever in said one direction to the over center position compresses the spring against the hook member to bias and lock the intermediate portion of the hook member against the ladder.

4,008,839

TAPE FEEDING APPARATUS

Kyoichi Yamashita, Yokohama, Japan, assignor to Koyo Jidoki Kabushiki Kaisha, Yokohama, Japan

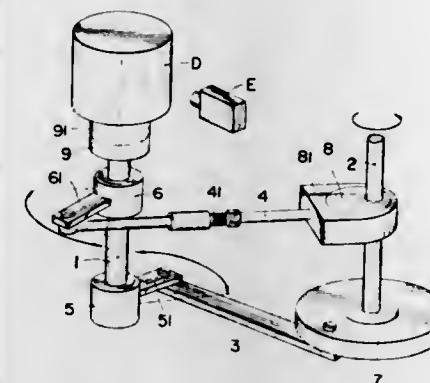
Filed Nov. 6, 1975, Ser. No. 629,414

Claims priority, application Japan, Nov. 7, 1974, 49-127542

Int. Cl.² B65H 23/18

U.S. Cl. 226-32

7 Claims



2. A tape feeding apparatus, comprising:
rotary shaft means having a rotary tape-feeding member connected thereto for rotation therewith;
first and second one-way clutch means drivingly connected to said rotary shaft means for rotating same in one direction only;

rotary driving means;
first and second linkage means drivingly connected between said rotary driving means and said first and second clutch means, respectively, for rotating said shaft means at different speeds and with a phase difference therebetween, said first linkage means causing a low-speed rotation of said shaft means while said second linkage means causes a higher-speed rotation of said shaft means;

said first linkage means including first lever means connected to said first clutch means for effecting rotation thereof in response to swinging movement of said first lever means, and first connecting rod means pivotally and drivingly connected between said first lever means and said rotary driving means, whereby said rotary driving means causes reciprocation of said first connecting rod means which thereby causes swinging of said first lever means;

said second linkage means including second lever means drivingly connected to said second clutch means for effecting rotation thereof in response to swinging movement of said second lever means, and second connecting rod means pivotally and drivingly connected between said second lever means and said rotary driving means, whereby said rotary driving means imparts a reciprocating motion to said second connecting rod means to thereby swing said second lever means;

said rotary driving means having first and second means associated therewith and drivingly connected to said first and second connecting rod means, respectively, for effecting reciprocating movement thereof with a phase difference therebetween so that said first connecting rod means is drivingly displaced in a direction for causing a low-speed rotation of the rotary shaft means shortly before the termination of the motion of the second connecting rod means in its driving direction;

sensing means coacting with the tape being fed from said rotary member for sensing an indicator or marking on the tape when said shaft means is being driven at said low speed; and

brake means for stopping said rotary member when said sensing means senses the indicator or marking on the tape.

4,008,840

WORKPIECE TRANSPORTING APPARATUS

Horst Lorenz, Solingen, and Kurt Pauls, Langenfeld, both of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed Oct. 10, 1975, Ser. No. 621,632

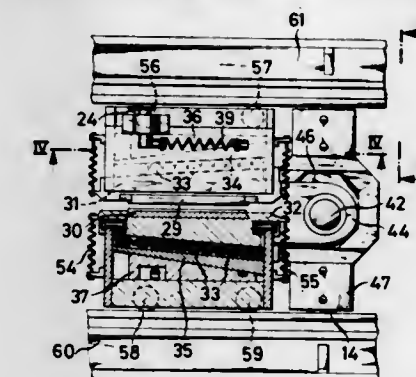
Claims priority, application Germany, Oct. 18, 1974, 2449579

Int. Cl.² B65H 17/34

U.S. Cl. 226-173

10 Claims

1. Apparatus for gripping an elongated workpiece and drawing it out of a machine tool, comprising transporting means comprising a chain movable in a predetermined direction; workpiece gripping means for gripping the workpiece, said gripping means being movable with said transporting means and also being movable relative to said transporting means in and opposite to said direction, said gripping means comprising gripping devices each including gripping jaw, at least one wedge-shaped roller-adjustable jaw holder, and at least one slidably mounted adjusting wedge; control means for controlling the relative movement between said gripping means and transporting means; an adjusting lever having one arm and another arm which is movably guided in said adjusting wedges; spring means connecting said arm with said adjusting wedges; and tensioning cam means extending substan-



tially equidistantly along said chain and cooperating with said one arm of said adjusting lever.

4,008,841

TWO PIECE SHEET METAL CAPSTAN HOUSING ASSEMBLY

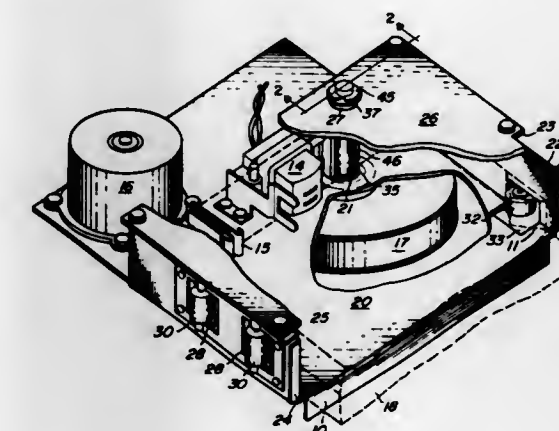
Donald J. Dattilo, Mount Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 469,203, May 13, 1974, Pat. No. 3,921,881. This application Nov. 20, 1975, Ser. No. 633,738. The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.² B65H 17/20

U.S. Cl. 226-194

1 Claim



1. A capstan housing assembly in a tape player device of the type using an exchangeable cartridge including in combination:

a capstan shaft,
first and second capstan bearings for supporting said capstan shaft,
a cartridge support member having a support wall having an opening therein adapted to receive said first capstan bearing, said first capstan bearing being supported by said support wall in said opening thereof,
first and second sidewalls spaced apart in relation to each other,
a support plate having an opening therein adapted to receive said second capstan bearing, said second capstan bearing being supported by said support plate in said opening thereof, said support plate being precisely positioned with respect to said cartridge support member to thereby accurately align said first and second capstan bearings,
means for fixedly connecting said cartridge support member and said support plate to said side walls to maintain said alignment and to form a cartridge receiving chamber, said capstan shaft being supported by said bearings, whereby said capstan shaft is held in a predetermined location with respect to the cartridge receiving chamber.

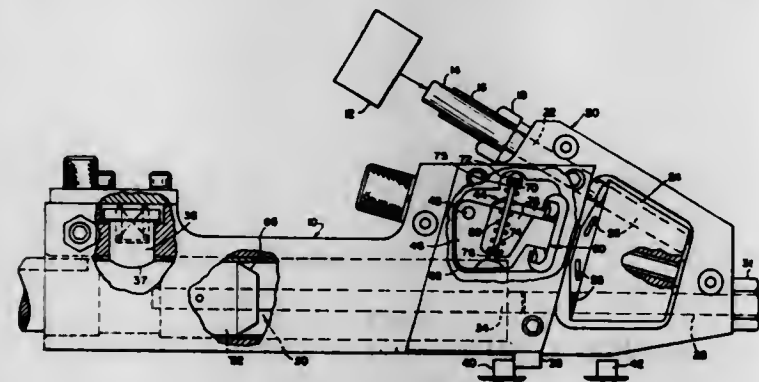
4,008,842

ELONGATED ARTICLE FEEDING AND DRIVING MECHANISM

Robert Burr Wilson, 4912 Mansfield, and Steven Maltland Cochran, 4916 Mansfield, both of Royal Oak, Mich. 48073
Filed Sept. 10, 1975, Ser. No. 612,100
Int. Cl.² B27F 4/00

U.S. Cl. 227-117

6 Claims



1. An article feeding and driving arrangement comprising:
a tool body;
a feed cylinder having a plurality of chambers extending in converging directions formed about the feed cylinder axis;
driver means including a driver tool adapted to be advanced along a line of movement;
means rotatably supporting said feed cylinder on said tool body with its axis at an angle inclined to the line of movement of said driver tool such that as said chambers rotate through a lower and upper position relative said cylinder axis the angle of inclination of said chambers becomes steeper relative the line of said movement of said driver tool;
indexing means supported by said tool body and drivingly connected to said feed cylinder indexing said feed cylinder about said axis of rotation;
passage means formed in said tool body and disposed to guide said articles successively into said chambers at said upper locations;
said driver means including means supporting said driver tool in alignment with said lower position so as to successively eject said articles from said chamber at said lower position upon advancement along said line of movement whereby said chambers at said upper location may be loaded with articles while articles may be ejected at said lower location.

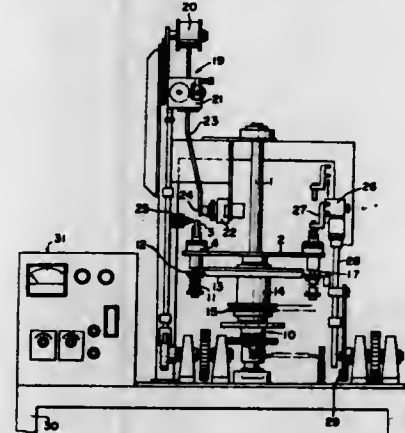
4,008,843
APPARATUS FOR SEALING TUBES
Kentaro Nagano; Ichiro Henmi, and Masahiro Kiyota, all of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1974, Ser. No. 465,133
Int. Cl.² B23K 1/12

U.S. Cl. 228-33

4 Claims

1. An apparatus for sealing insulation tubes comprising:
a turntable having a plurality of tube holders disposed in a circle about its central axis and means for intermittently turning said turntable through predetermined portions of a revolution so as to move said tube holders and said tubes to a plurality of working stations;
means associated with said insulation tube holders for rotating said insulation tube holders about their respective vertical axes;
means for stopping the rotation of a predetermined number of said holders at predetermined positions along the path of revolution of said turntable for removal of said tubes when sealed;
means for supplying a molten solder to said holders being rotated about their axes at a predetermined position in the revolution of said turn-table whereby the molten solder is distributed to the peripheral parts of the tube for sealing said tube;
means for heating said tubes at a plurality of predetermined positions along the path of revolution of said turntable so as to intermittently, yet gradually heat said tubes prior to said sealing of said tubes; and



said means for rotating said tube holders comprises a friction wheel co-axially disposed with respect to said turntable which contacts said tube holders below the surface of said turntable, said tube holders being disposed about the periphery of said friction wheel so as to be simultaneously driven thereby.

4,008,844

METHOD OF REPAIRING SURFACE DEFECTS USING METALLIC FILLER MATERIAL

David S. Duvall, Cobalt; William A. Owczarski, Cheshire; Daniel F. Paulonis, Moodus, and Robert P. Schaefer, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 6, 1975, Ser. No. 538,613
Int. Cl.² B23K 31/02

U.S. Cl. 228-119

9 Claims

1. The method of repairing surface and near-surface defects in a metallic article which comprises:
mechanically removing the defects from the article forming a cavity to be filled;
providing a metallic filler material mix comprising a blend of powders consisting of at least two distinct particulate components, the mix having a composition approximating that of the article, with a first powder component including in its composition a quantity of a melting point depressant such as boron substantially in excess of that in the article and sufficient to provide melting of a portion of the mix at a processing temperature below the melting temperature of the article, and a second powder compo-

nent having a composition which approximates that of the article being repaired with the ratio of the second powder component to the first powder component being from about 2:1 to about 9:1;
positioning the mix to fill the cavity;
raising the temperature of the article to the processing temperature whereat a portion of the mix liquefies;
holding the article at about the processing temperature and effecting isothermal resolidification of the mix by diffusion of the melting point depressant into the article being repaired and into the second powder component;
and continuing the exposure of the article to high temperature for homogenization of the filled volume.

4,008,845

METHOD OF POSITIVE AND NON-POSITIVE COLD-JOINING

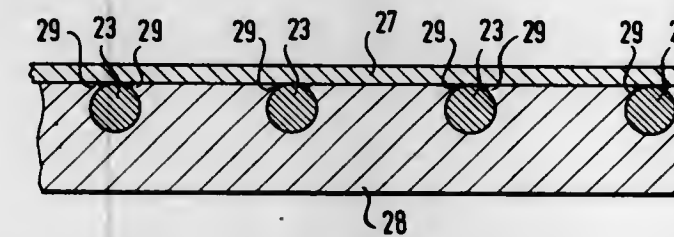
Richard Bleckmann, Imbergstrasse 24, Salzburg, Austria
Filed July 11, 1974, Ser. No. 487,633

Claims priority, application Germany, July 16, 1973, 2336149

Int. Cl.² B21D 39/03

U.S. Cl. 228-136

2 Claims



1. A method of joining a metallic first member to another metallic planar sheet member comprising the steps of providing a metallic first member and a metallic planar sheet member, providing at least one wire coil of metallic material having a hardness greater than the hardness of said sheet member, securing said wire coil to said first member, moving said metallic members together with at least a portion of said wire coil therebetween, compressing said metallic members into overlying, flush engagement to enclose said at least a portion of said wire coil with the material of said sheet member and thereby cold-join said metallic members together in a securely bonded relationship.

4,008,846

LEAKPROOF PAPERBOARD CONTAINER

Robert L. Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Filed May 10, 1976, Ser. No. 685,014
Int. Cl.² B65D 3/04, 3/10

U.S. Cl. 229-4.5

33 Claims



1. A leakproof, three-piece container suitable for shipping and storing liquids, frozen liquids, moisture sensitive materials and the like, which maintains its leakproof condition when

subjected to impact occasioned by the dropping of the container on its base portion during shipping and storage, comprising:

a generally cylindrical body wall portion and base wall portion constructed from a unitary, thermoplastic coated paperboard blank, said body wall portion foldably connected to said base wall portion; said base wall portion comprising a plurality of foldably connected panels, said panels being folded to form first and second upstanding members defining an annular channel therebetween; said first upstanding member comprising at least one panel, which panel lies in face-to-face contact with the lower surface of said cylindrical body wall portion, wherein at least said one panel of said first upstanding member is of greater height than the height of the second upstanding member;
a first end closure member having a downwardly projecting peripheral flange for sealing the lower end of the container, said flange occupying the annular channel formed between said first and second upstanding members; and
a second end closure member for sealing the upper end of said container.

4,008,847

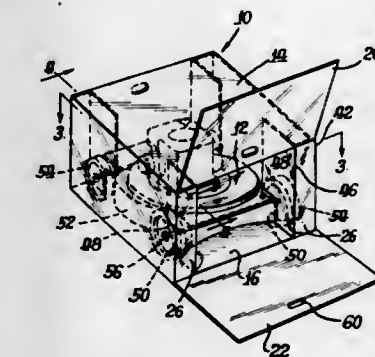
SHIPPING CONTAINER

John C. Davis, 1154 W. Mallard Drive, Palatine, Ill. 60067
Filed May 20, 1976, Ser. No. 688,383

Int. Cl.² B65D 5/50, 5/44, 25/14

U.S. Cl. 229-14 C

7 Claims



1. A one-piece fiberboard container for containing a lawnmower having a frame with four wheels, each carried on an axle substantially at four corners of said frame, said container comprising a top wall, a bottom wall and a pair of opposed sidewalls extending between and joining said top and bottom walls to form a generally tubular compartment with open fore and aft ends for containing said lawnmower in-line with said ends, side end flaps foldably attached to each end of said side walls, each of said side end flaps having an insert portion and an intermediate portion between said insert portion and the side wall to which it is attached, said intermediate portion being disposable at substantially right angles to said sidewall at the end of said container, said insert portion being foldable to extend into said tubular compartment for positioning between said frame and one of said wheels, said insert portion including a right-angled recess to nest against the axle of the lawnmower container therein, and closure flaps foldably secured to said top and bottom walls to close the fore and aft ends of said tubular compartment over said side end flaps, and substantially perpendicular to said insert portions, each of said closure flaps further extending substantially between said top and bottom walls.

4,008,848

CUP FORMED CONTAINER HAVING A LINING FOIL

Od Wikar Christensson, Stockholm, Sweden, assignor to Esseltepac Aktiebolag, Jarfalla, Sweden

Filed Nov. 24, 1975, Ser. No. 634,770

Claims priority, application Sweden, Dec. 10, 1974, 7415449

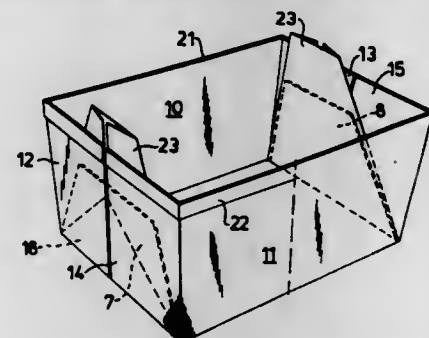
Int. Cl.² B65D 5/22, 25/14

U.S. Cl. 229-31 R

9 Claims

1. A cup formed container comprising an outer container made of a plain punched blank of cardboard or similar stiff

material comprising a bottom, two opposite side pieces foldably connected with said bottom along opposite first and second edges thereof and forming first and second opposite walls, said side pieces being extended at their ends so as to be longer than said first and second edges with which they are foldably connected, the extended ends of said side pieces being folded upwardly and inwardly from the blank form to form at least in part third and fourth opposite walls, two opposite joint flaps foldably connected to opposite third and fourth edges of said bottom and folded upwardly to lie adjacent and opposite said extended ends of said side pieces and cooperate therewith in forming said third and fourth walls, said joint flaps being no longer than said third and fourth edges, and a unitary inner lining blank extending over substantially the



entire surface of the outer container blank and adhered to at least the great majority of said surface to form an integral part of the combined container blank and the formed container, said lining blank having portions projecting a distance radially outside of said joint flaps and hence above the intended upper edge of the container, parts of said lining blank being folded in between each joint flap and its adjacent extended ends of said side pieces in said third and fourth walls, said projecting portions of said lining blanks forming projecting folded lining tongues which are folded over the upper edges of said third and fourth walls and attached to the outside surfaces of said third and fourth walls over the joining edges of said extended ends in said third and fourth walls.

4,008,849

BIDIRECTIONAL TEAR STRIP MEANS FOR CARTONS AND THE LIKE

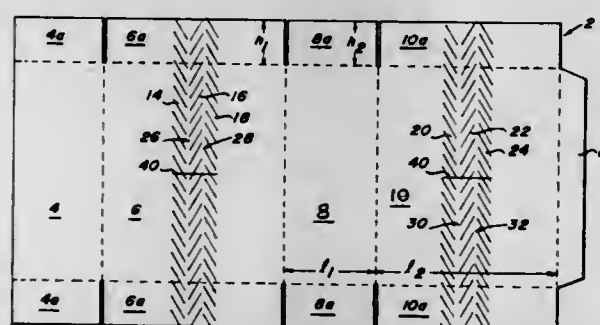
Donald D. Baber, Boise, Idaho, assignor to Boise Cascade Corporation, Boise, Idaho

Filed May 14, 1976, Ser. No. 686,641

Int. Cl.² B65D 5/54, 85/00, 71/00

U.S. Cl. 229-51 TS

18 Claims



1. In a unitary blank for forming a container, the invention which comprises

means defining a pair of contiguous tear strips operable in opposite tearing directions, respectively, said tear strip defining means including three generally parallel rows of slits, the slits of each row being generally parallel and arranged at an acute angle relative to the longitudinal axis of the associated tear strip, the slits of successive rows defining a herringbone pattern with the slits of the rows of one tear strip diverging in one direction relative to the longitudinal axis of said one tear strip, and the slits of the rows of the other tear strip diverging in the opposite direction relative to the longitudinal axis of the other tear strip, thereby to define said opposite tearing directions.

4,008,850 GUSSETED PINCH BOTTOM BAG

John J. Goodrich, Rumford, R.I., assignor to St. Regis Paper Company, New York, N.Y.

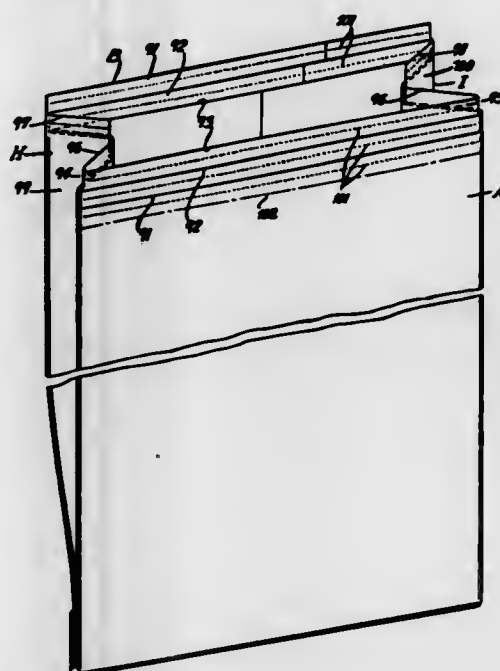
Continuation of Ser. No. 169,287, Jan. 29, 1962, abandoned.

This application Feb. 22, 1972, Ser. No. 228,255

Int. Cl.² B65D 33/02

U.S. Cl. 229-55

1 Claim



1. A bag of tubular form comprising a plurality of plies of flexible sheet material, said bag having a front surface and an oppositely disposed rear surface with the rear surface adapted to overlap said front surface in assembled relationship, said bag being longitudinally and reversely creased along diametrically opposed portions to provide a pair of oppositely disposed gussets, each gusset comprising front and rear gusset portions interposed between said front and rear surfaces and connected thereto to form said tube, said plies being successively stepped with respect to each other to form said rear surface and reversibly stepped with respect to each other to form said front surface at each end of said tube, and selected plies being stepped in a first direction with respect to each other in said front gusset portions and in a reverse direction in said rear gusset portions at each end of said tube, and one end of said tube including all of said plies being folded against said front surface and adherently secured in position.

4,008,851

ADHESIVE TAPE BAG CLOSURE

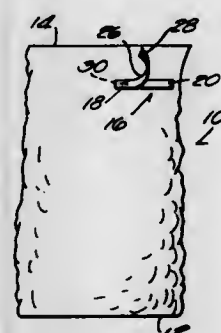
John L. Hirsch, Sheboygan Falls, Wis., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jan. 16, 1976, Ser. No. 649,879

Int. Cl.² B65D 33/24

U.S. Cl. 229-62

2 Claims



1. The combination of a bag and bag closure in which the bag closure comprises an elongated flexible closure tape, means relatively permanently attaching one end portion of said tape to the bag near its open end, a strippable adhesive

means between said tape and said bag in the area where the tape is not relatively permanently attached to said bag, whereby the portion of said tape which is not relatively permanently attached to said bag is strippably attached thereto and can be subsequently stripped away from said bag to serve as an adhesive closure tape for said bag, the portion of said tape which is relatively permanently attached to said bag serving as an anchor for said adhesive closure tape, a flexible foundation strip between said closure tape and said bag, said foundation strip being relatively permanently attached to the outer surface of said bag, and said one end portion of said closure tape being relatively permanently attached to a portion of the outer surface of said foundation strip, the outer surface of another portion of said foundation strip comprising a release surface for said strippable adhesive means.

4,008,852

APERTURED MAILING CARD AND METHOD OF USING

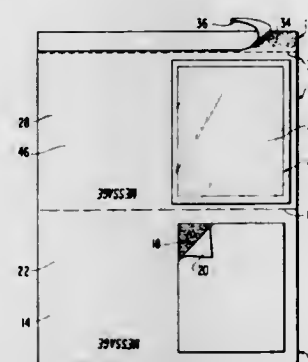
Elmer O. Davis, 762 La Mesa Drive, Salinas, Calif. 93901

Filed Feb. 3, 1976, Ser. No. 654,794

Int. Cl.² B65D 27/04

U.S. Cl. 229-92.3

2 Claims



1. A mailing card comprising:

a first card section formed of paper material and having first and second sides;

said first side of said first card section containing an adhesive surface for carrying an object such as a photograph;

a removable backing sheet overlying said adhesive substance;

a second card section formed of paper material attached to said first card section and having an first side contiguous with said first side of said first card section, and a second side contiguous with said second side of said first card section, said second card section including,

an opening situated for general alignment with said adhesive surface when said first and second card sections are in a folded condition with said second sides disposed in facing relationship, and

a transparent cover extending across said opening; and

a sealing strip extending along said second card section so as to extend beyond said first and second card sections when said card sections are in a folded condition, said sealing strip including an adhesive sealing area and being joined to said second card section by a fold line so as to be foldable into engagement with said first card section to secure said sections in said folded condition for mailing;

said second side of said first card section and said second side of said second card section each including pre-inscribed indicia indicating the positioning of a mailing address and postage to be applied thereto,

said first and second card sections being foldably attached along a perforation to enable said first card section to be optionally manually detached from said second card section and mailed separately as a postcard.

4,008,853

PRESSURE RESPONSIVE SELF-PURGING EMITTER

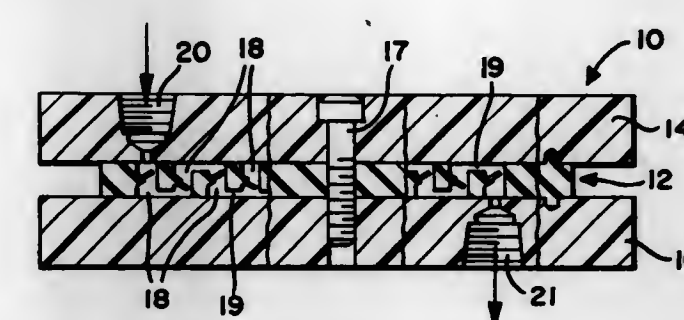
Kenneth C. Tregillus, Yellow Springs, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Oct. 31, 1975, Ser. No. 627,598

Int. Cl.² B05B 15/00

U.S. Cl. 239-542

13 Claims



1. A pressure responsive emitter comprising:

a. an emitter body,

b. means defining an inlet into said body and an outlet therefrom,

c. a flow path through said body interconnecting said inlet and said outlet,

d. a plurality of discrete valves each positioned in spaced relationship to each other along said flow path,

e. said valves being formed of an elastomeric material and each consisting of an individual lip cantilevered into said flow path from one wall portion thereof and cooperating about its periphery with opposing wall portions of said flow path to effect a valving action,

f. each of said valves being responsive, below a predetermined maximum pressure, to decrease the flow area of said flow path at that valve in response to increases in the pressure drop across that valve and, above a predetermined minimum pressure, to increase the area of said flow path at that valve in response to decreases in the pressure drop across that valve, and

g. each of said valves being responsive to an increase in the pressure drop across that valve above said predetermined maximum pressure to thereafter increase the area of said flow path at that valve and permit accumulated material to pass through that valve.

4,008,854

SPREADING IMPLEMENTS

Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

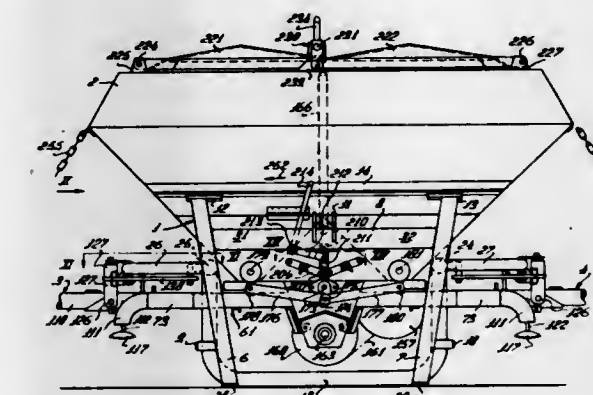
Filed Jan. 13, 1975, Ser. No. 540,327

Claims priority, application Netherlands, Jan. 18, 1974, 7400683

Int. Cl.² A01C 3/06

U.S. Cl. 239-655

87 Claims



1. A spreading implement comprising a substantially her-

metically enclosed hopper means for material to be spread and an air chamber with blower means being in communication with said hopper means, at least one delivery port in said hopper means and distributor pipe means extending outside of said hopper means adjacent said delivery port, inlet apertures in elongated channels of said distributor pipe means in communication with said delivery port during operation, a flow-control device positioned between said delivery port and said inlet apertures, said device controlling the flow of material through said delivery port to said pipe means, said channels having an inlet part that includes said inlet apertures and said inlet part being open with respect to said air chamber, whereby a stream of air from the blower means is forced through said chamber into said inlet part and material passing through said flow-control device is expelled from said channels.

4,008,855

SPREADING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

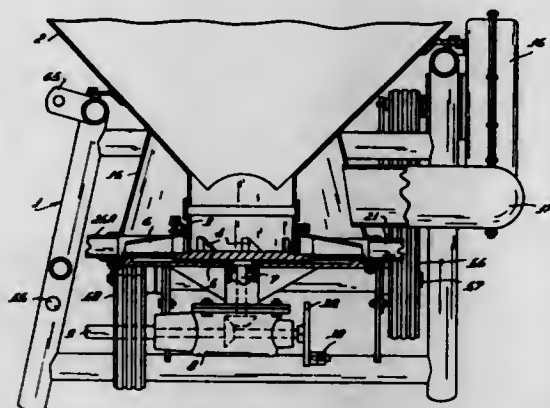
Filed Apr. 15, 1975, Ser. No. 568,262

Claims priority, application Netherlands, Apr. 25, 1974, 7405556

Int. Cl.² B67D 5/60

U.S. Cl. 239—682

32 Claims



1. A spreading implement comprising a frame and a container for material to be spread, the lower part of said container having port means and a rotatable ejector disc, a plurality of elongated delivery ducts extending substantially horizontally from said container in directions generally transverse to the normal direction of travel of the implement, the inner ends of said ducts being in communication with said port means and an air chamber that surrounds said port means, a pneumatic device communicating with said chamber and said ducts, the outer ends of said ducts being spaced apart from one another and being located at different lateral distances from said ejector disc, a movable spreading member being positioned adjacent each outer end and driving means associated with said spreading member, said driving means moving the spreader members to uniformly distribute material over a broad path during operation.

4,008,856

RECLAIMING SYSTEM FOR FOUNDRY SAND

Edward A. Sears, W. 708 Cliff Drive, Spokane, Wash. 99204

Filed Sept. 17, 1975, Ser. No. 614,323

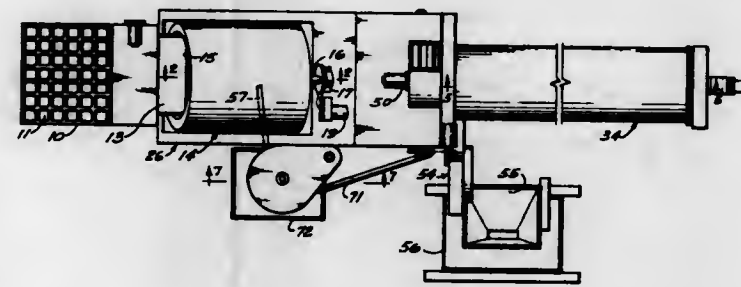
Int. Cl.² B02C 23/36

U.S. Cl. 241—46 R

3 Claims

1. A system for reclaiming used foundry sand containing solid lumps of sand and binder, comprising:
disintegrating the sand and binder into discrete solid particles in a liquid suspension by mechanically crushing the used sand while washing it within a liquid medium;
settling the sand from the liquid medium;
mechanically removing the heavier particles of settled sand;
and continuously drying the sand as it is removed by passage of the sand along first and second successive elongated

drying drums, the air system through the drums being connected in tandem, with fresh air being drawn into the sand exit end of the second drum, along the length of that



drum to its sand input end, then mixed with heated air at the sand exit end of the first drum, the flow of sand being opposite to the flow of air in both drums.

4,008,857

SCREEN MILL

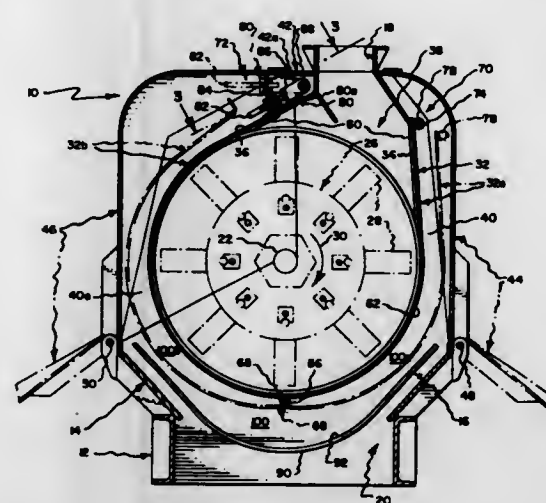
Harry D. Schutte, Amherst, N.Y., assignor to Schutte Pulverizer Co., Inc., Buffalo, N.Y.

Filed June 10, 1976, Ser. No. 694,556

Int. Cl.² B02C 23/16

U.S. Cl. 241—89.2

6 Claims



1. A hammer mill comprising in combination:
a casing bounding a chamber and having upper material inlet and lower material discharge openings communicating with said chamber, said casing being defined by opposite side walls and a cover extending between said side walls, said cover having horizontally opposite portions thereof defining access doors for affording operator access to said chamber intermediate said inlet and discharge openings;
a horizontally disposed and rotatable drive shaft projecting through said side walls;
a rotor assembly fixed for rotation with said drive shaft within said chamber and including a plurality of hammers arranged for movement along a path of travel disposed concentrically of the axis of said drive shaft;
generally arcuately shaped ledge means fixed one to each of said side walls to project inwardly of said chamber, said ledge means defining generally aligned bearing surfaces disposed to face outwardly of said axis and extend circumferentially of said rotor intermediate said path of travel and said cover between opposite sides of said inlet opening;
a generally arcuately shaped screen device sized to bridge essentially between said side walls for opposite marginal edge bearing engagement with said bearing surfaces and to extend essentially between said opposite sides of said inlet opening;
a mounting device carried by said casing adjacent one on

said opposite sides of said inlet opening for removably mounting one end of said screen device;
a clamping device carried by said casing adjacent a second of said opposite sides of said inlet opening for removably mounting an opposite end of said screen device and for drawing said screen device intermediate its ends into bearing engagement with said bearing surfaces, said screen device including at least two arcuately shaped and end-to-end connected screen sections, said screen sections having their adjacent ends hingedly connected, said access doors normally covering access openings arranged to afford access one to each of said mounting device and said clamping device and sized to permit removable insertion of at least one of said screen sections therethrough.

4,008,858

TREATING DEVICE FOR SYNTHETIC RESIN WASTE

Masatora Yamada, Iwata; Shigeo Tasaka, Tokyo; Tadayuki Okawa, and Taichi Suzuki, both of Ibaragi, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

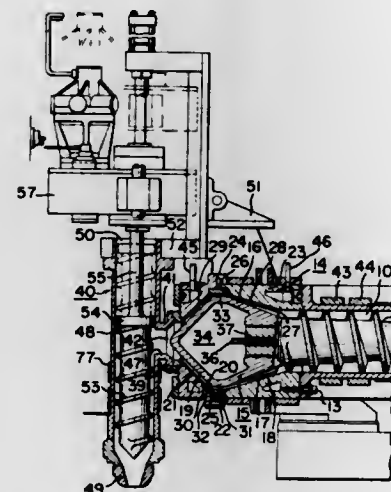
Continuation-in-part of Ser. No. 358,923, May 10, 1973, abandoned. This application July 22, 1975, Ser. No. 598,121

Claims priority, application Japan, May 12, 1972, 47-55244[U]; June 29, 1972, 47-64457; Nov. 4, 1972, 47-110507

Int. Cl.² B02C 7/175

U.S. Cl. 241—101.2

3 Claims



1. Apparatus for treating synthetic resin waste comprising a first cylinder, a rotary driven first screw in said first cylinder having a rotary body thereon for grinding resin waste and extruding it in a plastic state, means defining a raw material feed zone on said first cylinder, means defining a discharging portion for the resin waste in a plastic state, a deairing and back-pressure increasing device having a transfer port in communication with said discharging portion and comprising a second screw rotatably driven about an axis thereof transversely to the axis of said first screw, a second cylinder containing said second screw in communication with said transfer port and having an outlet through which treated resin waste is delivered by said second screw, said second screw having a flange portion disposed circumferentially of said second screw, said transfer port being disposed between said outlet and said flange portion, and said flange portion being of lesser diameter than said second cylinder defining therewith a deairing gap for passing volatilized matter without escape of the resin in a plastic state therethrough.

4,008,859

STRAND WINDING

Ralph W. List, East Lansdowne, and Robert K. Stanley, Media, both of Pa., assignors to Textured Yarn Co., Inc., Kennett Square, Pa.

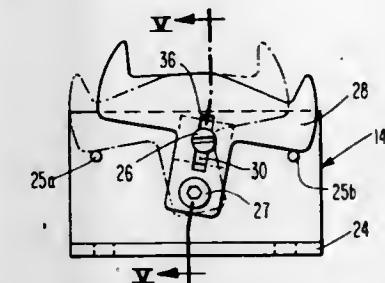
Division of Ser. No. 467,018, May 6, 1974, Pat. No. 3,936,006.

This application Jan. 20, 1975, Ser. No. 542,502

Int. Cl.² B65H 67/04, 57/00

U.S. Cl. 242—18 A

5 Claims



4. Inertial delay flip-flop guide for textile strands, comprising a fixed base portion having a pivot therein, a rigid portion upstanding from the base pivot and having strand-guiding surfaces thereon, and weight means attached to the upstanding portion to alter the force required to flip the guide from either of two strand-guiding positions to the other.

4,008,860

PAPER BOBBINS

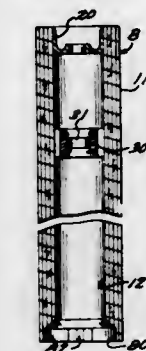
Junkichi Tanaka, Osaka, Japan, assignor to Tanaka Paper Tube Co. Ltd., Osaka, Japan

Filed Apr. 28, 1975, Ser. No. 572,213

Int. Cl.² B65H 54/54, 75/10, 75/30

U.S. Cl. 242—46.21

3 Claims



1. A discardable paper bobbin assembly for use on a metal bobbin spindle drive, which spindle drive is of the type that includes a vertically disposed shaft extending upwardly from a drive connection having a fitting face on which at least one horizontal straight surface is defined, with paper bobbin assembly includes:

- a paper tubular body having first and second ends and an elongate longitudinal bore, said paper tubular body adjacent said second end having a cut-out portion, with said longitudinal bore being adjacent said second end and of such transverse cross section as to slidably engage said drive connection when said cut-out portion is oppositely disposed relative to said straight surface;
- an end cap that extends into said bore adjacent said first end, with said end cap including a biased means that non-rotatably engages the interior surface of said paper tubular body;
- an internal bearing disposed in a fixed position in said bore intermediate said first and second ends of said tubular body, with said bearing rotatably engaging said shaft when said tubular body is in engagement with said drive connection; and
- fastening means removably engaged in said cut-out portion, with said fastening means in pressure contact with

said flat surface of said drive connection to prevent said paper tubular body from rotating relative to said drive connection.

4,008,861 WEB ROLL RETAINER

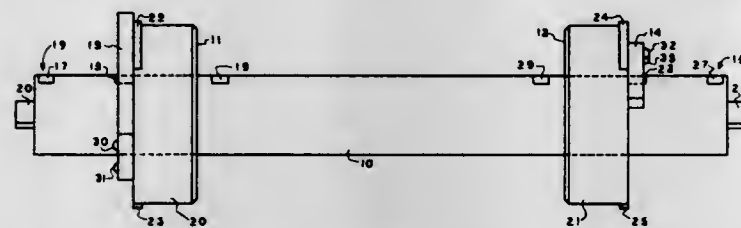
Heinz E. Hertel, Mount Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 18, 1975, Ser. No. 605,486

Int. Cl.² B65H 17/02

U.S. Cl. 242-68

10 Claims



1. A web roll retainer comprising:
an axial support bar having first and second ends;
first and second roll end supports mounted on said axial support bar in non-rotational relation to said support bar, said first end support being near said first end and said second end support being near said second end for supporting a web roll extending therebetween, and each of said first and second roll end supports including an annular bearing surface communicating with the web roll and web roll confining means for minimizing axial movement of the web roll on said end supports; and
end support holding means for maintaining said end supports in fixed axial relation on said support bar wherein said end support holding means includes at least one notch in said support bar near said first and second ends and a latch on each roll end support, a respective given one of said latches engaged with a respective given one of said notches to thereby maintain said end supports in fixed axial relation on said support bar; whereby,
as the web is withdrawn from the roll, said web roll confining means maintain the web roll in substantially fixed axial position and said annular bearing surfaces provide continuous resistance to web roll rotation through friction resulting from the gravitational force between the web roll and said annular surfaces.

4,008,862 BALE UNROLLING DEVICE

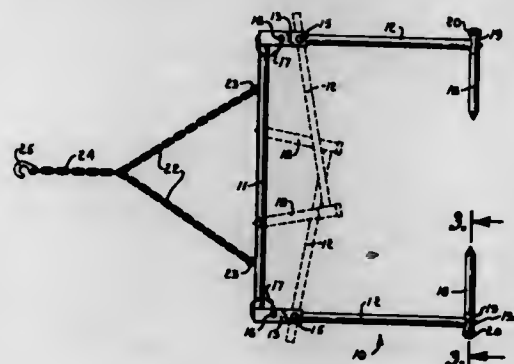
Raymond G. Wilmes, Rte. 2, Maryville, Mo. 64468

Filed Apr. 28, 1976, Ser. No. 681,278

Int. Cl.² B65H 75/46

U.S. Cl. 242-86.5 R

10 Claims



1. Apparatus for unrolling large hay bales comprising:
a cross member;
a pair of foldable arms;
means coupling said arms with the cross member for pivotal movement about respective pivot axes located in proximity to the opposite ends of the cross member and offset

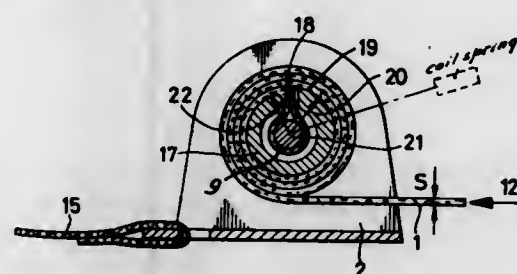
from said cross member, said arms being pivotal about said axes between a folded position lying generally parallel to said cross member and a bale engaging position wherein the arms are substantially perpendicular to said cross member and substantially parallel to one another; means for locking said arms in the bale engaging position; and
a pair of spikes projecting from the ends of the arms remote from said pivot axes, said spikes pointing generally toward one another to penetrate opposite ends of a bale when said arms are in the bale engaging position.

4,008,863
WINDING-UP ROLLER FOR SAFETY BELTS
Artur Föhl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany
Continuation of Ser. No. 317,356, Dec. 21, 1972, abandoned.
This application Oct. 8, 1974, Ser. No. 513,119
Claims priority, application Germany, Dec. 22, 1971, 2163788

Int. Cl.² A62B 35/00; B65H 75/48

U.S. Cl. 242-107.4 B

6 Claims



1. In the combination with a safety belt, of an impact emergency blocking belt winding-up roller system having a return spring and winding-up shaft means coupled to said return spring and connected to one of said belt, said roller system also having a locking mechanism for blocking further pull-out of said belt, the improvement which comprises forming said winding-up shaft means with an outer contour in the path of an Archimedes spiral having a pitch corresponding substantially to the thickness of said belt, said belt being wound on said shaft means starting at the point of smallest radius and proceeding about said spiral surface to the point of greatest radius, the contacting surface of said belt with the shaft means and with itself lying in the path of said Archimedes spiral, so that when said belt is drawn out or retracted at a uniform rate, the speed of rotation of said shaft means will vary at a uniform rate.

4,008,864
LOCKING MECHANISM FOR A SAFETY BELT
Nils Gustav Yngve Torphammar, Ostermahlsvagen 6, S-612 00 Finspang, and Per Gustav Torphammar, Surbrunnsgatan 8, S-411 19 Goteborg, both of Sweden
Filed Feb. 18, 1975, Ser. No. 550,398
Claims priority, application Sweden, Feb. 18, 1974, 7402102

Int. Cl.² A62B 35/02; B65H 75/48

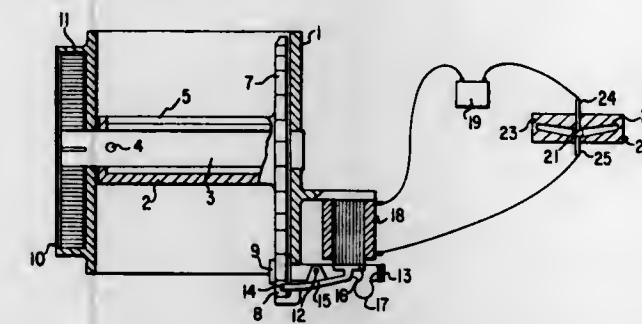
U.S. Cl. 242-107.4 R

5 Claims

1. In a safety belt of the type including a rotatable storage reel on which the belt may be automatically wound, a ratchet wheel connected to the reel, pivot means, a locking mechanism including pawl means mounted on said pivot means for engaging the ratchet wheel to prevent rotation of the storage reel, a lever having an arm contacting the pawl for actuating it and inertia responsive release means for operatively releasing the lever, the improvement in locking mechanism means comprising:

an oval shaped bearing hole located within the pawl means for permitting sliding movement of the pawl on the pivot

means in addition to pivoting movement when the pawl engages the ratchet wheel for locking,
a recess means formed on the pawl means for receiving the arm of the lever,
the recess means defining a cam-like surface on which the lever arm slides,



the cam-like surface of the recess means being shaped so as to cause the lever arm sliding thereon to move to the position it occupied prior to its release by the inertia responsive release means when the pawl undergoes sliding movement on the pivot means, and
means for biasing the lever arm to move the pawl into engagement with the ratchet wheel when the inertia responsive release means releases the lever.

4,008,865 VALVE FOR PNEUMATIC TUBE TRANSPORTING SYSTEM

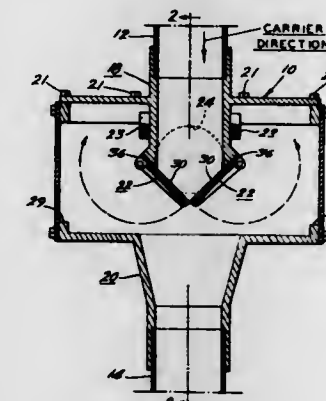
Chester N. White, Moylan, and John F. Lindsay, Wilmington, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 25, 1975, Ser. No. 616,738

Int. Cl.² B65G 51/04

U.S. Cl. 243-6

4 Claims



1. In a pneumatic tube delivery system wherein adjacent pneumatic tube sections are serviced by separate air flow sources and wherein a valve must be provided to separate and seal the adjacent tube sections such that the air flow sources do not work against each other, an improved valve for separating and sealing adjacent tube sections and comprising:

- a valve housing;
- an entrance tube into said valve housing;
- said entrance tube having a pair of flap seals with each flap seal being located on an opposite side of said entrance tube;
- spring means for biasing each of said flap seals closed to seal the valve and also to absorb the shock encountered by each flap seal when a container traveling through the pneumatic tube delivery system kicks open the flap seals;
- said housing further having shock absorbing means positioned by each flap seal to encounter each flap seal after the flap seal has traveled through an arc of greater than 180°, such as if the flap seal is kicked open by a container and travels against the action of said spring means beyond a predetermined point it will encounter said shock ab-

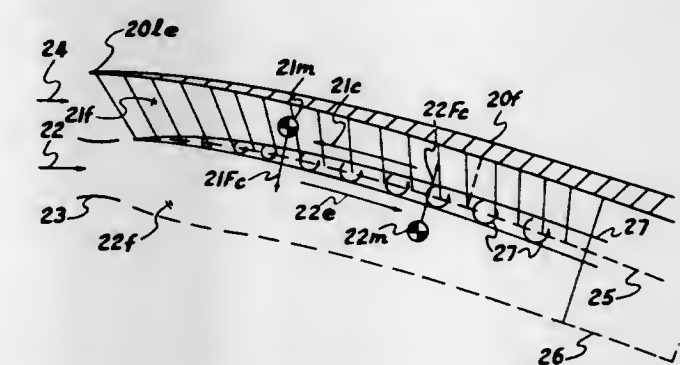
sorbing means to stop the flap seal and whereby said arc of greater than 180° allows said spring mean a substantial arc to absorb the shock encountered by each flap seal; and
f. an exit tube from said housing providing for the passage of a container from the valve.

4,008,866
COMPRESSION ENERGY TRANSFORMATION SYSTEM FOR A SUPERSONIC WING
Scott Carson Rethorst, South Pasadena, Calif., assignor to Vehicle Research Corporation, South Pasadena, Calif.
Continuation-in-part of Ser. No. 342,151, March 16, 1973, Pat. No. 3,904,151. This application June 6, 1975, Ser. No. 584,635

Int. Cl.² B64C 21/00

U.S. Cl. 244-1 N

5 Claims



1. An aircraft wing system to fly at supersonic speeds, said wing system comprising a wing having:
a lower surface element having its leading edge at substantially zero angle of attack and having a major portion of its downward concave curvature in its forward extent; said wing generating a compression layer of air thereunder; and
an underwing nozzle to emit a supersonic jet of fluid at a pressure greater than atmospheric comprising an expansion layer located below said compression layer wherein the correlation of the wing compression layer at the forward part of the wing and the short jet expansion concentrates density changes produced by said wing and said nozzle in adjacent regions and generates both (1) opposing sign perturbation velocities on the interface between the compression layer and the expansion layer, thereby invoking viscous forces to generate an ordered form of vorticity by spinning elements of said layers about spanwise axes, and (2) equal magnitude and opposite sign Coriolis reaction forces due to the contrasting changes in angular momentum of said layers as said layers are turned downward by the wing, and thereby forming a mechanism to feed energy into the vorticity generation process, and providing a downstream upwash producing at supersonic speeds an increased pressure on the lower surface enabling the wing to operate at a lesser angle with reduced drag.

4,008,867
AIRCRAFT WITH SAFETY TAIL UNIT
Herbert M. Kaniut, Orrerweg 33/35, 5000 Cologne 71, Germany
Continuation-in-part of Ser. No. 508,319, Dec. 4, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 633,994
Claims priority, application Germany, Aug. 16, 1974, 2439479

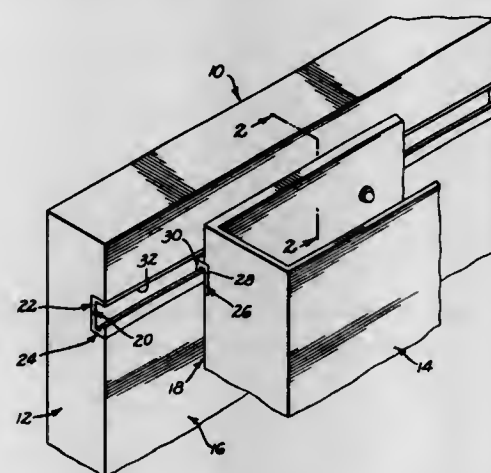
Int. Cl.² B64C 5/02

U.S. Cl. 244-87

11 Claims

1. In a supersonic aircraft having a variable geometry horizontal tail which is movable in longitudinal direction of aircraft and which for low-speed flight and particularly for take-

- c. a module having a rear side adapted to abut said front side of said supporting structure;
- d. a horizontally extending, downwardly facing hook secured to and projecting rearwardly from said rear side of said module, said downwardly facing hook being complementary to and interengageable with said upwardly facing hook within said groove in said front side of said supporting structure, with said rear side of said module abutting said front side of said supporting structure, the height of said downwardly facing hook being less than the height of said gap to permit insertion of said downwardly facing hook through said gap, and into engagement with said upwardly facing hook, simply by moving said module



rearwardly into abutting relation with said supporting structure;

- e. said downwardly facing hook comprising part of a horizontally extending supporting member recessed into said rear side of said module;
- f. said groove and said upwardly facing hook therein extending the full width of said supporting structure, and the width of said module being less than the width of said supporting structure, said downwardly facing hook extending the full width of said module; and
- g. said module carrying adjacent the bottom thereof adjustable means engageable with said front side of said supporting structure to compensate for deformation of said front side of said supporting structure.

4,008,873

ANGULARLY ADJUSTABLE SHELF BRACKET

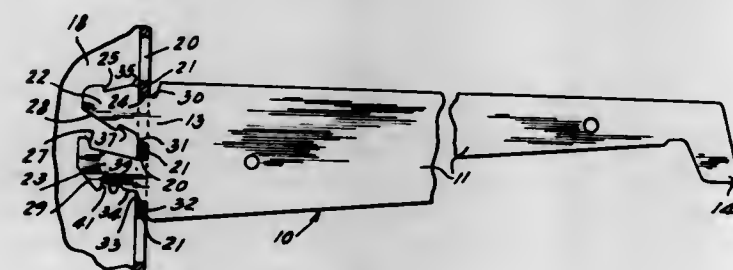
Vincent M. Travaglio, Rolling Meadows, and Michael L. Magnifico, Chicago, both of Ill., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 29, 1976, Ser. No. 653,292

Int. Cl.² A47G 29/02; A47F 3/06

U.S. Cl. 248—242

9 Claims



1. In a shelf supporting bracket comprising an elongated arm having a butt end from which extend a plurality of vertically spaced retaining fingers for supporting engagement with horizontal bars which separate vertically spaced openings in an upright supporting structure through which the fingers extend and with respect to which the bracket is adjustable to and between a plurality of different angular positions:

- the uppermost of said fingers having on its upper edge spaced shoulders facing toward said butt end and engageable with a hole-separating bar to retain the bracket in a plurality of selective different angular positions relative to the supporting structure;
- a lower finger having on its upper edge a shoulder facing toward said butt end and engageable with a bar to retain the bracket in another selective angular position relative to the supporting structure;
- and said fingers having safety catch means on their lower edges comprising shoulders facing toward said butt end and engageable with the hole-separating bars for interim arresting of the bracket against dropping away from the supporting structure when effecting adjustment from one angular position to another;
- the lower of said fingers having a safety catch shoulder which is spaced farther from the butt end than a safety catch shoulder on the upper of said fingers.

4,008,874

UMBRELLA SUPPORTING BRACKET FOR MOTORIZED CARTS

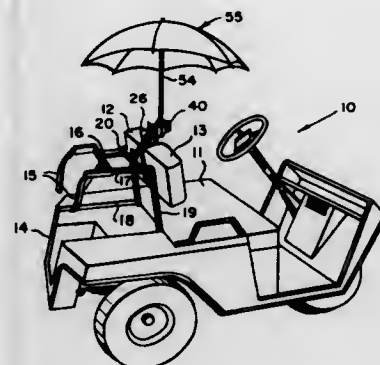
John W. Conway, Jr., 15035 Westholm Court, Silver Spring, Md. 20906

Filed Oct. 23, 1974, Ser. No. 517,392

Int. Cl.² A01K 97/10

U.S. Cl. 248—534

4 Claims



1. In combination, a canopy, a canopy supporting bracket, and a motorized cart equipped with a seating and storage area and wherein a pair of rearwardly extending horizontal bars are mounted on said cart, rearwardly of and directed away from said seating area, the improvement comprising, a forwardly inclined arm fixed to a transverse bar, one end of said bar provided with a fixed intumed lip engaging with one of said horizontal bars, the other end of said bar provided with a telescoping section having an intumed lip engaging with the other of said horizontal bars, securing said transverse bar to said rearwardly extending horizontal bars an adjustable bracket mounted on said forwardly inclined arm, said bracket including a two-part clamp engaging with the handle portion of said canopy and supporting the same in adjusted position over the seating area of said cart.

4,008,875

SEQUENCE VALVE FOR CLAMPING APPARATUS

John E. Olson, Portland, Oreg., and Richard D. Seaberg, Vancouver, Wash., assignors to Cascade Corporation, Portland, Oreg.

Filed Jan. 2, 1976, Ser. No. 646,401

Int. Cl.² F15B 13/06

U.S. Cl. 251—63.4

7 Claims

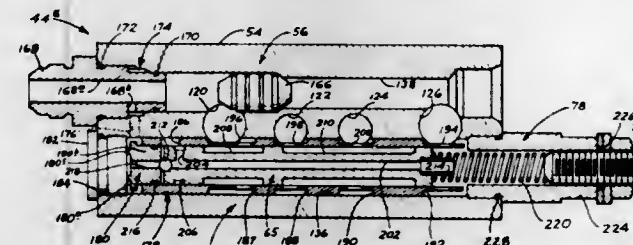
6. In a control valve for operating in response to the pressure difference between a pair of fluid communication ports in the valve, where the valve includes

- a valve body,
- a valve spool mounted within said body for shifting between a pair of control positions, with said spool including first and second working surface areas on opposite sides

- thereof on which pressure fluid may act to shift the spool toward its said two control positions,
- biasing means acting on said spool yieldably urging the same toward one of its said control positions, and
- means defining a pair of fluid passages in said body, one for communicating between one of said ports and said first working surface area, and the other for communicating between the other port and said second working surface area,

the improvement comprising:

- means interposed between said one fluid passage and said first working surface area constructed to enable exposure to pressure fluid within said one fluid passage of only a



- portion of said first working surface area with said spool in its said one control position, and constructed further to enable exposure of the full extent of said first working surface area to such pressure fluid with said spool shifted toward its said other control position; and

- changeable-condition pressure-balancing means for said spool including means defining an openable-closeable fluid path which, with said spool in its said one control position, allows fluid communication between said second working surface area and a portion of said first working surface area which is different from said first-mentioned portion, and which blocks such communication with said spool shifted toward its said other control position.

4,008,876

SOLENOID VALVE

Clifford F. Bastie, Milwaukee, Wis., assignor to The Singer Company, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,759

Int. Cl.² F16K 31/06

U.S. Cl. 251—129

3 Claims



1. A solenoid valve comprising,
- a housing having an inlet and outlet separated by a valve port,
- a valve on the inlet side of the port movable relative to the port to control flow from the inlet to the outlet,
- a coil mounted on the housing,
- a core inside the coil and magnetized by the coil when the coil is energized,
- an armature slidable inside the coil and having its working face spaced from the core when the valve is closed,
- said valve having a lost motion connection to the armature with a positive limit stop at each end of the motion,
- a return spring acting on the armature in a direction moving the armature to the valve closing position,

- a spring acting on the valve and moving the valve to a position against one limit stop providing the maximum lost motion between the armature and the valve,
- energization of the coil acting to initially move the armature towards the core against the weight of the armature and the compression force of both springs,
- the lost motion between the armature and the valve being taken up upon impact of the valve against the other limit stop prior to the armature seating against the core whereby the increased available magnetic force and the kinetic energy of the moving armature act to unseat the valve before the armature seats against the core,
- said valve spring acting to move the valve further from the port after the armature has seated against the core.

4,008,877

BUTTERFLY VALVE APPARATUS

Masahiro Yasuoka, and Yoshitsugu Okada, both of Hirakata, Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 419,368, Nov. 27, 1973, abandoned.

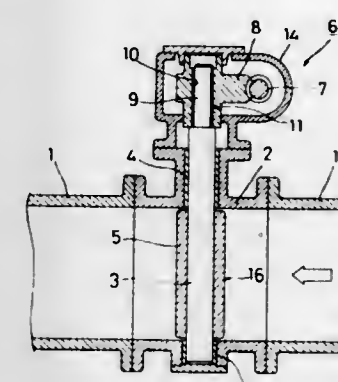
This application Aug. 6, 1975, Ser. No. 602,411

Claims priority, application Japan, Nov. 30, 1972, 47-120382

Int. Cl.² F16K 31/44

U.S. Cl. 251—249.5

6 Claims



1. A butterfly valve comprising:
- a housing including a tubular portion for carrying fluid therethrough;
- a rotatable valve shaft arranged to penetrate said tubular portion perpendicularly to the axis thereof, said valve shaft being held in sleeve bearings located adjacent to opposite walls of said tubular portion and further including a drive stem with a rectangular cross section;
- a butterfly valve plate fixedly mounted on said rotatable valve shaft in said tubular portion;
- a drive plate, having an aperture arranged to receive the drive stem of said valve shaft and further provided with gear teeth on part of its periphery; and
- means for oscillating said drive plate the improvement wherein:
- said drive plate has a rectangular means defining an opening including opposed longitudinal side dimensions which are perpendicular to the plane of said butterfly valve plate and transverse dimensions of said rectangular means defining the opening lies in planes parallel with said butterfly valve, said valve stem further including a stem portion of rectangular configuration complementary to said rectangular means defining the opening in said drive plate and having a smaller longitudinal dimension than said drive plate opening to thereby permit limited relative sliding movement of said complementally formed elements to thereby compensate for radial clearance in said bearings as well as to relieve pressure on the means motivating said drive plate.

4,008,878

GAS CONTROL VALVE FOR GAS SHIELDED ELECTRIC WELDING TORCHES

Louis F. Himmelman, deceased, late of Upper Saddle River, N.J., by William F. Himmelman, executor, 28 Arrowhead Drive, Upper Saddle River, N.J.

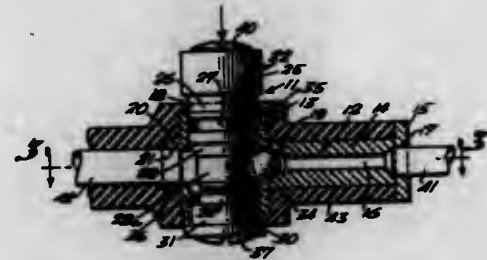
Continuation of Ser. No. 218,303, Jan. 17, 1972, abandoned.

This application July 8, 1974, Ser. No. 486,701

Int. Cl.² F16K 15/18, 1/14

U.S. Cl. 251-257

1 Claim



1. A gas flow control valve for electric arc torches comprising:

- a valve body member having substantially coaxial gas inlet and gas outlet passageways;
- a bore in said valve body member transverse with respect to and communicating at opposite interior sides thereof with said gas inlet and said gas outlet passageways;
- a frusto-conical passageway defining a valve seat recess at the inner end of said gas inlet passageway at the junction of said transverse bore;
- a ball check valve member disposed in said valve seat recess;
- a valve stem member slidably received within said transverse bore;
- said valve stem member having a cam means comprising a frusto-conical cam surface portion coaxially formed along said valve stem member and defining a recess in said transverse bore within which said ball check is partially received;
- said cam means operative upon axially shifting said valve stem member to move said ball check between unseated and seated positions with respect to said valve seat recess;
- said valve stem member comprising a pair of transversely divided upper and lower valve stem sections, said upper section comprising said frusto-conical cam surface portion, and means for bolting said upper and lower valve stem sections together within said transverse bore;
- said bolting means comprising a sleeve nut extending through axial bores in said upper and lower valve stem sections and a machine screw threaded in said sleeve nut;
- means for securing said valve stem sections in end-to-end interfitted engagement comprising a short, tapered cylindrical key portion formed on one of said valve stem sections receivable in a complementary tapered circular recess in the other of said valve stem sections; and
- means for sealing said upper and lower valve stem sections comprising resilient O-rings seated within annular grooves provided in said upper and lower valve stem sections.

4,008,879

CARPET STRETCHER

David R. Youngman, 39 E. Ravenwood Ave., Youngstown, Ohio 44507

Filed Mar. 4, 1976, Ser. No. 663,850

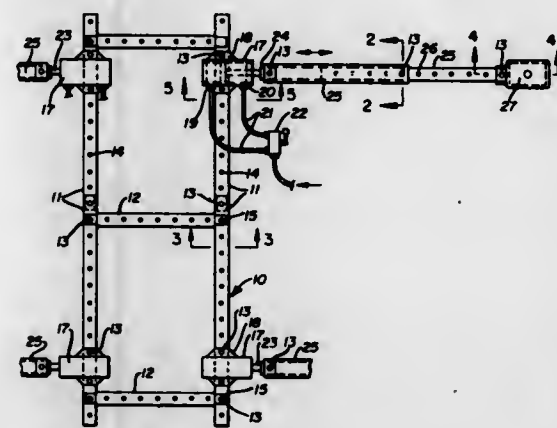
Int. Cl.² A47G 27/04

U.S. Cl. 254-57

6 Claims

1. A carpet stretcher comprising a pair of spaced ladder-like rails, cross members joining said rails to form an elongated frame having a plurality of apertures therein, carpet engaging points on said rails, at least one pneumatic piston and cylinder

assembly and means detachably mounting said piston and cylinder assembly on one of said rails of said frame at right angles thereto, at least one telescopic leg detachably secured to the piston of the pneumatic piston and cylinder assembly



and a foot on the other end of said telescopic leg and means on said foot for engagement with said carpet so that actuation of the pneumatic piston and cylinder will move the foot and the carpet engaged thereby relative to said frame.

4,008,880

WIRE TIGHTENER

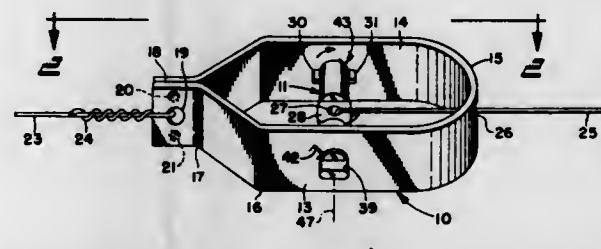
Michel Devis, 448 Geiger St., Berea, Ohio 44017

Filed July 7, 1975, Ser. No. 593,204

Int. Cl.² B66D 1/04

U.S. Cl. 254-161

17 Claims



1. A wire tightener comprising a frame having substantially parallel sides, a shaft journaled between and through holes in the sides of said frame, means to secure a wire end to said shaft, projections on said shaft between and adjacent the sides of said frame maintaining said shaft in position, and a strike in said frame contiguous with and adjacent one of said holes cooperating with the adjacent projection to preclude said shaft from rotating in one direction past said strike, said strike including a cam surface and a stop surface, the latter extending generally normal to the side of the frame and generally radially of the adjacent hole, the sides of said frame being resiliently urged apart as the edge of the projection moves over said cam surface as the shaft rotates in the opposite direction.

9. A wire tightening device comprising a frame including parallel sides, a shaft extending between said sides, means to secure a wire to said shaft, projections on said shaft adjacent the sides, and a cam strike in one of said sides cooperating with one of said projections to prevent said shaft from rotating in one direction, said frame being of sufficient resilience to permit said sides to move relative to each other slightly as said projection cams over said cam strike as said shaft rotates in the opposite direction.

4,008,881

PORTABLE WINCH RATCHET DOG

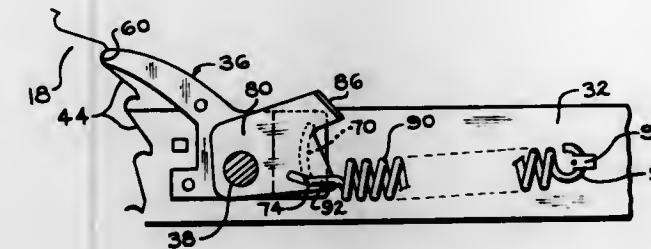
Karl J. Ross, Maumee, Ohio, assignor to American Gage & Manufacturing Co., Wauseon, Ohio

Filed Mar. 17, 1975, Ser. No. 558,644

Int. Cl.² A63B 61/04

U.S. Cl. 254-164

4 Claims



1. In a portable winch having a drum and ratchet wheel mounted upon a frame for rotation about an axis, a hand lever pivoted upon said frame for rotation about said axis, tension transmitting means wound upon said drum, a releasable stop pawl pivotally mounted upon said frame engaging said ratchet wheel permitting unidirectional rotation of said drum, the improvement comprising a ratchet dog, a pivot pivotally mounting said ratchet dog upon said hand lever for pivoting between an operative position engagable with said ratchet wheel and an inoperative position clearing said ratchet wheel during pivoting of said hand lever about said axis, an elongated closed spring anchor slot defined on said dog having spaced first and second spring receiving portions, a spring anchor defined on said hand lever, said slot being located between said pivot and said spring anchor, a tension spring having a first end directly slidably received within said slot and a second end attached to said anchor, and a spring shifter comprising a member pivotally mounted on said pivot directly engaging said spring first end adjacent said slot selectively shifting said spring first end within said slot between said first and second spring receiving portions, an opening defined in said spring shifter member receiving said spring first end, said anchor, spring receiving portions and pivot being so related that positioning said first spring end at said first spring receiving portion misaligns said spring first end from a straight line relationship between said pivot and spring anchor to produce a biasing force which pivots and maintains said dog at said operative position and positioning said first spring end at said second spring receiving portion misaligns said spring first end from a straight line relationship between said pivot and spring anchor to produce a biasing force which pivots and maintains said dog at said inoperative position.

4,008,882

MIXING UNIT FOR MIXING AND/OR TREATING FLUID MATERIALS

Povl Jørgen Jørgensen, Vedbaek, Denmark, assignor to Rotostat I/S, Copenhagen, Denmark

Filed Mar. 17, 1975, Ser. No. 559,031

Claims priority, application Denmark, Mar. 26, 1974, 1662/74

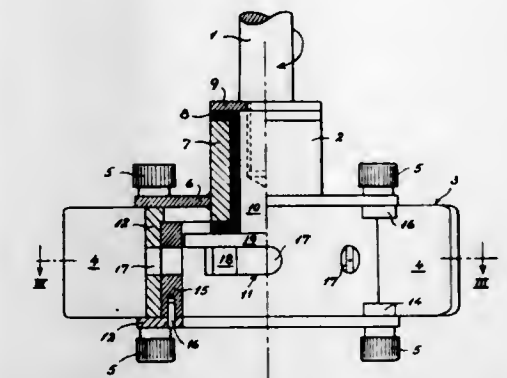
Int. Cl.² B01F 15/00, 7/02

U.S. Cl. 259-2

4 Claims

1. A mixing stirrer for mixing and treating liquid materials after being placed inside a container containing said liquid materials, comprising an outer housing comprising substantially a right cylindrical sidewall and two flat circular end plates with the sidewall defining openings for passage of said liquid materials and having disposed exteriorly thereof at least one outwardly radially extending flat paddle-like protrusion, a driven rotor having outwardly extending impeller blades mounted within said housing for rotation relative to said housing on a drive shaft adapted to be connected to a driving means with the axes of said right cylindrical sidewall, said

rotor drive shaft, and said rotor being coaxial, said housing being mounted for free rotation relative to said rotor, as well as to said container, and said rotor acting to direct the liquid materials to be treated outwardly through said openings in



said housing sidewall into an area adjacent said protrusions whereby the materials will be acted on by said protrusions and the rotation of said housing in said liquid material will be restrained.

4,008,883

BLENDER

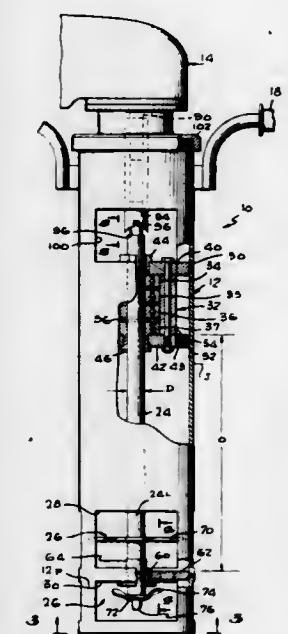
Robert Frutos Zubieta, 1101 Aviation Blvd., Hermosa Beach, Calif. 90254

Filed June 11, 1975, Ser. No. 585,853

Int. Cl.² B01F 5/16, 7/26

U.S. Cl. 259-108

2 Claims



1. A blender comprising:

- a tube (12 or 119) having upper and lower portions;
- a shaft (24 or 122) positioned in said tube to extend substantially axially therealong;
- a motor (14) coupled to said shaft to turn it in a predetermined direction;
- a bearing assembly (32) including a plurality of bearings mounted on said tube and rotatably supporting said shaft;
- said tube having a first plurality of circumferentially spaced openings (30 or 125) near the lower end thereof and a second plurality of circumferentially-spaced openings (28 or 123) located above said first openings;
- a plurality of blades (24 or 126 - 130) mounted on said shaft, some of said blades mounted at the level of said first plurality of openings in said tube and some of said blades mounted at the level of said second plurality of openings in said tube;
- a bushing support (62 or 118) mounted in said tube between said first and second openings;

a stabilizing bushing (60 or 114) mounted on said bushing support and having a bushing hole (66 or 114h) through which said shaft extends, said bearing assembly holding said shaft so it extends through the center of said bushing hole and said bushing hole being of a size which provides a clearance between the shaft and bushing of between 0.016 and 0.064 inch so that said shaft does not touch the walls of the bushing hole when the shaft is undeflected, said bushing hole being small enough that the shaft touches the wall of the bushing hole during resilient side-ward deflection of the shaft;

at least two blades (74 or 130) of said plurality of blades shaped to urge fluid through said stabilizing bushing hole when said shaft is rotated by said motor.

4,008,884

STIRRING MOLTEN METAL

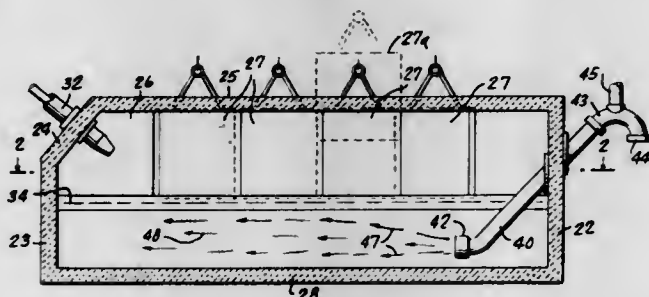
Nigel Patrick Fitzpatrick, Kingston, Canada; James Neville Byrne, Banbury, England, and Angus James MacDonald, Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed June 17, 1976, Ser. No. 697,113

Int. Cl.² C22B 9/02

U.S. Cl. 266—233

34 Claims



1. In a molten metal operation, the procedure of stirring a body of molten metal comprising alternately withdrawing molten metal upwardly from the body in a confined space to a level above the body and expelling the withdrawn molten metal into the body as a submerged high velocity jet, and repeating said alternate metal-withdrawing and metal-expelling steps to effectuate continued stirring in the body.

4,008,885

HOLDDOWN DEVICE FOR SHEARS

Albert Einhaus, Hagen; Rudi Gürath, Herbede, and Siegfried Klaus, Ennepetal, all of Germany, assignors to Firma Paul Ferd. Peddinghaus, Gevelsberg, Germany

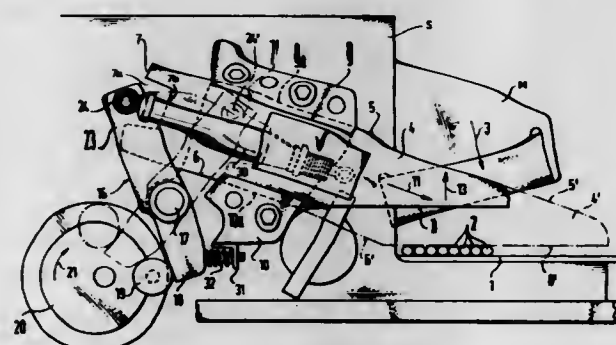
Filed May 6, 1976, Ser. No. 683,744

Claims priority, application Germany, May 9, 1975, 2520585

Int. Cl.² B25B 1/08

U.S. Cl. 269—162

4 Claims



1. A holddown device for shears mounted on a support structure including a trapezoidal beam guided on inclined tracks set laterally parallel to the shears opening, means for moving said beam between a starting position where it is out of engagement with the material it is to hold in place during

shearing and an operating position where it is in engagement therewith, said means including a two-armed lever pivotally mounted relative to said support structure and disposed adjacent said beam, a tension spring situated in the longitudinal direction of said beam and connected at one end to said beam and at its other end to one arm of said lever, and cam and second spring means constructed and arranged to engage the other arm of said lever whereby the beam can be resiliently moved into and out of engagement with the material to be sheared.

4,008,886

MACHINE TOOLS

Peter Murdoch, 5 Oakhurst, London Road, Henfield, Sussex, England

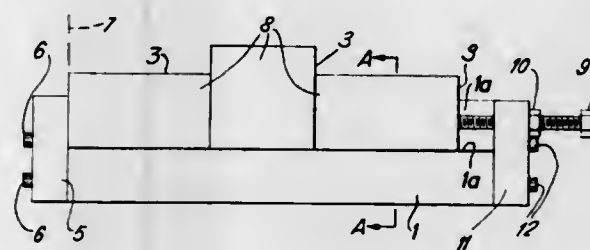
Filed Oct. 1, 1975, Ser. No. 618,830

Claims priority, application United Kingdom, Oct. 2, 1974, 42689/74

Int. Cl.² B25B 1/24

U.S. Cl. 269—266

8 Claims



1. A variable profile vice jaw face member comprising:
 - a. an elongated base member including a first insert supporting precision tooled surface lying in a plane extending generally transverse to the direction of closing of the jaw face member, the open area immediately in front of the said insert supporting surface defining generally an inset supporting area, the base member extending longitudinally transversely of the direction of opening and closing of the jaw face with the insert supporting area generally facing the direction of closing of said jaw face member;
 - b. a precision tooled groove area in said insert supporting surface extending longitudinally of the base member and transversely of the direction of closing of the jaw face member;
 - c. end plates secured to and spaced along the base member blocking the insert supporting area in an endwise sense;
 - d. at least one insert member disposed in the insert supporting area between the end plates, each insert supporting member having a complementary formed base engaging surface engaging the insert supporting surface of the base member, including the groove area, in contiguous relationship, and a work engaging surface generally facing the direction of closing of the jaw face member; and
 - e. locking means secured to one of said end plates for removably securing each insert member between the end plates within the insert supporting area of the base member.

4,008,887

APPARATUS AND METHOD FOR THE FOLDING OF MATERIAL TO BE PACKAGED

Oskar Karolyi, Boll, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed Feb. 11, 1974, Ser. No. 441,320

Claims priority, application Germany, Feb. 10, 1973, 2306653

Int. Cl.² B65H 45/00

U.S. Cl. 270—61 R

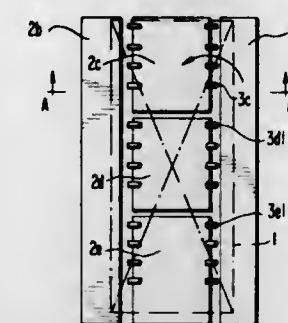
24 Claims

22. Apparatus for folding material to be packaged comprising: a plurality of folding flap means,

folding flap moving means for sequentially moving said flap means to effect folding of material placed on said flap means,

gripper means associated with at least one of said flap means, said gripper means being movable between a gripping position corresponding to gripping of material against a respective flap means and a non-gripping position,

and gripper control means for controlling movement of said gripper means between said gripping and non-gripping



positions during folding of material by said flap means and flap moving means,

wherein said gripper means are attached to rotatable gripper support shafts, and wherein said gripper control means includes flexible shafts which are attached to respective ones of said support shafts, and rotatable cam disks which are sequentially rotated in predetermined relationship to movement of the flap means, said cam disks being drivingly connected to said flexible shafts for imparting rotation to same.

4,008,888

DEVICE FOR THE TRANSPORT OF INDIVIDUAL PIECES OF FABRIC IN THE AUTOMATIC MANUFACTURE OF PRODUCTS THEREFROM

Costantino Vinciguerra, Florence, Italy, assignor to Nuovo Pignone, S.p.A., Florence, Italy

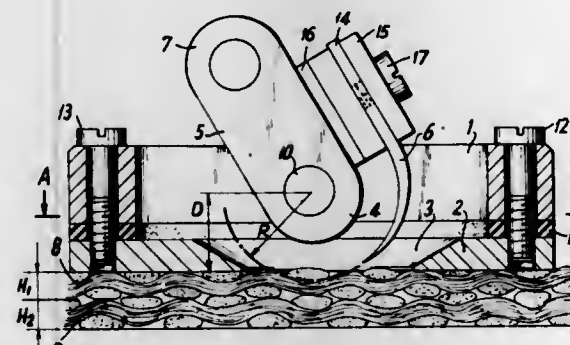
Filed Feb. 20, 1974, Ser. No. 444,117

Claims priority, application Italy, Feb. 20, 1973, 20575/73

Int. Cl.² B66C 1/58

U.S. Cl. 271—18.3

2 Claims



1. Apparatus for the automatic manufacture of articles from fabric by moving cut individual pieces of a set to a work station at which the pieces are sewed to each other, wherein the improvement comprises: a movable hollow frame, a flat plate adapted to be forced downwardly against the upper surface of a piece of fabric and having a centrally disposed opening, a connection between the plate and the frame, wherein said connection between the plate and frame is adjustable and comprises, a flexible gasket located between the lower face of the frame and the upper face of the plate, and a set of plate adjustment screws extending through the frame and the gasket and engaging the plate so that rotation of said plate adjustment screws will vary the distance between the plate and the frame, thereby changing the location of said arc,

an elongated oscillatory needle holder having its lower end supported by said frame along an axis of rotation located above said opening in the plate, a needle having a curved sharply tapered lower end and a stem, a connection between said stem and needle holder at a point above said lower end thereof whereby oscillation of said needle holder will cause the sharply tapered end of the needle to swing through said opening along an arc, and means for adjusting the location of said arc so that said tapered end of the needle is caused to penetrate said fabric to a predetermined depth.

4,008,889

VACUUM FEED MECHANISM

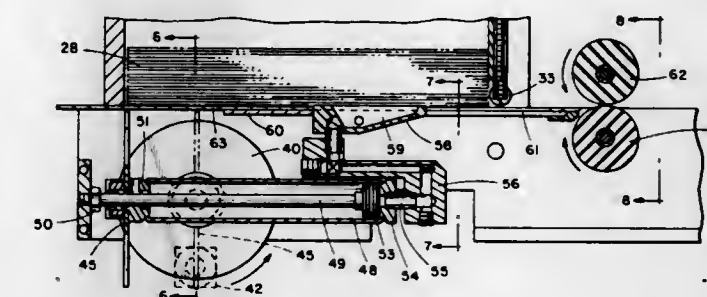
Walter D. Ayres, Burbank, Ill., assignor to Redco, Inc., Chicago, Ill.

Filed June 16, 1975, Ser. No. 587,129

Int. Cl.² B65H 3/12

U.S. Cl. 271—99

3 Claims



1. A pneumatic feed mechanism for removing one article at a time from the bottom of a stack of articles, the improvement comprising:

an article receptacle for positioning a stack of articles on a work table and said work table having an elongated opening therein and having a portion of said opening at the bottom of said receptacle; a vacuum shuttle positioned in said elongated opening and reciprocable therein to engage and move the bottom article from said stack; a feed gate positioned adjacent to said opening and having a movable tongue and roller assembly for guiding articles on said table; a drive mechanism coupled with said vacuum shuttle and said drive mechanism having a rotatable drive member coupled to a pivotally attached slide block; pneumatic means having a slider-drive coupled with the drive member and having piston means and cylinder means; one of said piston-cylinder means being movable with respect to the other of said piston-cylinder means to create an operating vacuum; and said vacuum shuttle having means coupled to said pneumatic means whereby said shuttle moves in unison with the movable portion of said pneumatic means, and said pneumatic means including a fixed piston rod and a cylinder reciprocally movable with respect thereto; and a chambered connecting fitting for transmitting vacuum interconnecting the movable cylinder with the vacuum shuttle.

4,008,890

METHOD AND APPARATUS FOR TRANSPORTING MATERIALS

William F. Pulda, Piscataway, N.J., assignor to Vanguard Machinery Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 545,038, Jan. 29, 1975, Pat. No. 3,982,750. This application June 5, 1975, Ser. No. 574,954

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.² B65H 5/24

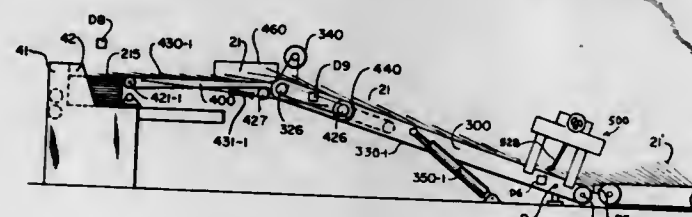
U.S. Cl. 271—151

11 Claims

1. The method of transporting and reorienting a stack of materials which comprises the steps of:

- a. conveying the stack to a prescribed position on and by one driven feed conveyor;

- b. pivoting another driven feed conveyor to a prescribed angular position relative to the one conveyor;
c. tilting said stack and letting it fall freely against the other conveyor to simultaneously upset and shingle said stack;



- d. positioning said other conveyor for the feed of the upset stack therefrom;
e. substantially uniformly increasing the shingle of said stack.

4,008,891

DISTRIBUTOR OF SHEETS IN WADS

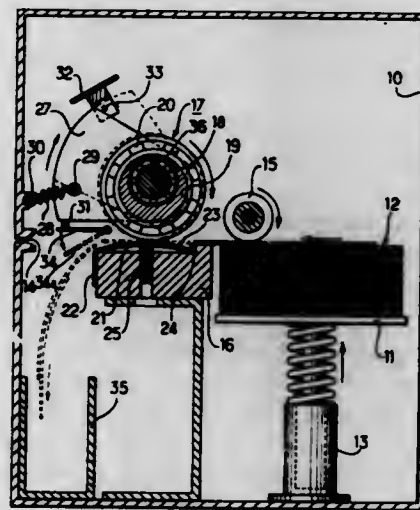
Henri Buys, Arpajon, France, assignor to Transac-Compagnie pour le Developpement des Transactions, Paris, France

Filed Oct. 16, 1975, Ser. No. 623,069

Claims priority, application France, Oct. 18, 1974, 74.35088

Int. Cl.² B65H 7/12

U.S. Cl. 271-263



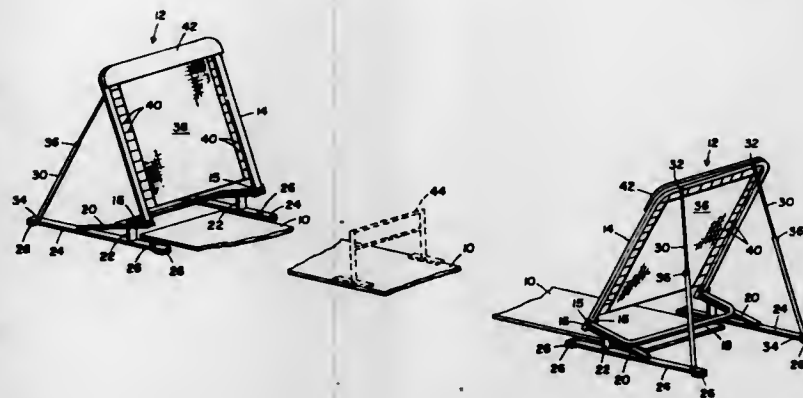
1. In a machine for distributing individual sheets from a stack comprising a receptacle for the stack, means for feeding the sheets one by one through an orifice in the receptacle, and detecting means for detecting the simultaneous presence of a plurality of sheets in the vicinity of the orifice and upstream therefrom, said detecting means comprising a support having a substantially planar top portion on which pass sheets extracted from the stack, an eccentric wheel, a stationary shaft rotatably supporting said wheel, said shaft extending parallel to the planar top portion and perpendicular to the direction of movement of the sheets, said wheel comprising a first ball bearing installed on said shaft, an eccentric ring mounted on said ball bearing, and a second ball bearing surrounding said eccentric ring, said wheel being arranged in the vicinity of the planar portion of the support but spaced therefrom such that the planar portion is spaced from the wheel by a distance at least equal to the thickness of one sheet and less than the thickness of two sheets, first means acting on the wheel for keeping it in a fixed angular position where there is, at most, one sheet between the support and the wheel, a vertical line passing through the center of said wheel in said fixed angular position passing through the center or slightly downstream of said stationary shaft in relation to the direction of movement of the sheets, and second means for detecting rotation of said wheel for diverting the passage of the sheets to the orifice, said rotation taking place when a plurality of sheets arrive simultaneously between the wheel and the support.

4,008,892
APPARATUS FOR REBOUND RUNNING
George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation
Continuation of Ser. No. 338,190, March 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 262,679, June 14, 1972, abandoned. This application Aug. 7, 1975, Ser. No. 602,683

Int. Cl.² A63B 5/08

U.S. Cl. 272-100

10 Claims



1. A combination for use with a confined floor area for running a first distance longer than a second distance between two locations within said area by reciprocally traversing the second distance a plurality of times, the combination comprising: an unsuspended running surface, means on said surface defining a substantially rectilinear running lane, the lane having two locations thereon spaced apart longitudinally thereof and adapted to be reciprocally traversed by a runner; a backstop disposed at at least one of said locations, the backstop including a flexible panel and a frame surrounding margins of the panel, the panel being suspended within the frame by resilient means attached to and between the frame and said panel margins; and means supporting the frame against movement relative to the lane and with a face of the panel disposed in an upright position transversely of the lane, the panel being so angled with the running surface that when said face thereof is struck by an upright portion of the body of a runner running in one direction along the lane toward the backstop, the runner is thereupon bodily rebounded therefrom back along the lane in the opposite direction toward the other of said locations at a speed substantially that at which he struck the panel.

4,008,893

SIMULATED BOWLING GAME

Mark Yoseloff, 8 Candle Lane, East Brunswick, N.J. 08816

Filed Feb. 26, 1975, Ser. No. 553,361

Int. Cl.² A63F 7/06

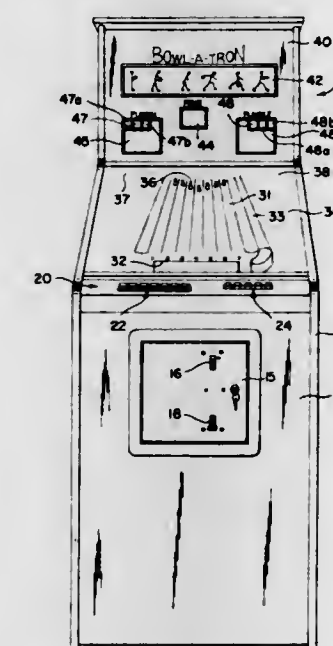
U.S. Cl. 273-85 R

24 Claims

1. A simulated bowling game, comprising:
means to provide a simulated ball and a simulated bowling alley having a starting line and a set of simulated bowling pins;
random signal means for generating random binary bits;
ball path selection means which comprises an initial ball position selector, ball position encoder means responsive to said initial ball position selector for providing an initial ball position signal, a ball direction selector, and ball direction encoder means responsive to said ball direction selector providing a ball direction signal; wherein said ball position encoder means includes means for generating a horizontal ball displacement signal in response to said ball direction signal and said random signal means; and adder means for adding said initial ball position signal and said horizontal ball displacement signal to provide a succession of horizontal ball position signals;
ball position means for simulating movement of said simulated ball down said simulated bowling alley from said starting line to said set of simulated bowling pins, wherein said ball position means includes horizontal ball position

means and vertical ball position means, said horizontal ball position means computing a horizontal position for said ball in response to said ball path selection means and said random signal means for each of a plurality of positions along said bowling alley, and wherein said vertical ball position means providing successive vertical ball position signals, said ball position means being responsive to said ball path selection means and said random signal means for determining the path of the ball;

display means for displaying the position of said simulated ball as it moves down said simulated bowling alley, said display means including a plurality of lamps arranged in a plurality of rows, representing vertical ball position, and a plurality of columns, representing horizontal ball position, simulating said bowling alley, and circuit means responsive to said horizontal ball position signals and said vertical ball position signals for successively energizing a lamp in a column selected by one of said horizontal ball position signals and a row selected by one of said vertical ball position signals in sequence to display the simulated movement of said simulated ball down said simulated



bowling alley from said starting line to said set of simulated pins;

step generator means for synchronizing said horizontal ball position means and said vertical ball position means, said step generator means providing step signals defining successive step intervals and vertical ball position means providing successive vertical ball position signals in successive step intervals, said step signals synchronizing said horizontal ball displacement generator means with said vertical ball position means whereby each successive horizontal ball position signal will coincide with a vertical ball position to signify horizontal and vertical positions of a simulated ball in said simulated alley;

pin disposition means enabled by a said step signal corresponding with the time of arrival of said ball with said set of bowling pins for determining which of said set of bowling pins will fall; and

random number generator means providing a random number signal at said time of arrival, and wherein said pin disposition means is responsive to said horizontal ball position signal and said random number signal provided upon the enablement of said pin disposition means.

4,008,894

RAILROAD TEETER SWITCH GAME

David L. Renner, Rte. 1, Wallace, Kans. 67761

Filed July 21, 1975, Ser. No. 597,439

Int. Cl.² A63F 7/04, 9/08

U.S. Cl. 273-110

5 Claims

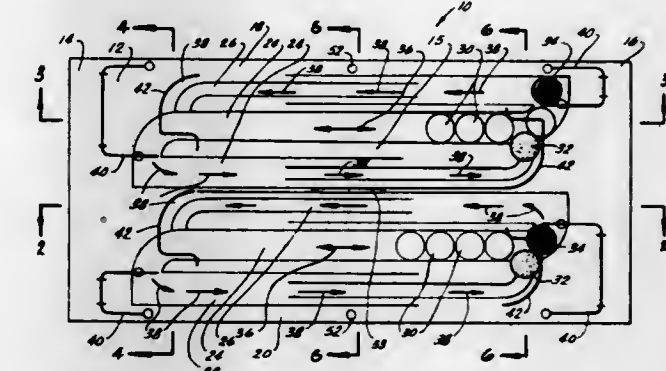
1. A railroad teeter switch game using colored roller balls,

the individual balls representing a railroad engine, a railroad caboose, and other railroad cars, the game comprising:
colored roller balls;

a game board;

pivot means attached to said board for tilting said board; a main channel in said board, said main channel parallel to the sides of said board, said main channel receiving said roller balls for rolling therein;

return channels in said board, said return channels positioned on either side of said main channel and parallel thereto, said return channels attached at both ends to said main channel for receiving and returning the roller balls to said main channel; said return channels are inclined in opposite direction so that said game board when tilted in



one direction one of said return channels will receive one of said roller balls from said main channel while said other return channel will return another of said roller balls to said main channel, when said game board is tilted in the other direction said other return channel will receive one of said roller balls from said main channel while said return channel will return another of said roller balls to said main channel; and

a plurality of switches attached to said board, said switches positioned at each end of said main channel to control the flow of the roller balls into said return channels as said game board is tilted;

said main channel representing a railroad track, said return channels representing railroad return tracks.

4,008,895

MAZE GAME

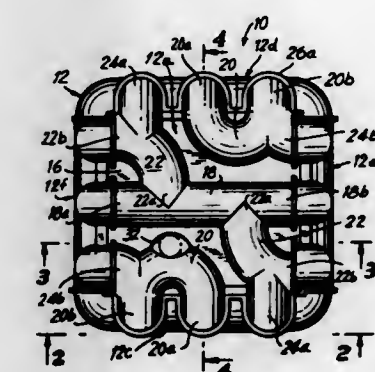
Lawrence L. Reiner, Woodbury, N.Y., and John P. McNett, Short Hills, N.J., assignors to Lawrence L. Reiner, Woodbury, N.Y.

Filed Sept. 15, 1975, Ser. No. 613,256

Int. Cl.² A63F 7/04

U.S. Cl. 273-113

15 Claims



1. Maze game comprising
a plurality of interconnected exterior walls forming a first three dimensional body of polyhedron shape,
a plurality of interconnected interior walls forming a second, similarly-shaped three dimensional body of smaller size than said first three dimensional body and disposed within the latter,

said interior and exterior walls having planar surfaces forming similar polyhedrons, with the planar surfaces of said interior walls underlying the planar surfaces of the exterior walls and being disposed parallel thereto to define a uniform spacing between said surfaces, each of said exterior walls being formed with a network of elongated channels projecting outwardly of the planar surface thereof and in a direction away from the underlying interior wall, said channels forming with said interior walls a corresponding network of passageways, whereby an object having dimensions greater than that of said uniform spacing can move only along paths defined by said passageways, each of said channels having end portions extending beyond the edges of the exterior wall containing said channel and formed with a corner portion having an angular bend, the corner portions of each of said exterior walls being connected in communication with the corner portions of adjacent exterior walls, whereby the passageways in each exterior wall are continuous with the passageways in each adjacent exterior wall and whereby objects within said network of passageways may move from the passageways in one exterior wall to the passageways in another exterior wall when said maze is turned to move successive exterior walls to uppermost horizontal positions, selected ones of said passageways of each exterior wall being provided with apertures for providing points of entry and exit for objects into and out of said network of passageways, whereby objects within said network of passageways may move through said passageways and escape through said apertures to the exterior of said maze when said maze is selectively turned to change the orientation of said exterior walls.

4,008,896

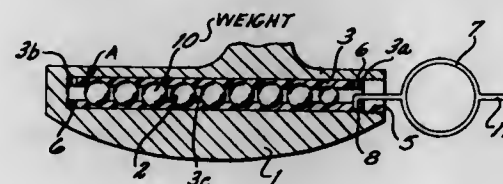
WEIGHT ADJUSTOR ASSEMBLY

Ambrose L. Gordon, 4301 E. 2nd, No. 1E, Long Beach, Calif. 90803

Filed July 10, 1975, Ser. No. 594,635
Int. Cl.² A63B 53/04

U.S. Cl. 273—171

3 Claims



1. A weight adjuster assembly for use on a golf club head having an elongate cavity therein that is substantially parallel to the striking surface of said head and a closure that removably engages the free end of said cavity, said weight adjuster assembly including:

- a. an elongate tube of a resilient material of such length and external diameter as to fit snugly within said cavity when the latter is closed by said closure, said tube having a longitudinal bore of a first diameter therein, said tube having first and second ends, at least one radial first opening adjacent said first end of said tube, a plurality of longitudinally spaced second radial openings of a second diameter in said tube, and a plurality of third radial openings of a third diameter in said tube that are transversely aligned with said second openings;
- b. a plurality of rigid weight balls, each of said balls of a fourth diameter that is greater than said first and second diameters, and said weight balls capable of being forced inwardly through said second openings into said bore to be frictionally gripped by said resilient tube to occupy a fixed longitudinal position therein; and
- c. a tool that includes a curved member, an elongate pin secured to said curved member, said hook when said

closure is removed from said head capable of engaging said first opening to permit said weight adjuster to be withdrawn from said cavity, and said pin after said weight adjuster is removed from said cavity capable of being moved radially through said third openings to force unwanted of said weight balls from said bore outwardly through said second openings.

4,008,897

SEALS FOR ROTATING SHAFTS, ESPECIALLY FOR STERN TUBE SEALS FOR SHIPS

Donald Wentworth, Tufnell Park, England, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Germany

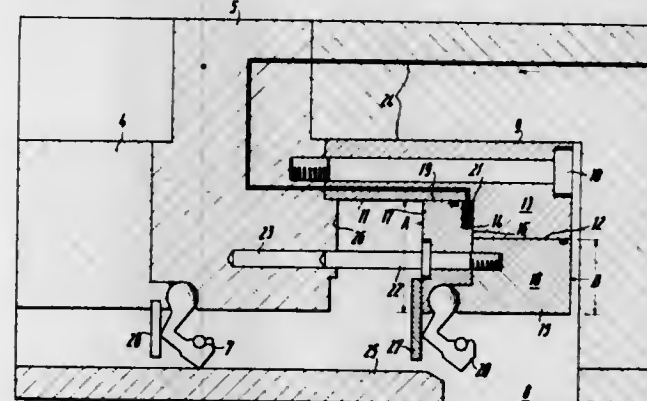
Filed Sept. 23, 1974, Ser. No. 508,619

Claims priority, application Germany, Sept. 28, 1973, 2348816

Int. Cl.² F16J 15/54

U.S. Cl. 277—9

2 Claims



1. A seal for a rotating shaft for the stern tube seal of a ship comprising a housing, a rotatable shaft within said housing, at least one radial sealing ring bearing in sealing manner against the shaft or a shaft bush, a support within said housing, at least one spare sealing ring mounted on said support, guides for said support movable within said housing, said support being movable by axial displacement of the support from a reserve position into a working position on the shaft, the support together with at least one spare sealing ring being movable in said guides on parts of the housing of the seal, the support of the spare sealing ring comprising on one side an annular shoulder which is supported on its outer surface for sliding movement in a supporting part of the housing, the support of the spare sealing ring being provided on its opposite side with guiding means being shiftable in a stationary part of the housing of the seal, the support on one side being provided with a chamber for receiving a pressure medium, especially a hydraulic medium, for moving the support and the spare sealing ring into a working position on the shaft, the said guiding means on one side of the support bearing one spare ring being formed by a number of sliding rods distributed around its circumference which are guided so as to slide in recesses in a stationary part of the housing of the seal.

4,008,898

WELL APPARATUS

James M. Weldon, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 480,754, June 19, 1974, abandoned. This application Nov. 13, 1974, Ser. No. 523,367

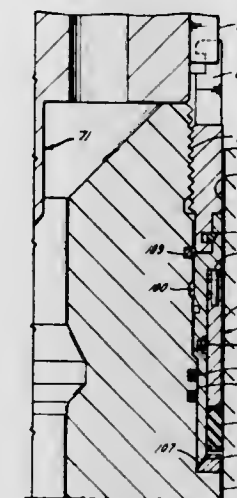
Int. Cl.² F16J 15/10

U.S. Cl. 277—116.2

22 Claims

1. Well apparatus, comprising an outer member having a vertical cylindrical bore therein, an inner member having a first cylindrical surface thereabout which is disposable concentrically within the bore of the outer member, means providing a second cylindrical surface about the inner member which is of larger diameter than the first cylindrical surface, a

seal ring of elastomeric material having its inner diameter close about the first cylindrical surface, means providing a first shoulder about the first cylindrical surface, means providing a second shoulder about the second cylindrical surface and facing the first shoulder, the outer edges of said shoulders being substantially vertically aligned with the outer diameter of said seal ring, means connecting said first and second shoulder-providing means against vertical movement with respect to said second surface-providing means to dispose said shoulders close to the ends of said seal ring, said connecting means



being releasable to permit relative vertical movement of first and second shoulder-providing means with respect to said second cylindrical surface-providing means, so as to stretch said seal ring into a position in which its inner diameter is sealably engaged about the second cylindrical surface and its outer diameter is outwardly of the outer edges of said shoulders for sealably engaging the bore, and means for limiting said relative movement thereof so as to locate said first and second shoulders in positions in which they are spaced from one another a distance not substantially greater than that of the end-to-end spacing of the stretched seal ring.

4,008,899

SEAL FOR PERMITTING TRANSFER OF TAPE FROM ONE PRESSURE REGION TO A REGION OF SUBSTANTIALLY DIFFERENT PRESSURE

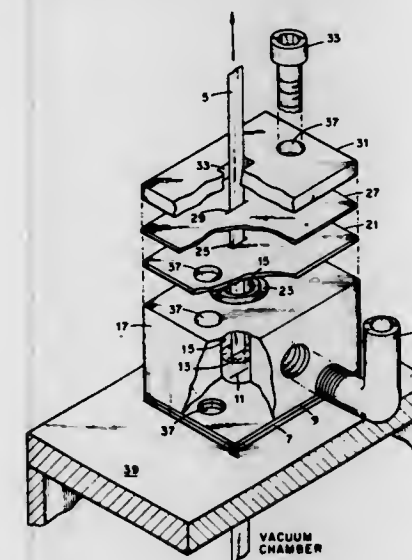
H. Kennon Carter, and Ronald L. Mlekodaj, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 27, 1976, Ser. No. 647,678

Int. Cl.² F16J 15/40

U.S. Cl. 277—135

2 Claims



1. A vacuum seal for permitting passage of an elongated

flexible tape between a vacuum chamber and a region of substantially higher pressure comprising:

- a first elastomer sheet disposed over an opening in a wall of said vacuum chamber and having a slitted opening therethrough aligned with said opening in the wall of said vacuum chamber for allowing restricted passage of said elongated tape therethrough from said vacuum chamber;
- a housing having an inner opening therethrough forming an upright intermediate pressure chamber having its lower end formed and sealed by said first elastomer sheet, said chamber containing a low vapor pressure sealing liquid partially filling said intermediate pressure chamber and contacting said first elastomer member so that said elongated tape passes through said liquid entering said chamber through said opening in said first elastomer sheet;
- a second elastomer sheet forming the upper end of said intermediate pressure chamber and sealing said intermediate pressure chamber from said higher pressure region and having a slitted opening therethrough for restricted passage of said elongated tape from said intermediate pressure chamber into said higher pressure region; and
- clamping means for sealably clamping said elastomer sheets at opposite ends of said housing in a sandwiched arrangement against said vacuum chamber wall, thereby forming sealed enclosures of said intermediate chamber ends.

4,008,900

INDEXING CHUCK

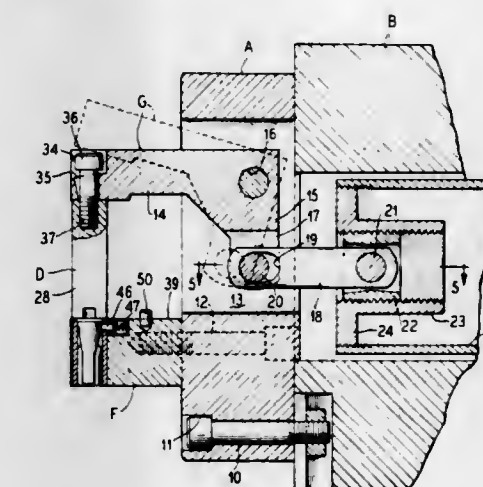
Mushie Khoshaba, Elk Grove Village, Ill., assignor to John Freedom, Chicago, Ill., a part interest

Filed Mar. 15, 1976, Ser. No. 666,965

Int. Cl.² B23B 31/34; B23Q 17/18

U.S. Cl. 279—5

10 Claims



1. An indexing chuck assembly which includes, in combination, raising means, means to actuate said raising means, a chuck block, a workpiece mounting passageway in said chuck block, fastening means at the top of said chuck block to engage said raising means, a cammed shaft extending downwardly at the bottom of said chuck block, said shaft having a plurality of grooved cam yokes, a communicating and reversing one-way cam path formed with adjoining yokes, each yoke formed by angular grooves joined in a Y configuration, alternating Y configurations being reversed relative to each other and adjoining yokes having common angular grooves, each angular groove having a straight branch substantially parallel to the axis of the shaft and an angular branch forming an angle with said axis of the shaft, the angular branch of a first groove forming a junction with the second groove in a yoke, a one-way cam drop at said junction into an upward cam path of the second groove, a bottomed stop at the end of the straight branch, the

angular branch of the second groove forming a junction with a first groove of an adjoining yoke, a one-way cam drop at said junction into a downward cam path, the bottom stop in one yoke being a rest stop towards the top of the shaft, and the bottomed stop in the adjoining yoke being a reverse stop towards the bottom of the shaft, a flat table member to support the bottom of the chuck block, a bore in said table member to rotatably receive said cam shaft, a cam follower in said table member and communicating with the said bore, and means urging said cam follower into sliding engagement with the angular cammed grooves whereby raising said chuck body imparts rotation to said chuck body as the bearing element follows a reversing cam path from a rest stop position, through a reverse stop position, and a rest stop position in the adjoining yoke.

4,008,901

TRIPLE SKATE ATTACHMENTS

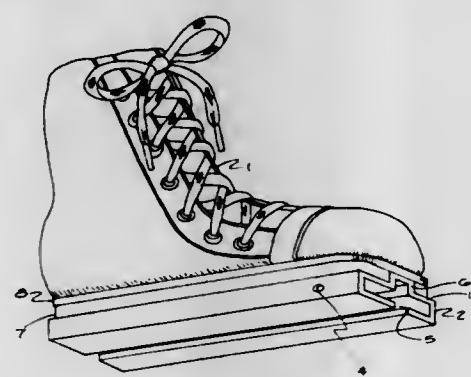
John L. Conn, Maple Terrace Drive, Apt. 14, Corbin, Ky. 40701

Filed June 11, 1975, Ser. No. 586,086

Int. Cl.² A63C 17/18

U.S. Cl. 280-7.13

3 Claims



1. The combination of a shoe and an attachment secured to the shoe for mounting various devices, said shoe including a sole with a longitudinal slot extending the length of the shoe, and said attachment includes a raised longitudinal vertical channel section of inverted U-shape adapted to fit snugly in said slot and having integral symmetrical lateral projections extending transversely from the bottom edges of said channel section, said projections including horizontal lower portions spaced from and parallel to upper portions and vertical members integrally connecting said upper and lower portions, said attachment having a slot, defined by inner edges of the lower portions, vertically aligned with said sole slot, and wherein each of said various devices includes a T-shaped upper locking member comprising a vertical web and symmetrical lateral horizontal wings, the web extending vertically above said wings to be snugly received in the channel section and vertically below said wings to engage the inner edges and be received in said attachment slot, and the wings engage the upper and lower portions of said projections.

4,008,902

STOCK TRAILER

Terry A. Dill, Keota, Iowa, assignor to Fairfield Engineering and Manufacturing Company, Fairfield, Iowa

Filed Jan. 29, 1976, Ser. No. 653,297

Int. Cl.² B62D 33/08

U.S. Cl. 280-43.23

6 Claims

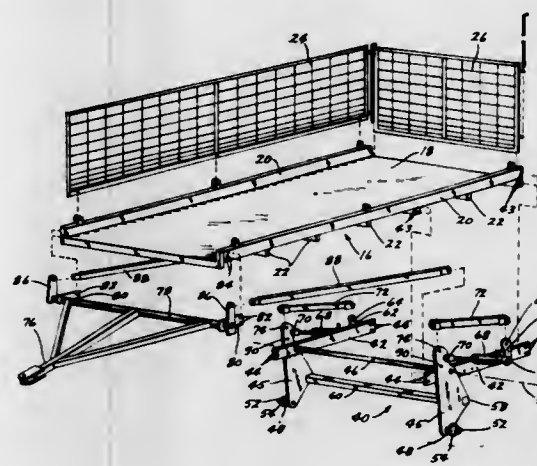
1. A stock trailer towable by a tractor comprising:
a. a portable frame,
b. hitch means connecting the front end of the portable frame to the tractor,
c. a lift frame assembly including a pair of lift arms arranged

at opposite sides of the portable frame, each lift arm having a ground engageable portion intermediate the ends thereof,

d. pivot means supporting the lift arms adjacent one of the ends thereof on said portable frame for pivotal movement about a common axis extended transversely of the portable frame,

e. a ground wheel rotatably supported at the other end of each lift arm,

f. levelling means for said portable frame movably interconnected to said hitch means and to said lift arms for level-



ling movement in response to a pivotal movement of said lift arms, and

g. means for pivotally moving said lift arms to first positions extended longitudinally of the portable frame wherein the portable frame rests on the ground, said ground engageable portions are in ground engagement, and said ground wheels are without load so that on initial pivotal movement of the lift arms to second upright positions therefor an upward movement of the portable frame is initiated by the lifting action applied at said pivot means by the fulcrum support of the lift arms on said ground engageable portions.

4,008,903

FORK FOR STEERING WHEEL OF VARIOUS CYCLES

Louis Maurice Ramond, 28, rue de la Baume, 42100 Saint-Etienne, France

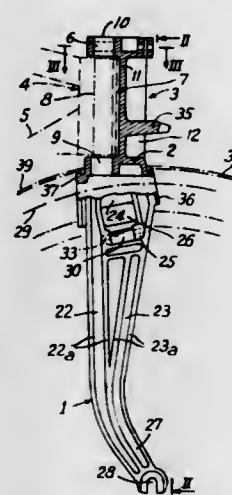
Filed Mar. 25, 1975, Ser. No. 561,835

Claims priority, application France, Mar. 29, 1974, 74.11908

Int. Cl.² B62K 21/02

U.S. Cl. 280-279

8 Claims



1. A fork for receiving a steering wheel of a cycle, said wheel having a rim and an axle and said cycle having a frame, a handlebar and braking means including oppositely disposed brake jaws, each jaw having a brake pad for engagement with a side of said rim, said fork having a central portion which has

a transverse portion which extends transversely to the plane of the wheel and a pair of spaced portions extending downwardly from the transverse portion and parallel to and on opposite sides of the plane of said wheel to thereby overlie said wheel in spaced relation to the periphery and sides of said wheel when it is received in said fork, and having a stock portion extending upwardly from and integral with said central portion, said stock portion having bearing means substantially co-axial with a pivot axis in said plane for pivotally engaging said frame and having handlebar support means for supporting mounting means for said handlebar, said fork also having a pair of spaced apart arms extending downwardly from said spaced, downwardly extending portions of said central portion for receiving said wheel therebetween, each of said arms comprising a pair of arm portions integral with and extending downwardly from said spaced, downwardly extending portions of said central portion and lying substantially in a plane substantially parallel to said plane of said wheel, said arm portions being spaced apart in the direction parallel to said plane of said wheel at the upper ends thereof at said spaced, downwardly extending portions of said central portion and converging and being integral with each other at the opposite, lower ends thereof, each of said arm portions being U-shaped in cross-section and each of said arms having an opening at the lower end thereof for receiving an end of said axle and having means adjacent said spaced, downwardly extending portions of said central portion for receiving and mounting one of said brake jaws intermediate the spaced apart portions of said arm portions for engagement of said pad on said jaw with said rim, and at least said arms and said central portion being made of a plastics material.

4,008,904

FIFTH WHEEL COUPLING

Philip Morey Davies, Potters Bar, England, assignor to Davies Magnet Works Limited, Ware, England

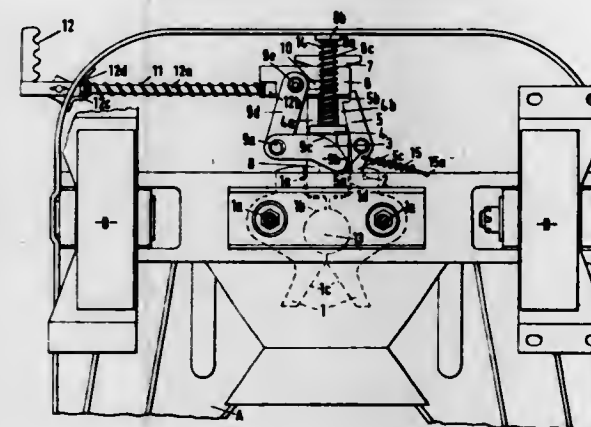
Filed Aug. 29, 1975, Ser. No. 608,979

Claims priority, application United Kingdom, Sept. 10, 1974, 39467/74

Int. Cl.² B62D 53/10

U.S. Cl. 280-435

7 Claims



1. A fifth wheel coupling for coupling a towing vehicle to a trailer king pin, comprising a coupling plate mountable on said towing vehicle, a pair of jaws rotatably mounted on said plate and having opposing king pin receiving recesses with their centres forwardly of the axes of rotation of said jaws with respect to said plate and having faces forming a rearwardly directed recess when said jaws are closed, a locking plunger movable with respect to the plate and urged into said recess, a trip member mounted on said plate and urged to maintain the plunger in an inoperative position out of said recess and trippable by closing movement of at least one of said jaws, a locking block movable with respect to said plate and plunger from an inoperative position to an operative position in which it prevents movement of said plunger out of said recess, and an actuating member pivoted with respect to said plate and having a portion engageable with said plunger and a portion

engageable through lost motion means with said block so as to be moved by said block, after withdrawal of said block from the path of movement of said plunger, to move said plunger rearwardly out of said recess to free said jaws.

4,008,905

HITCH ADAPTER

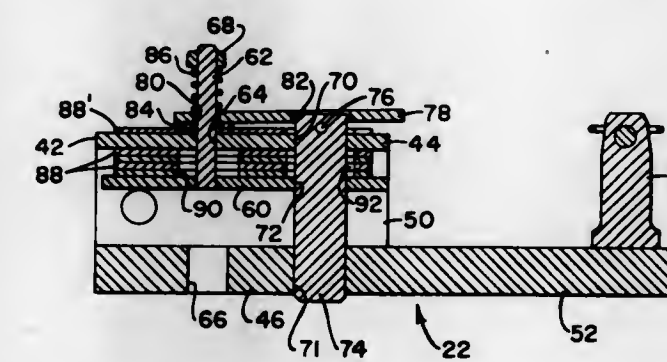
Gust Soteropulos, and James Lee Vogt, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 24, 1975, Ser. No. 625,545

Int. Cl.² B60D 1/00

U.S. Cl. 280-506

6 Claims



1. In a hitch adapter for connecting a tractor drawbar having flat, generally horizontal top and bottom sides and a vertical bore, to an implement tongue having a forward hitch element, the adapter including a forwardly open housing adapted to receive the rearward end of the drawbar and including top, bottom and opposite side walls, a vertical pin mounted in the housing and extendable through the drawbar bore, and a pivot member rearwardly of the pin and pivotally connectible to the hitch element on the implement tongue, the improvement comprising: a vertically adjustable, generally horizontal plate member mounted in the housing between the top and bottom walls; shim means insertable between the top of the plate member and the housing top wall to selectively vary the clearance between the plate and the bottom wall, so that the plate member and the bottom of the housing respectively engage the top and bottom sides of the drawbar when the adapter is connected to the drawbar, the selectively variable clearance accommodating drawbars having different vertical thicknesses; and connecting means between the plate member and the housing operative to accommodate vertical adjustment only of the plate member relative to the housing and including spring means operative to bias the plate member upwardly toward the housing top wall to clamp the shim means to the housing.

4,008,906

BALL COUPLING

Richard Arthur Schafer, Traer, and Bennie Joe Vaughn, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 19, 1975, Ser. No. 642,557

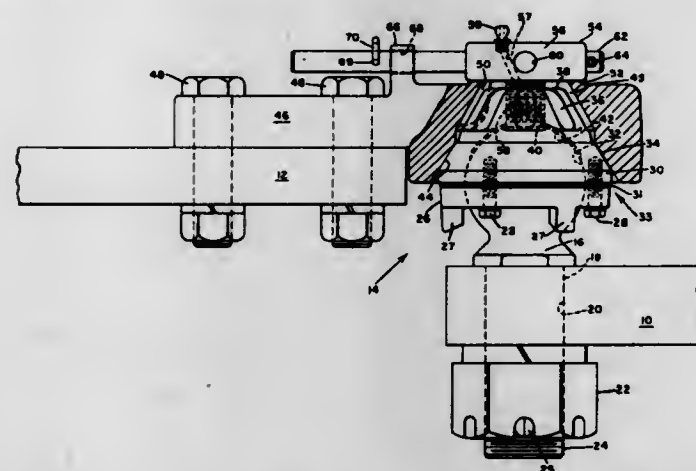
Int. Cl.² B80D 1/06

U.S. Cl. 280-511

8 Claims

1. A coupling comprising: a hitch ball; frusto-conical cap means having a hemi-spherical opening provided therein for engaging the hitch ball; collar means for encircling a spherical segment of the hitch ball and operatively connected to the cap

means to substantially englobe the hitch ball; adapter means having a frusto-conical opening provided therein for receiving



the cap means; and securing means for releasably drawing the cap means into engagement with the adapter means.

4,008,907

HEEL PIECES OF SKI BINDINGS

Masahiro Murata, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan

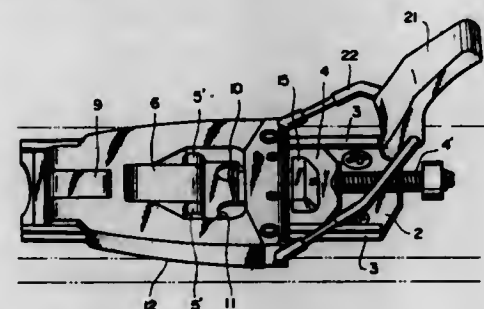
Filed Aug. 28, 1975, Ser. No. 608,638

Claims priority, application Japan, Aug. 31, 1974, 49-105196[U]

Int. Cl.² A63C 9/08

U.S. Cl. 280—614

6 Claims



1. A heel piece of a ski binding comprising a base plate adapted to be secured to a ski, a longitudinally extending connecting member having a first end pivotally mounted on a pin carried by said base plate and extending in a transverse direction of an associated ski, a heel piece, means for pivotally connecting a second end of said connecting member at a point longitudinally intermediate said heel piece, a locking member mounted on said heel piece for releasably locking the same to said base plate thereby preventing vertical rotary movement of said heel piece, and means for forming a lost-motion connection between said heel piece and said base remote from said locking member.

4,008,908

SNOW SKI BINDING

William M. Pierson, 1155 Buff Way, Eugene, Oreg. 97401

Filed Jan. 13, 1976, Ser. No. 648,811

Int. Cl.² A63C 9/00

U.S. Cl. 280—636

1 Claim



1. A ski boot binding for a single snow ski and comprising in combination, a toe piece for attachment to a ski rearwardly of a front mounted binding, said toe piece when attached to the ski

having a boot sole supporting surface inclined to the major axis of the ski, said toe piece additionally including sides extending upwardly from opposite sides of the inclined sole boot supporting surface, and a heel piece for attachment to the ski rearwardly offset from the toe piece and having heel supporting surface elevated from the ski, said heel supporting surface substantially coplanar with said inclined boot sole supporting surface of the toe piece with the plane being inclined to said axis of the ski, said heel piece additionally including upstanding ears on opposite sides of said heel supporting surface to confine the heel against lateral movement.

4,008,909

ACTUATOR FOR SAFETY SEAT BELT SYSTEM

Syuichi Otani, Tokyo, and Hideoki Matsuoka, Kamakura, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

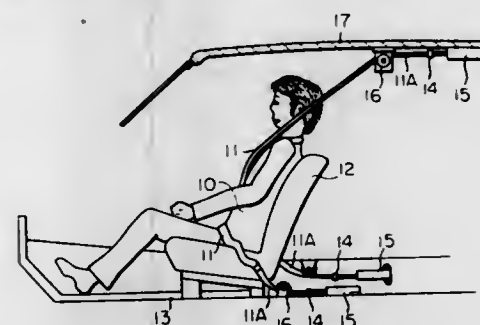
Filed Feb. 25, 1974, Ser. No. 445,158

Claims priority, application Japan, Feb. 26, 1973, 48-024419

Int. Cl.² B60R 21/10

U.S. Cl. 280—746

2 Claims



1. In a safety belt system for a vehicle, an actuator for retracting and straining a safety seat belt during a collision of the vehicle comprising:

- a. a cylinder;
- b. a cylinder head mounted on said cylinder at one end thereof;
- c. a piston accommodated in said cylinder, having a rod extending outwardly therefrom through said cylinder head for connection with one end of the safety seat belt;
- d. a working chamber defined by said cylinder, cylinder head and piston; and
- e. a gas generating device for supplying a gas under pressure into said working chamber when energized during a collision of the vehicle, comprising a container, a composition capable of producing a gas by combustion thereof and means to ignite said composition contained in said container, said gas generating device being fixed to said piston such that at least a portion of an open end of said container is exposed to said working chamber; which further comprises means to limit a range of the movement of said rod toward said safety seat belt; and in which said means comprises:

an outer retainer integral with said cylinder head and having a tapered bore coaxial with said cylinder, the small diameter end of said bore being adjacent to said cylinder head; a cylindrical block integral with said cylinder and having a bore coaxial with said cylinder; and a resilient, cone frustum shaped inner retainer disposed within the tapered bore of said outer retainer, covered with said cylindrical block, and having a bore coaxial with said cylinder which is nearly equal in diameter to said rod which is arranged to extend therethrough; whereby said inner retainer abuts with said tapered bore of said outer retainer when said rod begins to move toward the safety seat belt and is compressively deformed to exert a force on said rod to resist further movement of said rod toward the safety seat belt.

4,008,910

UNIVERSAL ELECTRICAL SWIVEL

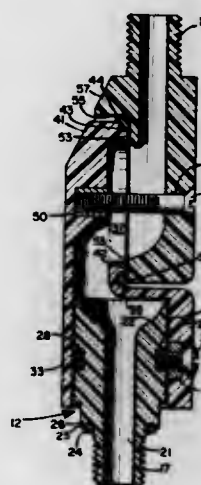
Thomas F. Roche, 21 W. Main St., Merrimac, Mass. 01860

Filed May 16, 1975, Ser. No. 578,207

Int. Cl.² H02G 13/00

U.S. Cl. 285—164

2 Claims



1. A universal swivel adapted to provide rotation and tilt of electrical apparatus about orthogonal axes and to serve as a conduit for an electrical conductor comprising:

a base member having a generally smooth outer cylindrical bearing surface and an axial passage, adapted for passage of an electrical conductor, said base member being formed at its outer end with means for attachment to said electrical apparatus and at its inner end with generally conical depression communicating with said axial passage;

a central body member formed with an integral cylindrical collar fitted over said cylindrical bearing surface for smooth rotation thereon and formed with a first generally circular dish-shaped portion extending outward from said cylindrical collar, said dish-shaped portion having a cylindrical outer edge surface, the inner end of said collar being substantially flat and sealed but formed with an opening adapted to permit passage of an electrical conductor from said conical depression of said base member through to the inner region of said first dish-shaped portion;

an upper body member formed with a second generally circular dish-shaped portion mating with and adapted to smoothly rotate about said first dish-shaped portion of said central body member, said upper body member being formed with an integral portion having an inner cylindrical wall extending over and smoothly mating with said cylindrical outer edge of said first circular dish-shaped portion of said central body member to limit the angle of rotation of said upper body member about said central body member;

said base member, central body member and said upper body member being formed of insulative, flexurally elastic polycarbonate substantially impervious to acid and alkali substances;

the axis of said outer cylindrical bearing surface of said base member being offset from the axis of said cylindrical collar of said central body member, said collar having a region of increased thickness at one side thereof; said means for limiting rotation of said central body portion about said base member including an annular recess in said base member;

a stop formed in said recess, and means projecting into said recess from said collar of said central body member, said last-mentioned means being securely affixed in said collar in said region of increased thickness; the inner surface of said first and second dish-shaped portions cooperating to form a circular hollow chamber; and means for retaining said circular portions of said central and upper body members in frictional engagement for rota-

tion in a plane parallel to the axis of said base member and for sealing said hollow chamber against the passage of moisture therethrough;

said upper body member having an integral outward extension adapted for attachment to said electrical apparatus and having an axial hollow passage communicating with said circular hollow chamber;

whereby an electrical conductor may pass inward freely through said axial passage and said conical depression in said base member, through said opening in the flat upper end of said central body member and into said circular hollow chamber and outward through said axial passage in said integral hollow extension of said upper body member.

4,008,911

JOINT ASSEMBLY FOR PLASTIC TUBES

Yoshiharu Kiyooka, and Ginji Kaneko, both of Okazaki, Japan, assignors to Maruyasu Kogyo Kabushiki Kaisha, Nagoya, Japan

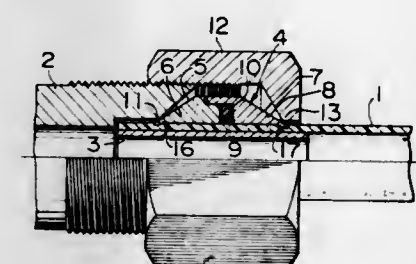
Filed Oct. 30, 1975, Ser. No. 627,265

Claims priority, application Japan, Nov. 14, 1974, 49-138031

Int. Cl.² F16L 33/20

U.S. Cl. 285—249

3 Claims



1. A joint assembly for plastic tubes comprising a sleeve inserted into an end portion of a plastic tube for supporting the inner peripheral surface of said end portion, an annular caulking element having a substantially triangular cross section as a whole and composed of two annular members, each having a tapered outer surface, said annular caulking members being adapted to be mounted around said end portion, a body member having an annular seal for receiving a tapered outer peripheral surface of one of said annular members, and a cap nut having an annular seal for receiving the tapered outer surface of another of said annular members and adapted to be screwed onto said body member, said annular members cooperating with each other to define an annular groove of substantially rectangular cross section and an annular elastic sealing element of substantially circular cross section disposed in said groove, said two annular members being engagable with each other for reducing the width of said groove to a size smaller than the normal width of said annular elastic sealing element, the height of said annular groove being substantially the same as the normal height of said annular elastic sealing element.

4,008,912

SELF-TIGHTENING KNOT

Iljusz Kotov, 120 S. Herbert Road, Riverside, Ill. 60546

Filed Dec. 15, 1972, Ser. No. 315,306

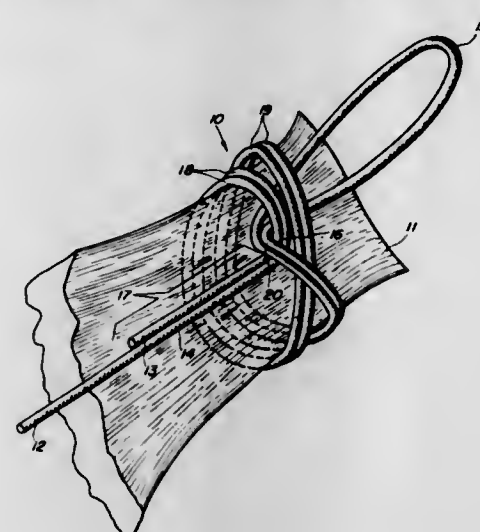
Int. Cl.² D04G 5/00; B65H 69/04

U.S. Cl. 289—1.2

4 Claims

1. A self-tightening knot formed from a single strand of a material for tying a tubular casing which comprises a flexible strand provided with a doubled end portion comprising a standing part and a running part and having a pair of substantially parallel strand segments and an end loop; at least a pair of turns in the running part of said doubled end portion and about said casing;

a first bight in the standing part of said doubled end portion and adjacent to said turns; and
a second bight in the running part of said doubled end portion between said turns and said end loop;
said second bight formed by passing said running part from the turn toward the end of said casing over all other turns



toward the inner portion of said casing and beneath all turns toward the end of said casing providing said end loop to the end of the casing, said first bight formed by passing said standing part from the turn toward the inner portion of said casing under the running part forming said second bight and toward the inner portion of said casing.

4,008,913

TOOL FOR MAKING WHIP FINISHING KNOT

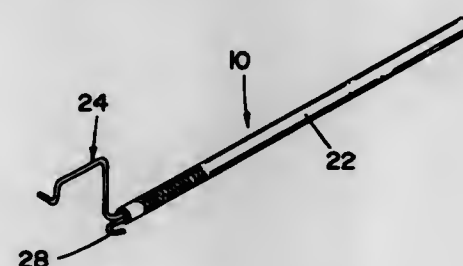
Lorin Charles Cole, 6052 Montgomery Bend, San Jose, Calif. 95135

Filed Oct. 9, 1975, Ser. No. 621,012

Int. Cl.² D03J 3/00

U.S. Cl. 289-17

5 Claims



1. A fly-tiers tool adapted for forming a whip finishing knot with a thread tied to a fish hook having a shank terminating at an eye portion, said tool comprising:

an elongated handle;
a thread engaging element attached to the end of said handle and having a first portion terminating in a first hook shaped end member spaced axially outwardly from the end of said handle, and a second portion terminating in a second hook shaped end member spaced axially closer to the end of said handle than said first end member, one of said hook shaped end members being substantially aligned with the longitudinal axis of said handle and the other said end member being offset from the longitudinal axis of said handle;

whereby said hook shaped end members are together adapted to retain a loop of the thread so that it can be rotated around the hook shank near its eye portion as an end portion of the thread is held parallel to the hook shank, and so that the loop can be retained until being released as the thread is drawn tight to form the whip finishing knot.

4,008,914

SEALING DEVICES

Michael Denny Anderson, Meopham, England, assignor to Versapak (UK) Ltd, Chislehurst, England

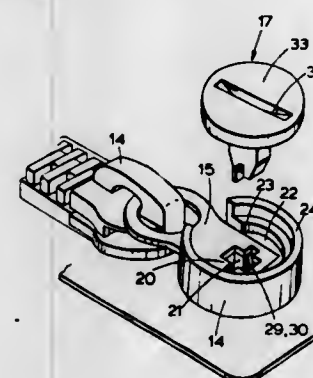
Filed Aug. 29, 1974, Ser. No. 501,630

Claims priority, application United Kingdom, Dec. 12, 1973, 42891/73

Int. Cl.² B65D 55/06

U.S. Cl. 292-307 R

1 Claim



1. A sealing device comprising a disposable part and a part retainable for re-use, said disposable part comprising a head portion and a tail portion, said retainable part including an engageable portion, said tail portion being engageable in said engageable portion to close the seal while said head portion is exposed, said engageable portion and tail portion including cooperating means whereby, once engaged, they are retained together, said cooperating means comprising rotation preventing means for preventing rotation of said tail portion and resilient portions of said tail portion being resiliently deflectable in the same direction on engagement of said disposable part and said retained part, said resilient portion latching under a fixed portion of said retainable part to retain the seal closed, a coin slot means being provided on said head portion and a weakened stem portion interconnecting said head and tail portions so that rotation of said head by a coin engaging said slot causes said weakened stem portion to break to release the sealing device.

4,008,915

IMPACT BARRIER FOR VEHICLES

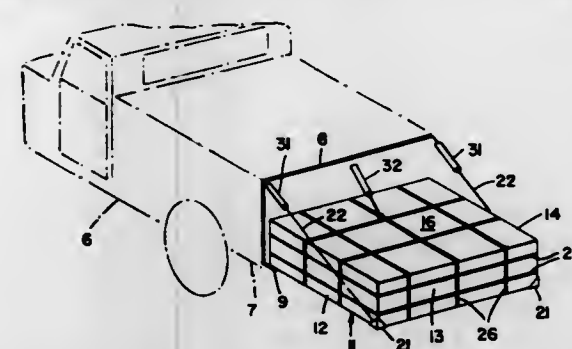
Grant W. Walker, Sacramento, Calif., assignor to Dynamics Research and Manufacturing, Inc., Sacramento, Calif.

Filed June 4, 1975, Ser. No. 583,683

Int. Cl.² B60R 19/04

U.S. Cl. 293-60

6 Claims



1. An impact barrier for vehicles comprising a generally rectangular enclosure open at the bottom and including side walls relatively movable toward each other, means for securing said enclosure to the back of a vehicle in a position projecting rearwardly therefrom, a plurality of substantially solid energy dissipating elements arranged within said enclosure, and means engaging said side walls for forcing said side walls toward each other and into substantial compressive supporting abutment with said elements.

4,008,916

LOAD UNITIZER

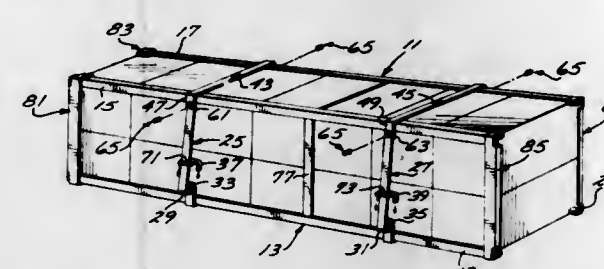
Allan R. Ide, 10066 Bloomfield, Cypress, Calif. 90630

Filed Nov. 6, 1975, Ser. No. 629,328

Int. Cl.² B66C 1/16

U.S. Cl. 294-67 R

9 Claims



1. A load unitizer for holding as a unit a plurality of cargo articles formed with opposed upper and lower corners and of uniform size to be collected together in a row to dispose the respective common corners of said articles in respective straight lines, said unitizer comprising:

upper and lower frames including respective pairs of spaced apart upper and lower corner retainers for projecting longitudinally of said row of articles, said upper corner retainers being shaped in cross section to nest over said opposite corners of said articles and said lower corner retainers being shaped in cross section to nest over said bottom corners of said articles;

coupling means including connecting arms pivotally connected on their upper extremities in spaced apart relationship to one side of said upper frame and formed on their lower extremities with respective turned-back portions defining first hooks;

second hooks mounted from said one side of said lower frame in spaced apart relationship for connecting with said respective first hooks; and

holding means for holding said first and second pairs of hooks connected to one another whereby said cargo articles may be assembled in a row on said lower frame with the respective corners thereof aligned with said upper frame positioned over said articles and said first and second hooks engaged together to hold said frames together and retain said articles on a unit for transfer thereof.

4,008,917

SEAT SAFETY BAR

Herbert Francis Sigwarth, Sherrill, and Richard Lukens Cade, Dubuque, both of Iowa, assignors to Deere & Company, Moline, Ill.

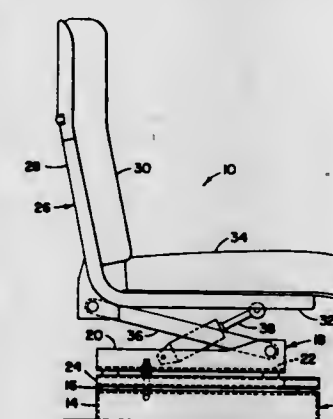
Continuation of Ser. No. 539,794, Jan. 9, 1975, abandoned.

This application May 10, 1976, Ser. No. 685,016

Int. Cl.² B60N 21/00; B60R 21/00

U.S. Cl. 296-65 A

3 Claims



1. In combination with a seat assembly including a base member, a platform, connecting means mounting the platform on the base for fore-and-aft movement between front and rear extreme positions relative to the base member and a seat

cushion secured to the platform, a safety device for preventing separation of the platform from the base member in the event of failure of the connecting means, comprising: said base member including a pair of parallel transversely spaced fore-and-aft extending guide slots; an elongate single rigid member having opposite end portions respectively received in the pair of guide slots and secured to said platform.

4,008,918

CHAIRS

Howard Lee Cooper, Ashbourne, and Stewart Banks, Ticknall, both of England, assignors to Products for Proud Parents Limited, Derby, England

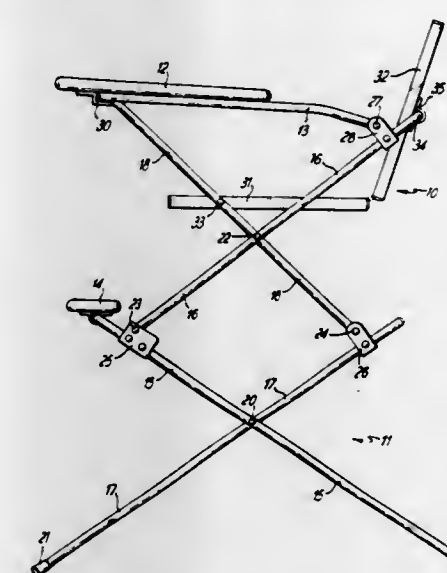
Filed July 2, 1975, Ser. No. 592,422

Claims priority, application United Kingdom, Aug. 7, 1974, 34738/74; Oct. 17, 1974, 45440/74

Int. Cl.² A47C 4/00; A47B 39/00

U.S. Cl. 297-16

5 Claims



1. A baby chair having a seat and a tray both mounted on a collapsible framework comprising two side frames in the form of X frames, one forming the legs or ground-engaging portion of the chair, and the other, mounted on top of the first, serving to support the seat and tray, the members of the framework being pivotally interconnected to form a lattice type structure which may be collapsed from an extended condition to a substantially flat condition, the seat having a bottom and a back hinged together and both pivotally connected to the framework, and the tray being supported in front of the seat and including a retaining member on its underside for releasable engagement with a cross member at the upper forward end of the upper X frame to maintain the framework in the erected condition.

4,008,919

TILTABLE SEAT LATCH DEVICES

Masakazu Muraishi, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 14, 1975, Ser. No. 577,553

Claims priority, application Japan, May 20, 1974, 49-58035[U]

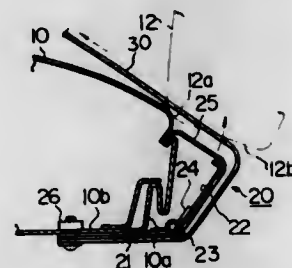
Int. Cl.² B60N 1/10

U.S. Cl. 297-331

6 Claims

1. A seat comprising a seat member having one lateral side hingedly connected to a stationary structure for pivotal movement between a horizontal position and a certain angular position and having an opposite side, an upstanding backrest having a bottom abutting side resting upon the opposite side of the seat member, and an yieldable latch member rigid with the opposite side of the seat member and hold in a projected latching position by means of the bottom abutting side when the seat member is in said horizontal position, said latch mem-

ber being resiliently deformable by engagement with the bottom abutting side of the backrest to be released from the



latching position during pivotal movement of the seat member.

4,008,920 SEAT BACK ADJUSTER

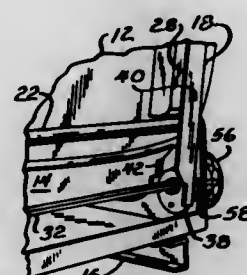
O. Harold Arndt, Milwaukee, Wis., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 23, 1976, Ser. No. 660,550

Int. Cl.² B60N 1/06; A47C 1/026

U.S. Cl. 297—361

8 Claims



1. An adjustment mechanism for locking a seat back in various positions of adjustment comprising a seat base; first and second spaced apart apertures in each side of the seat base; a pair of spaced apart support members adapted to support a seat back, said support members having a body portion with a pair of opposed side wall portions extending laterally therefrom; first and second spaced apart apertures in each of said support members said second apertures in each of said support members being elongated; pivot means passing through said first apertures in each side of said seat base and through said first apertures in said pair of support members for pivotally mounting said pair of support members relative to said seat base; a cam support rod pivotally mounted in said second apertures in each side of said seat base; said cam support rod passing through said elongated second apertures in said support members; a pair of spaced apart eccentric cams mounted on said cam support rod, each of said pair of cams lying between and being in peripheral engagement with said pair of opposed side wall portions on each of said pair of support members; an adjustment knob mounted on said cam support rod; spring means for biasing said adjustment knob toward said seat base and locking means on said adjustment knob and seat base for locking said adjustment knob and cam support rod against relative movement relative to said seat base, said adjustment knob being manually movable away from said seat base so as to disengage said locking means and permit said cams to be rotated to pivot said support members about said pivot means.

4,008,921 AUTOMATIC EXCAVATING MACHINE AND METHOD OF OPERATING THE SAME

Norbert Czauderna; Günther Fenske, both of Kirchhellen; Karl-Heinz Klimek; Siegfried Lubina, both of Bottrop; Fritz Malinowski, Kirchhellen, and Bernhard Schönrock, Dinslaken, all of Germany, assignors to Ruhrkohle AG, Essen, Germany

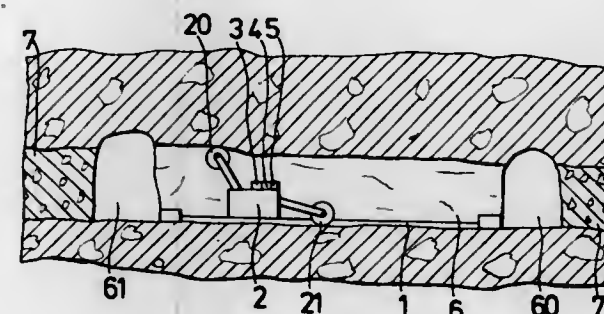
Filed June 19, 1975, Ser. No. 588,518

Claims priority, application Germany, June 21, 1974, 2429774

Int. Cl.² E21C 41/00

U.S. Cl. 299—1

7 Claims



1. A method of controlling the operation of an excavating machine of the type which during a working trip works the face of an excavation, particularly a cutter loader mounted for movement along the length of a face conveyor, or the like, comprising, in combination, the steps of determining the shape of a mineral interface along the length of the face of an excavation by performing mineralogical measurements at a plurality of locations along the length of the face; setting up an interface-shape program in a programmable control arrangement operative for causing the excavating machine to excavate in accordance with the program during at least one working trip; and thereafter causing the excavating machine to perform at least one working trip under the automatic control of the control arrangement, wherein said step of determining the shape of the mineral interface along the length of the face includes determining the inclination of the interface along the length of the face; further including the steps of detecting the discrepancy between the inclination of the interface and the inclination of the cut made by the excavating machine along the length of the face during one working trip and registering corresponding information in an information storage device; and compensating for the discrepancy by causing the control arrangement to modify the operation of the excavating machine during the next working trip in dependence upon the stored information.

4,008,922 METHOD AND A MACHINE FOR ADVANCING AN UNDERGROUND FACE OF A GEOLOGICAL FORMATION

Karl Åke Kallin, Bandhagen; Jan August Larcén, Ektorp, and Waldemar Meyer, Stockholm, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 5, 1974, Ser. No. 529,968

Claims priority, application Sweden, Dec. 7, 1973, 7316553

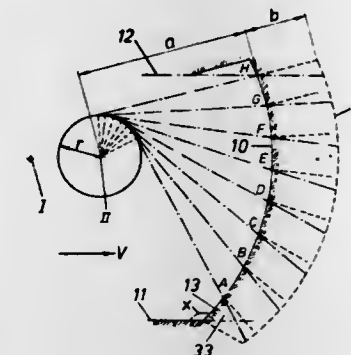
Int. Cl.² E21D 9/00

U.S. Cl. 299—13

52 Claims

1. A method for advancing a tunnel end face in rounds, each round comprising a plurality of cycles, each cycle comprising drilling a plurality of holes into the tunnel end face and then applying break-down-energy to the holes, the improvement comprising: drilling said holes and applying said break-down-energy with a rig such that said tunnel end face after each round is left with an inclined transition to the tunnel floor and that said tunnel end face, after a complete round, is concave as seen in vertical planes which are substantially

parallel with the direction of advancement, said tunnel end face, after said complete round, forming part of circles in vertical planes which are substantially parallel with the direction of advancement, said circles having their centers on a substantially horizontal straight line that is closer to the roof than to the floor of the tunnel; maintaining the rig at the face during both drilling of said



holes and applying said break-down-energy; and, in a subsequent round, opening up a cut in said inclined transition towards the tunnel floor and then stopping the tunnel end face towards said cut stepwise in at least two of said cycles until the roof is reached, said cut and each said stopping steps extending over substantially the whole width of the tunnel end face.

4,008,923 RIM, WHEEL AND FASTENING MEANS ASSEMBLY

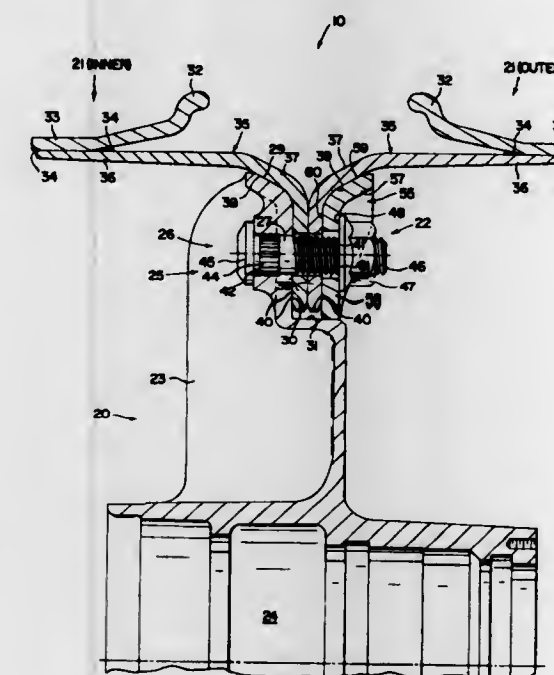
William D. Walther, Kettering, and Robert A. DeRegnaucourt, Centerville, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed Sept. 2, 1975, Ser. No. 609,594

Int. Cl.² B60B 23/10

U.S. Cl. 301—12 R

2 Claims



2. A combination of a tire carrying rim seated and locked by fastening means on a vehicle wheel, said wheel having a plurality of spoke members, each of said spoke members having a felloe comprising a radially inclined outer surface merging into a radially directed axially outer surface, each said radially directed axially outer surface having a mounting location for an axially projecting shank of said fastening means, said rim having radially outwardly directed bead flanges and radially inwardly projecting mounting flanges, each of said mounting flanges having an elongated axially extending portion, integrally attached to a base portion of said

rim between said bead flanges, and a radially inclined portion and a radially directed portion, each said radially inclined portion having an inner surface merging into an inner surface on each said radially directed portion, each said radially directed portion having a bore therein for receiving said shank of said fastening means,

each said fastening means comprising said shank, peripheral threads on the axially outer end of said shank, a clamp element supported by said shank, and a rotatable nut mounted on said peripheral threads, each said clamp element having a radially inclined portion and a radially directed portion, each said radially inclined portion having an inner surface merging into an inner surface on each said radially directed portion, each said radially directed portion having a bore therein for receiving said shank of said fastening means,

whereby, said rim is seated on, and thereafter locked on, said spoke members by tightening of each said rotatable nut of each said fastening means and by the mating engagement of said radially inclined and radially directed inner surfaces on each said clamp element with said radially inclined and radially directed portions on each said rim mounting flange, and by the mating engagement of said radially inclined and radially directed surfaces on each said spoke felloe with said radially inclined and radially directed inner surfaces on each said rim mounting flange.

4,008,924 PROCESS FOR REDUCING THE SETTLING RATE OF COMMUNUTED POROUS SOLIDS IN A WATER-SOLIDS SLURRY

William B. Gogarty, Littleton, and LaVaun S. Merrill, Jr., Englewood, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Apr. 18, 1975, Ser. No. 569,515

Int. Cl.² B65G 53/30

U.S. Cl. 302—66

17 Claims

1. In a process of transporting comminuted solids having a specific gravity greater than about 1.0 and a porosity greater than about 10% in a liquid carrier as a slurry, the improvement comprising substantially saturating the pores of the solids with a liquid hydrocarbon containing up to six carbon atoms and having a specific gravity less than about 1.0 and which is not miscible with the liquid carrier prior to slurrying the solids in the carrier.

4,008,925 VALVE DEVICES FOR USE IN LIQUID PRESSURE BRAKING SYSTEMS OF VEHICLES

Alastair John Young, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, England

Filed Nov. 26, 1975, Ser. No. 635,627

Claims priority, application United Kingdom, Jan. 31, 1975, 4371/75

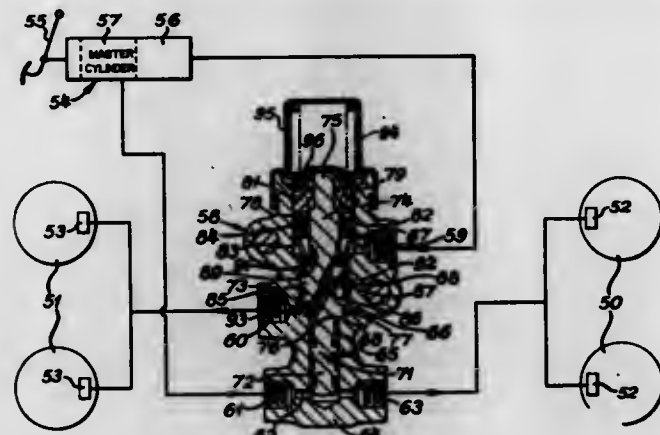
Int. Cl.² B60T 8/22, 8/26

U.S. Cl. 303—6 C

10 Claims

1. A valve device for use in a liquid pressure braking system of a vehicle to so control the pressure that is exerted to apply brakes on a group of wheels of the vehicle that that pressure, under a predetermined condition, is reduced in relation to the pressure at a source from which that pressure is derived, the predetermined condition being the pressure of the braking system at which the valve device becomes operative, including a valve body, a cavity which is formed in the valve body and which has a longitudinal axis, and first and second ports which are formed in the valve body, which communicate with the cavity and which are spaced apart in the direction of the longitudinal axis of the cavity, the first port being for connection to the source of liquid pressure and the second port being for connection to motor cylinders for operating brakes on said

group of wheels; a plunger, a land which is formed by the plunger and which makes a fluid tight sliding joint with a wall portion of the cavity which extends between the first and second ports, the plunger being so arranged that the area thereof exposed to liquid pressure at the first port is less than that exposed to liquid pressure at the second port; stop means which limit movement of the plunger in a direction in which it is biased by biasing means at least during operation of the liquid pressure braking system and which is the direction in which it is urged by the action of liquid pressure at said first port; a passage through the land in the plunger, a one-way valve in the passage, the one-way valve comprising a valve seat, a valve member and resilient means which urge the valve



member to seat upon the valve seat, the one-way valve being orientated so that flow through the plunger from the first port to the second port is prevented when the one-way valve member is seated, abutment means on the plunger and against which the resilient means that act to urge the one-way valve member to seat upon the valve seat react, a valve unseating pin within that part of the passage that extends from the one-way valve seat to the end of the passage that is nearer to the second port, and a stop surface in the cavity which co-operates with the valve unseating pin to unseat the one-way valve closure member when the plunger engages the stop means, wherein the improvement comprises said passage part being inclined to the axis of the plunger.

4,008,926

DEVICE FOR FIXING A BEARING ON A CONCRETE MASS

Gérard Belperin, Valdoie, France, assignor to Groupe Européen pour la Technique des Turbines à Vapeur G.E.T.T., Paris, France

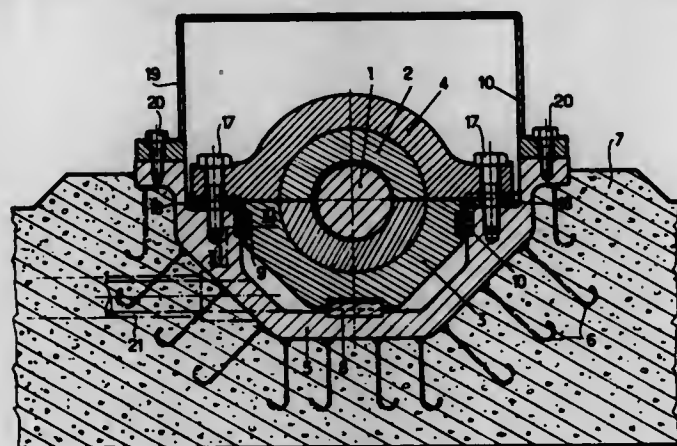
Filed Dec. 12, 1975, Ser. No. 640,299

Claims priority, application France, Dec. 27, 1974, 74.43063

Int. Cl.³ F16C 5/00

U.S. Cl. 308—3 R

4 Claims



1. In a mounting arrangement, on a concrete mass, of at least one bearing comprising a journal and a journal case

constituted by a support and a collar, the improvement wherein: said journal case rests on a metallic frame which surrounds said support and which is provided with a plurality of projecting arms sunk in the concrete mass.

4,008,927

CRANK SHAFT WELDED TOGETHER FROM INDIVIDUAL ELEMENTS

Karl Mayer, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

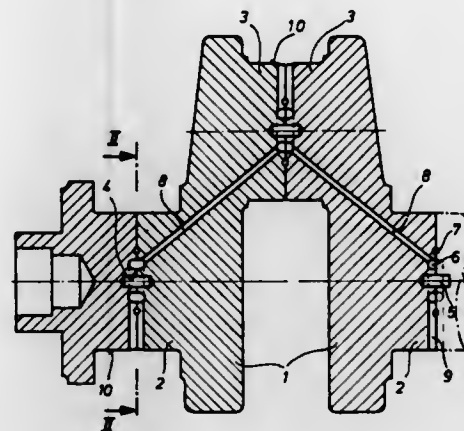
Filed June 9, 1975, Ser. No. 585,301

Claims priority, application Germany, June 8, 1974, 2427801

Int. Cl.³ F16C 3/06

U.S. Cl. 308—23

7 Claims



1. A crankshaft which includes: a plurality of individual elements each comprising a crank pin section with an end face and bearing surface means and also comprising a main shaft journal section with an end face and with bearing surface means, the end face of one crank pin section engaging and being welded to the end face of another crank pin section, and the end face of a main shaft journal section engaging and being welded to another main shaft journal section, each two welded together end faces of said elements being respectively provided with a bore perpendicular to the respective end face, and the bores of each two welded-together end faces being in axial alignment with each other; centering pins respectively inserted in said axially aligned bores, each of said welded-together end faces being provided with groove means extending in radially spaced relationship to and around the respective adjacent centering pin and forming an annular slag groove, each of said welded-together end faces also being provided with annular groove means interposed between and in radially spaced relationship to the respective adjacent centering pin and said annular slag groove and forming an annular oil groove, conduit means respectively arranged in said elements and establishing communication between the pertaining oil grooves of the respective individual element, and lubricating conduits respectively arranged in said welded-together end faces and communicating with the respective adjacent bearing surface means and with the respective adjacent oil groove.

4,008,928

LUBRICATING SELF-ALIGNING BEARING

Martin Abel, 25235 Canterbury, Franklin, Mich. 48025

Filed Mar. 25, 1975, Ser. No. 561,993

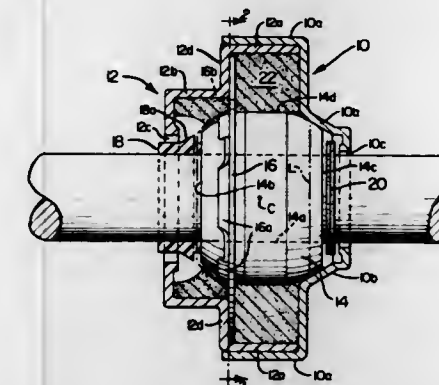
Int. Cl.³ F16C 1/24, 11/08, 25/04, 27/04

U.S. Cl. 308—72

5 Claims

1. A bearing assembly for a shaft, comprising a casing having two coaxial mating casing parts with respective coaxial apertures dimensioned to provide clearance for a shaft journaled in the bearing assembly, one of said casing parts having an interior tapered coaxial socket portion adjacent the respective aperture, a rounded porous bearing with a central bore for a shaft coaxially seated in said socket portion, the other casing part having a coaxial annular shoulder defining an interior

annular recess surrounding and communicating with said bearing, coaxial spring means supported axially against said shoulder in said recess for contacting a rounded surface of said bearing to urge said bearing firmly against said socket portion such that the geometrical center of the bearing is positioned by the axis of the socket portion to form a captive ball and socket arrangement permitting universal pivoting of said bearing to accommodate initial misalignment with a shaft journaled therein, the interior annular recess of said casing being substantially filled with a lubricant impregnated wicking



material, a ring-shaped oil slinger dimensioned to fit tightly around a shaft to be journaled in the bearing assembly for rotation therewith coaxially positioned in an annular end portion of said casing outwardly of said bearing to sling lubricant radially outward into said annular end portion surrounding said oil slinger, said spring means having means for intercommunicating said interior annular recess with said annular end portion to enable lubricant thrown radially outward from said oil slinger to be recirculated to said wicking material in said interior annular recess.

4,008,929

FRICTION DRIVE DEVICE

Henrik Gerner Olrik, Bakkegaardsvej 413, DK-3050 Humlebaek, Denmark

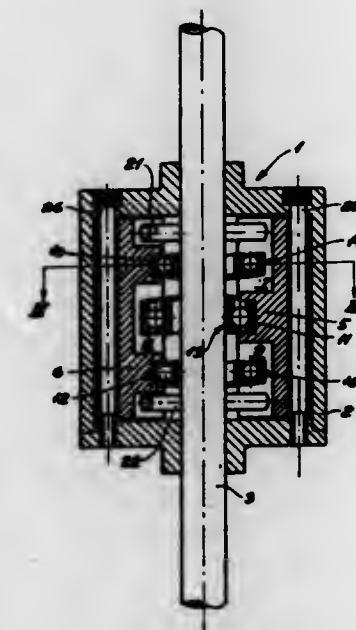
Filed Aug. 12, 1975, Ser. No. 603,917

Claims priority, application Denmark, Aug. 12, 1974, 4279/74; July 29, 1975, 3431/75

Int. Cl.³ F16C 19/04

U.S. Cl. 308—176

19 Claims



1. A friction drive device for converting a rotary motion into an axial motion comprising drive means and, associated with the rotating member thereof, a friction unit containing ball bearings of larger internal diameter than the external diameter of a shaft and abutting on the inner rings of the

bearings at an inclined angle, the friction unit containing further a retaining member in which is provided ball bearing jaws rotating with the retaining member relatively to the shaft and having recesses adapted to support the outer ring of at least one ball bearing and inclined so that the respective bearings abut on the shaft along generating lines and on rotation of the jaws roll on the shaft along helical lines of identical pitch and direction, characterized in that two or more ball bearing jaws (5, 6, 35, 36, 45, 46) are retained and angularly spaced apart around the shaft (3, 31) and interconnected by means (21, 22, 23, 23, 30, 50) adapted to receive the radial pressure of the shaft (3, 31) against the bearings (13, 14, 16, 32, 33), and that the supporting recesses (10, 11, 12, 38) in a section perpendicular to the axis of an associated bearing (14, 13, 16, 32) presents a curve whose radii of curvature are greater than the outer radius of the ball bearing (14, 13, 16, 32).

4,008,930

HUMIDOR

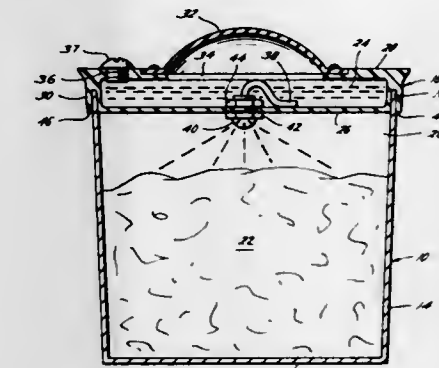
Ralph V. Swainson, Houston, Tex., assignor to Texas Bryre Industries, Houston, Tex.

Filed Nov. 14, 1975, Ser. No. 631,886

Int. Cl.³ A24F 25/02

U.S. Cl. 312—31.1

3 Claims



1. A humidor comprising, a body having bottom and side walls forming a storage compartment, a cover, means for removably securing the cover to the body to close the storage compartment, the cover including bottom, side and top walls forming a liquid reservoir, a domed-shaped depressible portion forming a portion of the top wall operable to apply pressure to liquid in the liquid reservoir, the cover including a closable filler opening for flow of liquid into the liquid reservoir, and liquid spray means operable to spray liquid into the storage compartment from the reservoir in response to pressure applied to the liquid by depressing the dome-shaped depressible portion, including a passage extending through the bottom of the cover and a spray nozzle communicating with the passage connected to the bottom and arranged to direct the spray of liquid downwardly into the storage compartment.

4,008,931

END PANEL CONSTRUCTION FOR MODULAR UNITS AND MODULAR UNIT EMBODYING THE END PANEL CONSTRUCTION

Robert J. Kennedy, Jr., and Kendall S. Smith, II, both of West Lafayette, Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Sept. 17, 1975, Ser. No. 614,327

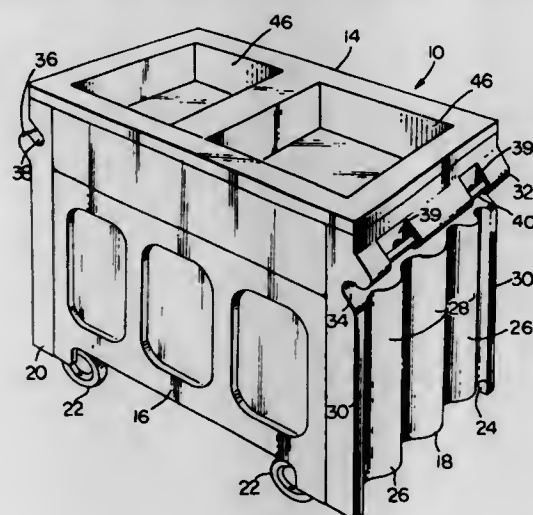
Int. Cl.³ F16B 12/00

U.S. Cl. 312—111

17 Claims

12. End panel construction, especially for a service counter

unit having a frame with sides and ends and a top; first and second end panels for mounting in vertical relation on opposite ends of a frame or on the opposed ends of adjacent frames and comprising respective complementary contoured portions which interfit when the panels are in opposed face to face abutting relation, said first and second end panels also comprising complementary formed elements of latch means thereon which interfit and latch the first and second end panels together in registration in the vertical direction when the panels are in said opposed face to face abutting relation, said contoured portions on said first and second end panels comprise vertically extending undulations formed therein, said undulations comprise a plurality of uniformly laterally spaced undulations distributed across the width of the respective end panel and providing for a plurality of



laterally shifted relative positions of said panels with at least a single undulation on the first end panel interfitted with an undulation on the opposed second end panel, said elements of latch means formed on said first and second end panels comprising an inclined tongue and an inclined groove adjacent thereto on each end panel, the tongue and groove on said first end panel inclining downwardly at a predetermined angle and the tongue and groove on said second end panel inclining upwardly at the same angle, said tongues and grooves extending laterally across substantially the entire width of the respective end panels, and the tongue and groove on the first end panel interfitting with the groove and tongue respectively on the second end panel in all adjusted positions of the said panels laterally in which undulations on the opposed first and second end panels interfit.

4,008,932

STRUCTURAL ELEMENT

Jan H. Wildschut, Zeist, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Sept. 24, 1974, Ser. No. 509,024

Claims priority, application Netherlands, Oct. 2, 1973, 7313505

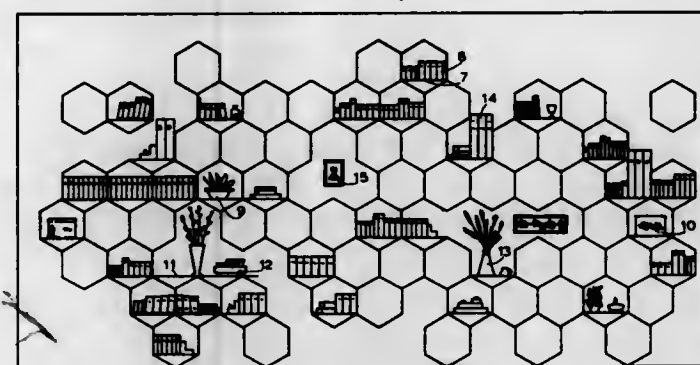
Int. Cl.² A47B 53/00

U.S. Cl. 312-198

4 Claims

1. Structure assembled of structural elements in which each of said structural elements consists of a polygonal, flat bottom and flat walls installed along the circumference of this bottom and positioned at a right angle thereto, which walls, at the angular points of the bottom, have their side edges adjoining, the structural element being characterized in that the bottom has the form of a regular hexagon and the vertical walls have the form of a rectangular trapezium whose difference in length

between the long and the short parallel side is equal to half the length of the sides of the hexagonal bottom, which walls are so



arranged that successive walls are adjoining with sides of equal length at the angular points of the bottom.

4,008,933

BATHROOM ACCESSORY

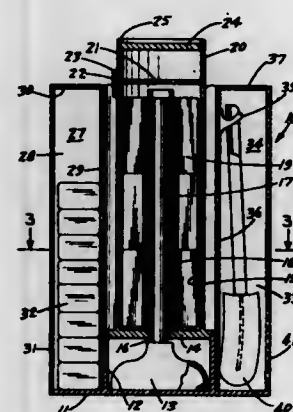
Leonard F. Wanek, 301 2nd St. North, Breckenridge, Minn. 56520

Filed July 24, 1975, Ser. No. 598,682

Int. Cl.² A47B 81/02

U.S. Cl. 312-206

5 Claims



1. A bathroom storage accessory comprising:
 - A. a base adapted to rest upon a floor,
 - B. a central toilet tissue storage compartment supported on said base, said compartment having an elongated vertical housing open at the top and an elongated central spindle within the housing adapted to engage a plurality of rolls of toilet tissue,
 - C. a further removable storage compartment of generally the same cross-sectional configuration overlying said tissue storage compartment and supported at the top thereof to function as a cover therefor,
 - D. a removable cover for said further storage compartment of generally the same cross-sectional configuration
 - E. a brush storage compartment supported on said base on one side of said tissue storage compartment adjacent thereto, said compartment having an elongated vertical housing, an access door to said housing and hook means within the housing for suspending a brush therefrom, and
 - F. a bar soap storage compartment supported on said base on the opposite side of said central tissue storage compartment and adjacent thereto, said compartment having an elongated vertical housing and an access door to said housing.

4,008,934

CHILD PROOF CABINET

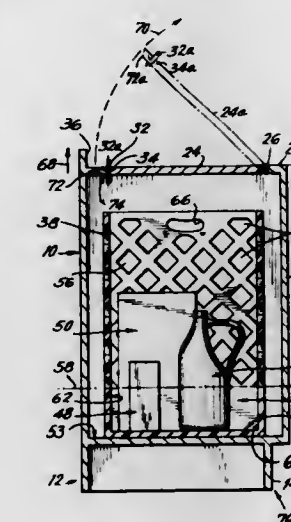
George A. Vice, 105C E. Crooked Hill, Pearl River, N.Y. 10965

Filed Feb. 25, 1976, Ser. No. 661,369

Int. Cl.² A47B 81/00, 95/02, 97/00

U.S. Cl. 312-209

17 Claims



1. A cabinet comprising an enclosure, said enclosure having a rearmost vertical wall, a door panel, a surface of said enclosure being disposed in a horizontal plane, an opening being disposed in said surface, hinging means hingably securing said door panel adjacent said opening, a substantially integrally formed frontmost wall said hinging means being disposed in spaced adjacent relationship to said frontmost wall, handle means for manually manipulating said door panel, said handle means being disposed on said door panel adjacent a marginal edge thereof, said marginal edge being disposed in spaced adjacent relationship to said rearmost vertical wall, a hollow container having an open mouth portion disposed at one end thereof, said door panel being capable of pivotal movement with respect to said hinge means for effectively covering and uncovering said opening, said hollow container including hand grasping means disposed adjacent said container open mouth portion for manually lifting said container upwardly through said opening when said door panel uncovers said opening, a supporting surface being disposed within said enclosure, and said container being supported by said supporting surface when positioned within said enclosure.

4,008,935

STAND FOR A PROJECTED IMAGE VIEWING APPARATUS

Daniel J. Zeloyke, New Kensington, Pa., assignor to Burrell Industrial Supply Company, New Kensington, Pa.

Filed June 2, 1975, Ser. No. 582,988

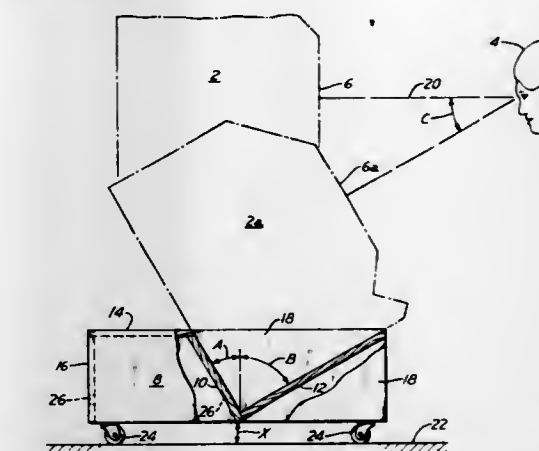
Int. Cl.² A47B 81/00

U.S. Cl. 312-252

3 Claims

1. In use with a projected image viewing apparatus of the type wherein there is provided a screen which displays a projected image thereon for viewing by an observer, a single stand adapted to support said image viewing apparatus which includes a single first flat laterally disposed member inclined rearwardly 20° - 40° from the vertical, a single second flat laterally disposed member inclined forwardly 50° - 70° from the vertical, the lower edges of said laterally disposed members being positioned coextensively adjacent each other, said

first laterally disposed member adapted to support the back of said image viewing apparatus, while said second laterally disposed member adapted to support the base of said image viewing apparatus, and recessed support means to maintain said stand as an integral unit whereby said lower edges of said



laterally disposed members are positioned at a predetermined height not to exceed 12 inches above said floor, said support means comprising back, front and side members integral with said flat laterally disposed members and provided with additional support means attached to said stand.

4,008,936

LD-3 CARGO CONTAINER

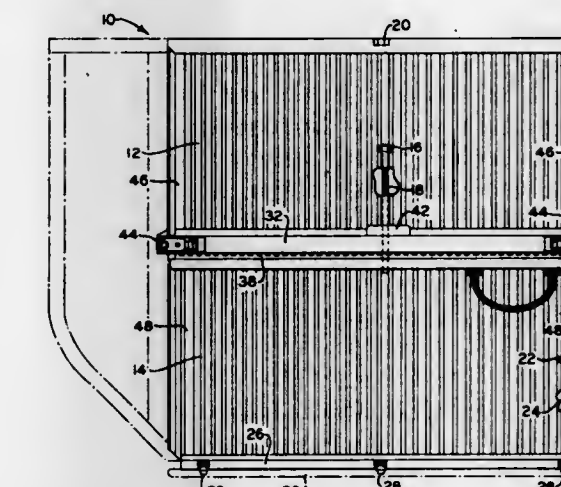
Oscar W. Meller, and John W. Lovich, both of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jan. 23, 1975, Ser. No. 543,564

Int. Cl.² A47B 87/00; E05D 15/26; B65D 87/00

U.S. Cl. 312-352

5 Claims



1. In a cargo container having a top, a base, two end panels interconnecting said top and base, and a header extending along the edge of the top and interconnecting the two end panels, the improvement, comprising:
 - an upper door section supportingly engaged at the top thereof by the header and having a channel member extending along the bottom edge thereof;
 - a lower door section having an edge member extending along and obliquely protruding from the top thereof;
 - a longitudinal hinge interconnected between the channel member and edge member and extending therealong; and
 - a shelf positioned within said container and vertically adjustable between the top and the base, the shelf having latch pin assemblies protruding therefrom, said latch pin assemblies comprising a pin slidably received within a bore and having a recessed portion thereabout defining an edge, and a spring strip fixed at one end and flexible at the other for making engagement with the recessed portion to fixedly secure the positioning of the pin within the bore, the spring strip being flexible in a plane perpendicular

lar to the axis of said pin, wherein the upper door section has an extended edge element along the upper edge thereof and having a U-shaped protrusion extending therefrom for making weight supporting engagement with a lip longitudinally extending along said header.

4,008,937

COUPLING ASSEMBLY

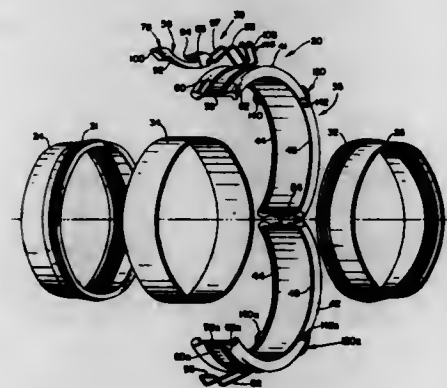
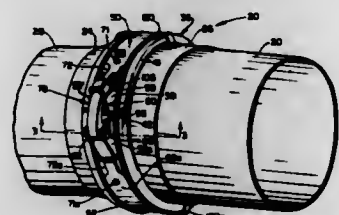
Ernest A. Filippi, Englewood, Colo., assignor to Stanley Aviation Corporation, Denver, Colo.

Filed Sept. 20, 1974, Ser. No. 507,686

Int. Cl.² H01R 3/04; F16L 21/02, 21/06

U.S. Cl. 339-15

23 Claims



1. A coupling assembly comprising a pair of confronting fluid-conveying members of tubular configuration, means coupling said members together and including a coupler removably circumferentially surrounding said members and limiting displacement of said members away from each other, and at least one electrically conductive spring metal jumper disposed entirely externally of said coupler and mounted on said coupler on the outer side thereof for removal therewith, said jumper having portions which seat against outer surfaces of said members to complete an electrical circuit between said members.

4,008,938

ELECTRICAL CONNECTOR

John W. Anhalt; David S. Goodman, both of Orange, Calif., and Leland W. Oliver, Scottsdale, Ariz., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,752

Int. Cl.² H05K 1/07

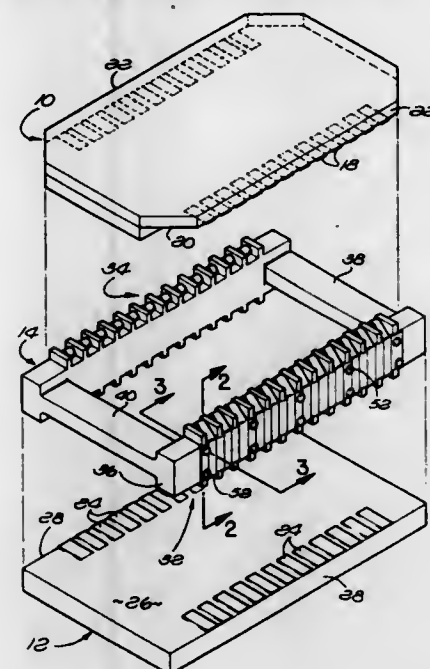
U.S. Cl. 339-17 CF

5 Claims

1. An electrical connector member for interconnecting a first electronic component having a first row of spaced conductive traces on the lower surface thereof with a second electronic component having a second row of spaced conductive traces on the upper surface thereof aligned with said first row of conductive traces comprising:

- an insulative member having upper and lower surfaces and a vertically extending side therebetween;
- a flexible dielectric tape mounted on said side, said tape having an outer surface opposite to said side;
- a plurality of vertically extending, parallel, spaced, continuous spring conductive strips bonded to said outer surface; and
- each said strip having an upper flexible free end portion and

a lower flexible free end portion, said upper end portion being spaced above said upper surface and said lower end



portion being spaced below said lower surface for resiliently interconnecting said traces.

4,008,939

AXIALLY CAMMED HOUSING FOR LOW INSERTION FORCE CONNECTOR

Robert John Kinkaid, New Cumberland, and John Carl Asick, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

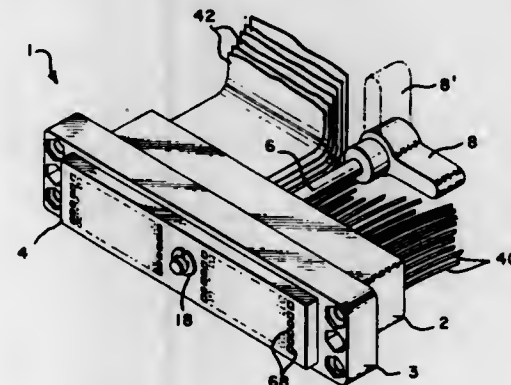
Continuation of Ser. No. 361,669, May 18, 1973, abandoned.

This application Sept. 17, 1974, Ser. No. 506,801

Int. Cl.² H01R 13/54

U.S. Cl. 339-75 M

2 Claims



1. In a low insertion force connector having a plurality of single resilient element electrical contacts in a housing capable of receiving a plurality of male electrical terminals which are initially disconnected from the electrical contacts in the housing, and a cam structure for camming said single resilient elements of said electrical contacts into mechanical and electrical engagement with said received male terminals subsequent to receipt of said male terminals in the housing, the improvement comprising:

- said housing being fabricated in two portions,
- a first portion of said housing having first receptacle passageways extending therethrough,
- a second portion of said housing having second receptacle passageways therein in alignment with said first receptacle passageways of said housing first portion, the second receptacle passageways of said housing second portion terminating in end walls against which said male terminals are seated when received in said receptacle passageways of both said housing first and second portions,

said housing first portion having cam surfaces on said cam structure for engagement against said single resilient elements,

said housing first portion being displaceable in a direction toward said housing second portion and along the lengths of said male terminals to engage said cam surfaces against said single resilient elements and to bias thereby said single resilient elements into engagement with said male terminals, and

said housing second portion engaging and supporting said received male terminals in said second receptacle passageways during engagement of said single resilient elements with said male terminals.

4,008,940

TELEPHONE APPARATUS INCLUDING ELECTRICAL CONNECTOR

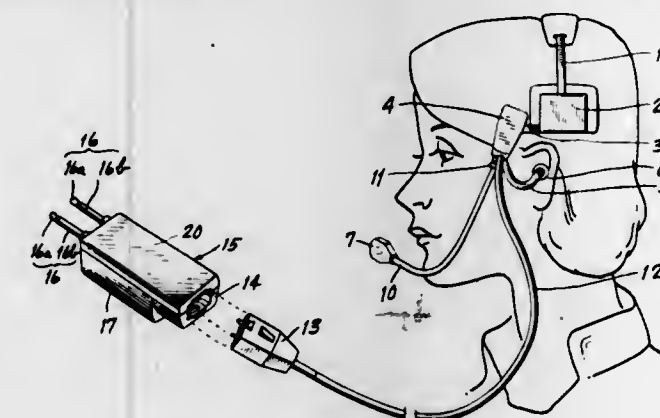
James P. Foley, Astoria, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,911

Int. Cl.² H01R 13/54

U.S. Cl. 339-91 R

6 Claims



1. An electrical connector including:
 - a. a receptacle having a recess in a surface thereof;
 - b. a seat in the recess;
 - c. a first electrically conductive connector element fixed on the seat;
 - d. two latch plates in the recess at opposite sides thereof;
 - e. a plug insertable in the recess so that an end of the plug engages the seat;
 - f. a second electrically conductive connector element on the plug and adapted to mate with the first element when the plug is engaging the seat;
 - g. two latch members movably supported within the plug at opposite sides thereof, each member having a tooth and an operating segment, said segments projecting outside opposite lateral surfaces of the plug;
 - h. spring means biasing each latch member to a latching position in which the tooth extends outside one of said lateral surfaces of the plug, each member being movable against its bias to a latch releasing position in which the tooth is retracted within the plug;
 - i. said latch plates being adapted to be engaged by the teeth on the latch members when said plug engages the seat and said members are in their latching positions, said teeth being releasable from said latch plates by gripping said plug manually at said opposite lateral surfaces to move said segments and thereby said latch members against said spring means; and
 - j. means yieldably engaging the end of a plug inserted in the recess and biasing it in a direction to hold the latch teeth firmly against the latch plate.

4,008,941

PRINTED CIRCUIT BOARD HOUSING SYSTEM

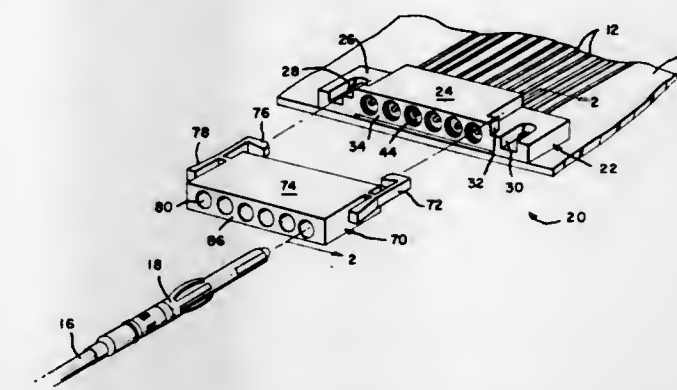
Donald Lee Smith, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 4, 1976, Ser. No. 663,649

Int. Cl.² H01R 17/06, 27/02

U.S. Cl. 339-91 P

4 Claims



1. A housing system for connecting a plurality of terminals having a center female receptacle and a cylindrical outer shell to a printed circuit board, which comprises:

- a. a first housing of insulating material adapted to be positioned on a printed circuit board, having a plurality of cavities arranged along the front end in a side-by-side relation, a pair of passages extending from each cavity rear wall rearwardly to the back end of the housing, the first passage opening located at the cavity center, and the second passage opening located at the cavity edge, said housing further having latching means thereon;
- b. a plurality of signal contact pins of conductive material having a mating section at the forward end and an elongated leg at the other end, said mating section extending into the center of the cavity and the leg extending through the first passage and depending downwardly from the housing for insertion into an opening in the printed circuit board;
- c. a plurality of a ground contact pins of conductive material having a sleeve at a forward end and an elongated leg at the other end, said sleeve positioned in the cavity in remote surrounding relation to the signal contact pin mating section and the leg extending through the second passage and depending from the housing for insertion into an opening in the printed circuit board; and
- d. a second housing of insulating material having latching means thereon adapted to cooperate with the latching means on the first housing so that the two housings can be latched together, further said second housing having a plurality of passageways extending therethrough and arranged in mating alignment with the cavities in the first housing, each passageway having an inwardly extending collar adapted to retain a terminal therein for connecting with the signal contact pins and the ground contact pins in the first housing when the two housings are latched together.

4,008,942

PRINTED CIRCUIT BOARD HOLDING SPRING

Benedetto Grossi, Norwalk, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed July 29, 1975, Ser. No. 600,171

Int. Cl.² H01R 13/54; H05K 1/14

U.S. Cl. 339-91 R

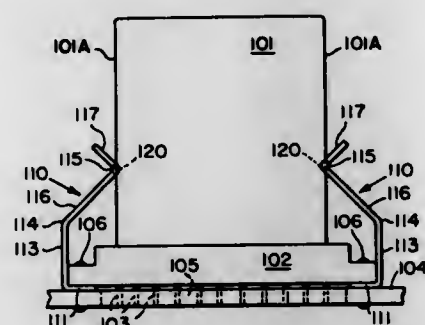
4 Claims

1. In a printed circuit board mounting and support system of the class having a mother board supporting a connector into which one edge of a planar printed circuit board of predetermined thickness is plugged for effecting electrical connections from said printed circuit board to said connector and wherein the improvement comprises:

- a. a formed resilient longitudinal retaining spring for supporting the printed circuit board from the edge and for

limiting the motion of said printed circuit board towards parallel planes;

- b. said retaining spring having a bend formed thereon at right angles to the length of said retaining spring to form a "V"; and said retaining spring otherwise shaped, formed and supported by the mother board to permit only the vertex of said "V" to contact the edge of the printed circuit board in a line normal to the plane of said printed circuit board; and wherein



- c. at least some of the material of said retaining spring is displaced from the central part of said vertex for a width equal to, or slightly more than, said predetermined thickness for creating a groove whereby when said vertex area is in contact with the printed circuit board said printed circuit board is contacted on its edge and adjacent sides to limit motion of said printed circuit board towards parallel planes.

4,008,943

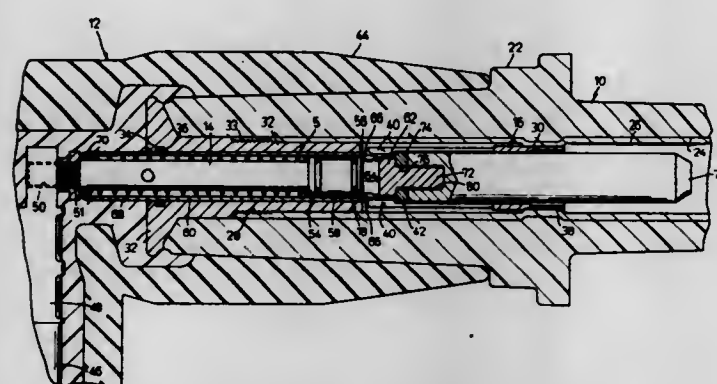
HIGH VOLTAGE CABLE TERMINATOR HAVING A FAULT ACTUATED PROBE

Richard P. Flatt, Oconomowoc, and Edwin A. Link, Waukesha, both of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed July 17, 1975, Ser. No. 596,767
Int. Cl.² H01R 13/52

U.S. Cl. 339-111

26 Claims



1. In a high voltage cable terminator for connecting a high voltage cable to a high voltage bushing, a gas actuated contact probe assembly comprising:

a probe contact and means mounted on said probe contact responsive to an increased pressure produced by a pre-strike arc of current for accelerating said probe contact into electrical connection to said bushing on close-in.

10. A quick-make contact assembly comprising, in combination:

an electrically conductive probe contact and an electrically conductive bore contact, said contacts being telescopically movable into engagement,

an electrically conductive pressure operated sleeve carried by said probe contact and being responsive to a fault current condition for rapidly connecting said probe contact to said bore contact.

23. A probe contact assembly for accelerating the electrical connection of a high voltage cable terminator to a high voltage

bushing under fault current conditions, said assembly comprising:

a probe contact, a fusible member mounted on the end of said probe contact and including a fusible section, an insulating cylinder mounted on said fusible member, and an electrically conductive sleeve mounted on said insulating cylinder and being telescopically receivable on said probe contact,

said sleeve defining a gas chamber around said fusible section,

an arc contact ring mounted on said fusible member for initiating an arc on close-in to provide an electrical current path through said fusible member to said probe contact whereby said fusible section will fuse under fault current conditions producing an increase in gas pressure within said chamber to accelerate the movement of said electrically conductive sleeve into electrical engagement with said bore contact.

4,008,944

GLOW PLUG CONNECTOR

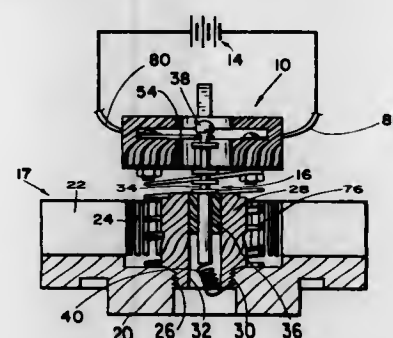
Calvin E. Jackson, Rte. 2, Box 197, Chouteau, Okla. 74337

Filed Mar. 8, 1976, Ser. No. 664,537

Int. Cl.² H01R 13/10

U.S. Cl. 339-253 R

9 Claims



1. A glow plug connector comprising an insulated plate member having an aperture therethrough for receiving a center pole of a glow plug therethrough, a first conductive elongated lead member having one end secured to one surface of the plate member, the opposite end portion extending across said aperture for selective locking engagement with the glow plug center pole, second conductive elongated lead member having one end secured to the opposite surface of the plate member, the other end portion having yieldable means being conductively engageable with the glow plug when said first lead member is in a lock position for completing an electrical circuit through the glow plug.

4,008,945

ULTRAVIOLET-TRANSMITTING WINDOW FOR A PROM

Jeremy D. Scherer, Dartmouth, Mass., assignor to Isotronics, Inc., New Bedford, Mass.

Division of Ser. No. 470,123, May 15, 1974, Pat. No. 3,924,246. This application Apr. 17, 1975, Ser. No. 569,001

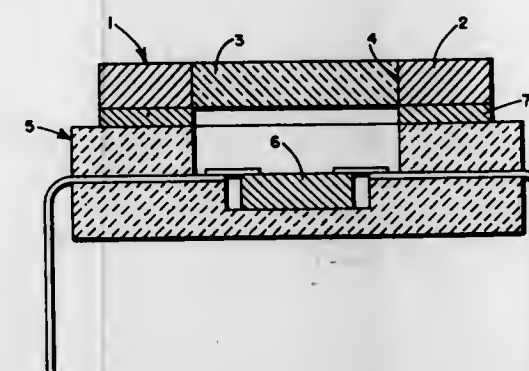
Int. Cl.² G02B 5/20

U.S. Cl. 350-1

11 Claims

1. An ultraviolet-transmitting window assembly comprising a metallic mounting member with an aperture therethrough, and an ultraviolet-transmitting borosilicate glass member positioned within said aperture, said metallic member having

a higher coefficient of thermal expansion than said glass member and wherein said glass member is held within the aperture



of said metallic member by a fused glass-to-metal hermetic compression seal.

4,008,946

POINTER PROJECTING MEANS FOR MICROSCOPES

Hiroshi Tsuda, Mitaka, and Toshimi Hayasaka, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

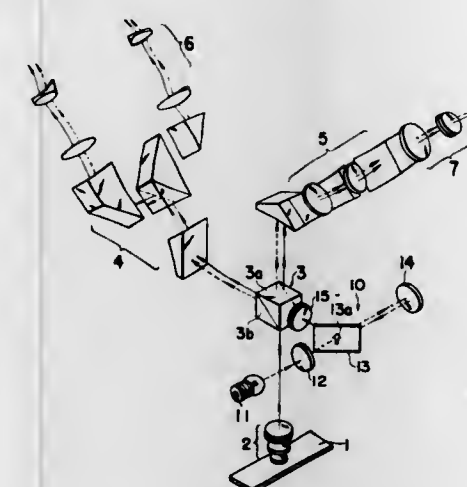
Filed July 9, 1975, Ser. No. 594,556

Claims priority, application Japan, July 13, 1974, 49-80591; Sept. 10, 1974, 49-103423

Int. Cl.² G02B 27/36

U.S. Cl. 350-10

6 Claims



1. A pointer projecting means comprising a microscope objective, a beam splitter arranged on the optical axis of said objective, a first eyepiece for observing a first image of an object formed by said objective after the light from said object passes through said beam splitter, a second eyepiece for observing a second image of the object formed by said objective after the light from the object is reflected by said beam splitter, a first reflecting mirror having a patterned transparent portion and positioned out of the optical axis of said object, means for directing light through said patterned transparent portion to form a pointer image, a second reflecting mirror for reflecting the pointer image back to said first reflecting mirror, a projecting lens, said first reflecting mirror reflecting the pointer image to said projecting lens, said projecting lens transmitting the pointer image to said beam splitter whereby a first image of the pointer is formed by said projecting lens near the first image of the object through reflection by said beam splitter, and a second image of the pointer is formed by said projecting lens near the second image of the object by transmission through said beam splitter, and including means for angularly adjusting at least said second reflecting mirror for effecting pointer image movement.

4,008,947

ELECTRO-OPTICAL SWITCH AND MODULATOR

Peter Baues, Krailling; Hans Mahlein; Achim Reichelt, both of Munich, and Gerhard Winzer, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

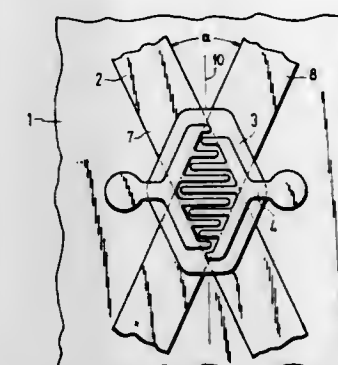
Filed July 28, 1975, Ser. No. 599,816

Claims priority, application Germany, Sept. 9, 1974, 2443038

Int. Cl.² G02B 5/14

U.S. Cl. 350-96 C

3 Claims



1. In an electro-optical switch and modulator for use in a region of a waveguide system selected from a group consisting of intersecting waveguides and branching waveguides, said waveguides being arranged on a dielectric substrate and consisting of an electro-optical material at the region with at least one dielectric insulating layer engaging the region of the waveguide, the improvements comprising at least one electrode structure being located at the region, each electrode structure comprising a plurality of electrode fingers extending at right angles to a line, said line being a bisector of an angle α of intersection of the intersecting and branching waveguides when the region is located at the point of branching and intersecting and said line being a longitudinal axis of the waveguide when the region is spaced from the point of branching and intersecting, and each of the dielectric insulating layers in the region of the electrode structure consisting of an electro-optical material.

4,008,948

OPTICAL FIBRE CONNECTORS

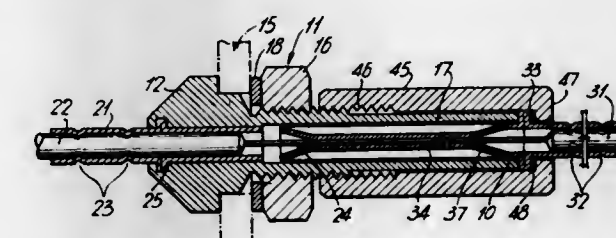
Jack Frank Dalglish, Ottawa; Helmut Hans Lukas, Carleton Place, and Louis Donald Charron, Greely, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 591,499, June 30, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,369

Int. Cl.² G02B 5/14

U.S. Cl. 350-96 C

15 Claims



1. A connector for releasably connecting at least one pair of single optical fibres in abutting end-to-end relationship, said fibres including a plastic coating, comprising two subassemblies and means for releasably retaining the assemblies in assembled relationship;

one of said subassemblies including at least one tubular connecting element having a bore at a rear portion which bore is a close sliding fit on a coated portion of one of said pair of coated fibres and a bore at a forward portion a close sliding fit on uncoated ends of both of said pair of fibres in end-to-end relationship, and a divergent surface at each end of said bore at said forward portion;

the other of said subassemblies including at least one tubular member having a bore at a rear portion a close sliding fit on a coated portion of the other of said pair of coated fibres, and a bore at a forward portion for reception of one of said tubular connecting elements of said one sub-assembly.

4,008,949

PROTECTIVE REFLECTIVE HELMET

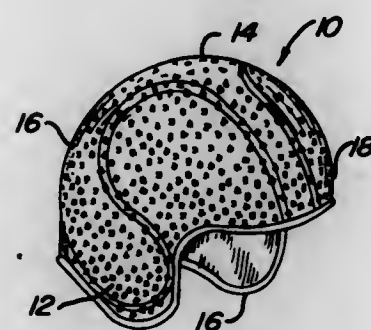
Jerry Martin Luna, 2795 S. Bannock St., Englewood, Colo. 80110

Filed Nov. 6, 1975, Ser. No. 629,212

Int. Cl.² G02B 5/12

U.S. Cl. 350—98

8 Claims



1. In a structure having a shell of protective material, the improvement comprising:

- a first layer of light transmitting gel coat containing metal flake and color ingredients uniformly formed over and integral with the outer surface of said shell,
- a plurality of randomly oriented flat reflective chips imbedded in at least portions of said shell and said first layer, each of said chips having a flat outer surface coplanar with the surface of said first layer,
- a second layer of light transmitting gel coat covering said flat outer surfaces of said chips and integral with the non-imbedded portions of said first layer, and
- a third layer of light transmitting gel coat uniformly formed over and integral with said second layer.

4,008,950

ELECTROCHROMIC DISPLAY CELL STRUCTURE

Richard A. Chapman; Raymond J. Jasinski, and William G. Manns, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 7, 1975, Ser. No. 593,409

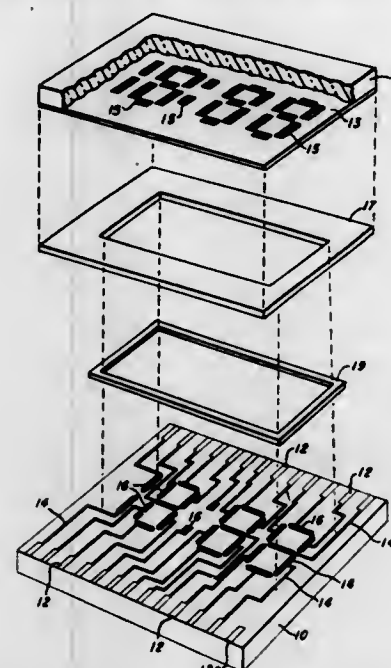
Int. Cl.² G02S 5/23

U.S. Cl. 350—160 R

12 Claims

- 1. An electrochromic information display cell comprising:
 - a. a transparent front panel having affixed to its internal surface an opaque metallic coating visible from its external surface to provide a background field for the display cell, said metallic coating having at least one opening therein permitting viewer observation of internal portions of said cell, and a counter-electrode layer affixed to said metallic coating;
 - b. a back panel having affixed to the internal surface thereof at least one display electrode positioned to be viewed through said at least one opening in said metallic coating affixed to said front panel; an electrical contact region corresponding to each of said at least one display electrode and positioned near an edge of said back panel; and an electrically conductive lead coating connecting each electrical contact region with its corresponding display electrode;
 - c. a spacer ring member sealed between said front panel and

said back panel, and defining an electrolyte chamber which includes said at least one display electrode and at



least a portion of said counter-electrode layer; and
d. an electrolyte within said electrolyte chamber.

4,008,951

CONTROL MECHANISM FOR OPTICAL SYSTEM WITH INDEPENDENTLY MOVABLE COMPONENTS

Paul Himmelsbach, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

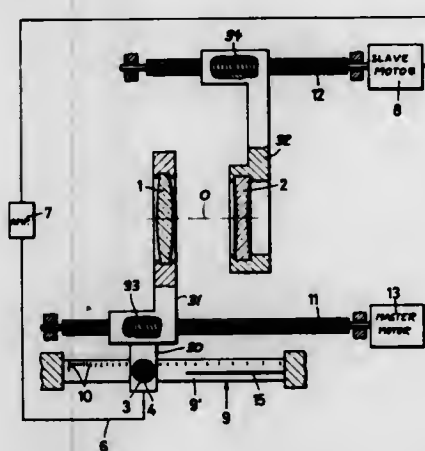
Filed May 27, 1975, Ser. No. 580,568

Claims priority, application Germany, May 28, 1974, 2425645

Int. Cl.² G02B 15/16

U.S. Cl. 350—187

8 Claims



1. A control mechanism for simultaneously displacing a plurality of components of an optical system according to a predetermined positional relationship therebetween, comprising:

- first transmission means for the displacement of a first optical component;
- second transmission means mechanically independent of said first transmission means for the displacement of a second optical component;
- master drive means positively coupled with said first transmission means;
- reversible slave drive means positively coupled with said second transmission means and provided with two inputs energizable for movement in opposite directions;
- position-scanning means including a movable member positively coupled with said master drive means for displacement in step with said first optical component, said position-scanning means being provided with first output means emitting a series of stepping pulses of varying density upon a movement of said member at a given speed over a predetermined range, said position-scanning

means being further provided with second output means emitting a control signal in certain parts of said range; and circuit means linking said output means with said slave drive means for operating same under the control of said stepping pulses, said circuit means including a switch operatively coupled to said second output means for applying said stepping pulses to one of said inputs in the presence of said control signal and to the other of said inputs in the absence thereof.

4,008,952

RETROFOCUS-TYPE LENS SYSTEM

Jihei Nakagawa, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

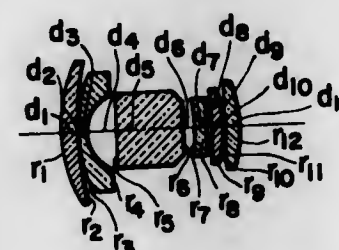
Filed July 1, 1975, Ser. No. 592,267

Claims priority, application Japan, July 3, 1974, 49-76054

Int. Cl.² G02B 13/04

U.S. Cl. 350—215

6 Claims



1. A retrofocus-type lens system comprising a first, second, third, fourth, fifth and sixth lens components, said first lens component being a positive meniscus lens, said second lens component being a negative meniscus lens, said third lens component being a positive lens of large thickness, said fourth lens component being a negative lens, said fifth lens component being a positive meniscus lens, and said sixth lens component being a positive lens, said retrofocus-type lens system satisfying the following conditions:

1. $0.14f < d_4 < 0.3f$
2. $0.25f < d_5 < 0.5f$
3. $0.4f < d_5 + d_7 < 0.6f$
4. $f < \Sigma d < 1.4f$

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol d_4 represents the airspace between the second and third lens components, reference symbols d_5 and d_7 respectively represents thicknesses of the third and fourth lens components, and reference symbol Σd represents the overall length of the lens system.

4,008,953

PROJECTOR CONTROL MECHANISM

Serge Besancenot, 20, Avenue de Livry, 93270 Sevran, France

Filed Oct. 22, 1975, Ser. No. 624,828

Claims priority, application France, Oct. 21, 1974, 74.35249

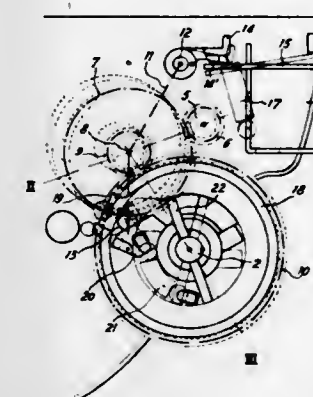
Int. Cl.² G03B 23/02; F16H 35/00, 57/00

U.S. Cl. 353—103

5 Claims

1. A control mechanism for controlling the reciprocating movement of a pusher for a picture-holder in a transparency projector of the type which includes a rotating shaft for driving the pusher to-and-fro, a rotation of 360° of the shaft corresponding to a complete to-and-fro movement of the pusher, and a continuously rotating electric motor, said mechanism comprising two stages of gears for coupling the motor to the shaft, and a control member for initiating the coupling of the motor to the shaft, whereby operation of the control member firstly causes a first of said stages to be engaged, and then a second of said stages to be engaged after engagement of the first stage thereby to complete the coupling of the shaft to the motor, said control member comprising a pivotal arm, a shaft carried by said arm, said first stage comprising a first pinion, said second stage comprising a first toothed wheel, said con-

trol member further comprising a second pinion and a second toothed wheel secured together and mounted on said shaft in an arrangement such that upon pivoting of said arm the sec-



ond toothed wheel engages said first pinion whereafter further pivoting of said arm causes the second pinion to engage said first toothed wheel.

4,008,954

DEVICE FOR EXTINGUISHING UNNECESSARY ELECTROSTATIC CHARGE IN ELECTROPHOTOGRAPHIC COPIER

Masaya Ogawa, Sakai; Yuji Enoguchi, Osaka; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Susumu Tanaka, Sakai; Takao Fujiwara, Sakai; Hiroshi Murasaki, Sakai, and Kenichi Wada, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

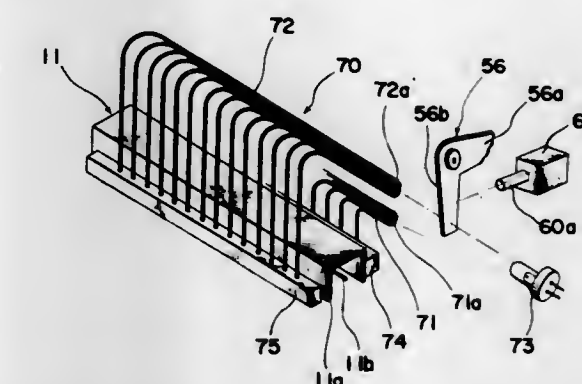
Filed June 9, 1975, Ser. No. 584,893

Claims priority, application Japan, July 15, 1974, 49-83865[U]

Int. Cl.² G03B 27/00; G03G 15/00

U.S. Cl. 355—1

10 Claims



1. In an electrophotographic copying machine which comprises a transparent support for support thereon of the original to be copied on a recording medium, said transparent support being reciprocally movably supported for movement between rest and scanned positions, an illumination device for illuminating the original on said transparent support, and an optical image projecting system for transmitting rays of light, which carry an image of the original thus illuminated towards a photoreceptor surface to form an electrostatic latent image thereon, an apparatus for extinguishing unnecessary electrostatic charge formed on the photoreceptor surface by means of an electrostatic charger at an area between each two adjacent areas to be optically exposed to the incoming light, which apparatus comprises:

- a source of discharging light;
- an elongated light guide for transmitting said discharging light towards said photoreceptor surface therethrough to extinguish said unnecessary electrostatic charge, said light guide having one end situated adjacent said discharging light source in position to receive the discharging light therefrom and the other end situated in the vicinity of said photoreceptor surface; and

intercepting means positioned between said discharging light source and said one end of said light guide for intercepting the transmission of said discharging light from said discharging light source towards said photoreceptor surface for a length of time corresponding to the length of the original to be copied, said intercepting means comprising an elongated actuating member supported for movement together with said transparent support and extending in parallel relation to the direction of movement of said transparent support, a pivotable plate lever supported for pivotal movement between inoperative and operated positions and normally biased to said inoperative position, said plate lever having one end adapted to be brought in position to intercept said transmission of said discharge light towards said light guide when said plate lever is pivoted to said operated position, and operating member having one end pivotally connected to the other end of said plate lever and the other end held in position in the path of travel of said elongated actuating member, said other end of said operating member being engageable with said actuating member to pivot said plate lever from said inoperative position towards said operated position immediately after the start of movement of said transparent support from said rest position towards said scanned position.

4,008,955

FUSER ASSEMBLY FOR AN ELECTROPHOTOGRAPHIC COPYING MACHINE

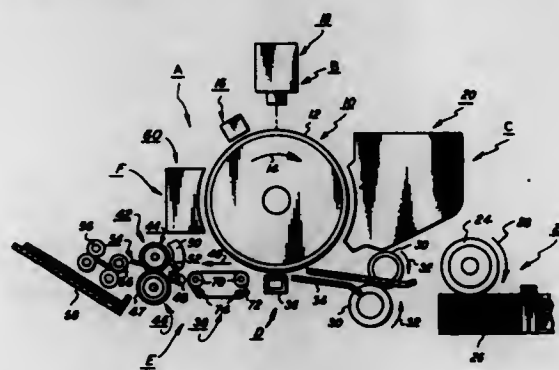
Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 12, 1975, Ser. No. 576,815

Int. Cl.² G03G 15/00; F27B 9/28

U.S. Cl. 355-3 R

8 Claims



5. An electrophotographic printing machine, including: a photoconductive member; means for charging said photoconductive member to a substantially uniform level; means for exposing the charged portion of said photoconductive member to a light image of an original document recording thereon an electrostatic latent image corresponding to the original document; means for developing the electrostatic latent image with toner particles forming a toner powder image of the original document on said photoconductive member; means for transferring the toner powder image from said photoconductive member to a sheet of support material; and a fusing apparatus for permanently affixing the toner particles to the sheet of support material, said fusing apparatus comprising a heated fuser roll, a backup roll in contact with the fuser roll to define a nip through which the sheet of support material passes with the particles contacting the fuser roll, means for conveying the sheet of support material toward the nip defined by the fuser roll and the backup roll, a plurality of opposed, spaced support members located between said conveying means and the fuser roll, said support members extending in an upwardly direction substantially normal to the path of movement of

the sheet of support material in engagement therewith and extending across the sheet of support material in a direction substantially normal to the path of movement thereof, and means for advancing the side marginal regions of the sheet of support material at a greater velocity than the central region thereof as the sheet of support material passes between the fuser roll and the backup roll so as to apply a force component thereon substantially normal to the path of movement of the sheet of support material in a plane defined by the sheet of support material preventing wrinkling thereof.

4,008,956

DOCUMENT HANDLING SYSTEM FOR PRE-COLLATION COPYING

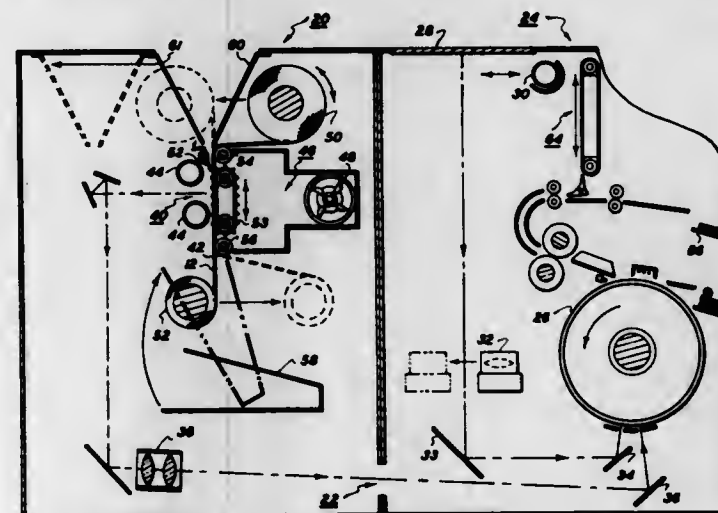
Denis L. Stemmler, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1975, Ser. No. 560,755

Int. Cl.² G03G 15/28; G03B 27/62

U.S. Cl. 355-8

4 Claims



1. In an automatic document handling system of a copying apparatus for making pre-collated copy sheet sets by repeated collated imaging of a set of original documents, the improvement comprising:

an elongated windable document holding web having a document supporting side, means for forming a spaced pair of oppositely wound scrolls of said web for retaining said documents within said scrolls by the winding up of the documents between the turns of said web on both said scrolls, said scrolls normally facing one another and forming a nip with said document supporting side of said web, said web having a minor intermediate unwound segment normally extending sufficiently linearly between said web scroll nips to prevent documents on said intermediate segment from stripping therefrom, means for automatically multiply recirculatingly winding and unwinding said web with the documents thereon through said intermediate segment between one said web scroll and the other said web scroll to multiply recirculatingly expose individual documents on said intermediate segment of said web in a pre-collated order for making said pre-collated copy sheet sets, imaging means for imaging documents on said intermediate segment of said web for said copying of said documents, and means for loading and unloading documents onto and off of said intermediate segment of said web including means for arcuately deforming said intermediate segment of said web from said normal extension thereof for automatically stripping documents from said intermediate segment of said web.

4,008,957

REPRODUCTION MACHINE CONTROL

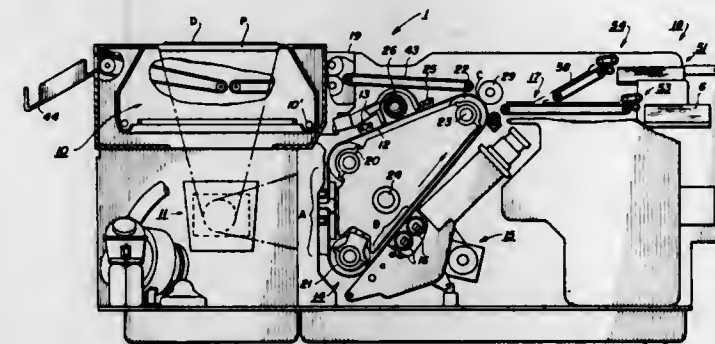
James E. Summers, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1975, Ser. No. 581,386

Int. Cl.² G03G 15/22

U.S. Cl. 355-14

2 Claims



1. In an electrostatic type reproduction apparatus having a photosensitive member on which electrostatic images of an original being reproduced are formed, with means to charge the member in preparation for imaging, exposure means to selectively discharge the member to form thereon electrostatic image of the original, means to develop the image, and transfer means to transfer the developed image to a sheet of copy substrate material, the combination of:

a source of said copy substrate material including at least two supply trays, at least one of said supply trays being independently adjustable to accommodate different size copy substrate material;

transport means to advance substrate material from any of said trays to said transfer means for transfer of a developed image thereto;

control means for operating said apparatus to produce a copy run using copy substrate material from a first of said supply trays, said control means including material monitoring means for monitoring the supply of copy substrate material in said first supply tray, said material monitoring means being operative on a preset low supply of copy substrate material in said first tray to switchover to a second one of said supply trays; and

inhibit means operative to intervene and prevent switchover from said first supply tray to said second supply tray during said copy run when the size of the substrate material in said second supply tray is different from the size of the substrate material in said first supply tray.

4,008,958

OPTICAL SYSTEM EFFECTING IMAGE ROTATION

David O. Kingsland, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 24, 1975, Ser. No. 552,003

Int. Cl.² G03B 27/48, 27/50, 27/70; G03G 15/28

U.S. Cl. 355-51

3 Claims

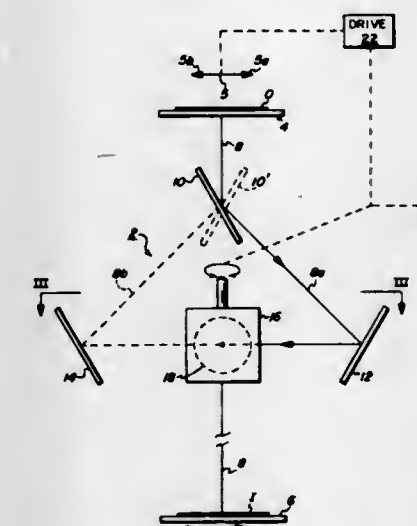
1. An optical scanning system for projecting an image of an object from an object plane to an image plane and having an optical axis including first and second alternate optical paths extending between said object plane and said image plane, said image being in a first orientation at said image plane when projected along said first optical path and in a second orientation, rotated 180° about the axis of propagation from said first orientation, when projected along said optical path, said system including:

a lens to project and image from said object plane to said image plane, a photoreceptor disposed for uni-directional motion at said image plane, scan drive means for effecting relative reciprocatory scanning motion of said object and said optical axis, optical path drive means to place said object plane and said image plane in optical communication successively along

said first and said second alternate optical path, and to switch between one to the other of said alternate optical paths at the end of said reciprocatory motion in each direction,

said first alternate optical path including first, second, and third reflectors with said first and third reflectors being in first alternate positions, to rotate an image wavefront propagating from said object in first directions of rotation about each of two orthogonal axes lying in the plane of said wavefront,

said second alternate optical path including first, alternate second, and third reflectors, with said first and third reflectors being in second alternate positions, to rotate an image wavefront propagating from said object in second



directions of rotation opposite to said first directions of rotation about each of said orthogonal axes lying in the plane of said wavefront,

said first and third reflectors being common to both said first and second alternate optical paths, said optical path drive means being operatively connected to said first and third reflectors,

whereby said image wavefront propagating along said first alternate optical path is rotationally displaced by 180° about its axis of propagation relative to said image wavefront propagating along said second alternate optical path so as to project an ordered image of said object onto said moving photoreceptor during both direction of reciprocatory scanning motion.

4,008,959

PHOTOGRAPHIC REPROPORTIONING SYSTEM

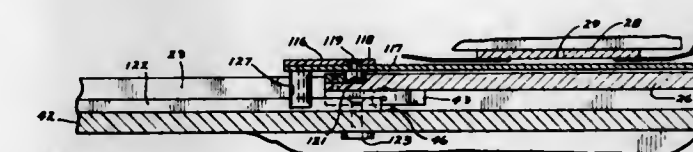
James C. Parsons, Minneapolis, Minn., assignor to Combined Services, Incorporated, Minneapolis, Minn.

Filed June 16, 1975, Ser. No. 587,037

Int. Cl.² G03B 27/10

U.S. Cl. 355-84

37 Claims



1. An apparatus for changing one dimension of a two-dimension image projected on a photosensitive film comprising: a support, a first means having a top surface for carrying a sheet having an image thereon or a photosensitive film, means movably supporting the first means on the support, drive means connected to the first means to move the first means along a linear path, a member having an elongated slit allowing light to project onto the top surface of the first means, a light source operable to project light through said slit, opaque cover means attached to the member for covering said top surface, a second means having a top surface located

adjacent one side of the first means for carrying a sheet having an image thereon or a photosensitive film, means movably supporting the second means on the support for movement in the same direction as the linear path of the first means, motion transmitting means operably connected to the first means and second means operable to move the second means in response to movement of the first means at a speed equal to or less than the speed of the first means, said motion transmitting means having an arm having a linear edge, pivot means connecting the arm to the first means whereby the arm moves with the first means, holding means for limiting pivotal movement of the arm relative to the first means, a movable member having a portion engageable with the edge of the arm, track means on said support for guiding the movable member along a path extended in a direction at an angle to the linear path of movement of the first means, and means connecting the movable member with the second means whereby on movement of the first means by operation of the drive means the arm moves the movable member along the track means at a speed dependent on the angle of the arm relative to the linear path of the first means, said second means being moved by the movable member at the same speed as the movable member, the speed being equal to or less than the speed of the first means.

4,008,960

PHOTOELASTIC STRAIN GAUGE COATING AND METHOD OF USING SAME

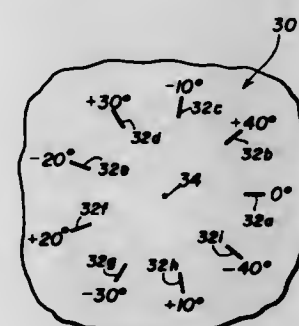
Zinoviy V. Reytblatt, 530 W. Aldine Ave., Chicago, Ill. 60657

Filed Aug. 18, 1975, Ser. No. 605,720

Int. Cl.² G01B 11/18

U.S. Cl. 356-33

18 Claims



1. A photoelastic strain gauge coating adapted to be bonded to a surface of a workpiece, comprising a sheet of photoelastic material having a multiplicity of minute discontinuity means therein, each of said discontinuity means being operative to display patterns representative of the principal directions of strain and the magnitude of the difference in strain along such directions in the region of the workpiece respectively aligned with each of said discontinuity means, and means for reducing sharp changes of the strain in said sheet of photoelastic material in the region of the boundaries of said photoelastic material and the workpiece.

4,008,961

MONOCHROMATIC DETECTION OF PLURAL ROTATIONAL RAMAN SPECTRA GENERATED BY MULTIPLE FREQUENCY EXCITATION

Joseph J. Barrett, Morris Plains, and Ernest D. Buff, Bernardsville, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 21, 1975, Ser. No. 570,107

Int. Cl.² G01J 3/44

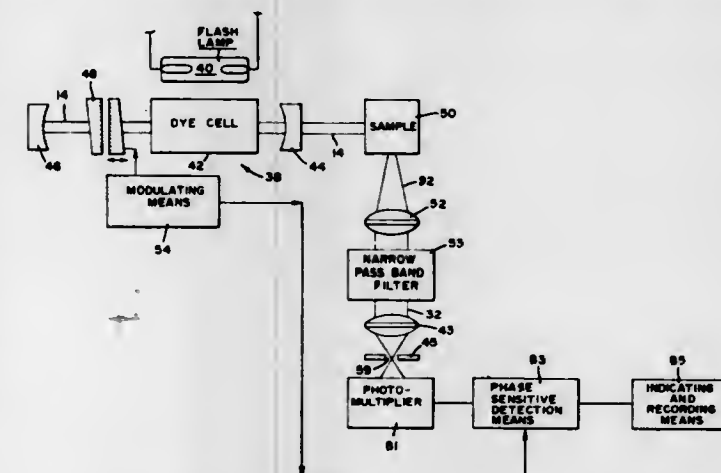
U.S. Cl. 356-75

22 Claims

1. Apparatus for spectroscopically analyzing gas comprising:
a. radiation source means for generating a plurality of spatially superimposed beams of monochromatic radiation;
b. tuning means for adjusting the frequency difference between radiation beams of adjacent frequencies to equal

substantially an odd integral submultiple of the frequency difference between adjacent spectral components of the periodic spectrum for a preselected constituent of gaseous material;

c. projecting means for directing said radiation beams through said gaseous material to produce scattered radiation, the scattered radiation produced by each of said radiation beams having spectral components periodic in frequency and the spectral components for said pre-



lected constituent being superimposed to form, within the spectrum produced by combined scattering of said radiation beams, the periodic spectrum for said preselected constituent;

d. filtering means adapted to receive said scattered radiation, for selectively transmitting a detectable signal composed of a single superimposed spectral component of said spectrum, whereby said detectable signal is derived from a plurality of spectral lines and has an intensity substantially equal to their sum.

4,008,962

COLOR PRINTING METHOD

Robert F. Nepper, St. Paul, Minn., assignor to Minnesota

Mining and Manufacturing Company, St. Paul, Minn.

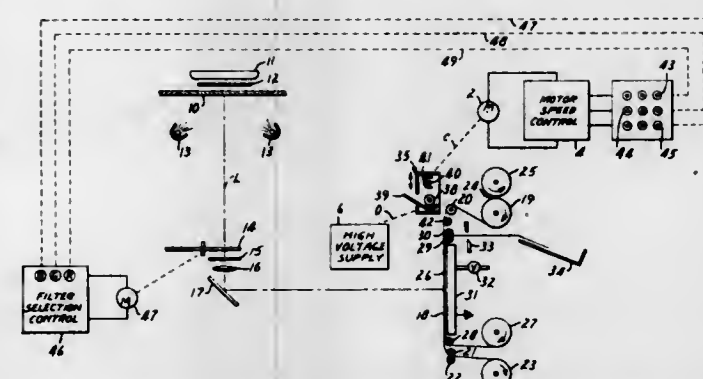
Division of Ser. No. 406,189, Oct. 15, 1973, Pat. No.

3,901,592. This application May 23, 1975, Ser. No. 580,367

Int. Cl.² G03B 27/32

U.S. Cl. 355-77

2 Claims

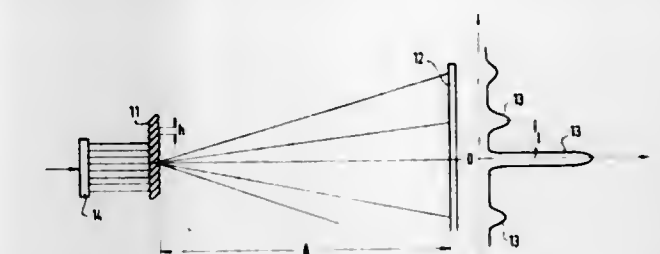


1. A method for making a color print from a multicolored original wherein a color present in the original is presented as the same or as a different color in the color print, the method including the steps of

a. providing an apparatus which produces a color print from a multicolored original wherein a color present in the original is presented as the same or different color in the color print, said apparatus providing said color print in accordance with control data provided by manually adjustable controls or in accordance with control data obtained from a stored data media;
b. operating said apparatus using said manually adjustable controls to obtain a desired color print;

c. determining the control data provided by use of the manually adjustable controls in step (b);
d. storing said control data determined in step (c) in a stored data media which is machine readable for subsequent read out and use in operating said apparatus using the data stored in the stored data media provided by step (c) to provide a reprint of the color print obtained in step (b).

diffraction image from said illuminated turns on a receiving surface disposed behind the thread, and determining the pitch



of said thread from the positions of the diffraction maxima of said image.

4,008,963

METHOD OF AND DEVICE FOR THE ANALYSIS OF SAMPLES BY MEANS OF FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

Bernhard Werner Huber, Überlingen, and Rolf Günther Arnold Tamm, Salem, both of Germany, assignors to Bodenseewerk Perkin-Elmer & Co. GmbH, Überlingen, Germany

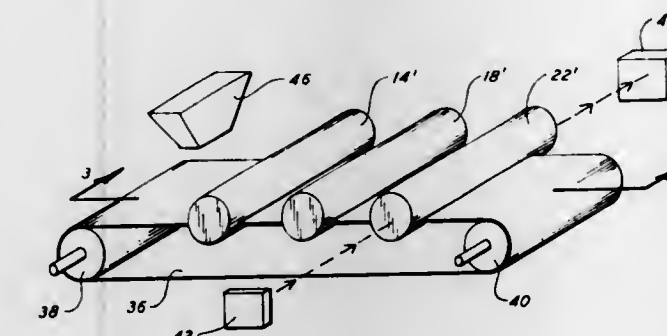
Filed Mar. 6, 1975, Ser. No. 555,723

Claims priority, application Germany, Mar. 7, 1974, 2410892

Int. Cl.² G01J 3/42

U.S. Cl. 356-85

14 Claims



1. Apparatus for flameless atomization of a sample for spectroscopic analysis comprising:
means for defining a plurality of chambers disposed in proximity to one another;
continuous conveyor means for transporting in sequence through each of said chambers a sample to be analyzed;
means for heating said chambers to respective predetermined temperatures, each higher than in the preceding chamber in the direction of sample transport, one of said chambers being heated to a temperature required for drying the sample, another of said chambers in the direction of sample transport being heated to a temperature required for ashing the sample, and one of said chambers lattermost in the sequence being heated to the temperature required to effect atomization of the sample; and means defining a radiation-transparent passage through said lattermost chamber.

1. A method for detecting the precise focussing point of a lens, comprising the steps of: placing a photoelectric element on the optical path of said lens, said element producing an output indicative of the sharpness of focus;
converting the output of said element to a frequency variation of an A.C. signal; and
detecting from said A.C. signal a signal of a frequency corresponding to said precise focussing point.

4,008,966

METHOD AND APPARATUS FOR BEAM SAMPLING BY ACOUSTIC PULSES

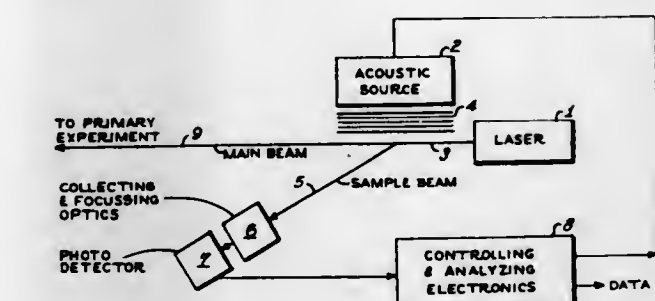
Konrad Frank, Aberdeen, Md., and Peter F. Klon, Cudahy, Wis., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 9, 1975, Ser. No. 620,978

Int. Cl.² G01J 1/42; G01N 21/34

U.S. Cl. 356-218

9 Claims



1. An apparatus for simultaneously sampling and scanning a portion of a light beam with acoustic energy, comprising,

4,008,964

METHOD OF MEASURING THE PITCH OF TWISTED THREADS

Johann Plöckl, Unterhaching, Germany, assignor to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed May 5, 1975, Ser. No. 574,254

Claims priority, application Germany, May 6, 1974, 2421851

Int. Cl.² G01B 9/02

U.S. Cl. 356-109

1 Claim

1. A method of measuring the pitch of a twisted thread having a plurality of turns, comprising: illuminating a plurality of said turns simultaneously from a direction transverse to the length of the thread with monochromatic light, receiving the

means for generating an acoustic pulse consisting of one or more cycles of a specified frequency and having a length shorter than the width of said light beam,
means for propagating said acoustic pulse across said light beam, the pressure variations which comprise said pulse forming a diffraction grating for deflecting said light beam over its volume of interaction with said pulse, whereby as said pulse propagates across the width of said portion of said beam successive parts thereof are deflected.

4,008,967

DEVICE FOR TESTING MASKS FOR SEMICONDUCTOR COMPONENTS

Horst Klemle, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

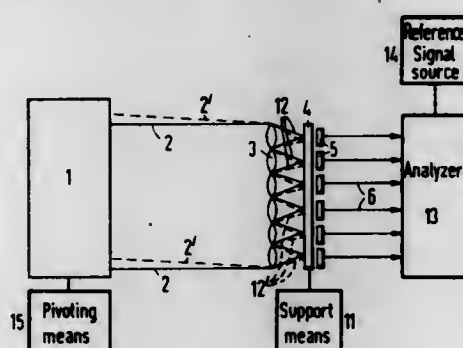
Filed Aug. 19, 1975, Ser. No. 605,913

Claims priority, application Germany, Aug. 29, 1974, 2441336

Int. Cl.² G01N 21/32; G02B 27/17

U.S. Cl. 356—239

8 Claims



1. A device for automatically testing a mask and particularly masks used in producing semiconductor components comprising means supporting a mask to be tested, a source projecting a beam of coherent light at said mask, multiple optic means disposed in a path of the beam of coherent light for converting the beam into a plurality of individual beams and focusing the individual beams onto the mask, means for detecting light from each of the individual beams passing through the mask, and means for pivoting the light beam from the source about at least one axis lying in a plane of the multiple optic means so that all of the individual beams are moved together to scan the mask in at least one direction.

4,008,968

WASHING DEVICE

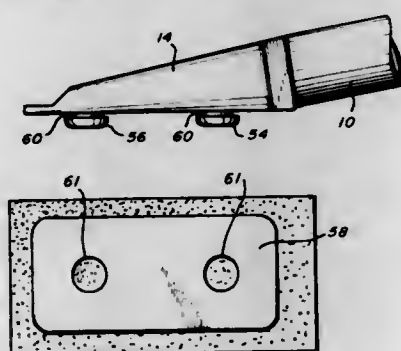
Leonard E. Hobbs, 710 N. Ocean Blvd., Apt. 410, Pompano Beach, Fla. 33062

Continuation-in-part of Ser. No. 572,743, April 29, 1975, abandoned. This application Oct. 10, 1975, Ser. No. 621,282

Int. Cl.² B43M 11/06

U.S. Cl. 401—207

6 Claims



1. A washing device comprising, a hollow handle having means at one end for receiving a liquid cleaner and a relatively flat wall at the other end defining a flat outer surface having

opposite ends, a spout having a passage therethrough and extending from the flat outer surface of the wall, said spout being disposed nearer one end of the flat outer surface, a spout-like member spaced from the spout disposed nearer the other end of the flat outer surface and extending from the flat outer surface, a relatively thin flat plate having a sponge secured thereto, said plate having a pair of apertures spaced the same distance as the spout and spout-like member, one aperture for receiving the spout with the spout extending through the one aperture below the plate and contacting the sponge, the other aperture for receiving the spout-like member with the member extending through the other aperture below the plate and contacting the sponge, both said spout and spout-like member providing securing means in combination with the apertured plate for holding the plate and attached sponge to the handle.

4,008,969

WRITING INSTRUMENT TOP

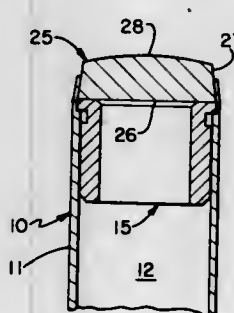
Olof Verner Anderson, North Kingstown, R.I., assignor to Anson Incorporated, Providence, R.I.

Continuation-in-part of Ser. No. 480,005, June 17, 1974. This application Oct. 22, 1975, Ser. No. 624,662

Int. Cl.² B43K 9/00

U.S. Cl. 401—292

2 Claims



1. A writing instrument top consisting of a tube having a wall and an axial passageway, a counterbore in said wall providing a shelf in one end of said tube, a ferrule having a primary surface and a smaller secondary surface, a recess separating said primary surface from said smaller secondary surface, a ledge formed at the juncture of said recess with said primary surface and in cooperation with said smaller secondary surface, said ferrule positioned in said axial passageway with said ledge engaging said shelf and said smaller secondary surface engaging said wall to re-enforce said wall, an ornament having a bottom and a side provided with a taper, said ornament positioned in said counterbore with said bottom engaging said ferrule, and said wall deformed against said side provided with a taper to secure said ornament in said counterbore and against said ferrule.

4,008,970

FORCE APPLYING

John Charles Purcupille, Monroeville; Martin J. Dempsey, Bethel Park, and Selwyn Raymond Rackoff, Pittsburgh, all of Pa., assignors to Asko, Inc., West Homestead, Pa.

Filed Nov. 13, 1975, Ser. No. 631,436

The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.² F16D 3/80

U.S. Cl. 403—31

7 Claims

1. Apparatus for applying pressure to an annular object generally parallel to the axis of said object, including an annular member having a cavity therein, a deformable membrane, of a material capable of withstanding high pressure, whose plane is generally perpendicular to the axis of said annular member closing said cavity and sealed by a weld to said member forming a pressure-tight enclosure for said cavity, means connected to said cavity for supplying a medium for producing

pressure in said cavity to deform said membrane in a direction generally parallel to the axis of said member, and means having a surface engaging said membrane and supporting said



membrane as it is deformed and actuatable, on the deformation of said membrane, to transmit force generally in the direction of the axis of said member.

4,008,971

JOINT FOR RATTAN POLES

Wong Kam Wah, and Ting Yuet Kam, both of 10 Man Wan Road, 17th Floor, Block C, Waterloo Hill, Kowloon, Hong Kong

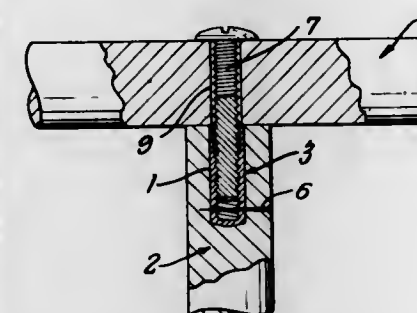
Filed Dec. 8, 1975, Ser. No. 638,822

Claims priority, application United Kingdom, Jan. 8, 1975, 779/75

Int. Cl.² F16B 7/00

U.S. Cl. 403—237

2 Claims



1. A mechanical joint comprising:
a. a first cylindrical member having a generally diametrically oriented opening.
b. a second cylindrical member having one end formed to fit the cylindrical contour of the first member and having a generally axially oriented opening aligned with said opening in said first member,
c. an internally threaded insert in said opening of said second member said insert having a closed inner end abutting the inner end of said opening in said second member and extending the full length thereof,
d. means for anchoring said insert in said second member opening,
e. a screw extending through said first member opening and threadably received in said insert,
f. said means for anchoring said insert comprises ribs on the outside surface thereof to prevent rotation of said insert in its second member opening, and including at least one pin oriented normal to the axis of said second member and extending diametrically thru said insert adjacent the inner end thereof.

4,008,972

TUBING CONNECTOR

Carl E. Lindberg, New Orleans, La., assignor to Continental Oil Company, Ponca City, Okla.

Filed Sept. 30, 1974, Ser. No. 510,278

Disclosure was also published under second Trial Voluntary Patent Program on Mar. 30, 1976

Int. Cl.² F16D 1/00

U.S. Cl. 403—341

7 Claims



1. A connector for joining a tool to a substantially rigid metallic tubing, said connector comprising:

- a substantially rigid tubular member, having an outer diameter smaller than the inside diameter of said metallic tubing, said tubular member being positioned inside said metallic tubing with said outer diameter of said tubular member being in slidable contact with the inside diameter of said metallic tubing;
- a tool joining means axially attached to one end of said tubular member said one end extending beyond an end of said metallic tubing;
- an elongated substantially tubular shaped clamp means having means along its length for urging the inner diameter of said clamp means into gripping contact with the outer diameter of said metallic tubing and urging said inner diameter of said metallic tubing into contact with said outer diameter of said tubular member; and
- means for connecting said clamp means to said one end of said tubular member to prevent axial movement of said clamp means with respect to said metallic tubing and said tubular member

so that when said inner diameter of said clamp means is urged into gripping contact with said outer diameter of said metallic tubing and said inner diameter of said metallic tubing is urged into contact with said outer diameter of said tubular member thus joining said connector to said tubing.

4,008,973

REFLECTIVE PAVEMENT MARKER

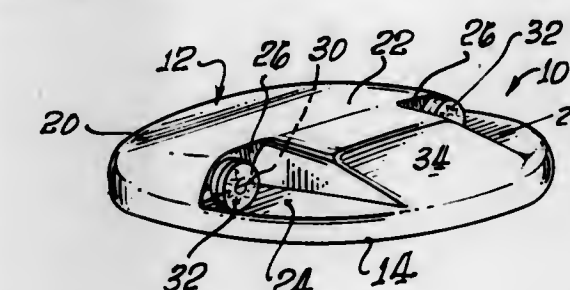
Joseph W. Montigny, 2441 Merced, South El Monte, Calif. 91733

Filed Sept. 10, 1975, Ser. No. 611,983

Int. Cl.² E01F 9/04

U.S. Cl. 404—16

8 Claims



1. A reflective pavement marker comprising:
a generally flat and relatively thin marker button to be secured to a vehicle roadway with a given edgewise axis of the button aligned lengthwise of the roadway, said button having a pair of recesses entering its upper surface at opposite sides of said axis, each recess having a substantially flat end wall substantially midway of the length of the marker and facing in one endwise direction of said axis, and having an inclined side wall extending laterally of and away from said axis, said inclined recess side walls being oppositely spaced laterally.

ally of said axis to define a wide load-bearing ramp extending from said recess end walls to the perimeter of said button.

said walls of each recess intersecting to define a single interior corner of the recess and extending outwardly from said corner to the perimeter of said button to define an open recess extending along said button perimeter between the outer ends of said walls, the recess opening in both said one endwise direction of said axis and laterally of said axis, said recess thus defined maintaining itself clean and debris-free under the action of vehicle air-streams, wind and rain,

light reflectors mounted in said recess end walls for reflecting light from head lights of approaching vehicles, and said ramp rising above said reflectors, whereby vehicle wheeled tires rolling over said pavement marker ride along said ramp to the crest substantially midway of the button without contacting said reflectors.

4,008,974

SEALING MEMBER

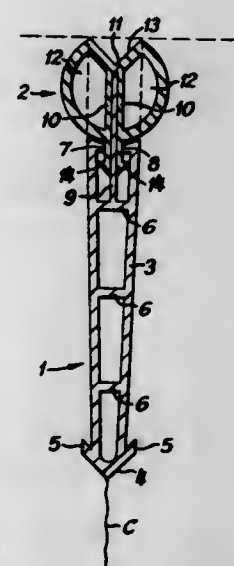
John Aubrey Miers, Woodford Green, England, assignor to L. J. A. Miers (Exports) Limited, Woodford Green, England
Continuation of Ser. No. 527,867, Nov. 27, 1974, Pat. No. 3,967,911. This application Apr. 21, 1976, Ser. No. 679,132
Claims priority, application United Kingdom, Nov. 28, 1973, 55173/73

The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.

Int. Cl.² E01C 11/02

U.S. Cl. 404-48

6 Claims



1. An insertion member for use in the construction of concrete slabs, comprising a first elongated element of rigid synthetic plastic material having an upper and a lower portion each extending longitudinally of said first element, said first element diverging in direction from said lower to said upper portion, said upper portion being formed with shoulder region and with an upstanding reinforcing plate extending upwardly beyond said shoulder region, said plate being separated from said shoulder region by a pair of slits extending longitudinally of said first element; and a second elongated element of resiliently yieldable material including a bifurcated web extending longitudinally of said second element and having a top end and a pair of limbs extending downwardly from said top end and each having a lower end formed with a laterally extending rib, and a pair of hollow sections laterally flanking said web adjacent said top end thereof, said first and second elements being so connected that said second element straddles said reinforcing plate of said first element and said ribs of said limbs are received in said slits, respectively, so that said plate extends toward the uppermost part of the insertion member and so that, when said hollow sections are evacuated and collapsed against said reinforcing plate for insertion of the

insertion member between the slabs, said reinforcing plate reinforces said hollow sections and said shoulder region protects the same from below during said insertion.

4,008,975

APPARATUS FOR CONVEYING ASPHALT CONCRETE MIXTURES

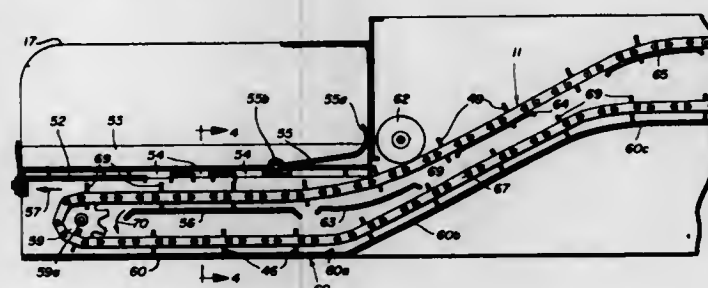
Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving Associates Incorporated, Lawrence, Kans.

Filed Oct. 28, 1975, Ser. No. 626,360

Int. Cl.² E01C 19/12

U.S. Cl. 404-101

2 Claims



1. In a road surfacing machine comprising a self-propelled vehicle, a conveyor apparatus on said vehicle for moving material from a loading station adjacent a front end of said vehicle rearwardly to a dispensing station comprising, a hopper at said loading station for receiving said material from a source of supply such as a truck, said hopper having opening means at the bottom thereof at a first relatively low elevation through which said material passes, a fixed platform mounted beneath said opening means and terminating at locations adjacent forward and rear margins of said opening means for receiving said material, a continuous conveyor having an upper return run passing over said platform and a lower active run passing beneath said platform, said continuous conveyor including a pair of spaced parallel endless flexible elements and a plurality of spaced apart transverse pusher bars extending between said flexible elements at spaced intervals and providing pusher members for sequentially positively advancing substantially all of the material received from the hopper in a first direction to said lower active run and then in an opposite direction to said dispensing station, an open top trough disposed beneath said continuous conveyor, said trough including a bottom wall beneath said lower active run for supporting material being moved therealong by said lower active run, said trough bottom wall including a first generally horizontal portion beneath said platform, an intermediate diagonally upwardly inclined portion extending rearwardly from said first portion to an elevation above said first mentioned elevation, and a second generally horizontal portion extending rearwardly from said intermediate portion substantially to said dispensing station, and a plurality of discrete guide elements spaced above said intermediate and second horizontal bottom portions for engaging and guiding upper runs of said endless flexible elements above material being moved by said lower active run to the dispensing station.

4,008,976

CUTTING TOOL AND METHOD FOR MAKING SAME

Robert A. Holzl, La Canada, Calif., assignor to Chemetal Corporation, Pacoima, Calif.

Continuation-in-part of Ser. No. 470,538, May 16, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 570,551

Int. Cl.² B23B 27/18, 51/02

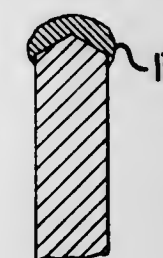
U.S. Cl. 408-144

21 Claims

1. A cutting tool comprising, a tool body and a thermochemically deposited hard metal alloy layer extending from at least one surface of said tool body, said layer having a thickness of at least about 25 microns and having at least one cutting edge machined within the boundaries of said layer, said thermochemically deposited hard metal alloy being com-

prising primarily of tungsten and carbon and having a Vickers hardness of at least about 1,500 kg. per sq. mm. and a modulus of rupture in bending of greater than about 200 kg. per sq. mm. in the deposited or deposited and heat-treated condition, and wherein the thickness and strength of said layer are sufficient that the modulus of rupture in bending of the composite of said body and said layer is at least about 200 kg. per sq. mm.

7. A method for making a cutting tool comprising, thermochemically depositing on at least one surface of a body a hard



metal alloy to form a layer having a thickness of at least 25 microns, said hard metal alloy being comprised primarily of tungsten and carbon and having a Vickers hardness of at least about 1,500 kg. per sq. mm., and a modulus of rupture in bending of greater than about 200 kg. per sq. mm. in the deposited or deposited and heat-treated condition, and machining at least one cutting edge in said layer, said layer having a thickness and strength after machining sufficient that the modulus of rupture in bending of the composite of said body and said layer is at least about 200 kg. per sq. mm.

4,008,977

COMPRESSOR BLEED SYSTEM

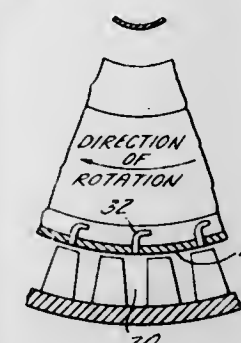
Wayne Myron Brown, Southwick, Mass., and Joseph Carmen Manente, Jr., Takottville, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 19, 1975, Ser. No. 614,807

Int. Cl.² F01D 25/12

U.S. Cl. 415-1

6 Claims



1. A method for flowing cooling air from the compressor section of a gas turbine engine to the turbine section wherein said engine has a compressor drum and a drum cavity which are located radially inward of the flow path for the working medium gases and a rotor shaft which connects the compressor drum to the turbine, comprising the steps of:

bleeding air from the flow path for the working medium gases in the compressor section;
discharging the bleed air into the drum cavity in a tangential direction relative to the drum which is opposite to the direction of drum rotation; and
flowing the discharged air radially inward through the drum cavity and axially rearward to the turbine section of the engine.

6. The invention according to claim 5 wherein the air is discharged into the compressor drum at an absolute tangential velocity which approaches zero to minimize the vortex pressure loss on the air flowing through the drum cavity.

4,008,978
CERAMIC TURBINE STRUCTURES

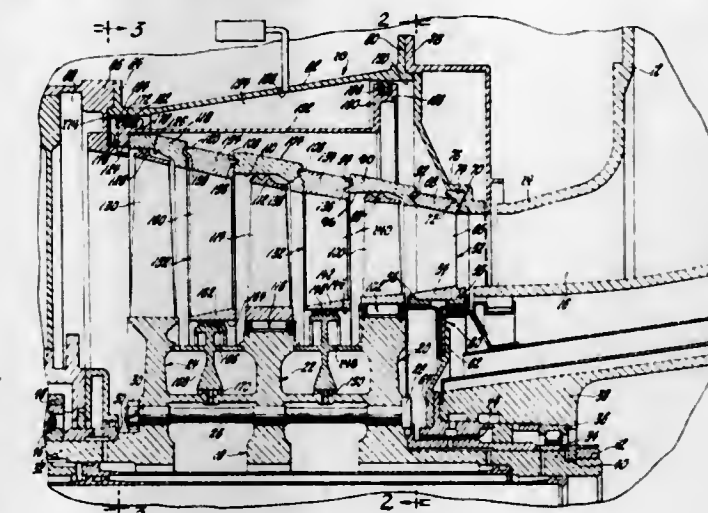
Charles H. Smale, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 19, 1976, Ser. No. 668,428

Int. Cl.² F01D 25/26

U.S. Cl. 415-134

4 Claims



1. A gas turbine comprising a turbine wheel having a turbine blade row therein, a ceramic ring member spaced radially outwardly of said blade row to define a flow passage there-through, a ceramic stator vane stage interposed axially of said turbine blade row, said stator vane stage including a radially outwardly located ring portion, coacting tongue and groove means on said ring member and said ring portion to join said ring member and ring portion at an axial joint therebetween to define a continuous outer wall having opposite ends thereon, support means including an annular ceramic stop ring in engagement with one of said opposite ends, an axially movable piston in engagement with the other of said opposite ends, and means for applying a primary force on said piston to maintain the joint between said ring member and ring portion as the turbine temperature increases thereby to hold said stator vane stage in a desired position with respect to said support means notwithstanding differences in thermal expansion between said stator vane stage and said support means.

4,008,979

CONTROL FOR HELICOPTER HAVING DUAL RIGID ROTORS

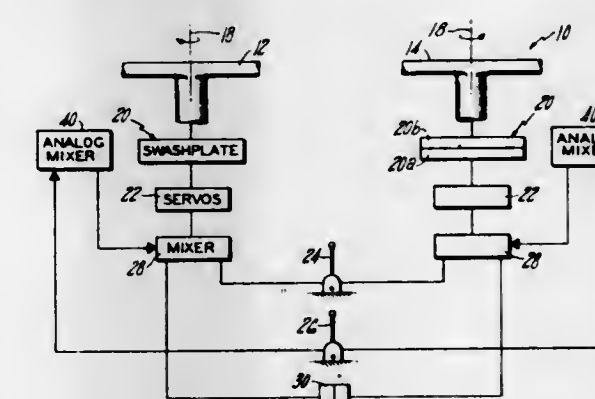
Dean Earl Cooper, Trumbull, and Robert Fuller Klingloff, Huntington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 13, 1975, Ser. No. 631,600

Int. Cl.² B64C 27/80

U.S. Cl. 416-40

64 Claims



33. A control for a helicopter rotor system utilizing two, rigid, counterrotating rotors including means to selectively vary the phase angle of the rotors as a function of helicopter forward speed to both optimally position the rotor lift vectors so as to produce maximum rotor lift-to-drag ratio performance.

ance, and generate an aerodynamic moment in each rotor to cancel or minimize the gyroscopic precession moment created during maneuver.

4,008,980

COMPOSITE HELICOPTER SPAR AND MEANS TO ALLEVIATE STRESS CONCENTRATION

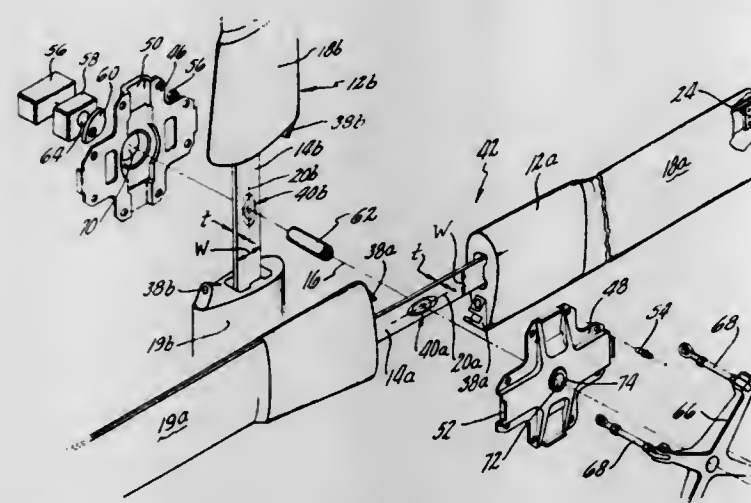
William Lawrence Noehren, Huntington, and Edward Stanley Hibyan, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 26, 1975, Ser. No. 590,773

Int. Cl.² B64C 11/04, 27/46

U.S. Cl. 416-134 A

18 Claims



1. A two-bladed rotor adapted to be mounted for rotation about an axis of rotation and including:

A. an aerodynamic blade positioned on each side of and substantially equidistant from the axis of rotation,

B. a central spar of rectangular cross section extending through the axis of rotation and connected to each blade to support the blades for rotation about the axis of rotation,

1. being made of high modulus fibers extending substantially parallel to the blade span and joined by a binder, and

2. having an elliptically shaped hole severing said fibers and passing therethrough concentrically about the axis of rotation and with the major axis of the ellipse parallel to the blade span and shaped and sized to produce minimum stress concentration factor across the spar at the hole as the spar carries balanced centrifugal blade loads during rotor rotation,

C. blade pitch change means including a shaft member of circular cross section and extending along and concentric about said axis of rotation and extending through said spar hole,

D. a cylindrical centering pin enveloping said shaft member and located within said spar hole,

E. an elliptically shaped plug member having a circular inner diameter enveloping and matingly engaging said centering pin and having an elliptical outer surface enveloped within and in spaced relation to the elliptical spar hole so as to define concentric ellipses therewith and sized to define a cavity therebetween which has selected dimension along the common ellipse major axis and the common ellipse minor axis,

F. an elastomer of selected durometer and shape factor filling said cavity to support said elliptical plug member from said elliptical spar hole in floating relationship so that the stress concentration factor created as the spar carries balanced centrifugal blade loads across the spar hole-elastomer-floating plug-centering pin combination is substantially equal to said stress concentration factor so established in the spar by carrying balanced centrifugal blade loads through said spar hole along, and further, so that the elastomer is capable of withstanding anticipated unequal centrifugal blade loads thereacross, and

G. means independent of said plug member and said elastomer to support and drive said spar and blades in rotation about said axis of rotation.

4,008,981 DEVICE FOR LOCATING THE POSITION OF THE CONTROL RACK OF A PUMP AND FOR LOCKING THE LATTER IN DISASSEMBLING POSITION

Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

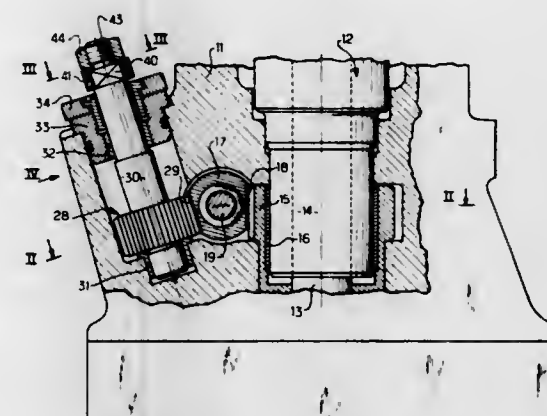
Filed Mar. 26, 1975, Ser. No. 562,003

Claims priority, application France, May 17, 1974, 74.17318

Int. Cl.² F04B 21/00, 7/04, 39/10

U.S. Cl. 417-63

6 Claims



1. Variable displacement pump, for use as a fuel injection pump for an internal combustion engine or the like of the type provided with a constant delivery-stroke piston, the angular position of which inside a casing for the pump determines a particular amount of fluid delivered in each cycle, comprising a toothed rack having a toothed portion, a pinion cooperating with said toothed portion through which said piston is adapted to slide axially, said piston being movable in translation jointly with pump actuating means and to rotate jointly with said pinion for varying said angular position and therefore said particular amount; said pump also including means for displaying said particular amount, comprising an auxiliary shaft pinion adapted to rotate about its own longitudinal center-line disposed in meshing relationship with said rack and supporting an indicating needle supported by said last-named pinion, a graduated sector over which said needle is movable; said pump being also of the type wherein at a given angular position of said piston the latter may be removed from the pump casing and whereby one end of said auxiliary shaft pinion is accessible, said end comprising driving square means for enabling said rack to be displaced manually through the medium of said auxiliary shaft pinion.

4,008,982 ROTARY FLUID ENERGY CONVERTER

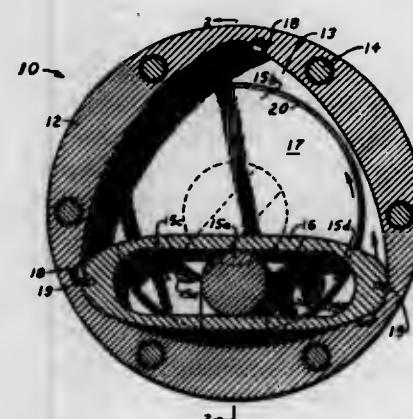
Earl W. Traut, 8040 Palm Lake Drive, Orlando, Fla. 32811

Filed Apr. 28, 1975, Ser. No. 572,384

Int. Cl.² F04B 23/10; F01C 1/02, 21/16; F16D 31/00

U.S. Cl. 417-204

8 Claims



1. A rotary fluid energy converter comprising: at least one chamber,

said chamber being generally triangular and including three rounded corners and three interposed arcuate sides, at least one rotor, said rotor being elongate and including a longitudinally oriented slot, said rotor being rotatable end over end within said chamber and dividing it into two compartments, a rotatable shaft with crank, said crank extending into said rotor slot and dividing it into two cells, at least one disk, said disk being affixed to said crank axially adjacent said rotor, a fluid inlet port and a fluid outlet port, each said port comprising an opening in the face of said disk and communicating with an opening in said rotary fluid energy converter, each said port being shaped and oriented so that it is blocked by said rotor from both said chamber compartments and in communication with one of said slot cells when both ends of said rotor are in corners of said chamber, so that each said port is blocked from both said slot cells and in communication with one of said chamber compartments when one of said rotor ends is located adjacent the midpoint of one of said chamber walls, and so that each said port communicates with one said chamber compartment and one said rotor slot cell at all other positions of said rotor, so as to occasion energy conversion between torque of said crank acting on said rotor and fluid pressure in said chamber compartments and said slot cells.

4,008,983 TIP TURBINE INFLATING DEVICE WITH MOTOR-ACTUATED CLOSURE AT INLET

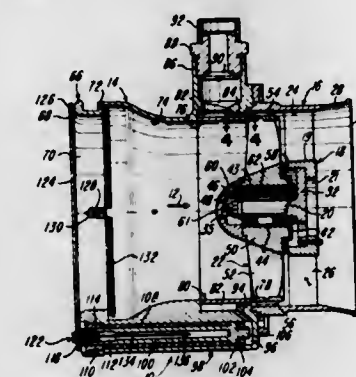
Joseph Flatt, Dayton; Robert C. LoPiccolo, Bellbrook, and Eugene Linsker, Kettering, all of Ohio, assignors to Tech Development Inc., Dayton, Ohio

Filed Nov. 27, 1974, Ser. No. 527,745

Int. Cl.² F04B 17/00, 35/00; B63C 7/16

U.S. Cl. 417-348

11 Claims



1. Apparatus for producing a flow of air under pressure having particular advantage for use in inflating inflatable articles, particularly those applied to safety purposes, comprising a housing having an inlet thereto and an outlet therefrom, a portion of said housing defining a flow passage interconnecting said inlet and said outlet, a rotor in said flow passage the operation of which will induce a through flow of air under pressure, said rotor including peripherally projected blade segments positioned adjacent and in following relation to a shoulder defined in said flow passage in facing relation to said outlet, the portion of said housing defining said flow passage having formed therein immediately preceding said shoulder a chamber receiving a fluid under pressure from which chamber pressure fluid is directed to drive said blades and thereby to drive said rotor, means in connection with said housing for normally sealing said inlet, the wall structure of said housing embodying means defining axially extended pockets opening from the inlet thereof, in which pockets are

contained piston means in connection with said sealing means, said piston means having in connection therewith means for biasing the same in a direction to cause said sealing means to maintain a seal of said inlet and passages defined in said housing communicating said chamber with said piston means to influence the axial displacement of said sealing means substantially simultaneously with the drive of said rotor.

4,008,984 PUMP APPARATUS

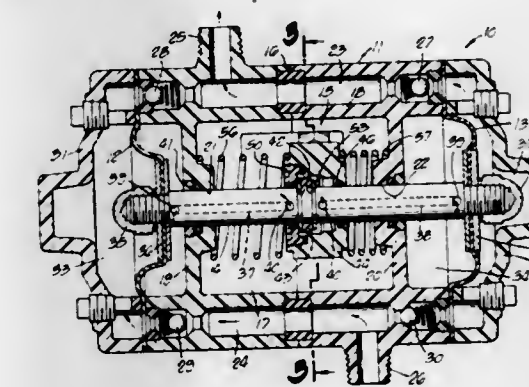
William R. Scholle, 3000 Via Mondo, Compton, Calif. 90224

Filed Oct. 23, 1975, Ser. No. 625,252

Int. Cl.² F04B 43/06, 45/00, 17/00, 35/00

U.S. Cl. 417-393

6 Claims



1. A double-acting pump apparatus having a pair of pressurizing diaphragms respectively connected to the ends of a shaft, walls enclosing the shaft-connected side of each diaphragm to form a chamber thereabout, valved pump chambers communicating with the respective diaphragm sides opposite the shaft-connected sides, said shaft including a pair of passageways extending therealong, each of which has a first opening communicating with one of said chambers and a second opening spaced from said first opening and lying outside said chambers, comprising:

an annular valving member slidably received on said shaft outwardly of said chambers and having an internal chamber for connection with a source of supply of pressurized gas;

first and second compression coil springs received on said shaft at opposite sides of said valving member, said springs engaging both the valving member and one of the walls defining a diaphragm chamber and each spring continuously urging said valving member toward the other spring, whereby said valving member will experience a reciprocating movement along said shaft to interconnect one of said shaft second openings with the pressurized gas while at the same time leaving the other second opening exposed, and then changing interconnection with said shaft second openings; and

a friction ring received on said shaft between the shaft second openings which engages interfering parts of the valving member defining the valving chamber and serves as a limit stop for the reciprocating movement on said shaft.

4,008,985 PUMPING DEVICE FOR FLUIDS

Hugo Schemmann, Schaesberg, Netherlands, and Leo Bertram, Stolberg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1975, Ser. No. 543,767

Claims priority, application Germany, Feb. 14, 1974, 2407109

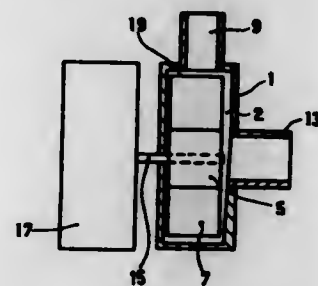
Int. Cl.² F04B 17/00

U.S. Cl. 417-423 R

4 Claims

1. A pumping device for fluids, in particular for low viscosity liquids, comprising an annular pump chamber, a pump

impeller having flexible vanes mounted for rotation in said chamber, and a drive motor connected to said pump impeller, wherein the motor is a pure single-phase synchronous motor,



and the impeller vanes have sufficient elasticity to bend backward during acceleration such that the motor can accelerate to full speed within a quarter revolution after starting upon application of electrical power.

4,008,986

CORNER SEAL FOR ROTARY MECHANISMS

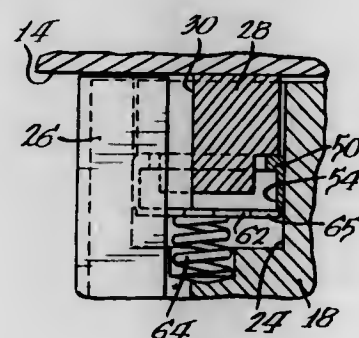
Myron R. Gibson, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1975, Ser. No. 643,431

Int. Cl.² F01C 19/08; F04C 27/00; F01C 1/02

U.S. Cl. 418-51

9 Claims



1. In a rotary mechanism having a housing defining a chamber with a rotor movable therein, the combination of: a piston seal receiving bore in said rotor; a piston seal received in said bore to be carried by said rotor and sealingly engaging one wall of said chamber, said piston seal being stepped along its length to provide a shoulder within said bore; an apex seal receiving groove in said rotor and intersecting said bore; an apex seal received in said groove to be carried by said rotor and sealingly engaging another wall of said chamber; and a ring-like expander seal within said bore sealingly engaging said shoulder on said piston seal and said bore when gas under pressure is directed to said bore from said groove.

4,008,987

COMBINED TIMING GEAR AND PUMP FOR ROTARY MECHANISMS

James A. Ritchie, Solihull, England, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 7, 1976, Ser. No. 647,296

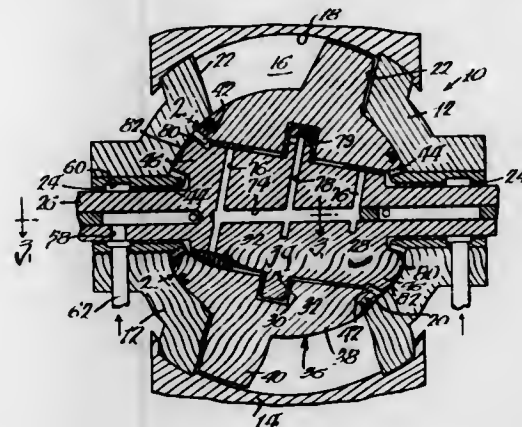
Int. Cl.² F01C 1/02, 21/04; F04C 29/02

U.S. Cl. 418-53

6 Claims

1. In a rotary mechanism, the combination of: a housing defining an operating chamber; a shaft journaled in said housing and having an eccentric within said chamber; a rotor within said chamber and journaled on said eccentric; a timing gear carried by said housing and within said chamber and having a predetermined number of teeth;

an internal ring gear carried by said rotor and meshed with said timing gear, said ring gear having a number of teeth greater than said predetermined number whereby a crescent-shaped gap between said gears will exist; a crescent-shaped pad carried by said eccentric within said gap; an inlet port in said eccentric adjacent one corner of said pad for supplying hydraulic fluid to said gap; and



an outlet port in said eccentric adjacent the other corner of said pad for conveying pressurized hydraulic fluid to a point of use within said mechanism; said shaft including a hydrostatic thrust bearing and a conduit in said shaft extending from said outlet port to said thrust bearing.

4,008,988

ROTARY PISTON EXPANSIBLE CHAMBER DEVICE

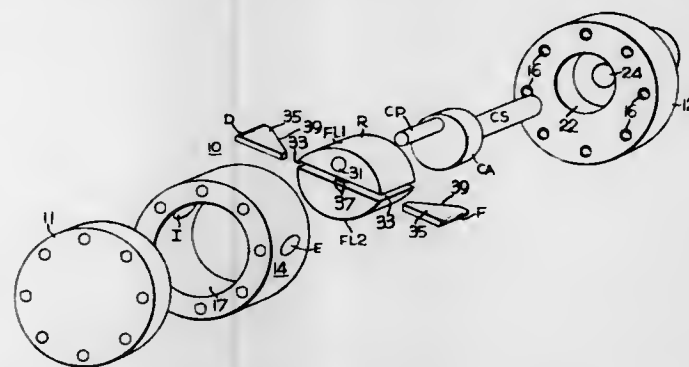
A. Frank Putz, 401 N. 89th St., Wauwatosa, Wis. 53226

Filed Dec. 16, 1974, Ser. No. 533,332

Int. Cl.² F04C 1/02

U.S. Cl. 418-54

44 Claims



1. A rotary piston expansible chamber device comprising, in combination, a housing (10, FIGS. 1-4) having a cylindrical bore (17) whose cross section is a closed curve (U) with the center (O) at the intersection of first and second rectangular coordinate axes (X, Y), a cylindrical rotary piston (R) rotatable within said bore (17) with its axis parallel to the bore axis and having first and second arcuately spaced apices (D, F) which divide said bore into first and second chambers (C1, C2) on opposite sides of said rotary piston, a shaft (CS) rotatable within said bore about an axis (C) parallel to the bore axis, means including a single force transmitting member (CA) carried by said shaft (CS) for operatively connecting said shaft to said rotary piston (R) so that they rotate together in a one-to-one ratio while concurrently permitting rocking movement of said rotary piston (R) relative to said shaft (CS) and to said force transmitting member (CA) about a surface radially outward from the shaft axis and so that said first and second apices are displaced through different angles than said shaft, and

means (17, D, F) for displacing said rotary piston (R) as it revolves together with said shaft (CS) so that said first and second chambers (C1, C2) vary inversely in volume and said first and second apices (D, F) remain in substantially continuous contact with said bore (17) in all positions of said rotary piston R and also so that a straight line (DGF) connecting said first and second apices (D, F) remains perpendicular to a rotatable reference diameter (OGA) through the center (O) of said closed curve (U) in all positions of said rotary piston (R).

4,008,989

BOLT SEAL FOR ROTARY PISTON MACHINE

John Michael Clarke, Banbury, and David Stuart Gilchrist, Harwich, both of England, assignors to Caterpillar Tractor Co., Peoria, Ill.

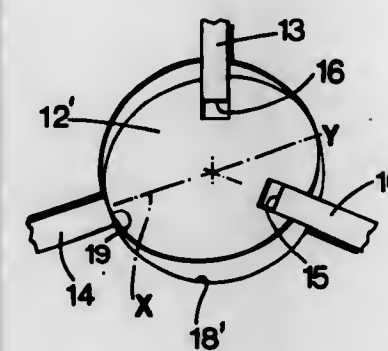
Filed Oct. 10, 1975, Ser. No. 621,428

Claims priority, application United Kingdom, Oct. 10, 1974, 43856/74

Int. Cl.² F04C 27/00

U.S. Cl. 418-120

5 Claims



1. A rotary piston machine comprising a housing, a rotor mounted thereon, and a rotor seal grid comprising a plurality of peripheral and apex seals extending around surfaces of said rotor and together defining closed working chambers in said housing, a plurality of generally cylindrical seal connectors (herein called a bolt) by which adjacent ends of adjacent seals are connected together, each said bolt, located in a respective socket in said rotor and each bolt having clearance laterally of its longitudinal axis from the peripheral wall of the respective socket to permit lateral movement of said bolt in said socket except in one direction laterally of the longitudinal axis of said bolt, in which direction, movement of said bolt is restrained by said bolt being held between fixed laterally opposite positions engaging its peripheral surface.

4,008,990

MOLD PIVOTING MECHANISM

Armin Alexander Hiemer, Unterreitnau, and Siegfried Hermann Jäger, Lindau, both of Germany, assignors to The Upjohn Company, Kalamazoo, Mich.

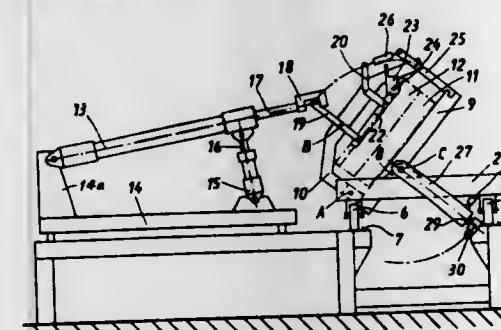
Filed Mar. 26, 1975, Ser. No. 562,165

Claims priority, application Germany, Apr. 1, 1974, 2415703

Int. Cl.² B29B 1/16

U.S. Cl. 425-454

8 Claims



1. A continuously moving molding apparatus having provi-

sion for pivoting the molding members thereof to inclined position for venting purposes, comprising:

- endless track means, carriage means trained for travel along said track means, and means for advancing said carriage means continuously along said track means;
- a mold assembly on said carriage means, said assembly comprising pivotally joined upper and lower mold holding portions and complementary mold head and mold base, respectively, supported therein for movement between open and closed relation, and means mounting said mold assembly for pivotal movement as a whole relative to its carriage;
- lever means on said upper mold holding portion for pivoting it relative to said lower portion and for simultaneously latching said portions in closed relation;
- a movable support disposed laterally of and movable parallel to a predetermined portion of said endless track means for reciprocation between the limits of said predetermined portion, said support having means for causing it to travel together with said carriage means as it advances continuously along said predetermined portion of said track and, upon reaching the forward limit of said track portion, for causing it to return to the rearward limit thereof;
- a mold assembly operating mechanism, fixed to said movable support, for both closing and automatically locking said mold holding assembly and also for tilting it to inclined position relative to its carriage, said operating mechanism comprising:
- a pivoting cylinder and piston rod movable between retracted and extended positions in said cylinder, and having means at its free end for engaging said lever of said upper mold holding portion;
- means causing said free end of said piston rod to engage said lever means when said mold holding portions are in open position and for pivoting them to and latching them in closed position on extension of said piston rod, and subsequently tilting said mold assembly as a whole relative to its carriage upon retraction of said piston rod, whereby to orient the mold assembly in inclined position for venting;
- means for engaging and disengaging the free end of said piston rod from said upper mold holding portion lever; and
- means for retaining said mold assembly in inclined position as said carriage advances continuously along said predetermined portion of said endless track after disengagement of said piston rod from said lever, whereby to allow venting of the mold to occur.

4,008,991

HEAT POWER PLANT

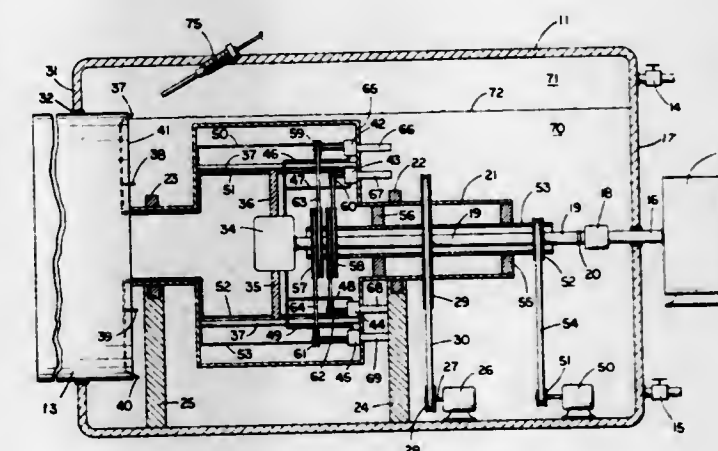
William J. McAleer, R.R. 2, Morocco, Ind. 47963

Filed Oct. 20, 1975, Ser. No. 623,664

Int. Cl.² F23C 5/02

U.S. Cl. 431-1

8 Claims



1. A heat producing apparatus comprising: a sealed container with a heat outlet; a source of fuel located externally of said container;

cooling means within said container dividing said container into a cooled portion and an uncooled portion with said uncooled portion providing a combustion chamber;
a frame rotatably mounted in said container and positioned in said cooled portion;
an inertia wheel rotatably mounted and connected to said frame being rotatable therewith, said inertia wheel being at least partially positioned in the said cooled portion;
fuel injectors mounted to said inertia wheel and positioned on said inertia wheel to move to and from said chamber as said inertia wheel rotates, said fuel injectors being connected to said source of fuel and including pump means; and,
ignition means mounted to said container and projecting into said chamber operable to ignite fuel injected into said chamber producing heat.

4,008,992

VALVE SYSTEM, PARTICULARLY FOR CIGARETTE LIGHTER

Lars Bertil Johansson, Jonkoping, Sweden, assignor to Societe anonyme dite Etablissement GENOUD & Cie., Venissieux, France

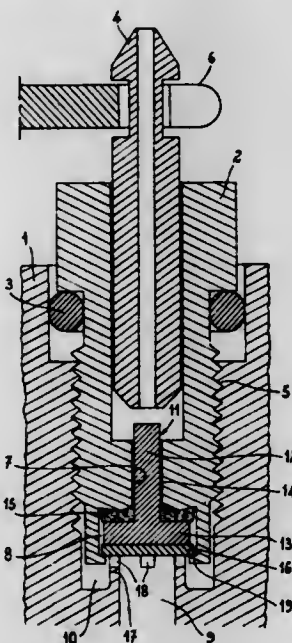
Filed Nov. 18, 1974, Ser. No. 524,889

Claims priority, application France, Nov. 20, 1973, 73.41913

Int. Cl.² F23Q 2/16

U.S. Cl. 431—344

10 Claims



1. A valve system comprising:
a housing connectable with a fluid source;
means forming a pressure-control valve in said housing;
means forming a flow-blocking valve in said housing, both of said means having a valve member in common, said member being composed of elastomeric material, said member having a first portion forming part of said pressure-control valve and a second portion forming part of said flow-blocking valve, said second portion comprising a cylindrical stem and said first portion is a disk-shaped base unitary with said stem, said housing being formed with an outlet and a narrow passage receiving said stem with a narrow clearance;
means for axially compressing said stem to expand the same against the wall of said passage to block flow of fluid therethrough, said housing being formed with an enlarged compartment receiving said base and communicating with said passage, said housing being formed between said compartment and said passage with an annular surface; and
an annular washer of porous and compressible material forming part of said pressure control valve and compressed between said base and said annular surface around said stem.

4,008,993
METHOD OF PREHEATING THE WALL OF A FURNACE CHANNEL AND ARTICLE FOR GENERATING CIRCULATION OF HEATED AIR FOR PREHEATING THE WALL OF A FURNACE CHANNEL

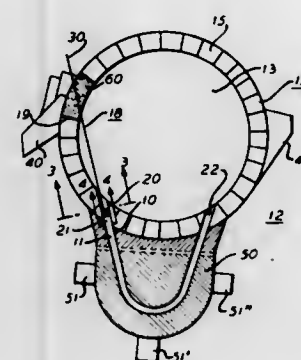
Norman W. Severin, Basking Ridge, N.J., assignor to Hotwork, Inc., Lexington, Ky.

Filed Apr. 7, 1975, Ser. No. 565,555

Int. Cl.² F27D 7/00

U.S. Cl. 432—4

11 Claims



1. A method of preheating the wall of a channel which extends in a furnace through a wall of the hearth of the furnace at one location therein, through an inductor mounted on the wall of the hearth, and through the wall of the hearth at another location therein and which opens at the opposite ends thereof into the hearth through the channel, comprising:
a. heating the air in the hearth so as to heat the walls thereof;
b. generating circulation of heated air by creating a pressure drop at one end of the channel to draw heated air from the hearth through the channel to heat the wall thereof; and
c. further heating the air in the hearth and channel to further heat the walls thereof.

4,008,994

APPARATUS AND METHOD FOR REGENERATION OF SPENT WET ACTIVE CARBON

Kouichi Numasaki, Yokohama; Nobutaka Ninomiya, Nagaoka-kyo; Zenji Matsumoto, Izumi, all of Japan; Kiyoshi Adachi, Penang, Malaysia, and Toyohisa Fujimoto, Shimizu, Japan, assignors to Japan Gasoline Co., Ltd., Toyko and Takeda Chemical Industries, Ltd., Osaka, both of, Japan

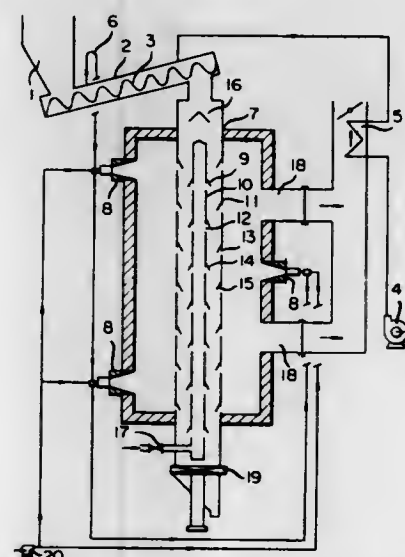
Filed May 8, 1975, Ser. No. 575,597

Claims priority, application Japan, May 15, 1974, 49-53991

Int. Cl.² F27B 15/10

U.S. Cl. 432—14

14 Claims



1. A method for regenerating spent wet active carbon, utilizing a drier, a heating furnace, at least one regeneration chamber disposed inside said furnace, said regeneration

chamber being defined between concentric, radially spaced, inner and outer cylinders which extend vertically in said furnace, said inner and outer cylinders each having a multiplicity of holes through the side walls thereof, comprising the steps of: feeding a stream of wet spent carbon through said drier and therein evaporating water from said spent carbon by heating same with a stream of heated gas wherein the heated gas utilizes the sensible heat of the gaseous products of combustion discharged from said furnace; feeding the stream of dry spent carbon from the drier vertically downwardly into said regeneration chamber so that the spent carbon falls downwardly, by gravity, through the space between said cylinders, simultaneously flowing a regeneration gas through said inner cylinder and outwardly through said holes in the side wall of said inner cylinder into contact with the spent carbon falling downwardly in the regeneration chamber, and simultaneously burning a fuel in said furnace to heat the spent carbon falling downwardly in the regenerating chamber and discharging the gasified substances from the spent carbon through said holes in the wall of said outer cylinder into the furnace so that said substances are burned in said furnace; removing the regenerated active carbon from the lower end of said outer cylinder; discharging the gaseous products of combustion from said furnace and utilizing the sensible heat thereof to evaporate water from the spent carbon in the drier.

6. An apparatus for regenerating spent wet active carbon, comprising: a drier for substantially drying the spent carbon, said drier including means for feeding a stream of spent carbon and means for supplying a stream of heated gas in heat exchange relationship with said spent carbon to evaporate water therefrom; a heating furnace having at least one burner for burning a fuel and also having at least one duct for discharging gaseous products of combustion from said furnace; at least one regeneration chamber disposed within said furnace for being heated by combustion of fuel in said furnace, said regeneration chamber being defined between concentric, radially spaced, inner and outer cylinders that extend vertically in said furnace and at least said outer cylinder penetrates through the top and bottom walls of said furnace, said inner and outer cylinder each having a multiplicity of holes through the side walls thereof; the upper end of said outer cylinder being connected to said drier for receiving dried spent carbon therefrom so that said dried spent carbon falls downwardly, by gravity, through the space between said cylinders, and the lower end of said outer cylinder having means to discharge the regenerated carbon; means connected to said inner cylinder for supplying regeneration gas thereto so that the regeneration gas flows through the openings in the inner cylinder into the space between said cylinders to contact the spent carbon falling downwardly therein to regenerate same and the substances adsorbed in the spent carbon are gasified and flow out through the openings in the outer cylinder into the furnace and are burned therein; and means for utilizing the sensible heat of the gaseous products of combustion flowing through said duct to evaporate water from the spent carbon in said drier.

4,008,995

ROTARY KILN CONSTRUCTION

Hans Mollenkopf, Neubeckum; Ewald Angelbauer, Oelde; Jurgen Wurr; Paul Abel, both of Ennigerloh; Horst Bonisch, Neubeckum, and Antonius Vering, Ahlen, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Nov. 21, 1975, Ser. No. 633,969

Claims priority, application Germany, Jan. 14, 1975, 7500800[U]

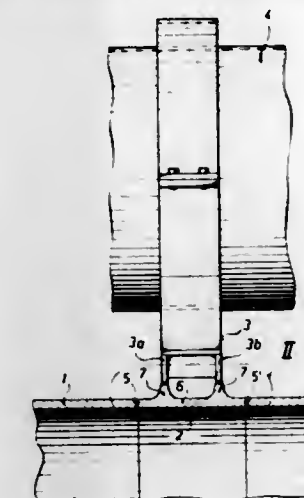
Int. Cl.² F27B 7/38

U.S. Cl. 432—80

8 Claims

1. A rotary kiln having an elongate, cylindrical casing provided with planetary cooling tubes spaced circumferentially about said casing, and attaching means for attaching each of said tubes to said casing, said attaching means comprising at least one annulus welded into and constituting a longitudinal

section of said casing, said annulus having an internal diameter corresponding to that of said casing and having a wall thickness at least as great as that of said casing, a mounting member carried by each of said cooling tubes, each of said mounting members having a predetermined width in a direc-



tion axially of said casing, and supporting means extending radially outwardly of said annulus and being secured to the latter and to each of said mounting members, each of said supporting means consisting of a pair of members spaced from one another axially of said casing a distance corresponding to the width of the associated members.

4,008,996

MULTIPLE TIER OVEN

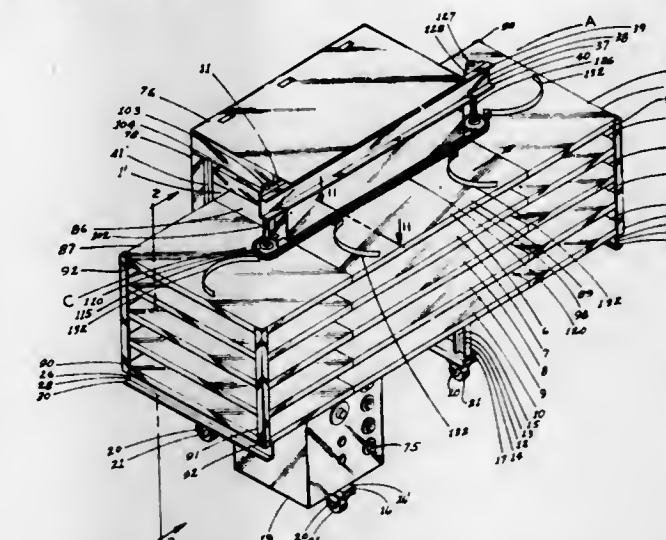
Harold D. Wells, St. Louis County, Mo., assignor to Black Body Corporation, Fenton, Mo.

Filed May 6, 1975, Ser. No. 574,926

Int. Cl.² F27B 13/02

U.S. Cl. 432—128

23 Claims



1. A multiple tier oven comprising of framework, means defining a plurality of superimposed oven chambers mounted on said framework in registering relationship, each of said oven chambers having a floor, means defining an oven-serving deck associated with each oven externally thereof, means maintaining said serving decks in vertically spaced apart relationship, each of said oven chambers being of tunnel form having an ingress at one end and an egress at the opposite end, the related oven-serving deck having first and second end portions adjacent to, and extending respectively from, the ingress and egress of the associated oven chamber in continuity with the tunnel floor thereof, said oven-serving decks each having at least one lateral section disposed adjacent one side of said oven chamber and extending between the associated first and second end portions, an endless conveyor associated with each oven chamber and having an inner course and an

outer course within a plane parallel to the plane of the related oven-serving deck, said inner course presented interiorly of the related oven chamber above the floor thereof, said outer course presented exteriorly of the associated oven chamber above the related deck lateral section, means effecting travel of said endless conveyors, and means heating said oven chambers.

4,008,997
SAGGER

George J. Krasl, St. Joseph, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed July 14, 1975, Ser. No. 595,845

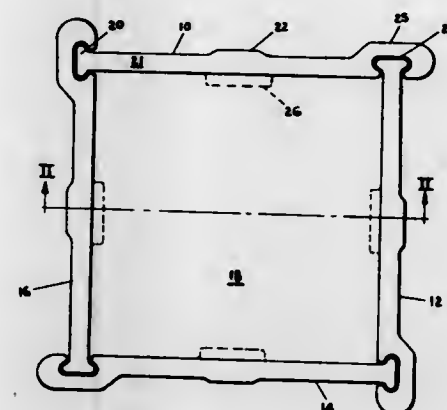
Int. Cl.² F27D 5/00

U.S. Cl. 432-258

10 Claims

1. A sagger for the kiln firing of ceramic articles comprising: a plurality of loosely interfitted side walls, each side wall including an elongated flange extending vertically along one end thereof and an elongated socket formed at the opposite end thereof and extending vertically along said opposite end, said flange and said socket shaped to slid-

ably fit in a corresponding socket and flange, respectively, of adjacent side walls for interlocking said side walls such that they can be separated only by sliding said flange out of said socket; and



floor means extending between said side walls to define an open topped sagger.

4,008,998
TRANSFERS DYEING BY ROLLING UP WEBS WITH A CONDUCTOR

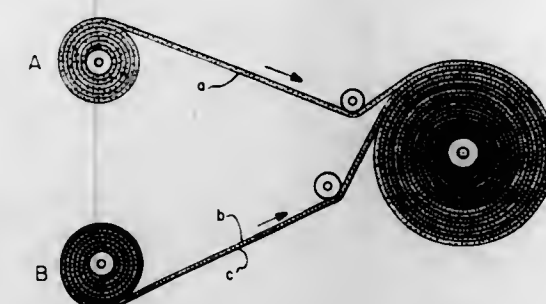
Charles Serex, Geneva, Switzerland; Bernard Hugelin, Gallard, and Robert Decombe, Ferney-Voltaire, both of France, assignors to Sublatic Holding S.A., Glaris, Switzerland
Filed May 9, 1974, Ser. No. 468,588

Claims priority, application Switzerland, May 11, 1973, 6691/73

Int. Cl.² D06P 7/00; B41C 1/06

U.S. Cl. 8-2.5 A

17 Claims



1. In a process for dry transfer dyeing or printing which comprises bringing the dry transfer dyestuff and/or optical brightening agent treated surface of a temporary carrier sheet into face-to-face contact with the surface of a substrate to be dyed or printed and heating the joined materials while in contact to a temperature of from 150° to 220° C. for a period of time sufficient to cause transfer of transferable material to the surface of the substrate to be dyed or printed and subsequently separating the temporary carrier from the substrate, the improvement according to which a conductive belt is provided said belt being placed in face-to-face contact with the nontreated surface of the temporary carrier, winding the temporary carrier, substrate to be dyed or printed and conductive belt into a coil, placing the coil in a heated environment and conducting heat into the coil by means of the conductive belt to cause transfer of transferable material to the surface of the substrate to be dyed or printed.

4,008,999
N,N-DIALKYLAMINO DIPHENYLAMINES FOR DYEING KERATINIC FIBERS

Gregoire Kalopissis, Neuilly-sur-Seine; Andrée Bugaut, Boulogne-sur-Seine, and Françoise Estradler, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Feb. 21, 1975, Ser. No. 551,653

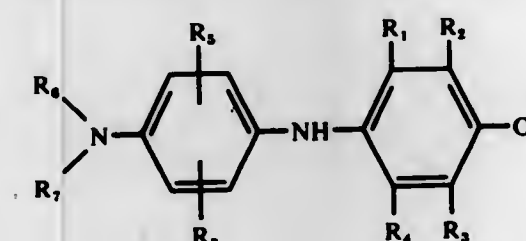
Claims priority, application Luxembourg, Feb. 22, 1974, 69459

Int. Cl.² A61K 7/13

U.S. Cl. 8-10.2

24 Claims

1. A composition for coloring keratinic fibers comprising in an aqueous or hydroalcoholic solution an effective amount of at least one diphenylamine compound of the formula.



wherein

R₁ and R₄ each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1-6 carbon atoms, lower alkoxy containing 1-6 carbon atoms, amino, lower alkyl amino wherein the alkyl moiety has 1-6 carbon atoms, acetalamino, lower carbamylalkyl amino wherein the alkyl moiety has

CHEMICAL

1-6 carbon atoms, lower hydroxyalkyl amino wherein the alkyl moiety has 1-6 carbon atoms, lower carbalkoxy amino wherein the alkoxy moiety has 1-6 carbon atoms and ureido;

R₂ and R₃ each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1-6 carbon atoms, lower alkoxy containing 1-6 carbon atoms, acetalamino and ureido;

R₅ and R₆ each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1-6 carbon atoms and lower alkoxy containing 1-6 carbon atoms; and

R₆ and R₇ represent lower alkyl having 1-6 carbon atoms; or a salt thereof.

4,009,000
PROCESS FOR THE DYEING OR PRINTING AND SIMULTANEOUS FINISHING OF CELLULOSE MATERIALS

Hermann Bühler, Reinach, Basel-Land, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,273

Claims priority, application Switzerland, Dec. 21, 1972, 18661/72

Int. Cl.² D06P 3/58, 3/60, 3/68

U.S. Cl. 8-17

16 Claims

1. A process for dyeing or printing and simultaneously finishing cellulose materials, comprising the steps of impregnating the cellulose material with an aqueous liquor containing

a. 10 to 100 g/l of a dyestuff of the formula (W)_{m-1} - D - [A - X]_n

wherein

W is an SO₃H group or a COOH group,

D is a chromophoric radical of a formazan, azomethine, nitro, azo, anthraquinone or phthalocyanine dyestuff,

A is a bridge member selected from the group consisting of a heterocyclic-aromatic radical, a substituted amino, carbonamido or sulphonamido radical, or an alkyleneaminocarbonyl radical, or a -SO₂- or a -NH-CO- group,

X is a monohydroxyalkyl radical of 2 to 10 carbon atoms having at least 2 carbon atoms between the hydroxy group and the bridge member, and m and n are integers of 1 to 5,

b. 20 to 60 g/l of a water-soluble or water-dispersible synthetic-resin-forming intermediate selected from the group consisting of an aminotriazine-formaldehyde addition product, an oxydiaminotriazine-formaldehyde addition product, a dioxaminotriazine-formaldehyde addition product, a triazone-formaldehyde addition product, a guanamine-formaldehyde addition product, a urea-formaldehyde addition product, a thiourea-formaldehyde addition product, an ethyleneurea-formaldehyde addition product, a dicyanodiamide-formaldehyde addition product, methylolmelamine, methylolurea, methylolethyleneurea at least partially etherified with a C₁-C₃-alkanol, methylolpropyleneurea at least partially etherified with a C₁-C₃-alkanol, methylolguanyleneurea at least partially etherified with a C₁-C₃-alkanol, methylolacetyleneurea at least partially etherified with a C₁-C₃-alkanol, and 4,5-dihydroxyimidiazolidone-2,

c. 5 to 30% of the weight of the dyestuff of formaldehyde or a water soluble polymeric form of formaldehyde, and

d. 1 to 50 g/l of an acid catalyst;

drying, steaming or cold-storing the impregnated material; and finally heating the material to fix the dyestuff thereon.

4,009,001

PROCESS FOR THE PRODUCTION OF SPACE-DYED EFFECTS ON ACRYLIC YARNS

James P. Reid, Jr., and Bobby L. McConnell, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 468,989, May 10, 1974, abandoned, which is a continuation of Ser. No. 247,385, April 25, 1972, abandoned. This application Sept. 23, 1975, Ser. No. 616,015

Int. Cl.² D06P 5/12, 5/22

U.S. Cl. 8-15

15 Claims

1. A process for producing a space-dyed effect on an acrylic textile material, said process consisting essentially of contacting at least 5% but less than 80% of the length of an acrylic yarn comprising more than 50% by weight of basic-dyeable acrylic fibers with a resisting amount of an aqueous solution of a polyvalent metal cation selected from the group consisting of calcium, barium, magnesium, strontium, tin, zinc, lead, iron, nickel, cobalt, copper, and manganese ions and mixtures thereof at a pH of about 2.5 to about 8.0, thereafter bulking the yarn in the relaxed state by steaming at a temperature of about 170° to about 240° F., to fix the metal cation on the yarn and, thereafter dyeing said yarn with at least one basic dye, whereby the areas of said yarn treated with said cation resist said dye to produce a space-dyed appearance of said yarn.

4,009,002

PROCESS FOR TREATING TEXTILE FABRIC TO RETARD INFLAMMABILITY

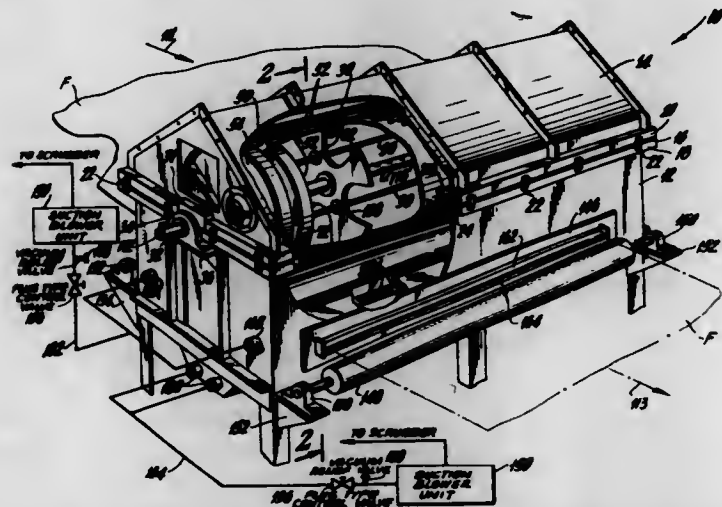
William Carter, Greenville, S.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Division of Ser. No. 323,655, Jan. 15, 1973, Pat. No. 3,946,497. This application Feb. 11, 1974, Ser. No. 441,471

Int. Cl.² D06B 1/16; D06M 1/04

U.S. Cl. 8-116 P

5 Claims



1. A method for treating a continuous length of textile fabric composed of greater than about 50 percent by weight cellulose previously impregnated with THPOH with gaseous ammonia to impart thereto flame-retardant characteristics, said method being applicable to textile fabrics of various widths wherein said method comprises the steps of flowing a gas selected from the group consisting of ammonia and mixtures of ammonia and air or an inert gas in a confined gas flow path through a hollow cylindrical shell having a cylindrical wall with orifices therethrough, said shell being rotatably mounted within a substantially gas-tight treatment chamber, continuously passing said textile fabric through the interior of said treatment chamber in a manner such that a plurality of the orifices of the cylindrical shell are covered by said fabric and at a line speed within the range from about 15 to 50 yards per minute corresponding to the speed of rotation of the

cylindrical shell, and constraining substantially the entire amount of said gas flowing in said path through the orifices covered by said textile fabric and across the path of the said textile fabric to flow directly through said textile fabric, the rate of flow of said gas being within the range from about 0.75 to 5 pounds per minute and being sufficient to substantially reduce the contact pressure between said textile fabric and said hollow cylindrical shell and wherein said treatment chamber has a vacuum applied thereto which serves to draw off the reaction products of the treatment process and ensure a positive flow of gas from the interior of said hollow cylindrical shell.

4,009,003

METHOD FOR DETERMINING SUITABILITY OF TRIORGANOPHOSPHORUS LIGANDS FOR USE IN HYDROFORMYLATION PROCESSES

Adin Lee Stautzenberger, and James Leonard Paul, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,546

Int. Cl.² B01J 31/12; G01N 31/08

U.S. Cl. 23-230 R

8 Claims

1. A method for determining the purity of a triorganophosphorus ligand comprising the steps of:
a. forming an admixture of said ligand and an aldehyde;
b. forming a ligand-free test standard comprised of said aldehyde;
c. heating said admixture and said test standard under like conditions; and
d. comparing the amount of reaction products from said admixture with the amount of reaction products from said test standard.

4,009,004

REAGENT AND METHOD FOR DETERMINATION OF PHOSPHOROUS

Marvin E. Hutchinson, Jr., 5020 Palmetto Way, Pacifica, Calif. 94044

Filed May 17, 1976, Ser. No. 687,354

Int. Cl.² G01N 31/22, 33/16

U.S. Cl. 23-230 B

18 Claims

15. A method of determining phosphate content in serum without removing the protein content therein which comprises admixing a sample of the serum with a reagent comprising ammonium salt of molybdic acid, ferric ammonium sulfate, an acid and a lineating surfactant, and measuring the absorbance on a colorimeter or spectrophotometer.

4,009,005

APPARATUS FOR RADIOIMMUNOASSAY WITH REGENERATION OF IMMUNOABSORBENT

Lavell R. Johnson, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Continuation-in-part of Ser. No. 342,513, March 19, 1973, Pat. No. 3,896,217. This application Apr. 7, 1975, Ser. No. 565,850

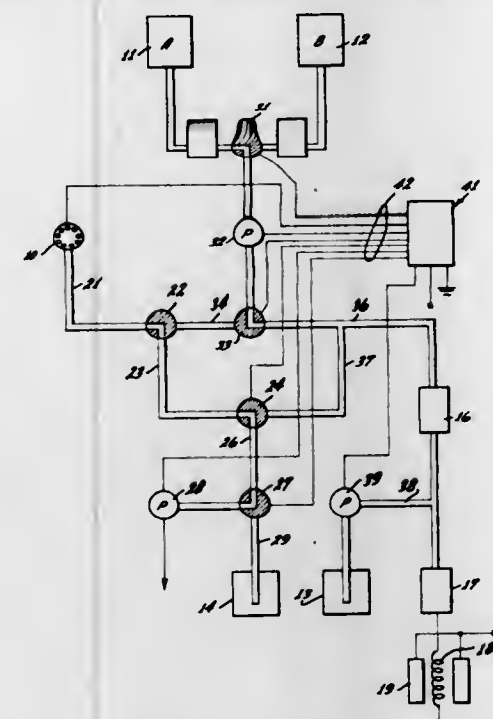
Int. Cl.² G01N 31/06, 33/16

U.S. Cl. 23-253 R

22 Claims

1. Apparatus for automated radioimmunoassay comprising:
means for holding at least one antigen sample to be analyzed,
means forming a contact chamber through which said samples are flowed,
immobilized immunoabsorbent means positioned within said chamber,
said immunoabsorbent including a particulate material having chemically bound thereto an antibody specific to the antigen in said sample and for forming a fraction bound to said antibody and an unbound fraction which passes through said chamber,
means forming a storage for eluant solution,

flow line means for flow of fluid to and from said contact chamber,
means for detecting radioactive impulses positioned to receive impulses of a radioactive material from at least one of said bound and unbound fractions in said flow line means,
means for directing flow of an antigen sample and a radioactive labelled antigen into said contact chamber to form said bound and unbound fraction,
means to direct flow through said contact chamber of sol-



vent to effect stoichiometric release of the antigens bound to said immobilized immunoabsorbent to form a released bound fraction
means to effect flow sequentially of successive antigen samples through said contact chamber for assay thereof and to effect flow of eluant solution through said chamber subsequent to flow of each said antigen sample; and
said detecting means being operative to receive impulses from one or both of said unbound fractions and said released bound fraction passing through said flow line means.

4,009,006

WATER TO FUEL CONVERTER

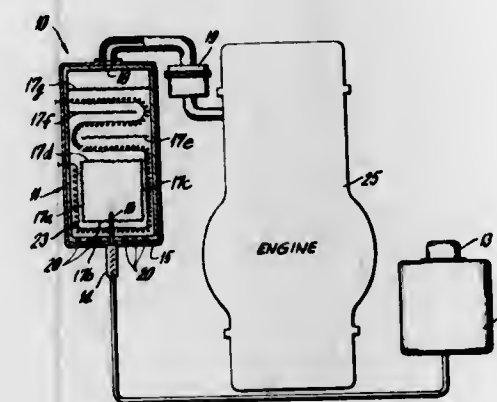
Frank Hreha, Sun Valley Drive, Croton Falls, N.Y. 10518

Filed Aug. 18, 1975, Ser. No. 605,439

Int. Cl.² B01J 1/00, 8/00; C01B 1/18

U.S. Cl. 23-281

4 Claims



1. A water to fuel converter comprising:
a pressurized water source,
a heater connected to the water source for heating said water,
an insulated chamber having a plurality of copper screens mounted therein,

means for heating said chamber, comprising a heating coil mounted about said copper screens, said chamber having an outlet aperture at the upper end thereof and a plurality of air inlets in the base thereof, and,
a spray nozzle on the outlet of the heater mounted through the base of the chamber to spray the pressurized water into said heated chamber and through the copper screens wherein it becomes decomposed into gases which escape through the outlet aperture to serve as a fuel.

4,009,007

TANTALUM POWDER AND METHOD OF MAKING THE SAME

Stanley S. Fry, North Chicago, Ill., assignor to Faunsteel Inc., N. Chicago, Ill.

Filed July 14, 1975, Ser. No. 595,569

Int. Cl.² C22C 1/04; H01G 9/05

U.S. Cl. 29-182.5

20 Claims

1. A tantalum powder containing an added phosphorus-containing material in an amount equivalent to from about 5 to about 400 parts per million of elemental phosphorus.

4,009,008

COLORED WATER IMMISCIBLE ORGANIC LIQUID

Richard B. Orelup, Upper Saddle River, N.J., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

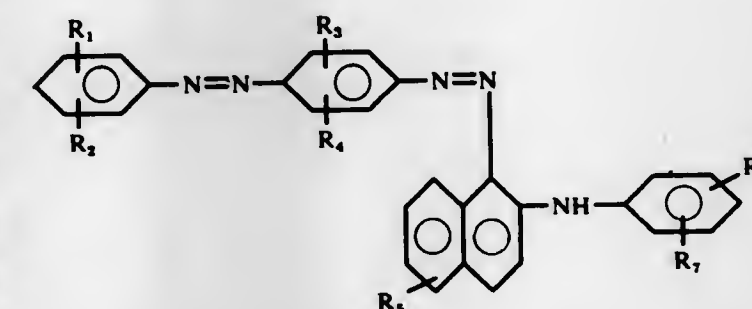
Division of Ser. No. 313,591, Dec. 8, 1972, Pat. No. 3,862,120. This application Nov. 18, 1974, Ser. No. 524,528

Int. Cl.² C10L 1/10, 1/22; D06P 1/08

U.S. Cl. 44-59

3 Claims

1. A colored water immiscible organic liquid having dissolved therein a disazo colorant corresponding to the formula



in which R₁ is H, CF₃, or alkyl having from 1 to 4 carbon atoms, R₂ is H or alkyl having from 1 to 4 carbon atoms, R₃ and R₄ are each H, OCH₃, OC₂H₅ or CH₃, and R₅, R₆ and R₇ are each H or alkyl having 1 to 12 carbon atoms, at least one of said R₅, R₆ and R₇ being alkyl, said disazo colorant being highly resistant to removal from said organic liquid by the commonly used adsorbents such as carbon black, charcoal, clay and silica.

4,009,009

PROCESS FOR REDUCING THE COS CONTENT OF GASEOUS HYDROCARBON STREAMS BY USE OF SUPPORTED LEAD OXIDE

Franklin E. Massoth, Salt Lake City, Utah, and John E. Young, Jr., Woodridge, Ill., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 492,276, July 26, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,427

Int. Cl.² B01D 53/04

U.S. Cl. 55-73

14 Claims

1. A process for reducing the COS content of a gaseous feedstream free of arsenic which comprises:
contacting said feedstream at a temperature of 80° F. to 250° F. with a sorbent dispersed upon a carrier material, said sorbent consisting essentially of lead oxide, and recovering a product gas stream containing less than 10 ppb of COS.

4,009,010

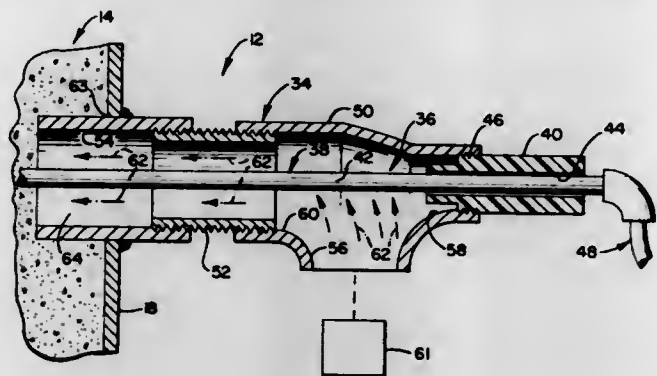
METHOD AND APPARATUS FOR FOAM SCRUBBER LEVEL DETECTOR

Philip D. Sauer, and Thomas F. Payne, both of Flathead, Mont., assignors to The Anaconda Company, New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,679
Int. Cl.² B01D 47/04

U.S. Cl. 55-87

9 Claims



1. In a foam scrubbing apparatus comprising a container having inlet and outlet means with a layer of foam material therebetween and means connected with the outlet means for creating at least a partial vacuum in the container, the improvement comprising monitoring means for monitoring said foam material and for enabling the prevention of the accumulation of foreign material thereon, said monitoring means comprising a first means connected to the container, and electrode means centrally mounted in said first means and extending into said foam layer for monitoring the foam layer; fluid supply means in fluid-flow communication with a passage in said first means for supplying a stream of insulating fluid into said first means through said passage and through said first means around said electrode means in response to the partial vacuum in said container to prevent foreign material from accumulating on said electrode means.

4,009,011

CAPACITOR DISCHARGE OF LATCHING RELAYS AND ROTARY FILTER

Gary T. Ross, Burnsville, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

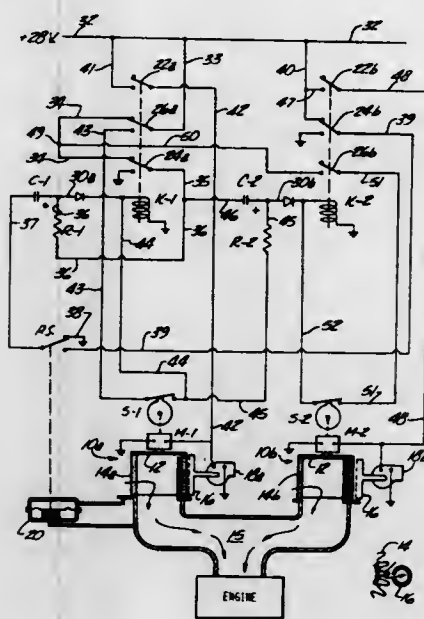
Filed Aug. 22, 1975, Ser. No. 606,825
Int. Cl.² B01D 46/00

U.S. Cl. 55-273

2 Claims

1. Circuitry for sequentially energizing first and second load devices from a direct current source, comprising: a first relay coil (K-1) electrically associated with the first load device, and a second relay coil (K-2) electrically associated with the second load device; first power contacts (22a) controlled by said coil (K-1) connecting the first load device to the current source only when said first coil (K-1) is energized; second power contacts (22b) controlled by said second coil (K-2) connecting the second load device to the current source only when said second coil (K-2) is energized; means for energizing the first relay coil comprising a first capacitor (C-1) having one of its leads normally connected to ground at 38 and its other lead connected to the first relay coil, a first interruptible high resistance path including a switch (33) (34) (35) connecting the current source to the other capacitor lead only when the first relay coil is de-energized whereby the first capacitor is charged without operating the coil, a first interruptible low resistance path including a switch (40) (39) connected to the current source, and cycle-initiating switch means (P.S.) operable to disconnect the ground and connect said one capacitor lead to said low resistance path whereby a relatively large voltage is then impressed

on said one capacitor lead to thus cause the capacitor to energize the first relay coil (K-1); means for energizing the second relay coil (K-2) comprising a second capacitor (C-2) having one of its leads connected to ground through relay contacts (24a) only when relay coil (K-1) is energized, said second capacitor having its other lead connected to the second relay coil (K-2), a second interruptible high resistance path including a switch (33) (43) (45) supplying current from the aforementioned source to said other lead of the second capacitor



tor only when the first relay coil (K-1) is energized, a second interruptible low resistance current path including a switch (33) (34) (46) connecting the current source to said one lead of the second capacitor only when the first relay coil is de-energized, a timer switch (S-1) operable to de-energize said first relay coil (K-1) and thereby enable a relatively large voltage to be impressed through the second low resistance path onto said one lead of the second capacitor, whereby that capacitor energizes the second coil.

4,009,012

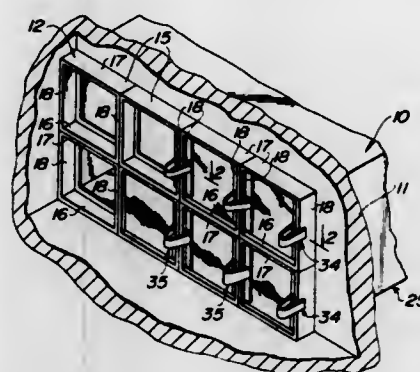
FILTER ELEMENT RETAINER CONSTRUCTION

Martin Heffler, 6202 Oxford Ave., Philadelphia, Pa. 19111

Filed Oct. 20, 1975, Ser. No. 623,573
Int. Cl.² B01D 50/00, 59/50; A44B 21/00

U.S. Cl. 55-483

9 Claims



1. In a filter bank, the combination comprising a framework including a plurality of intersecting walls defining therebetween openings for receiving filter elements, internal flange means fixed in each opening for marginally engaging one face of the received filter element, holding means removably positioned in each opening for holding engagement with the other face of the received filter element substantially completely along opposite margins thereof and facing through said oppo-

4,009,015

METHOD OF MAKING GLASS-CERAMICS FROM MODIFIED BASALTS

Howard L. McCollister, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 29, 1975, Ser. No. 600,020
Int. Cl.² C03B 32/00

U.S. Cl. 65-33

2 Claims

1. The method of making a glass-ceramic having a Knoop micro hardness of at least 800, over 85 volume percent crystallinity, containing a multitude of randomly oriented, essentially homogeneously dispersed crystals, essentially all of which are less than 5 microns across in their largest lineal dimension, which comprises

1. melting under essentially non-reducing conditions a batch consisting essentially of basalt and one or more oxide (or precursor thereof) selected from CaO, MgO and SiO₂, the selection of such oxide(s) and amounts thereof being effective to result in an overall composition having the following two ratios in the indicated ranges:

$$\frac{\text{Moles SiO}_2}{\text{Moles CaO} + \text{Moles MgO} + (3\%) (\text{Moles Fe}_2\text{O}_3)} \quad (I)$$

in the range of 0.9 to 1.1, and

$$\frac{\text{Moles CaO}}{\text{Moles MgO} + (\%) \text{ Moles Fe}_2\text{O}_3} \quad (II)$$

in the range of 0.9 to 1.1

wherein the "Moles Fe₂O₃" represents the entire iron oxide content of the batch expressed as Fe₂O₃, including the actual Fe₂O₃ as well as the FeO present in the basalt,

2. cooling the melt to form an essentially homogeneous and essentially entirely vitreous solidified glass and

3. heating said glass according to a time and temperature schedule effective to crystallize same to said glass-ceramic having essentially no magnetite crystals and having the ratios (I) and (II) above.

4,009,016

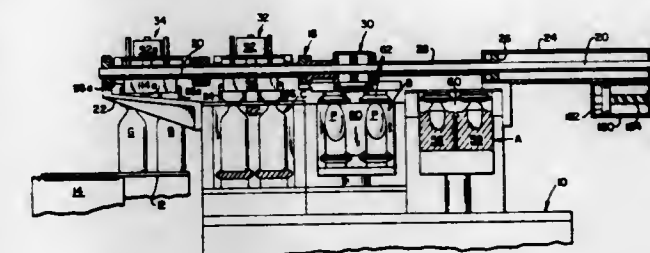
METHOD OF MAKING GLASSWARE WITH A HIGH SPEED PRESS AND BLOW TECHNIQUE

Thomas Vincent Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 462,078, April 18, 1974, Pat. No. 3,914,120. This application Aug. 18, 1975, Ser. No. 605,761
Claims priority, application United Kingdom, Nov. 23, 1973, 54389/73Int. Cl.² C03B 7/00, 9/14

U.S. Cl. 65-76

4 Claims



1. A process of forming glassware in a press and blow technique utilizing at last one upright parison mold in a first station of a forming machine section which also has two additional stations spaced apart longitudinally of the section and wherein a parison is to be initially formed at the first station for further forming at the second station and for final forming or shaping into an article of glassware at the third station, the said process comprising the steps of placing a gob of molten glass in the parison mold, closing the parts of a neck ring over said parison

site margins toward said flange means for clamping a filter element in position, and releasable gripping means carried by said holding means for releasable gripping engagement with the walls of said framework for releasably retaining said holding means in said clamping relation.

4,009,013

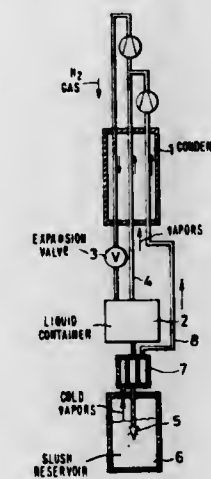
PROCESS FOR THE PRODUCTION OF SLUSH OF LOW-BOILING GASES

Rolf Schrauer, Bruchkobel; Josef Bardenheier, Frankfurt am Main, and Jurgen Koch, Mannheim, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed May 12, 1975, Ser. No. 576,848
Claims priority, application Germany, May 15, 1974, 2423610Int. Cl.² F25J 1/00, 5/00

U.S. Cl. 62-10

5 Claims



1. In a process for the preparation of fine-grained slush from a supply of low boiling gases which utilizes therein liquefied gas or very cold gas under high pressure, the improvement comprising relieving a portion of the gas in the supply from stress, by expansion through a nozzle alternately to a pressure below the pressure of the triple point for the formation of slush in the gas-ice region and discharging that portion from the nozzle as snow, then subsequently in 5-10 seconds isenthalpically expanding an additional portion of the gas from the supply to a pressure above the triple point in the gas-liquid region, to discharge that additional portion from the nozzle as liquid by altering the conditions within the nozzle, and continuing to quickly alternate the pressure releasing steps every 5-10 seconds with further portions of gas from the supply to create a fine-grained homogeneous snow and liquid slush mixture having a grain size of 1 mm to 3 mm.

4,009,014

OPTICAL FIBER MANUFACTURE

Philip William Black, Stansted Mountfitchet, and John Irven, Bishop's Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 3, 1975, Ser. No. 610,021
Claims priority, application United Kingdom, Sept. 5, 1974, 38826/74Int. Cl.² G02B 5/14; C03C 21/00

U.S. Cl. 65-3 A

3 Claims

1. A method for forming an optical fiber preform for producing low mode dispersion optical fibers comprising the steps of:

depositing phosphorus pentoxide on the inner surface of a silica tube to provide a region of high index of refraction on said inner surface;

heating the phosphorus pentoxide coated tube up to a first temperature of 1400° C to diffuse the phosphorus pentoxide into the silica; and

subsequently heating the tube to a second temperature of 1700° C to collapse the tube and form the preform.

mold and then thrusting a plunger through the neck ring to form a parison, removing the plunger and mold from the parison to leave it suspended by the neck ring, transferring the neck ring to the second of said stations, engaging the upper portion of the parison by first tongs at said second station to support the same for further forming while said neck ring is returned to the first station, transferring the first tongs and further formed parison to the third station, engaging the parison at the third station by second tongs to support the same for final shaping while the first tongs are returned to the second station, blowing the parison to the final shape of an article of glassware at the third station, transferring the second tongs and suspended article to a point beyond said third station, releasing said article at said point, and returning the second tongs to said third station.

4,009,017

SYSTEMS FOR TRANSFERRING HEAT THROUGH A GLASSWARE FORMING MOLD

Stanley Peter Jones, Doncaster, England, assignor to Emhart (U.K.) Limited, Doncaster, England

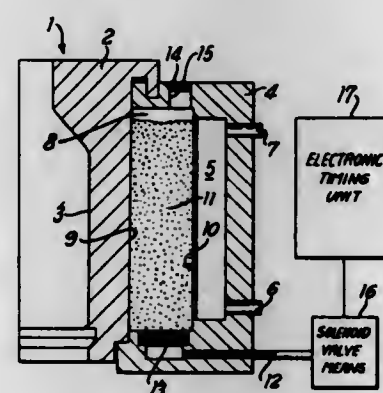
Filed July 21, 1975, Ser. No. 597,784

Claims priority, application United Kingdom, July 22, 1974, 32311/74

Int. Cl.² C03B 9/38

U.S. Cl. 65-162

6 Claims



1. A glassware forming system including a forming mould and cooling means for removing heat from the forming mould, the cooling means comprising means defining a cooling chamber through which a cooling fluid may be circulated and a fluidizable bed of solid particles within a cavity located between a part of the forming mould and the cooling chamber.

4,009,018

GLASSWARE FORMING MACHINE OF THE I. S. TYPE WITH IN-LINE MOLD MOTION

Hermann Nebelung, Zurich, and Edward Charles Christopher, Zollikon, both of Switzerland, assignors to Emhart Industries, Inc., Farmington, Conn.

Filed July 7, 1975, Ser. No. 593,752

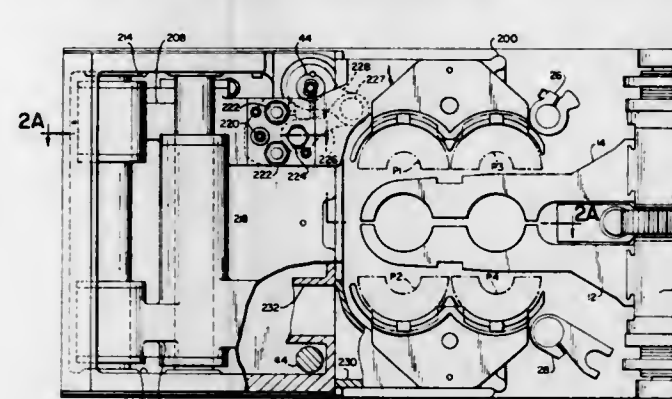
Int. Cl.² C03B 9/00

U.S. Cl. 65-229

18 Claims

1. A glassware forming machine comprising
a. a blank mold station having blank mold cavity defining structure for receiving the gobs of glass and means for partially forming the gobs into parisons,
b. partible neck ring mold structures for mating with said blank mold cavity defining structure at said blank station,
c. a blow mold station horizontally spaced from said blank station in the same plane and having upwardly open blow mold cavity defining structure for receiving the partially formed parisons from said blank station,
d. transfer means for said parisons including neck ring arms associated with said partible neck ring mold structure and means pivotally supporting said arms for movement about a horizontal axis located between said blank mold and blow mold stations,

e. means defining fixed horizontally extending ways at least at one of said stations, which ways are oriented parallel to the said axis of pivotal movement for said neck ring arms,
f. said mold cavity defining structure at said one station including mold holder means movably received on said



fixed ways for supporting mold segments thereon for parallel movement toward and away from one another, and
g. means for moving said mold holder means in synchronism with one another.

4,009,019

BLOWHEAD ASSEMBLY FOR HIGH SPEED PRESS AND BLOW INDIVIDUAL SECTION GLASSWARE FORMING MACHINE

Thomas Vincent Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 462,078, April 18, 1974, Pat. No.

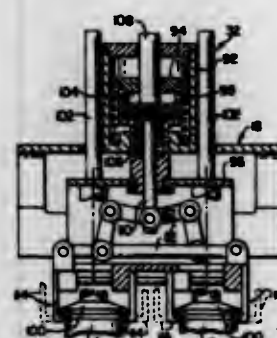
3,914,120. This application Aug. 18, 1975, Ser. No. 605,727

Claims priority, application United Kingdom, Nov. 23, 1973, 54389/73

Int. Cl.² C03B 9/00, 9/14

U.S. Cl. 65-261

2 Claims



1. A blowhead assembly for association with a multi-part glassware mold having parts adapted to engage each other to define a mold cavity and to engage a glass parison below its finish and thus to support the parison within the cavity, the said assembly comprising a cylinder supported above the mold, a first piston reciprocable in said cylinder, a blowhead connected to said first piston for movement therewith and including conduit means adapted to be closely associated with the parison finish and to introduce a gas under pressure to the interior thereof when the first piston is moved downwardly, a second piston supported by said blowhead within said cylinder for reciprocation upwardly and downwardly with the first piston, means for changing fluid pressure on one side of said second piston and thereby selectively to move it vertically toward or away from said first piston, a pair of tongs movable generally horizontally into and out of engagement with said parison beneath its upper edge and above the mold parts, and linkage elements connected between said second piston and said pair of tongs respectively to engage and disengage said tongs with the parison responsive to movement of said second piston relative to said first piston.

4,009,020

METHOD OF REGULATING PLANT GROWTH

George Robert Starke, Perkase, and Anson Richard Cooke, Hatfield, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed May 6, 1975, Ser. No. 574,990

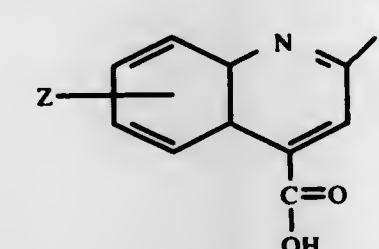
Int. Cl.² A01N 5/00

U.S. Cl. 71-76

56 Claims

1. A method for producing a resistance to freeze injury in a plant which comprises applying to the plant an effective amount, with respect to the plant being treated, of a compound selected from the group consisting of:

(A)



wherein Z is selected from the group consisting of:

- hydrogen,
- chlorine, and
- fluorine;

R₂ is selected from the group consisting of:

- hydrogen,
- trifluoromethyl,
- bromine, and
- chlorine; and

B. agriculturally acceptable salts of (A) selected from the group consisting of:

- alkaline earth metal salts,
- mono-, di or tri alkylamine salts of 1 to 3 carbon atoms,
- mono-, di or tri-alkanolamine salts of 1 to 3 carbon atoms, and
- acid addition salts of a non-phytotoxic acid.

4,009,021

IMIDAZOLE PLANT GROWTH REGULATORS

Roy Y. Yih, and Pyung K. Yu, both of Doylestown, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

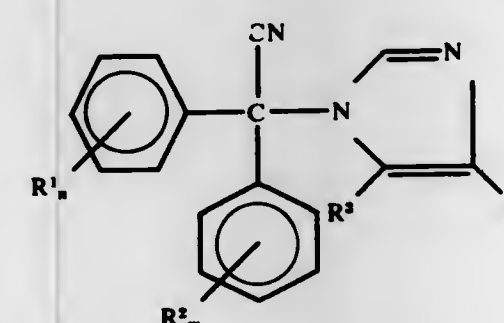
Filed Oct. 30, 1975, Ser. No. 627,483

Int. Cl.² A01N 9/22

U.S. Cl. 71-92

11 Claims

1. A method for regulating plant growth which comprises applying to a plant, to plant seeds, or to the locus of a plant an effective amount of a compound of the formula



wherein

- R¹ is a halogen atom, a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a trifluoromethyl group, or a nitro group,
- R² is a halogen atom, a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a trifluoromethyl group, or a nitro group,
- R³ is a hydrogen atom or a (C₁-C₄)alkyl group,
- R⁴ is a hydrogen atom or a (C₁-C₄)alkyl group,
- n is 0, 1, or 2, and
- m is 0, 1, or 2,

or an agronomically-acceptable acid addition salt thereof.

4,009,022

SELECTIVE ANTAGONISTS FOR TRIAZINE HERBICIDES

Ted Tsutomu Fujimoto, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

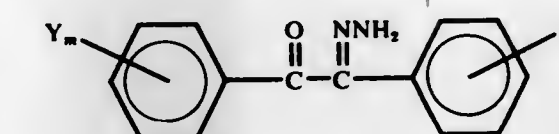
Filed Oct. 30, 1975, Ser. No. 627,482

Int. Cl.² A01N 9/22

U.S. Cl. 71-93

15 Claims

1. A method for reducing the phytotoxicity of a triazine herbicide selected from the group consisting of atrazine, simazine, metribuzin, ametryn, prometryne, propazine, procymazine, and terbutryn to an agronomic crop to which the triazine herbicide has been applied which comprises applying to the locus of the crop, prior to emergence of the crop, an effective amount of a compound of the formula



wherein

X and Y are individually halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, trifluoromethyl, or nitro, and
n and m are 0 to 3, at a rate of about 1 to about 30 pounds per acre.

4,009,023

METHOD FOR THE REFINING OF MOLTEN METAL

Karl Erik Öberg, and Bengt Olof Sjöberg, both of Hagfors, Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

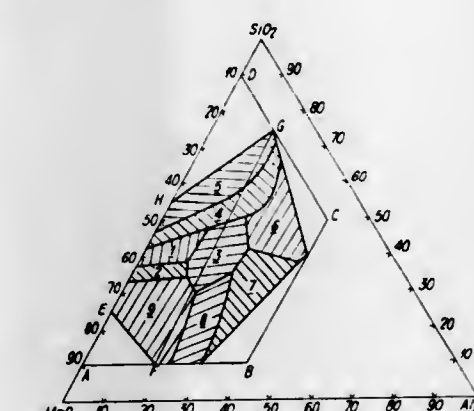
Filed Feb. 15, 1974, Ser. No. 443,160

Claims priority, application United Kingdom, Feb. 15, 1973, 7588/73

Int. Cl.² C21C 5/52

U.S. Cl. 75-12

9 Claims



1. A process for producing a steel substantially free from calcium containing inclusions which are not plastically deformable at a hot forming temperature of the steel which comprises forming a body of molten steel in a vessel having a lining in contact with the molten steel, the lining being substantially free from calcium containing compounds and from magnesium containing compounds and introducing into the body of molten steel, below the surface thereof, a slag powder, having a composition falling within the area defined by the boundaries ABCDA in the drawing, and having a melting point not higher than that of the steel and a density not higher than that of the steel, whereby the slag interacts with any inclusions in the molten steel bringing some of the inclusions to the surface of the molten steel and transforming other inclusions so that any inclusions which form in the steel on solidification are plastically deformable at hot forming temperatures.

4,009,024

PROCESS FOR REGENERATION AND REUSE OF STEELMAKING SLAG

A. Leslie Miller, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 26, 1975, Ser. No. 616,873

Int. Cl.² C21B 3/04

U.S. Cl. 75—30

15 Claims

1. A method of treating molten steelmaking slag comprising:

- isolating molten steelmaking slag from a steel heat;
- simultaneously introducing sufficient oxygen and a fluid hydrocarbon fuel into the molten slag to reduce the oxides of iron, manganese, phosphorus and silicon to their elemental state to form a contaminated liquid steel; and,
- recovering the contaminated steel so produced.

4,009,025

LOW PERMEABILITY, NONMAGNETIC ALLOY STEEL

Robert T. Morelli, Pittsburgh, Pa., assignor to Crucible Inc., Pittsburgh, Pa.

Filed Mar. 5, 1976, Ser. No. 664,323

Int. Cl.² C22C 38/04

U.S. Cl. 75—123 B

2 Claims

1. A stable austenitic steel characterized by low magnetic permeability in both the annealed and unannealed condition, said steel consisting essentially of, in weight percent, carbon 0.35 to 0.45, manganese 14 to 16.5, phosphorus 0.05 max., sulfur 0.07 to 0.12, silicon 0.55 to 1.15, nickel 3.5 to 5.5, nitrogen 0.12 max., chromium 0.50 max. and the balance iron and incidental impurities.

4,009,026

STRONTIUM-SILICON-ALUMINUM MASTER ALLOY AND PROCESS THEREFOR

Robert T. C. Rasmussen, Pottstown, Pa., assignor to Kaweck Berylo Industries, Inc., Reading, Pa.

Continuation-in-part of Ser. No. 500,893, Aug. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 488,667, July 15, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,333

Int. Cl.² C22C 1/03

U.S. Cl. 75—148

4 Claims



1. A process for producing a master alloy for adding a modifying amount of strontium to eutectic and hypoeutectic aluminum-silicon alloys, said process comprising adding a strontium-silicon alloy consisting essentially of:

- between about 15 and 60 weight percent strontium;
 - between about 40 and 75 weight percent silicon; and
 - the balance incidental impurities to substantially pure aluminum at a temperature of between about 1450° and 2100° F, said strontium-silicon alloy being added in an amount to produce a strontium-silicon-aluminum master alloy containing:
- between about 3 and 20 weight percent strontium;
 - between about 5 and 28 weight percent silicon; and
 - the balance aluminum and impurities.

4,009,027

ALLOY FOR METALLIZATION AND BRAZING OF ABRASIVE MATERIALS

Jury Vladimirovich Naidich, ulitsa Vernadskogo, 85, kv. 48; Galina Alexeevna Kolesnichenko, ulitsa Prazhskaya, 3, kv. 128, both of Kiev; Leon Izraelovich Feldgun, Ligovsky prospekt, 3/9, kv. 1; Mark Simonovich Drui, ulitsa Chekhova, 4, kv. 93, both of Leningrad; Boris Dmitrievich Kostjuk, ulitsa Dobrokhotova, 21, kv. 104; Nikolai Stepanovich Zjukin, ulitsa Kurskaya, 8a, kv. 59, both of Kiev; Vladislav Sergeevich Lysanov, ulitsa Vavilovskaya, 15, korpus 3, kv. 73, and Alla Alexandrovna Lavrinovich, ulitsa Shvernika, 16, kv. 51, both of Leningrad, all of U.S.S.R.

Filed Nov. 21, 1974, Ser. No. 525,981

Int. Cl.² C22C 9/02

U.S. Cl. 75—154

2 Claims

1. An alloy for metallization and brazing of abrasive materials, consisting essentially of, by weight:

- 60–80% copper;
 - 7–17% tin;
 - 0.3–5% of at least one metal selected from the group consisting of tungsten and molybdenum;
 - 0.003–5% tantalum;
 - 0.5–8.16% of at least one metal selected from the group consisting of cobalt and nickel;
 - 1.5–10% of at least one metal selected from the group consisting of lead and bismuth; and
 - 3–15% of at least one metal selected from the group consisting of zirconium and titanium.
2. An alloy for metallization and brazing of abrasive materials, consisting essentially of, by weight:
- 25.2–85.7% copper;
 - 1.8–17% tin;
 - 0.3–35% of at least one metal selected from the group consisting of tungsten and molybdenum;
 - 3–15% of at least one metal selected from the group consisting of titanium and zirconium;
 - 0.5–8.16% of at least one metal selected from the group consisting of cobalt and nickel; and
 - 1.5–10% of at least one metal selected from the group consisting of lead and bismuth.

4,009,028

REVERSAL MIGRATION IMAGING SYSTEM

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 454,515, March 25, 1974. This application Apr. 2, 1975, Ser. No. 564,241

Int. Cl.² G03G 5/04

U.S. Cl. 96—1 PS

1 Claim

1. A method of preparing a migration imaging member comprising:

- providing a member comprising a substrate, a layer of substantially electrically insulating softenable material on said substrate, said softenable material containing a layer of migration material contiguous an interface of said softenable material and said substrate, said softenable material capable of being softened sufficiently to allow migration of migration material in said softenable material;
- applying a reverse migration force to said migration material sufficient to cause migration of substantially the entire layer of migration material away from the substrate and towards the free surface of the imaging member;
- softening the softenable layer sufficient to allow migration of substantially the entire layer of migration material away from the substrate and toward the free surface of the softenable material;
- after step (c) applying an imagewise migration force to said migration material sufficient to cause imagewise migration of the migration material in depth in said softenable layer; and
- developing said imaging member by softening the softenable material.

able material at least sufficient to allow imagewise migration of migration material at least in depth in said softenable layer.

4,009,029

CYANOETHYL-CONTAINING BLOCKED DEVELOPMENT RESTRAINERS

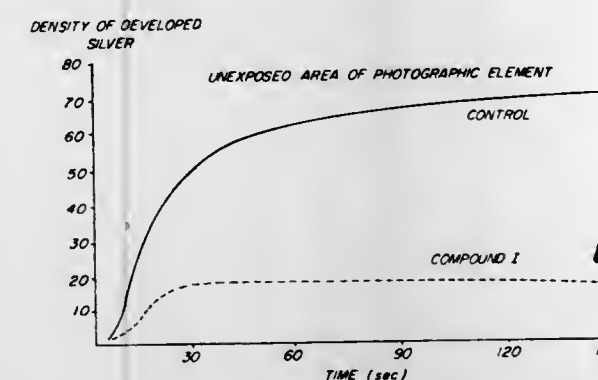
Howell Allen Hammond; Wilbert Jephth Humphlett, and Il-mari Fritiof Salminen, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 367,306, June 5, 1973, abandoned. This application June 20, 1975, Ser. No. 588,976

Int. Cl.² G03C 7/00, 5/30, 1/48, 1/40

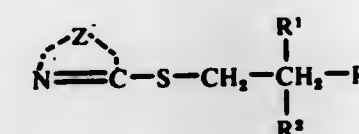
U.S. Cl. 96—3

33 Claims



27. In a process for producing a photographic transfer image comprising:

- imagewise-exposing a photosensitive element comprising a support having thereon a layer containing a silver halide composition having associated therewith an image dye-providing material,
 - treating said photosensitive element with an alkaline processing composition to effect development of said exposed silver halide emulsion layer,
 - forming an imagewise distribution of diffusible image dye-providing material as a function of development of said silver halide emulsion layer, and
 - at least a portion of said imagewise distribution of diffusible image dye-providing material diffusing to an image-receiving layer,
- the improvement wherein said silver halide emulsion has associated therewith a blocked development restrainer of the formula:



wherein Z represents the nonmetallic atoms necessary to form an uncharged nucleus which completes a 5- or 6-membered heterocyclic ring on said structure; R is a cyano group; and R¹ and R² can each be hydrogen atoms, alkyl groups or aryl groups.

28. A process according to claim 27 wherein said photosensitive element contains a layer containing a red-sensitive negative silver halide emulsion, a layer containing a green-sensitive negative silver halide emulsion and a layer containing a blue-sensitive negative silver halide emulsion, at least one of said layers containing silver halide emulsion having associated therewith an image dye-providing material.

4,009,030

TIMING LAYER FOR COLOR TRANSFER ASSEMBLAGES COMPRISING A MIXTURE OF CELLULOSE ACETATE AND MALEIC ANHYDRIDE COPOLYMER

Edward P. Abel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,221

Int. Cl.² G03C 7/00, 5/54, 1/40, 1/76

U.S. Cl. 96—29 D

24 Claims

18. In a process for producing a photographic transfer image in color comprising:

- imagewise exposing a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material;
 - treating said element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers, said processing composition contacting said emulsion layer prior to contacting a neutralizing layer;
 - an imagewise distribution of dye image-providing material being formed as a function of development;
 - at least a portion of said imagewise distribution of dye image-providing material diffusing to a dye image-receiving layer;
 - permeating a timing layer associated with a neutralizing layer with said alkaline processing composition after a predetermined time, said timing layer being disposed between said neutralizing layer and said photosensitive silver halide emulsion layer so that said processing composition must first permeate said timing layer before contacting said neutralizing layer;
 - neutralizing said alkaline processing composition by means of said neutralizing layer associated with said photographic element after said predetermined time;
- the improvement comprising employing as said timing layer a compatible mixture of cellulose acetate and a maleic anhydride copolymer to provide a clear layer, said mixture comprising about 2 to about 20% by weight of said copolymer.

4,009,031

DIFFUSION TRANSFER IMAGE-RECEIVING ELEMENT HAVING POLYVINYLPIRIDINE LAYER TREATED WITH HYDROPHILIC COLLOID/AMMONIA SOLUTION

David P. Carlson, Westboro; Thomas R. Keenan, Reading, and Douglas L. Marks, Burlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 420,134, Nov. 29, 1973, abandoned. This application June 6, 1975, Ser. No. 584,488

Int. Cl.² G03C 5/54, 7/00, 1/40; B44D 1/09

U.S. Cl. 96—29 D

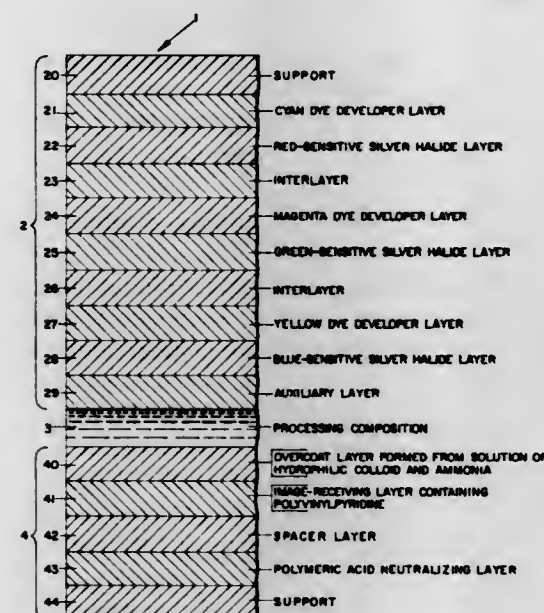
17 Claims

1. An image-receiving element for use in a photographic diffusion transfer color process which comprises, in sequence:

- a support;
- an image-receiving layer comprising polyvinylpyridine on one surface of said support; and
- an overcoat on said image-receiving layer, said overcoat formed, after drying of said image-receiving layer, by coating said image-receiving layer with an aqueous solution comprising a hydrophilic colloid and ammonia.

13. In a process for forming a diffusion transfer dye image wherein an aqueous alkaline processing composition is applied to an exposed photosensitive element which includes a silver halide emulsion having associated therewith a dye developer, thereby effecting development of exposed silver halide, and an imagewise distribution of mobile dye developer is formed which is transferred at least in part, to a superposed image-receiving element having an image-receiving layer comprising polyvinylpyridine, to impart thereto a dye image, and said image-receiving element is separated from contact with said processing composition subsequent to the formation of said dye image, the improvement which comprises:

employing an image-receiving element as defined in claim



4,009,032

PROCESS FOR PREPARING WATERLESS PRINTING MASTERS COMPRISING COPOLYMER OF SILOXANE AND THERMOPLASTIC BLOCKS

Richard L. Schank, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1974, Ser. No. 517,347

Int. Cl.² G03F 7/02; G03G 13/14

U.S. Cl. 96—33

11 Claims

1. A method of preparing a printing master comprising coating a master substrate with a copolymer having from 50–99% by weight siloxane blocks which are curable to an elastomeric ink releasable condition and organic ink accepting blocks which are thermoplastic when heated, selectively curing the siloxane blocks so as to render the polymer ink releasing but wherein the organic thermoplastic blocks are substantially uncrosslinked, depositing an ink accepting particulate material on said master in image configuration, and heating said coating to soften the organic thermoplastic blocks and allowing the coating to cool so as to bond the particulate imaging material to the master.

4,009,033

HIGH SPEED POSITIVE PHOTORESIST COMPOSITION

Peter Bakos, and John Rasile, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,636

Int. Cl.² G03C 1/54; G03F 7/08

U.S. Cl. 96—33

12 Claims

1. A positive photoresist composition developable in an alkaline solution comprising an admixture of a resin, a light-sensitive or electron beam-sensitive 1, 2-quinone-diazide sulfonic acid ester sensitizer and an acid compound selected from the group consisting of picric acid, nicotinic acid and nitrocinnamic acid in admixture characterized by increased sensitivity to light or electron beams as a result of the presence of said acid compound wherein said acid compound is present in an amount such that satisfactory image resolution is obtained.

4,009,034

DRY FILM PROCESSING

Joseph N. May, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 377,887, July 9, 1973, Pat. No. 3,902,041.

This application Feb. 18, 1975, Ser. No. 550,302

Int. Cl.² G03C 5/24, 1/02

U.S. Cl. 96—48 HD

3 Claims

1. A process for developing a discrete area of an extended exposed dry film having a heat developable emulsion placed upon a support material including the following steps in sequence:

- positioning said discrete area of the support side of said film in tension and in contact with a convex surface of a first heating element, said convex surface disposed in spaced face-to-face relationship with a concave surface of a second heating element to define therewith a developing cavity;
- effecting relative movement of said heating elements in a direction to narrow said cavity and to place the exposed emulsion side of said film into close non-contiguous relationship to said concave surface, and
- heating said first and second heating elements substantially uniformly and to substantially the same temperature at or above the threshold developing temperature of said film, whereby the image on said film is fixed in accordance with the pattern created during its exposure

4,009,035

PROCESS FOR FORMING CYAN DYE PHOTOGRAPHIC IMAGES

Tamotsu Kojima; Shui Sato; Takaya Endo; Tugumoto Usui, and Tomio Horiuchi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1975, Ser. No. 543,044

Claims priority, application Japan, Jan. 25, 1974, 49-10787

Int. Cl.² G03C 7/00, 1/40

U.S. Cl. 96—55

3 Claims

1. A process for forming a cyan dye photographic image, which comprises bringing a monohydro-polyfluoroalkylcarbamido compound of the formula



wherein A is a phenolic or naphtholic cyan coupler residue and n is a positive integer of 1 to 7, into contact with exposed silver halide crystals in the presence of an aromatic primary amine type color developing agent for said silver halide crystals.

4,009,036

PHOTOGRAPHIC DEVELOPER

Manfred Becker, Leverkusen, and Roswitha Ullrich, Burscheid, both of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Germany

Filed Dec. 9, 1974, Ser. No. 530,871

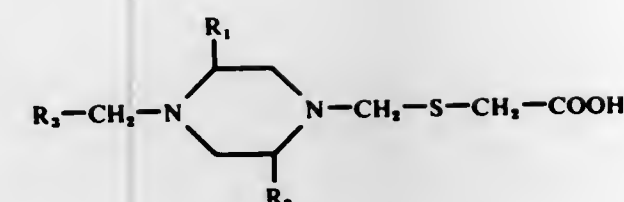
Claims priority, application Germany, Dec. 13, 1973, 2361947

Int. Cl.² G03C 5/30

U.S. Cl. 96—66.3

6 Claims

1. An aqueous alkaline photographic black- and white developer solution containing at least one o- or p-N-hydroxyethylaminophenol developer substance for developing exposed photographic materials which contain at least one silver halide emulsion layer in which the silver halide consists substantially of silver bromide, the improvement which comprises containing in said solution for development retardation at least one piperazine derivative of the formula



wherein

R₁ and R₂ which may be the same or different represent hydrogen or methyl and R₃ represents hydrogen, —S—CH₂—COOH or a photo-graphically inert group stable in alkaline solution selected from the class consisting of an alkyl, cycloalkyl, aralkyl, aryl or heterocyclic group in an amount of from 0.3 to 30 m Mol per liter.

4,009,037

COATED SYNTHETIC FILM MATERIALS

David Roderick Mann, Colchester, and James Albert Barker, Ipswich, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 21, 1974, Ser. No. 435,175

Claims priority, application United Kingdom, Feb. 1, 1973, 5089/73

Int. Cl.² G03C 1/78, 1/96

U.S. Cl. 96—87 R

10 Claims

1. A process for producing a light transmitting coated synthetic film material, which comprises pretreating the surface of a styrene homopolymer or copolymer film and coating said surface with a gelatin-containing layer, the pretreating step consisting of treating the film surface with a solvent for the film without whitening so as to make said film surface porous to said gelatin-containing layer thereby enabling said gelatin-containing layer to penetrate into said film to a greater depth than when said film is not treated with a solvent, drying the solvent, and subsequently corona discharge treating the solvent treated surface.

10. A light transmitting coated synthetic film produced according to the process of claim 1.

4,009,038

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Atsushi Arai; Reichi Ohi; Minoru Yamada; Kenji Yokoo, and Hiroshi Hara, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 23, 1975, Ser. No. 580,272

Claims priority, application Japan, May 23, 1974, 49-58271

Int. Cl.² G03C 1/40, 1/84

U.S. Cl. 96—100

13 Claims

1. A silver halide color photographic material comprising a support having thereon at least a silver halide emulsion layer containing a hydrophobic phenolic or naphtholic cyan dye-forming coupler and at least one 2-(2'-hydroxyphenyl)-benzotriazole compound.

4,009,039

HEAT DEVELOPABLE LIGHT-SENSITIVE OXAZOLINE CONTAINING ELEMENT

Takao Masuda, and Nobuyoshi Sekikawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 18, 1975, Ser. No. 605,700

Claims priority, application Japan, Aug. 19, 1974, 49-94847

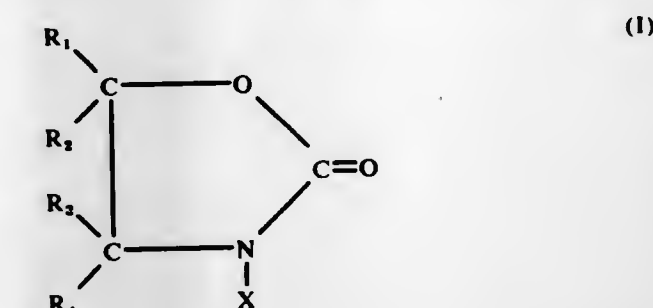
Int. Cl.² G03C 1/02, 1/34

U.S. Cl. 96—114.1

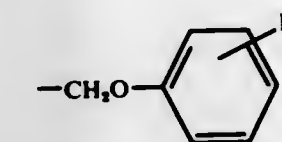
6 Claims

1. A heat developable light-sensitive element comprising a support having therein or in at least one layer thereon (a) an organic silver salt, (b) a light-sensitive silver halide or a compound capable of forming a light-sensitive silver halide upon

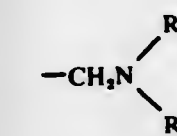
reaction with the organic silver salt, (c) a reducing agent and (d) an oxazolinone compound represented by the following general formula (1):



wherein R₁, R₂, R₃ and R₄ each is a hydrogen atom; an alkyl group having 1 to 22 carbon atoms; a haloalkyl group having 1 to 22 carbon atoms; an amino group; a hydroxyalkyl group having 1 to 22 carbon atoms; an allyl group; a naphthyl group; a benzyl group; a



group in which R₅ is a hydrogen atom, a halogen atom, an alkyl group, an alkylthio group, an amino group or an alkyl-amino group; a benzyloxy group; an aryl group; a haloaryl group; an alkylaryl group; an alkoxyaryl group; an -OR₆ group in which R₆ is hydrogen atom, an alkyl group, an allyl group, an aryl group or an alkoxyaryl group; a



group in which R₇ and R₈ each is a hydrogen atom, an alkyl group, an aryl group or an allyl group; a cyclohexyl group; a —CH₂OR₉ group in which R₉ is a naphthyl group; or a —CH₂R₁₀ group in which R₁₀ is a morpholino group, a piperadino group or an alkylthio group; and X is a hydrogen atom, a chlorine atom or a bromine atom.

4,009,040

HEXAARYLBIMIDAZOLE POLYMERS

William John Nebe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

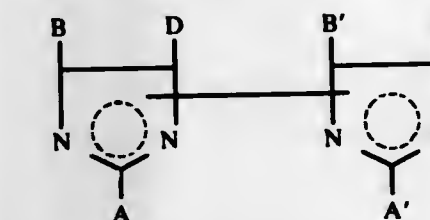
Continuation-in-part of Ser. No. 480,408, June 18, 1974, abandoned. This application May 21, 1975, Ser. No. 579,601

Int. Cl.² G03C 1/68; C08F 2/46

U.S. Cl. 96—115 R

18 Claims

1. A film forming polymer containing a plurality of hexa-arylbimidazole groups of the formula



incorporated in the main chain or a cross-linking side chain of the polymer through one A, B or D group and through one A', B' or D' group wherein

A, B, D, A', B' and D' individually are aryl groups of 6–12 ring atoms substituted with up to one or more of fluorine, chlorine, bromine, cyano, nitro, phenylthio, or alkyl,

alkoxy, acyloxy, acylamido, alkylthio or dialkylsulfamoyl group each having 1-6 carbon atoms.

4,009,041

FOGGED, DIRECT-POSITIVE SILVER HALIDE EMULSION CONTAINING A GALLIUM SULFIDE SEMICONDUCTOR

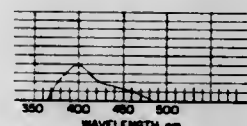
Boris Levy, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1974, Ser. No. 511,462

Int. Cl.² G03C 1/28, 1/02

U.S. Cl. 96-120

6 Claims



1. A direct positive photosensitive element which comprises a particulate dispersion of fogged silver halide crystals, adapted to discharge the fog upon exposure of said crystals to incident electromagnetic radiation actinic thereto, having in contact therewith in electron accepting relationship a particulate dispersion of gallium sulfide semiconductor adapted to accept electrons from said silver halide crystals as a function of said exposure of said crystals to said incident electromagnetic radiation actinic thereto.

4,009,042

TRANSPARENT, INFRA-RED TRANSMITTING GLASS-CERAMICS

Hermann L. Rittler, Horschenda, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,475

Int. Cl.² C03C 3/22, 3/04

U.S. Cl. 106-39.7

1 Claim

1. A transparent glass-ceramic article exhibiting a coefficient of thermal expansion (R.T. to 300° C.) less than about $10 \times 10^{-7}/^\circ\text{C.}$, excellent detergent durability, an infra-red transmittance at a wavelength of 3.5 microns through a polished plate of about 4 mm. thickness greater than 40%, and wherein the crystal phase consists essentially of beta-quartz solid solution, which consists essentially, by weight on the oxide basis, of about 3-4% Li_2O , 20-30% Al_2O_3 , 50-65% SiO_2 , 3-7% TiO_2 , 1.5-3% ZrO_2 , and 2-5% P_2O_5 , and wherein additional alkali metal oxides, the alkaline earth metal oxides, and B_2O_3 are essentially absent.

4,009,043

REINFORCED PLASTICS AND A PROCESS FOR THEIR PRODUCTION

Lothar Preis, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Nov. 5, 1975, Ser. No. 629,105

Claims priority, application Germany, Nov. 15, 1974, 2454221

Int. Cl.² C08L 1/00

U.S. Cl. 106-204

5 Claims

1. Moulding compositions containing 60 to 90% by weight of a thermoplastic or thermosetting polymer or a mixture thereof, 5 to 30% by weight of carbon fibres with an average fibre length of from 200 to 1,000 μm and an average fibre diameter of from 6 to 10 μm and 5 and 30% by weight of potassium titanate whiskers of the formula



with an average fibre length of from 5 to 10 μm and an average fibre diameter of from 0.10 to 0.15 μm .

4,009,044

ADHESIVE COMPOSITION

Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Antonina Mikhailovna Polyakova, ulitsa Vavilova, 55/7, kv. 54; Kira Alexandrovna Mager, Beskudnikovskiy bulvar, 10, korpus 11, kv. 44, and Vyacheslav Nikolaevich Semyantsev, ulitsa Gorkogo, 28, kv. 6, all of Moscow, U.S.S.R.

Filed Mar. 7, 1975, Ser. No. 556,538

Int. Cl.² C09K 3/00

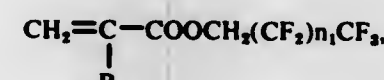
U.S. Cl. 106-287 R

4 Claims

1. An adhesive composition containing monomeric α -cyanacrylates selected from the group consisting of alkyl- α -cyanacrylates, wherein alkyl group contains from 1 to 7 carbon atoms, and allyl- α -cyanacrylate, as well as a modifying additive selected from the group of monomeric fluorinated acrylates consisting of fluorinated methacrylate and fluorinated acrylate of the general formula



wherein $n=1-3$, R is H, CH_3 , and



wherein $n_1=1-2$, and R has the above-mentioned significances, monomeric α -cyanacrylates being used in an amount of 70-90 w.% and the modifying additive in an amount of 10-30 w.%.

4,009,045

CONTINUOUS CRYSTALLIZATION PROCESS AND APPARATUS

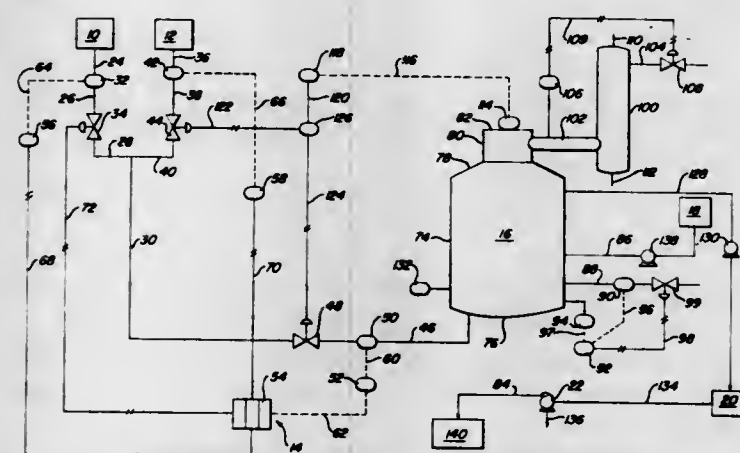
Peter H. Petri, LaPlace, La., assignor to Godchaux-Henderson Sugar Co., Inc., Denver, Colo.

Filed Apr. 21, 1976, Ser. No. 678,937

Int. Cl.² C13F 1/02; C13G 1/06

U.S. Cl. 127-16

13 Claims



1. An apparatus for continuously crystallizing sugar from a sugar bearing solution formed as a mixture of a relatively low purity sugar bearing solution and a relatively high bearing sugar solution, comprising:
a single stage vacuum pan means for continuously boiling a sugar bearing solution and sugar seed crystals at a regulated temperature and pressure to form a massecuite,

means for continuously supplying a relatively low purity sugar bearing solution to form a relatively low purity sugar bearing solution flow stream,
means for continuously supplying a relatively high purity sugar bearing solution to form a relatively high purity sugar bearing solution flow stream,
means for combining the relatively low purity sugar bearing solution flow stream with the relatively high purity sugar bearing solution flow stream to form a mixture of the relatively low purity sugar bearing solution and the relatively high purity sugar bearing solution in a combined flow stream,

a purity control means for controlling the purity of the sugar bearing solution in the combined flow stream by regulating the ratio of the rate of flow of the relatively low purity sugar bearing solution flow stream to the rate of flow of the relatively high purity sugar bearing solution flow stream into the combined flow stream,
means for supplying the combined flow stream to the vacuum pan at a regulated rate,
a sugar seed crystal supply means for supplying sugar seed crystals to the vacuum pan means at a regulated rate,
means for removing at least a portion of the massecuite from the vacuum pan means at a regulated rate to maintain a constant level of massecuite in the vacuum pan means, and
means for continuously separating product sugar crystals from the removed massecuite.

4,009,046

PROCESS FOR TREATING SUGAR-FACTORY MOLASSES

Romain Gustave Edgard Vandewijer, and Joseph Theo Degeest, both of Kuntisch, Vissenaeken, Belgium, assignors to Raffinerie Tirlemontoise, Brussels, Belgium

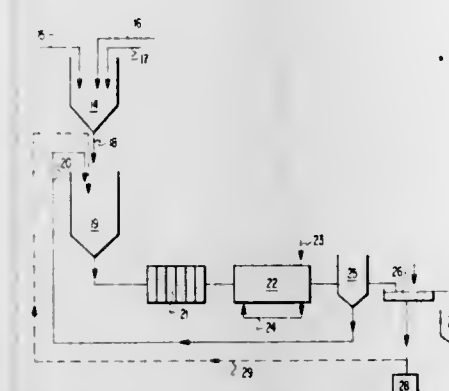
Filed Nov. 8, 1974, Ser. No. 522,175

Claims priority, application Belgium, Nov. 8, 1973, 807063

Int. Cl.² C13J 1/04

U.S. Cl. 127-47

6 Claims



1. In a process for cold treatment of sugar-factory molasses including diluting the molasses with cold water, adding quicklime to the diluted molasses, precipitating a saccharose-lime combination from the molasses and then filtering the molasses, the improvement which comprises adding an electrolyte selected from the group consisting of CaCl_2 , $\text{Ca}(\text{NO}_3)_2$, NaCl , MgCl_2 , and Na citrate in an amount of at least 50 meqv. per 100 g of the saccharose in the molasses prior to or during one of the steps of dilution, addition of quicklime, and precipitation.

4,009,047

METHOD AND DEVICE FOR CLEANING SHEETS

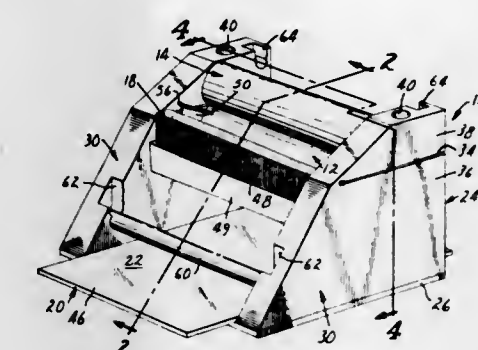
Thomas W. Lindsay, St. Anthony Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 421,326, Dec. 3, 1973, Pat. No. 3,914,817. This application Nov. 19, 1974, Ser. No. 525,098

Int. Cl.² B08B 6/00, 11/00; G03D 15/00

U.S. Cl. 134-9

17 Claims



1. A device for cleaning foreign particles from at least one surface of a sheet, comprising:
a frame;
a cleaning roller rotatably mounted on said frame and comprising a layer of elastic, resilient polymeric material defining for the cleaning roller a cylindrical peripheral surface with a high surface tack adapted to transfer foreign particles from a said sheet to the peripheral surface of the roller upon contact and subsequent separation therebetween while affording clean separation between the sheet and the peripheral surface;
means adapted for defining a path for a said sheet past said cleaning roller with said one surface moving generally tangentially across and in rolling contact with the peripheral surface of said cleaning roller in a direction generally normal to its axis, including means adapted for biasing the sheet to slightly compress the layer of tacky material on the roller when in contact therewith, whereby foreign material on the surface of the sheet will transfer to the tacky peripheral surface of the cleaning roller;
a roller cleaning member having a contact surface with a width about the same as the width of said peripheral surface defining said sheet path, a length at least as long as the circumference of said cleaning roller, and with a greater surface tack with respect to foreign particles than said peripheral surface adapted to transfer said foreign particles from the peripheral surface of said cleaning roller to said contact surface upon contact and subsequent separation therebetween while affording clean separation between said cleaning roller and said contact surface; and
means adapted for moving said contact surface longitudinally over said cleaning roller with rolling contact therebetween for a distance at least equal to the circumference of said cleaning roller to transfer foreign particles on the cleaning roller to the roller cleaning member.

4,009,048

SOLVENT CLEANING AND RECOVERY PROCESS

Bruce E. Jensen, Pensacola, and Jimmie G. Tolar, Milton, both of Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed July 11, 1975, Ser. No. 595,134

Int. Cl.² B08B 3/08, 3/10

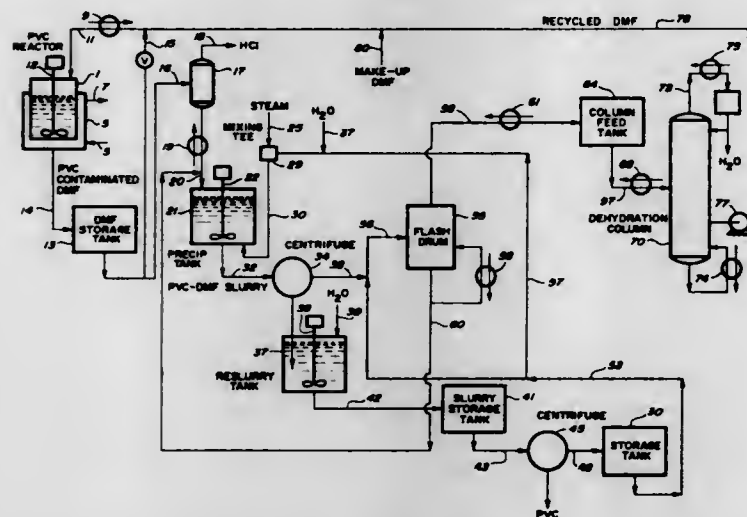
U.S. Cl. 134-12

17 Claims

1. In a process for solvent cleaning polymerization reaction equipment to remove vinyl halide polymers from the internal surfaces thereof which comprises contacting said internal surfaces with a solvent for said vinyl halide polymers heated to

an elevated temperature, said solvent having an atmospheric boiling point above 100° C, and removing a solution containing the vinyl halide polymers dissolved in said solvent from said reaction equipment, the improvement which comprises the steps of:

1. contacting said solution with steam in a vessel to precipitate substantially all of the vinyl halide polymers from said solution to form a first slurry comprising said vinyl halide polymers in an aqueous solution of said solvent and water, said first slurry containing greater than about 6% by weight water and having a temperature within the range of about 75° to 120° C.



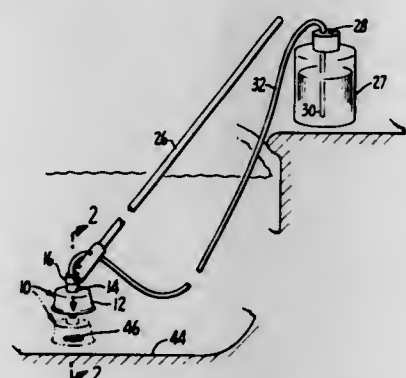
2. cooling said first slurry from step (1) to a temperature less than the highest temperature obtained during step (1) sufficient to form a crumbly precipitate,
3. separating the cooled first slurry from step (2) into a first aqueous solvent solution and a precipitate,
4. adding water to said precipitate from step (3) with agitation to form a second slurry,
5. separating said second slurry into a second aqueous solvent solution and vinyl halide polymers, and
6. dehydrating at least one of said aqueous solvent solutions to recover said solvent.

4,009,049
STAIN REMOVER FOR SWIMMING POOLS, APPARATUS AND METHOD
Andrew L. Pansini, 200 Golden Gate Ave., Belvedere, Calif. 94920

Filed May 15, 1975, Ser. No. 577,900
Int. Cl.² B08B 5/04

U.S. Cl. 134-21

6 Claims



1. Stain remover apparatus for swimming pools comprising a bowl member open at its lower end and adapted to enclose and isolate a pool wall stain area, enclosure means associated with said bowl member defining a chamber for a stain remover liquid, a passageway interconnecting said chamber and the interior of said bowl member, and valve means to selectively open and close said passageway, said valve means including means automatically operable responsive to the bringing into engagement of said bowl member with the pool floor to open said passageway and automatically operable responsive to the

removal of said bowl member from engagement with the pool floor to close said passageway.

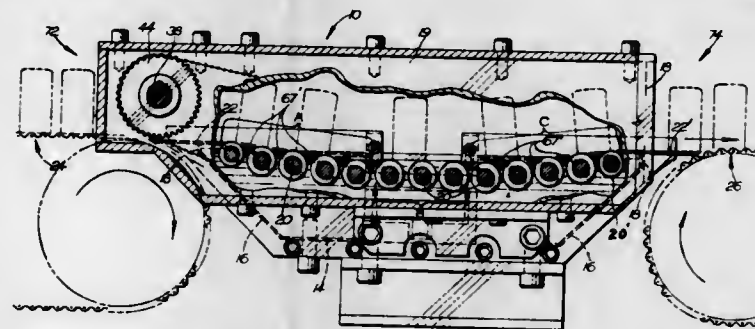
4,009,050
TRANSFER MECHANISM

Arnold D. Beyer, Newark, and Harry X. Tjon, Fremont, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 18, 1975, Ser. No. 642,023
Int. Cl.² B08B 3/04

U.S. Cl. 134-66

22 Claims



1. An article transfer device of the type described comprising the combination of a trough, an article supporting endless surface means disposed in the trough, portions of said surface means being located at selected levels in the trough and providing inclined trough entry and exit ramps, means for effecting movement of said endless surface means so as to provide a forward motion to articles such as can bodies supported in an upright and inverted position on the said endless surface means and a passage of said articles through said trough, means for introducing a liquid medium into said trough and for circulating said medium in the trough and means for controlling the level of said liquid medium in and the circulation of said liquid medium through said trough whereby said liquid medium can be brought into contact with the lower extremities of the articles located in the trough but without adversely affecting the normal upright position of the said articles.

4,009,051

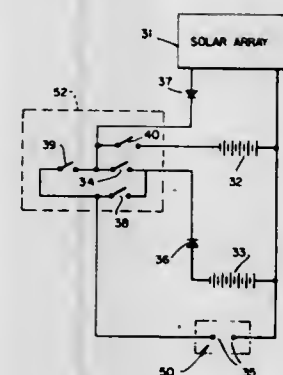
SOLAR POWER PACK APPARATUS

Earle W. Kazis, Rye, N.Y.; Robert Mark, Deerfield Beach, Fla., and Thomas J. Wetherell, New York, N.Y., assignors to General Solar Power Corporation, New York, N.Y.

Filed Feb. 10, 1976, Ser. No. 656,862
Int. Cl.² H01M 10/00

U.S. Cl. 320-15

9 Claims



1. Solar power pack apparatus comprising: photovoltaic cell means; first electrochemical cell battery means in circuit with said photovoltaic cell means; second electrochemical cell battery means having a watt-hour capacity sufficient to increase the watt-hour capacity of said first electrochemical cell battery means when said second electrochemical cell battery means is electrically coupled to said first electrochemical cell battery means; electrical coupling means operative to selectively couple said first and second electrochemical cell battery means; and electrical load terminal means adaptable for connection thereto of an electrical load in circuit with said electrical coupling means.

4,009,052

CHALCOGENIDE BATTERY

M. Stanley Whittingham, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.
Continuation-in-part of Ser. No. 552,599, Feb. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 396,051, Sept. 10, 1973, abandoned. This application Apr. 5, 1976, Ser. No. 673,696
Int. Cl.² H01M 35/02

U.S. Cl. 429-191

24 Claims

1. A battery comprising:
 - a. an anode containing as the anode-active material a metal selected from the group consisting of Group Ia metals, Group Ib metals, Group IIa metals, Group IIb metals, Group IIIa metals, Group IVa metals, and mixtures containing the aforesaid metals such that the aforesaid metals can be electrochemically released from the mixtures;
 - b. a cathode with a sole cathode-active material consisting essentially of
 1. a layered chalcogenide of the formula MZ_x , wherein M is an element selected from the group consisting of titanium, zirconium, hafnium, niobium, tantalum and vanadium; Z is an element selected from the group consisting of sulfur, selenium and tellurium, and x is a numerical value between about 1.8 and about 2.05 or
 - (2) alloys of the aforesaid chalcogenides with one another, said chalcogenides having a structure which will permit intercalation therein by ions of the anode-active material; and
 - c. an electrolyte which does not chemically react with said anode or said cathode and which will permit the migration of ions from said anode-active material to intercalate said cathode-active material.

4,009,053

WRAPPED-ELECTRODE BATTERY

Gerd Schenk, Iserlohn, and Heinz Haake, Rummenohl, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

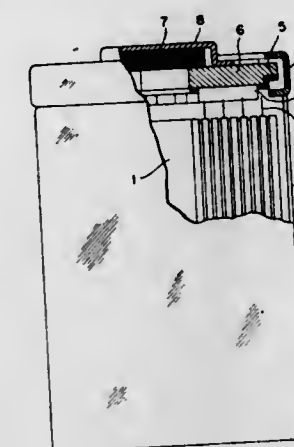
Filed June 16, 1975, Ser. No. 587,165

Claims priority, application Germany, Aug. 9, 1974, 2438296

Int. Cl.² H01M 2/30

U.S. Cl. 429-94

3 Claims



1. In a storage battery having a wrapped electrode, a current take-off conductor contacting the rim of the electrode, and a conductive lid contacting the conductor, the improvement wherein

the current take-off conductor is a generally circular plate having a plurality of radial slots extending between a solid inner annular portion and a solid outer annular portion, the slots having confronting radial edges turned out of the plane of the plate and extending across consecutive turns of the wrapped electrode and engaging the adjacent rim of the electrode, the conductive lid being of annular shape and resting directly on the take-off conductor plate and extending

radially from the inner to the outer solid portion of the plate, and means are provided for pressing the lid against the conductor plate through closure of the battery, whereby conductive connection is established between the plate and the lid.

4,009,054

TERRESTRIAL SOLAR CELL GENERATOR

Hans Gochermann, Holm, and Dieter Rüscher, Wedel, Holstein, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 23, 1975, Ser. No. 616,036

Claims priority, application Germany, Sept. 25, 1974, 2445642

Int. Cl.² H01L 31/04; C03C 27/10

U.S. Cl. 136-89 P

8 Claims



1. In a terrestrial solar cell generator including a plurality of solar cells, a plurality of leads electrically connecting said solar cells to one another, and a transparent housing for said solar cells; the improvement wherein said housing is entirely formed of the same radiation resistant glass fiber reinforced plastic material and encapsulates said solar cells and said connecting leads on all sides, whereby a terrestrial solar cell generator with improved thermal stress properties and whose solar cells are protected against adverse environmental influences is provided.

4,009,055

APPARATUS FOR PRODUCING ELECTRICITY IN CASE OF FIRE

Akinobu Fujiwara, 3204 Shimohatsukari Hattukaricho, Otsubu, Yamanashi, Japan

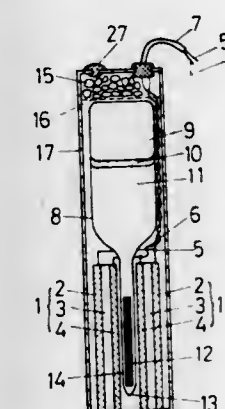
Filed June 3, 1975, Ser. No. 583,396

Claims priority, application Japan, July 15, 1974, 49-81557

Int. Cl.² H01M 6/30

U.S. Cl. 429-112

15 Claims



1. An apparatus for producing electricity in case of a fire, comprising a housing, water-activated cell element, and a normally sealed vessel of breakable material containing an amount of activation electrolyte therein and having tubular capillary means of breakable material integrally thereof and disposed close to said cell element, said tubular capillary means having thermo-sensitive element of bendable material therein.

4,009,056

PRIMARY ALKALINE CELL HAVING A STABLE DIVALENT SILVER OXIDE DEPOLARIZER MIX

El Sayed Megahed; Carol Ruth Buelow, both of Madison, and Patrick Joseph Spellman, Middleton, all of Wis., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Mar. 15, 1976, Ser. No. 666,655

Int. Cl.² H01M 6/06

U.S. Cl. 429-126

18 Claims

4,009,058

METHOD OF FABRICATING LARGE AREA, HIGH VOLTAGE PIN PHOTODIODE DEVICES

Mark Philip Mills, Carleton Place, Canada, assignor to RCA Corporation, New York, N.Y.

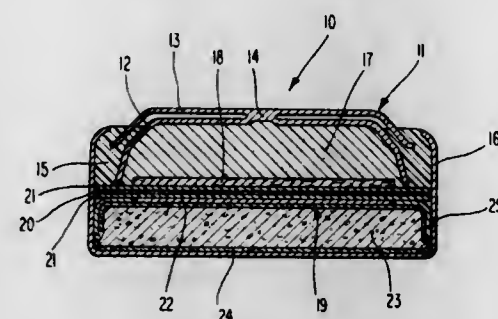
Continuation of Ser. No. 587,360, June 16, 1975, abandoned.

This application Jan. 26, 1976, Ser. No. 652,226

Int. Cl.² H01L 21/265

U.S. Cl. 148-1.5

12 Claims



1. A primary alkaline cell comprising a negative electrode, a divalent silver oxide depolarizer mix containing divalent silver oxide, a separator between said negative electrode and said divalent silver oxide depolarizer mix, and an aqueous alkaline electrolyte, said divalent silver oxide depolarizer mix being surrounded by a reduced layer formed by treating said depolarizer mix with a mild reducing solution, and a layer of silver on the surface of the reduced layer adjacent to the separator, whereby the cell is characterized by the stability of the depolarizer mix in the alkaline electrolyte, a maximum open circuit voltage of about 1.75 volts and a single voltage plateau during discharge.

4,009,057

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Michel de Brebisson, Caen; Alain Gerard Monfret, Echirolles Village, and Jean-Michel Decrouen, Argences, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

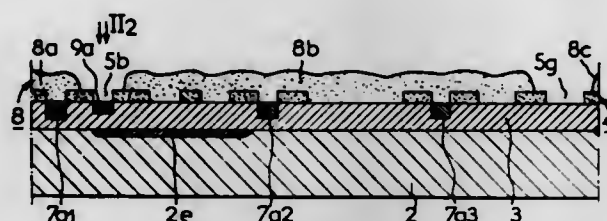
Filed July 22, 1975, Ser. No. 598,015

Claims priority, application France, Aug. 12, 1974, 74.27905

Int. Cl.² H01L 21/265

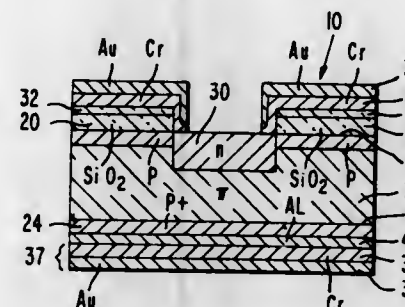
U.S. Cl. 148-1.5

12 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:

- providing a semiconductor body having a substantially flat surface,
- providing a first masking layer of a first material on said surface,
- forming from said layer a basic mask having at least one window,
- providing a second layer of a second material, parts of said second layer being disposed on said first material and at least a part thereof being present on said semiconductor surface within said window,
- removing said first material together with the parts of said second material present thereon so that an island of said second material remains on the semiconductor surface and is present only within the circumference of said window, and
- providing a further mask utilizing said island as an alignment feature related to said basic mask.



1. In a method of fabricating a PIN photodiode device having a body of intrinsic silicon semiconductor material with a resistivity in the range of 5,000 to 30,000 Ω-cm, a large incident surface area, and capable of operating in a reverse bias voltage in the range of 150 to 400 volts, the step of:

- doping said body with an N-type dopant source of a minimum dopant concentration of about 10^{14} atoms per square centimeter without causing lattice damage to the surface of said PIN photodiode body.

4,009,059

REVERSE CONDUCTING THYRISTOR AND PROCESS FOR PRODUCING THE SAME

Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 367,430, June 6, 1973, Pat. No. 3,914,782.

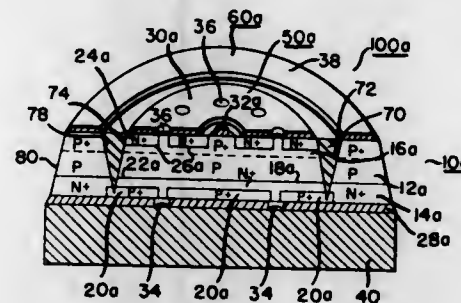
This application Apr. 15, 1975, Ser. No. 568,287

Claims priority, application Japan, Jan. 8, 1972, 47-57193

Int. Cl.² H01L 21/22

U.S. Cl. 148-187

2 Claims



1. A process fabricating a thyristor device, comprising the steps of:

- providing a semiconductor substrate of a first conductivity type and having a pair of opposed major surfaces;
- diffusing impurity atoms of said first conductivity type into said semiconductor substrate to form a region in said substrate at one of said major surfaces and extending into said substrate and which is higher in impurity concentration than the remainder of said substrate;
- diffusing impurity atoms of a second conductivity into said semiconductor substrate to form a region in said substrate at the other of said major surfaces and extending into said substrate and which has a conductivity type opposite that of said substrate;
- diffusing impurity atoms of said second conductivity type into the region of high impurity concentration of said first conductivity type to form a surface region of said second conductivity type extending from said one of said major

surfaces into said region of high impurity concentration and forming therewith a PN junction, said surface region of said second conductivity type being formed to expose portions of said high impurity concentration region which extend to said one of said major surfaces of said substrate; and

- diffusing impurity atoms of said first conductivity type into said region of said second conductivity type at said other of said major surfaces to form thereat and extending into said region of said second conductivity type a second surface region of said first conductivity type and forming therewith a PN junction, said second surface region being formed to expose portions of said region of said second conductivity type which extend to said other of said major surfaces of said substrate.

4,009,060

PRIMER COMPOSITION FOR USE WITH EXPLOSIVE CHARGES

Harold F. Bluhm, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed Sept. 12, 1975, Ser. No. 613,032

Int. Cl.² C06B 25/32, 25/08

U.S. Cl. 149-93

9 Claims



1. A homogeneous primer composition of uniform sensitivity for use with explosive charges consisting of about 50% by weight of the total composition of a nitrotoluene blend of 20-50% dinitrotoluene (DNT) having a melting point of about 69° C. with 50-80% of trinitrotoluene of about 80° C., and about 50% of the total composition of finely granulated pentaerythritol tetranitrate (PETN) of 120-150 mesh size which remains in suspension in the nitrotoluene blend after being mixed with the nitrotoluene blend.

4,009,061

ETCHANT AND METHOD OF ETCHING TIN OXIDE FILM

Paul W. Simon, Millington, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 14, 1975, Ser. No. 604,649

Int. Cl.² B29C 17/08; C23F 1/02

U.S. Cl. 156-635

6 Claims



1. The method of etching tin oxide films comprising the steps of providing an etchant made up of a solution of chromium metal in hydrochloric acid to form chromous ions, and dipping a plate carrying a film of tin oxide in said etchant.

4,009,062

GYPSUM WALLBOARD — MAKING PROCESS AND PRODUCT

William J. Long, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

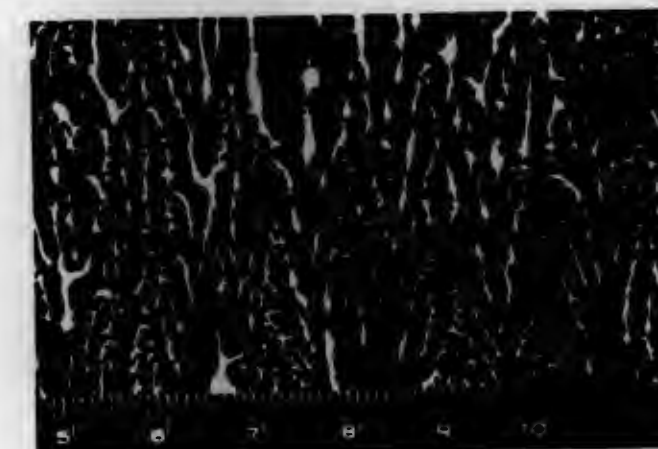
Division of Ser. No. 491,097, July 23, 1974, which is a continuation of Ser. No. 221,324, Jan. 27, 1972, abandoned.

This application May 2, 1975, Ser. No. 574,159

Int. Cl.² B32B 31/12

U.S. Cl. 156-39

7 Claims



1. A process for producing gypsum wallboard comprising the following steps:

- providing at least one paper cover sheet having a bond liner and applying a coating of a non-migratory raw starch adhesive by calendering to provide a pattern having said starch adhesive at limited areas of said bond liner while leaving substantial areas free of said starch adhesive,
- casting an aqueous slurry of calcium sulfate hemihydrate on said paper cover sheet over said bond liner with the water from said aqueous slurry establishing wet bonding between said slurry and the uncoated portions of said bond liner, and
- setting said slurry to form a core and setting said starch adhesive to establish an adhesive bond between said core and said paper cover sheet at the limited areas containing said starch adhesive.

4,009,063

METHOD OF LINING A PIPE

Eric Wood, Ossett, England, assignor to Insituform (Pipes and Structures) Limited, Horbury Junction, near Wakefield, England

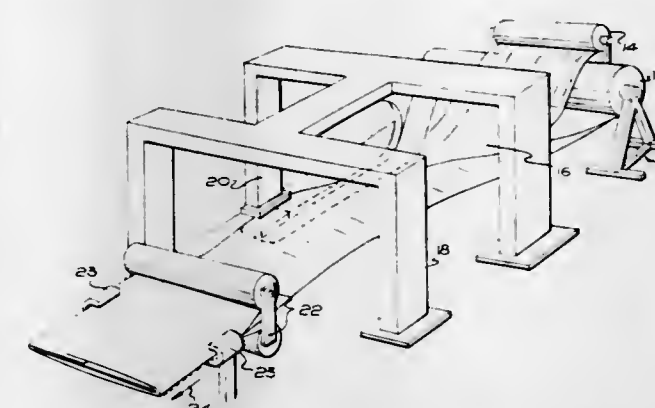
Continuation of Ser. No. 282,071, Aug. 21, 1972, abandoned.

This application Jan. 29, 1975, Ser. No. 544,879

Int. Cl.² E03B 7/00

U.S. Cl. 156-71

19 Claims



1. A method of lining a surface at least partially defining a passageway wherein a laminate of non woven felt sandwiched between an outer membrane and an inner membrane of plastics sheet material is urged by fluid pressure so that said outer membrane lies against said surface, said method including the additional steps of totally impregnating the felt with an un-

cured thermosetting resin so as to completely immerse the felt in the resin, and curing the resin while the laminate is held against such surface so as to form a hard, cured and selfsupporting resin lining having embedded felt reinforcement.

4,009,064

METHOD OF FORMING LAMINATED CURVILINEAR GLASS SHEET

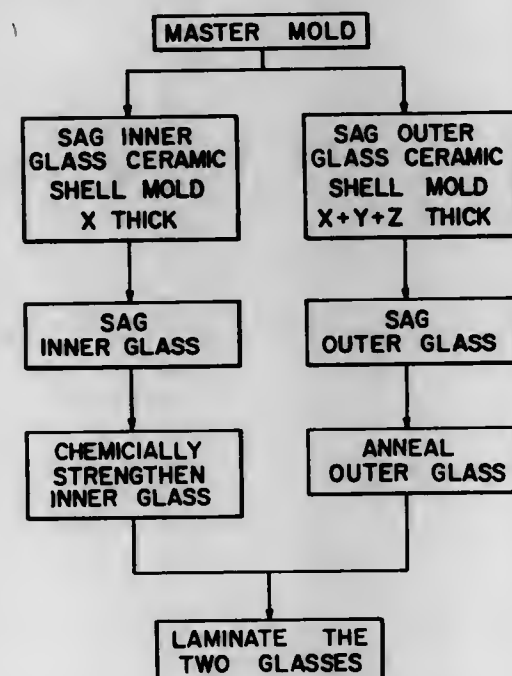
Wendell C. Andrews, Mesa, Ariz., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,697

Int. Cl.² B32B 17/00; C03B 11/00

U.S. Cl. 156-102

7 Claims



1. A method of forming a laminated curvilinear article from glass sheet which comprises, forming a master mold having a surface contour representing the desired contour of the laminated curvilinear article to be formed, sag-forming an inner shell mold of a first predetermined thickness on said master mold with a surface contour virtually identical to that of the master mold, sag-forming an outer shell mold of a second predetermined thickness on said master mold with a surface contour virtually identical to that of said master mold, positioning a first sheet of glass on said inner shell mold and sagging said sheet to conform to the surface contour of said inner shell mold, positioning a second sheet of glass on said outer shell mold and sag-forming said sheet to the surface contour of said outer shell mold, interposing laminating material between said sagged inner and outer layers, and laminating said layers together into a curvilinear composite laminate.

4,009,065

METHOD FOR SPLICING STRIP ENDS TOGETHER

Budai Mikulas, St. Gallen, Switzerland, assignor to Ferd. Ruesch AG, St. Gallen, Switzerland

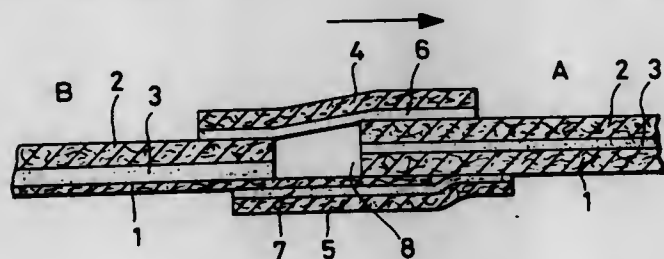
Filed Oct. 10, 1974, Ser. No. 513,751

Claims priority, application Germany, Oct. 13, 1973, 2351533

Int. Cl.² B31F 5/06

U.S. Cl. 156-159

2 Claims



1. A method for splicing the ends of self-stick label compos-

ite strips each formed by a label strip comprising a series of labels and having a pressure-sensitive adhesive inner side, and a label carrier strip having an adhesive-repellent treated inner side on which the label strips' inner side is stuck for subsequent separation therefrom, said label and carrier strips having outer sides forming the outsides of the composite strip and providing adherence for pressure-sensitive adhesive, the composite strip ends being positioned to form an end-to-end joint and spliced by applying flexible pieces spanning said joint on both outsides of the composite strips and having pressure-sensitive adhesive surfaces stuck on said outsides of the composite strips by pressing the splicing pieces towards one another; wherein the improvement comprises first removing a length of said label strip from one of said composite strip ends so as to leave a length of said carrier strip extending therefrom with its said adhesive-repellent treated inner side exposed, and via the repellent treated inner side lapping said length of carrier strip on the adjacent outside of the carrier strip of the other of the composite strip ends while positioning the composite strip ends to form said joint and with said length of carrier strip spanning the joint, and then applying said flexible splicing pieces and pressing them towards each other, said length of carrier strip being interposed between the splicing pieces' pressure-sensitive adhesive surfaces in the event said joint is made with a space between said composite strip ends and the splicing pieces are by flexing pressed inwardly into said space.

4,009,066

METHOD OF MANUFACTURING TUBULAR ELEMENTS

Wilhelm Lachenmayer, Berlebeck, Germany, assignor to Benteler Werke AG, Bielefeld, Germany

Division of Ser. No. 225,878, Feb. 14, 1972, Pat. No. 3,776,993, which is a division of Ser. No. 865,283, Oct. 10, 1969, Pat. No. 3,661,184. This application July 27, 1973, Ser. No. 383,449

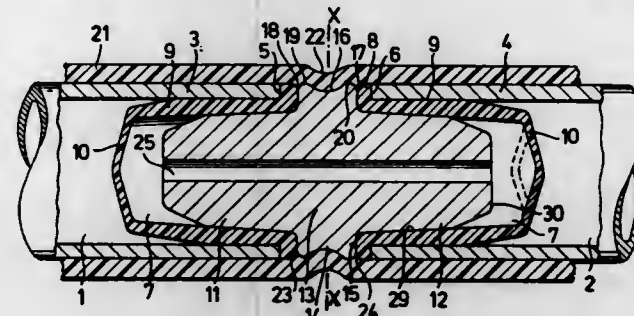
Claims priority, application Germany, Nov. 26, 1968, 1810957

The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.

Int. Cl.² B32B 31/00; B29C 19/00

U.S. Cl. 156-221

6 Claims



1. A method of manufacturing tubular elements comprising the steps of producing a pair of tubular members having opposite open ends and a radial end face surrounding each of said open ends; closing each of said open ends with discrete insert means, each including an annular portion overlying the respective radial end face; aligning said pair of tubular members and substantially juxtaposing said annular portions with spacing therebetween; surrounding both of the tubular members including the transition therebetween with insulating jacket means; and severing said jacket means intermediate said annular portions to thereby obtain two discrete tubular elements.

4,009,067

PROCESS OF FABRICATING COMPOSITE STRUCTURAL MEMBERS

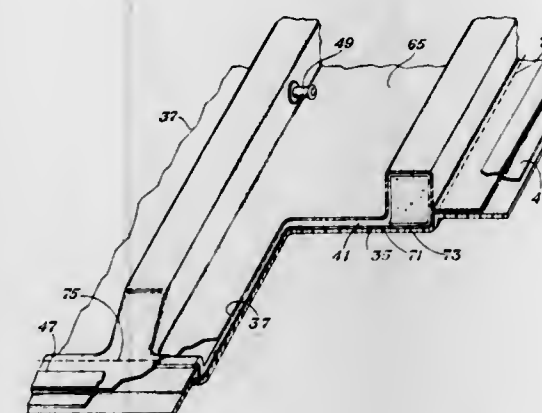
Charles W. Rogers, 4029 Shadow Drive, Forth Worth, Tex. 76116

Filed July 7, 1975, Ser. No. 593,437

Int. Cl.² B29C 17/04

U.S. Cl. 156-245

5 Claims U.S. Cl. 156-380



1. The method of fabricating a structural member having two opposite sides of predetermined shapes, respectively, comprising the steps of:

obtaining two preformed sheets of thermoplastic material preformed to said predetermined shapes respectively, said two preformed sheets being adapted to be assembled together with their inside surfaces facing each other, said two preformed sheets being shaped such that the inside surfaces of their outer edges will abut against each other with a cavity formed between said two preformed sheets inward of their outer edges when said two preformed sheets are assembled together, laying reinforcing material on the inside of at least one of said two preformed sheets in an area which defines the wall of said cavity, said reinforcing material comprising thermosetting resin in the uncured state reinforced with fibers, said thermosetting resin being of the type capable of bonding to said thermoplastic material, said thermoplastic sheets of material having a thickness sufficient to maintain said predetermined shapes at atmospheric pressure during lay-up of the reinforcing material but thin enough to be moved inward to seat against the reinforcing material by a pressure differential created between the inside and outside of the cavity, assembling said two preformed sheets together by abutting the inside surfaces of their outer edges with said reinforcing material located in said cavity between said two preformed sheets, sealing together the outer edges of said two preformed sheets, creating a gas pressure differential between the inside and outside of the cavity with a lower pressure maintained within the cavity relative to the pressure outside of the cavity to cause the walls of said two preformed sheets to seat against said reinforcing material, and curing said resin at a temperature less than the softening temperature of said thermoplastic material to cause said resin and said fibers to bond together and to said preformed sheets such that said preformed sheets become an integral part of said structural member and define the outer surface thereof.

4,009,068

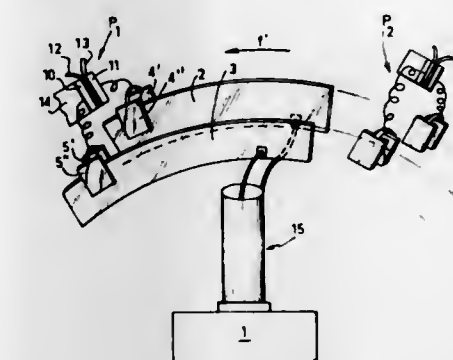
HIGH-FREQUENCY BONDING APPARATUS

Pierre Boussageon, Paris, France, assignor to Societe Generale pour l'Emballage, Paris, France

Continuation-in-part of Ser. No. 551,329, Feb. 20, 1975. This application Feb. 20, 1976, Ser. No. 659,955

Int. Cl.² B32B 19/02; H05B 9/04

9 Claims



1. High-frequency bonding apparatus which comprises a rotating platform carrying a plurality of circumferentially spaced presses, each of said presses having electrode means for bonding material held thereby, stationary high frequency inductor means adjacent said rotating platform, a high frequency generator connected to said stationary inductor means, and a plurality of movable inductor means mounted on said platform, said movable inductor means being connected with the electrodes of said presses respectively and extending in position to overlap said stationary inductor means successively as said presses pass thereby and couple the inductor means of the presses with the stationary inductor means to supply high frequency energy to the electrodes of the presses successively for bonding the material held by the presses.

4,009,069

METHOD AND APPARATUS FOR PRODUCING SYNTHETIC RESIN TUBE

Mikio Kobayashi, Takatsuki, and Isamu Nakano, Toyonaka, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

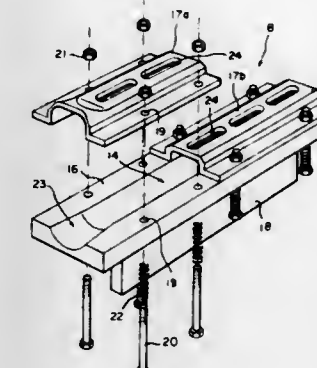
Filed Jan. 27, 1975, Ser. No. 544,665

Claims priority, application Japan, Jan. 28, 1974, 49-12089; Apr. 16, 1974, 49-42871

Int. Cl.² B29D 23/10

U.S. Cl. 156-466

18 Claims



1. An apparatus for producing a synthetic resin tube comprising feed means for transporting a strip of synthetic resin having laterally disposed edges in a longitudinal direction, means for rendering at least one lateral edge of the strip adhesive during transport, and means defining a restricted space for passing the strip therethrough during transport so that the restricted space deforms the strip into a tubular shape having an axis extending in the longitudinal direction of the strip with the laterally disposed confronting edges of the strip being joined together.

brought into pressing contact with each other to conjoin the said edges, characterized in that the feed means comprises a pulling means for transporting the strip, the means defining the restricted space has a plurality of pressing members arranged along the periphery of the restricted space at least some of which are movable relative to each other diametrically of the said restricted space and wherein said movable members are urged in a direction toward a support member.

4,009,070

DEVICE FOR LABELLING OBJECTS ON TWO SIDES
René Maurice Limmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

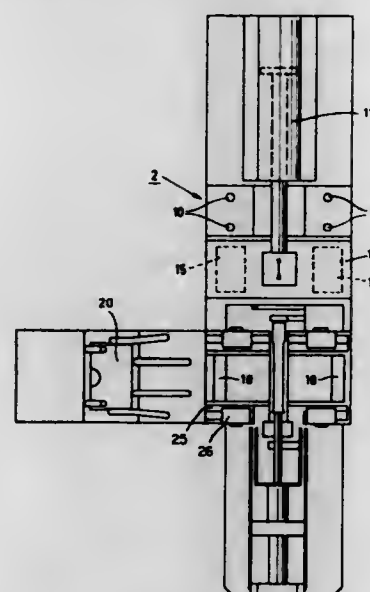
Filed Dec. 2, 1975, Ser. No. 637,069

Claims priority, application Netherlands, Feb. 12, 1974, 7415665

Int. Cl.² B32B 31/00

U.S. Cl. 156—559

2 Claims



1. A device for labelling objects, such as tape cassettes, on two sides, the device being provided with two magazines for the relevant labels and means co-operating therewith for removing and transporting the labels to stations in the device adapted to receive the objects to be labelled, characterized in that the device comprises at least one feeding means for the objects to be labelled for feeding the objects to a track along which the objects can be transported to the stations, said track at the area of the stations comprising positioning means for the objects; a turn-over device arranged between these two stations, said turn-over device comprising a frame having a fully or partly closed window opening which is arranged transverse to the direction of the track and which opening has an inner circumference which at least substantially corresponds to the outer circumference of the objects in a direction transverse to the track, the frame being arranged in the track such that the objects can slide through the window when transported over the track, and means for moving the frame completely outside the track in a direction transverse to the tracks, rotating the frame through an angle of 180°, and returning the frame subsequently to the track.

4,009,071

SHEET BINDING APPARATUS

Donald L. Snellman; John C. Kuspert, both of Seattle, and Arthur G. Saunders, Maple Valley, all of Wash., assignors to Norfin, Inc., Seattle, Wash.

Filed Aug. 10, 1973, Ser. No. 387,541

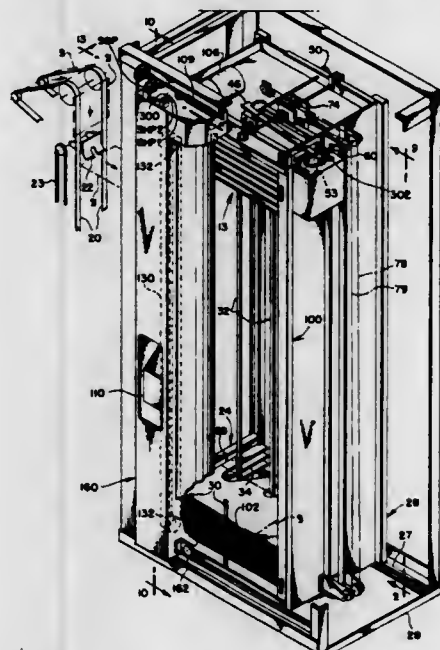
Int. Cl.² B32B 31/00; B05C 1/00; B65H 39/02

U.S. Cl. 156—563

21 Claims

1. Sheet binder apparatus, comprising in combination; compartment means for assembling sheets into individual groups with the sheets having at least one of their edges aligned in a

single plane, adhesive binding means operatively associated with said compartment means and located adjacent said coplanar sheet edges for applying adhesive to bind the sheets in at least one of said groups at a location along the length of the



coplanar edges thereof, and hold down means operatively associated with said binding means and said compartment means for holding the sheets of said one group stationary to maintain coplanar edge alignment thereof during binding.

4,009,072

STRIP APPLYING DEVICE

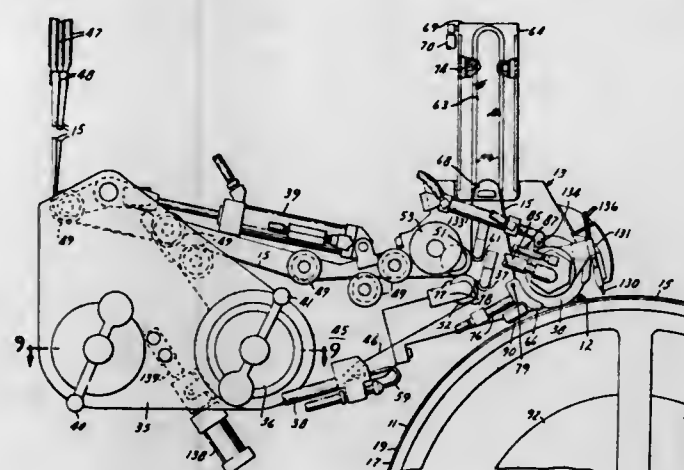
Thomas E. Schultz, Roseville, and Peter W. Schuchardt, May Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 451,684, March 15, 1974, Pat. No. 3,899,383. This application Aug. 11, 1975, Ser. No. 603,790 The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.

Int. Cl.² B29H 21/02

U.S. Cl. 156—584

2 Claims



1. A mechanism adapted to drive a length of strip material from a supply length of strip material having a protective liner applied thereto while stripping the liner from the strip material, said mechanism comprising:

a first roller having a cylindrical peripheral surface about an axis;

a second roller having cylindrical peripheral surface portions about an axis and at least two flattened peripheral surface portions, said first and second rollers being spaced in an axially parallel relationship to provide a nip therebetween adapted to afford driving engagement on opposite surfaces of said lined strip material extending

through the nip therebetween when one of said cylindrical peripheral surface portions is at said nip, and said flattened peripheral surface portions affording movement of the lined strip material through the nip relative to the periphery of the rollers when one of said flattened peripheral surface portions is at said nip;

means for individually driving said first roller and said second roller in opposite rotational directions to propel said lined strip material through said nip when one of said cylindrical peripheral surface portions is at said nip;

means for pressing the separated strip material into continuous driving engagement with the periphery of said first roller at a position spaced around the periphery thereof from said nip; and

an idler roller spaced around the periphery of said second roller from said nip and spaced from said second roller to provide driving engagement between the second roller and the liner when one of said cylindrical peripheral surface portions is adjacent said idler roller and to afford movement of the liner relative to said second roller when one of said flattened peripheral surface portions is opposite said idler roller, said flattened peripheral surface portions on said second roller being spaced so that at an adjust position of said second roller during each revolution thereof, one flattened peripheral surface portion is at the nip between said first and second rollers, while the other flattened peripheral surface portion is opposite said idler roller so that the mechanism will provide positive separation of the liner from the strip material when the lined strip material is driven through the nip between the driven first and second rollers with the strip material then extending along the periphery of the first roller to said means for pressing and the liner extending along the periphery of the second roller to the idler roller, and any slack accumulated in the strip material and liner on the peripheries of the first and second rollers will be removed by slippage caused from tension in the supply length of lined strip material when said second roller rotates through said adjust position.

4,009,073

PRODUCTION OF HARDBOARD IN A CLOSED WATER SYSTEM

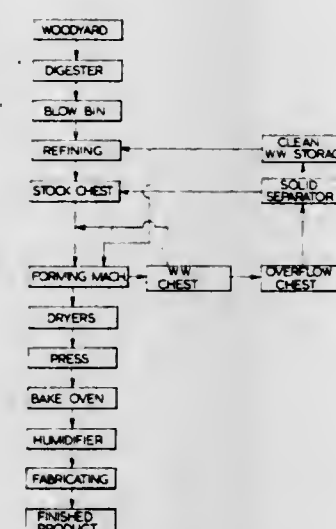
James A. Pozzo, Troy, Mich., and Maxwell M. Yan, Oakville, Canada, assignors to Abitibi Paper Company Ltd., Toronto, Canada

Filed Aug. 11, 1975, Ser. No. 603,686

Int. Cl.² D21F 11/04, 13/00

U.S. Cl. 162—132

11 Claims



1. A process of manufacturing hardboard including the steps of: preparing a pulp stock comprising a suspension of lignocellulose fibres in water, said water also containing therein dissolved solubles which consist essentially of wood sugars released primarily during the pulp stock preparation,

mechanically dewatering said pulp to form a wet mat, drying the wet mat by thermal evaporation, and subsequently pressing the dry mat between the forming surfaces of a heated press to form a hardboard, the improvement comprising: retaining the solubles released during said pulp stock preparation in the water in which said fibres are suspended collecting said solubles-containing water which is separated from said pulp during said mechanical dewatering thereof and feeding said solubles-containing water back to join the water which is used in the process, including that used to suspend the pulp, thereby to provide a closed water process with said water thereby being enriched principally by the dissolved wood sugars therein such that said wood sugars are present in the pulp stock in an amount of from about 2.5 to about 10% by weight, a substantial portion of the dissolved wood sugars in said wet mat being deposited on the surfaces of said mat during said drying of the mat by thermal evaporation, retaining said sugars on the surface of the dry mat, and effecting said pressing of the dry mat to form said board while maintaining the forming surfaces of the press at a temperature sufficient as to cause flowing and caramelization of the sugars retained on the major surfaces of the board immediately adjacent to or in contact with the press forming surfaces to thus provide a skin or crust of said sugars at said major surfaces of the board.

4,009,074

PREPARATION OF LEVULOSE FROM GRANULAR STARCH

Raoul Guillaume Philippe Walon, Brussels, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 13, 1975, Ser. No. 558,184

Int. Cl.² C12B 13/02

U.S. Cl. 195—31 F

12 Claims

1. A process for the direct conversion of granular starch to levulose comprising forming an aqueous slurry of granular starch, bacterial alpha-amylase, glucoamylase and glucose isomerase derived from *Streptomyces albus*, at a temperature of at least about 40°C and below the temperature at which the starch is gelatinized, at a pH of from about 5 to about 7 and maintaining the conditions of temperature and pH so that the insoluble starch retains its essentially granular form while a soluble starch hydrolysate containing levulose is produced, whereby any residual insoluble starch remains in essentially granular, ungelatinized form.

4,009,075

PROCESS FOR MAKING ALCOHOL FROM CELLULOSIC MATERIAL USING PLURAL FERMENTS

William H. Hoge, Flemington, N.J., assignor to Bio-Industries, Inc., Hialeah, Fla.

Filed Aug. 22, 1975, Ser. No. 606,789

Int. Cl.² C12C 11/14

U.S. Cl. 195—33

9 Claims

1. A process for making ethanol from cellulosic fibrous material comprising the steps of steam sterilization of the cellulosic material, thereafter subjecting the resultant sterilized cellulosic material to digestion and fermentation reaction with an inoculum mixture comprising cellulase enzyme and a yeast whereby the cellulosic material is converted to simple sugars with conversion of said sugars to ethanol and recovering ethanol from said digestion and fermentation reaction by vacuum stripping, and recycling the inoculum enzyme-containing residual liquid for reuse to digest subsequent charges of cellulosic material, said digestion of the cellulosic material to simple sugars and the fermentation reaction of the sugars to ethanol being carried out concurrently.

4,009,076

ENZYME GRANULES

Robin John Green; Michael David Key, both of Wirral, England, and Keith William Murray, Mold, Wales, assignors to Lever Brothers Company, New York, N.Y.
Filed Nov. 2, 1973, Ser. No. 412,394
Claims priority, application United Kingdom, Nov. 3, 1972, 50681/72

Int. Cl.² C07G 7/02

U.S. Cl. 195—63

11 Claims

1. An enzyme granule comprising a granule core of solid material carrying an enzyme, said granule having around it a continuous, non-tacky solid coating of plasticised resin substantially free of the enzyme, the resin being selected from the group consisting of dextrin and alkali metal liguosulphonate and having at 20° C and at a neutral pH, a solubility in water of at least 50% by weight, and a 50% aqueous solution of the resin at 20° C having a viscosity of from 0.1 to 25 poises.

4,009,077

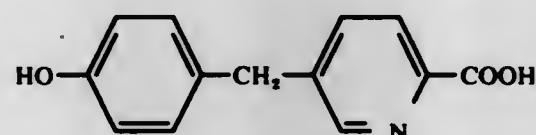
PROCESS FOR THE PREPARATION OF PHENOPICOLINIC ACID

Osamu Tanabe; Akira Obayashi, both of Uji; Teruya Nakamura, Muko; Osamu Suzuka, Kyoto; Masao Murayama, Kyoto, and Shingo Matsumura, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan
Continuation-in-part of Ser. No. 582,766, June 2, 1975, abandoned. This application Aug. 22, 1975, Ser. No. 607,039
Int. Cl.² C12D 13/02

U.S. Cl. 195—81

2 Claims

1. Process for preparation of phenopicolinic acid of the formula:



which comprises culturing a phenopicolinic acid producing strain of the genus Paecilomyces, under aerobic conditions in a medium containing one or more assimilable sources of carbon and one or more assimilable sources of nitrogen, and isolating the phenopicolinic acid thus formed from the culture broth.

4,009,078

DETECTING THE PRESENCE OF MICROORGANISMS
Judd R. Wilkins, Hampton, and Glenn E. Stoner, Charlottesville, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C. and The University of Virginia, Charlottesville, Va.
Continuation-in-part of Ser. No. 543,860, Jan. 24, 1975, abandoned. This application Dec. 16, 1975, Ser. No. 641,279
Int. Cl.² C12K 1/04

U.S. Cl. 195—103.5 R

15 Claims

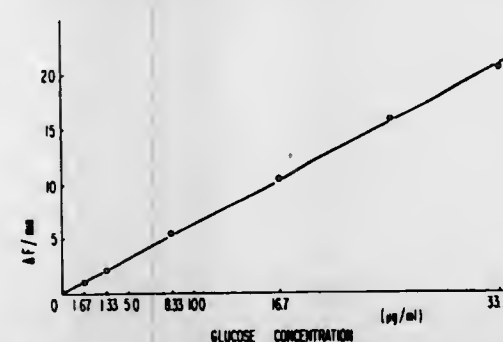
1. A method for detecting the presence of a microorganism in a fluid sample, which comprises:
culturing a microorganism in a liquid growth medium which is in contact with a measuring electrode and a reference electrode; and
detecting the changing potential between said electrodes, which arises by the migration and accumulation of said microorganism adjacent the surface of said measuring electrode thus forming a charge-charge interaction between said measuring electrode and accumulated microorganisms, by measuring said potential change with a high impedance potentiometer having an input impedance of 10^7 to 10^{10} ohms.

4,009,079

METHOD FOR QUANTITATIVELY DETERMINING GLUCOAMYLASE IN HUMAN URINE AND BODY FLUIDS
Kazuaki Tsujino; Junnosuke Kida, both of Osaka; Masanobu Hosotani, Takatsuki; Noshi Minamiura, Nara, and Takehiko Yamamoto, Izumi, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan
Filed Jan. 26, 1976, Ser. No. 652,012
Claims priority, application Japan, Jan. 24, 1975, 50-10731
Int. Cl.² G01H 31/14

U.S. Cl. 195—103.5 R

1 Claim



1. A method for determining the amount of glucoamylase in human urine and body fluids which comprises removing low molecular weight substances having a molecular weight of from about 500 to about 20,000 from a human urine or body fluid sample, adding to the resulting sample which is free of low molecular weight substances maltotriitol which is a specific substrate of glucoamylase, and measuring the amount of glucose, which is the degradation product of the substrate.

4,009,080

METHOD OF TREATING WASTE COMBUSTION GAS FROM COKE OVEN

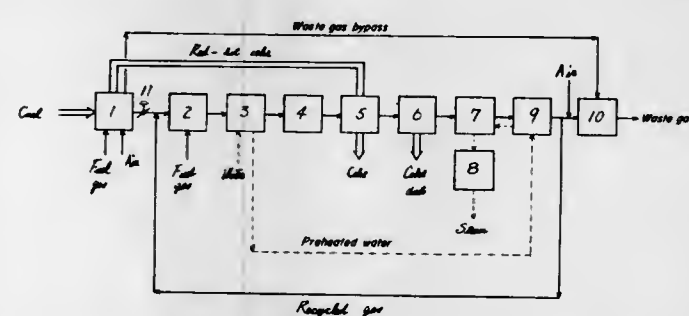
Masaharu Kurokawa, Sakai, and Mitsuru Torii, Itami, both of Japan, assignors to Osaka Gas Company, Ltd., Osaka, Japan
Filed Oct. 14, 1975, Ser. No. 622,240

Claims priority, application Japan, Oct. 16, 1974, 49-119617

Int. Cl.² C10B 39/02

U.S. Cl. 201—29

3 Claims



1. A method of treating waste combustion gas from a coke oven containing nitrogen oxides comprising the steps of passing the waste gas to a deoxidizing zone and burning said waste gas with a fuel gas in the presence of an oxidizing catalyst in said deoxidizing zone, introducing the deoxidized gas into a dry-quenching unit, quenching red-hot coke introduced into said dry-quenching unit with said deoxidized gas passing said heated deoxidized gas to a boiler for the recovery of the sensible heat of the red-hot coke given to the deoxidizing gas egressing from the dry-quenching unit for use as a heat source for generating steam, recycling the deoxidized gas from said boiler to said deoxidizing zone for use as a gas for quenching the red-hot coke, said oxidizing catalyst being at least one species selected from the group consisting of platinum, ruthenium, palladium, oxides of vanadium, cobalt, copper nickel, manganese, chromium and silver.

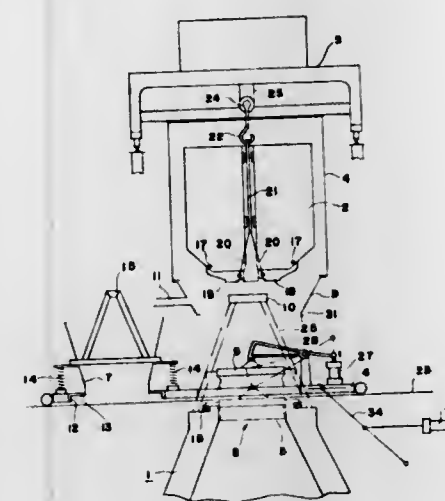
4,009,081

DUST ARRESTING APPARATUS FOR A COKE DRY QUENCHING STATION

Takeshi Ueda; Kunlhei Koizumi, both of Yokohama; Tatsu Otani, Yokosuka, and Shun-ichi Hironaka, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 21, 1975, Ser. No. 634,324
Claims priority, application Japan, Nov. 27, 1974, 49-135598

Int. Cl.² C10B 31/02

U.S. Cl. 202—227



1. In a coke dry quenching installation including a traveling crane for moving a coke bucket which is loaded with hot coke from a coke oven to a position above the top of a dry quenching station, the provision of a dust arresting apparatus comprising: a first hood permanently mounted on said traveling crane to enclose an upper surface and an outer side wall of said coke bucket when said coke bucket is suspended from said traveling crane; rest means fixedly mounted above a coke charging hole provided at the top of said dry quenching station for holding said coke bucket suspended from said traveling crane to charge the hot coke in said bucket into said quenching station; a second hood fixedly mounted together with said rest means to enclose said rest means and adapted to form a unitary hood together with said first hood when said coke bucket is positioned in place on said rest means by said traveling crane, the lower edge portion of said first hood being then positioned close to the upper edge portion of said second hood; a duct connected to said second hood for connecting the interior of said second hood to a suction port of a dust collecting means; a traveling carriage mounted above said coke charging hole and including a top lid for closing the coke charging hole of said dry quenching station, and a chute, said carriage being displaceable to place said chute above said coke charging hole in alignment with said second hood, means for opening and closing said top lid, said top lid being raisable in its open position to a level above the top of the station to permit travel of said carriage; elastic means for urging the lower end of said chute to a position above the top of the station to permit travel of the carriage when the weight of said coke bucket is not applied on said chute; a flange having a downwardly extended peripheral wall at the lower end of said chute; and means for lowering said chute in response to the weight of said coke bucket comprising a pair of saddles mounted on said movable chute to normally occupy a position above said rest means such that when the coke bucket is lowered it rests on said saddles and lowers said chute against the action of the elastic means, an annular groove being provided in said top around said coke charging hole and containing water, said annular groove being positioned to receive said peripheral wall of said flange to provide a water seal when said chute is lowered.

4,009,082

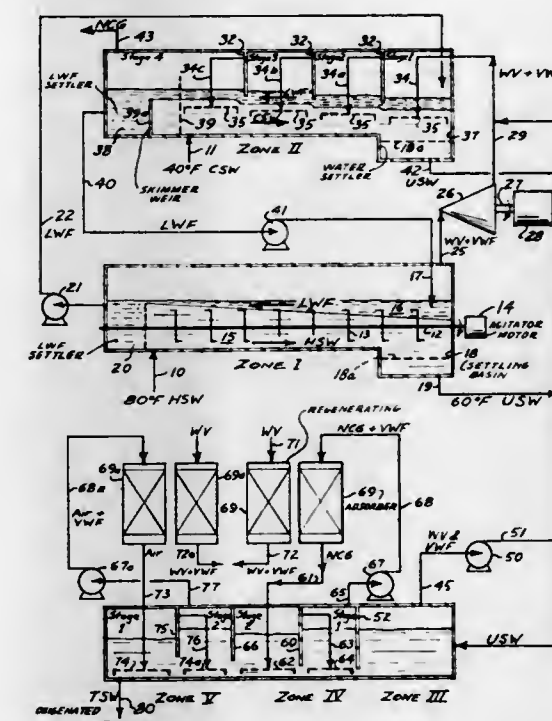
PRODUCTION OF ENERGY BY DIRECT CONTACT OF WATER IMMISCIBLE WORKING FLUID WITH HOT OR WARM WATER TO VAPORIZE LIQUID WORKING FLUID, UTILIZATION OF VAPOR TO PRODUCE MECHANICAL ENERGY AND DIRECT CONTACT OF SPENT VAPOR WITH COLD OR COOL WATER TO CONDENSE SAME

Calvin Schwartz Smith, Jr., 8529 Betty Lane, El Cerrito, Calif. 94530

Continuation-in-part of Ser. Nos. 480,963, June 19, 1974, and Ser. No. 224,018, Feb. 7, 1972, Pat. No. 3,856,631, and Ser. No. 19,592, March 16, 1970, Pat. No. 3,640,850. This application Dec. 1, 1975, Ser. No. 636,417
Int. Cl.² B01D 3/00, 3/34

U.S. Cl. 203—11

25 Claims



- g. causing the vapor of working fluid (VWF) generated in step (f) to expand through a combustionless gas pressure to mechanical energy converter thereby producing mechanical energy,
- h. causing the expanded vapor (VWF) from step (g) to pass into Zone II and to flow, together with its condensate (LWF), through Zone II countercurrently to the flow of water (CW) therein and in intimate direct contact with said water, thereby condensing the vapor of working fluid (VWF) to liquid working fluid (LWF), and
- i. separating the liquid working fluid (LWF) produced in step (h) and returning it to Zone I.

4,009,083

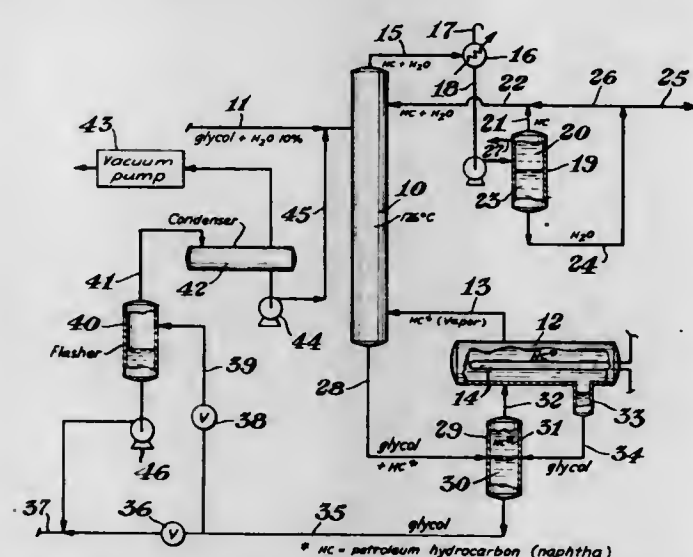
REGENERATION OF LIQUID DESICCANTS AND ACID GAS ABSORBING LIQUID DESICCANTS

George W. Lyon, Midland, Mich., and Roscoe L. Pearce, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 177,414, Sept. 2, 1971, abandoned. This application June 23, 1975, Ser. No. 589,225 Int. Cl.² B01D 3/34, 53/02

U.S. Cl. 203-49

25 Claims



1. In a method of regenerating liquid desiccants or acid gas absorbing liquid desiccants or mixtures thereof, the steps comprising, feeding a rich liquid absorbent into an upper portion of a regeneration column, vaporizing by heat a normally liquid hydrocarbon or mixture of hydrocarbons substantially insoluble in the dried desiccant and in water, which hydrocarbon has a boiling temperature below the upper and above the lower critical solution temperatures of the mixture of the desiccant and the said hydrocarbon under the pressure conditions employed, passing the vapors upwardly through the rich liquid absorbent, said vapors being the sole source of heat added for regeneration of the desiccant, condensing overhead vapors from the regenerator out of direct contact with the rich liquid absorbent, separating liquid hydrocarbon from water, and returning at least a portion of the overhead hydrocarbon condensate to the regeneration column as reflux, passing a two phase liquid mixture from the regenerator into a separator to form a lean desiccant phase and a liquid hydrocarbon phase, passing the hydrocarbon phase into a vaporizer wherein the hydrocarbon phase is heated and vaporized for recycle to the regenerator, and removing the lean desiccant phase from the separator.

4,009,084

PROCESS FOR THE SEPARATION OF DIOLEFINS FROM MIXTURES CONTAINING THE SAME

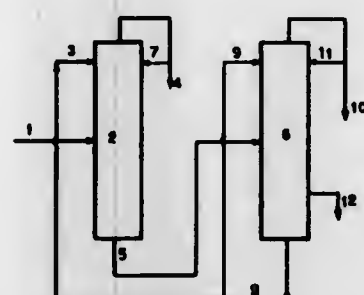
Giancarlo Paret, Milan, and Ermanno Cinelli, San Donato Milanese, both of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 305,549, Nov. 10, 1972, abandoned, which is a continuation of Ser. No. 55,660, July 17, 1970, abandoned. This application Jan. 15, 1975, Ser. No. 541,343

Claims priority, application Italy, July 18, 1969, 19814/69 Int. Cl.² B01D 3/34

U.S. Cl. 203-53

1 Claim



1. An extractive distillation process for separating butadiene from a hydrocarbon mixture containing butadiene, C-4 saturated and olefinic hydrocarbons and acetylenic compounds which comprises the steps of feeding said hydrocarbon mixture to a first stage extractive distillation column at a point spaced below the top thereof and feeding an extractive distillation agent consisting of an aqueous mixture of N-formyl morpholine and up to 20% of water to said first stage extractive distillation column at the top thereof, withdrawing said C-4 saturated and olefinic hydrocarbons from the top of the first stage extractive distillation column, withdrawing the butadiene, the extractive distillation agent and the acetylenic compounds as a bottom product from said first stage extractive distillation column, thereafter feeding said bottom product to a second stage extractive distillation column at a point spaced below the top thereof, recovering butadiene from said second stage extractive distillation column as overhead, recovering the acetylenic compounds and the extractive distillation agent from the bottom of the second stage extractive distillation column, dividing the extractive distillation agent recovered from the bottom of the second stage extractive distillation column into two portions, recycling one of said portions to the first stage extractive distillation column to the top thereof, and recycling the other of said portions to said second stage extractive distillation column to the top thereof.

4,009,085

LUBRICATING COATING FOR METAL SHEET

Richard E. Woehle, Berkley, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation of Ser. No. 545,986, Jan. 31, 1975, abandoned, which is a division of Ser. No. 320,642, Jan. 2, 1973, Pat. No. 3,922,183, which is a continuation-in-part of Ser. No. 158,511, June 30, 1971, abandoned. This application Dec. 18, 1975, Ser. No. 642,065

Int. Cl.² C25D 9/08

U.S. Cl. 204-27

7 Claims

1. A process for treating metal sheet and strip stock to impart lubricity and abrasion resistance thereto which comprises electrodepositing a lubricating film containing both trivalent chromium oxide and a water soluble surfactant from an aqueous bath composition and containing hexavalent chromic acid in a concentration of from 1 gram per liter to 100 grams per liter and at least one water soluble surfactant in a concentration of 0.05 grams per liter to 20 grams per liter which comprises passing current from an anode to a cathode through said aqueous bath composition, at a current of 1-30 amperes per square decimeter (asd) and a temperature of 40°-85° C, for a time period of from 0.5 to 5 seconds to de-

posit a lubricant containing trivalent chromium oxide film containing 0.1 milligrams to 100 milligrams of occluded surfactant and 3 milligrams to 300 milligrams of trivalent chromium oxide per square meter of treated surface upon said cathode.

4,009,086

METHOD FOR A SURFACE TREATMENT OF AN IRON, FERROUS ALLOY OR CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyooka; Tohru Arai, and Yoshihiko Sugimoto, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Division of Ser. No. 412,246, Nov. 2, 1973, Pat. No. 3,930,575.

This application Oct. 17, 1975, Ser. No. 623,330

Claims priority, application Japan, Nov. 6, 1972, 47-111030; Nov. 6, 1972, 47-111033; June 26, 1973, 48-071276; June 26, 1973, 48-071277

Int. Cl.² C25D 3/66

U.S. Cl. 204-39

12 Claims

1. A method for forming a hard layer comprising the carbide of titanium on the surface of an iron or ferrous alloy article containing at least 0.05% by weight of carbon, comprising the steps of

preparing a molten bath consisting essentially of 60 to 99% by weight of a molten boron compound selected from the group consisting of boric acid and borate and 1 to 40% by weight of a substance containing titanium in a vessel, immersing the article into the molten bath at a temperature within the range of from 800° to 1100° C, applying an electric current with a current density of cathode within a range of 0.005 to 5 A/cm² to the molten bath through said article being used as the cathode and a carbon anode being contacted with the molten bath for forming the hard layer comprising the carbide of titanium on the surface of said article, and taking said article out of said molten bath.

4,009,087

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M&T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 525,718, Nov. 21, 1974, Pat. No. 3,956,079, and a continuation-in-part of Ser. No. 525,940, Nov. 21, 1974, Pat. No. 3,940,320, which is a

continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Dec. 24, 1975, Ser. No. 644,350 Int. Cl.² C25D 3/38

U.S. Cl. 204-52 R

84 Claims

1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

- 0.005 to 40 grams per liter of an N-heteroaromatic compound containing 1 or 2 N-heteroaromatic rings, said rings being selected from a group consisting of pyridine, quinoline, isoquinoline and the benzoquinolines, which compound does not contain nonquaternary amino groups that are not part of the said N-heteroaromatic rings, nor bivalent sulfur atoms, and is not quaternized on its ring nitrogen atoms by aralkyl, aryl, alkaryl radicals; and
- about 0.01 mg/l to 1000 mg/l of sulfoalkylsulfide and sulfoarylsulfide compounds containing the grouping $-S_n-X-SO_3M$ where $n = 1$ to 5 , $-X-$ is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms or a divalent aromatic or aliphatic-aromatic hydrocarbon group of 6 to 12 carbon atoms and M is one gram-equivalent of a cation.

4,009,088

PROCESS FOR PRODUCING AQUEOUS SOLUTIONS OF SODIUM, AMMONIUM AND MAGNESIUM SULPHITE

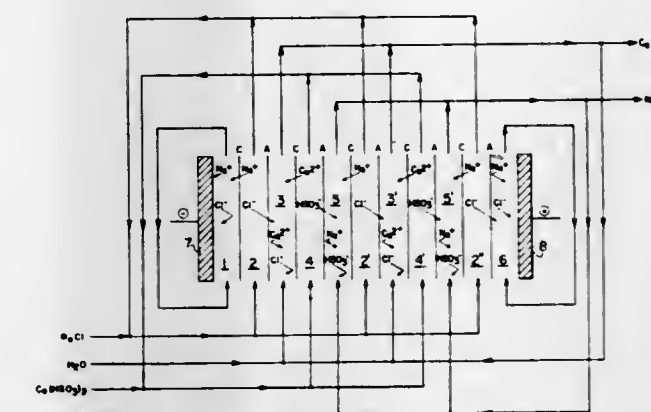
Hans Joachim Hampel, Eschborn; Rolf Eggersdorfer, Bad Homburg, both of Germany, and Alpo Johannes Ora, Rauma, Finland, assignors to Rauma-Repola Oy, Rauma, Finland

Continuation of Ser. No. 665,851, March 10, 1976, abandoned. This application Apr. 7, 1976, Ser. No. 674,554 Claims priority, application Germany, Mar. 10, 1975, 2510343

Int. Cl.² B01D 13/02

U.S. Cl. 204-180 P

10 Claims



1. A process for producing an aqueous solution of a solute product selected from the group consisting of sodium sulphite, sodium hydrogen sulphite, ammonium sulphite, ammonium hydrogen sulphite, magnesium sulphite and magnesium hydrogen sulphite by electrochemical treatment of a first aqueous feed solution of a solute selected from the group consisting of calcium sulphite and calcium hydrogen sulphite and a second aqueous feed solution of a chloride salt selected from the group consisting of sodium, ammonium and magnesium chloride, said electrochemical treatment producing the solute product and calcium chloride as a by-product wherein the electrochemical treatment is performed in a multi-cell stack electrochemical unit having an anode and a cathode electrode and alternately arranged anion and cation selective membranes between the cells thereof, which comprises flowing the first aqueous feed solution through a first cell having a cation selective membrane separating it from the cell on one side and an anion selective membrane separating it from the cell on the other side; flowing a dilute aqueous solution of the by-product through the cell adjacent the cation selective membrane side of the first cell and a dilute aqueous solution of the solute product through the cell adjacent the anion selective membrane side of the first cell and passing the second aqueous feed solution of the chloride salt through cells on each of the other sides of the product and by-product cells, the second feed solution cell being separated from the by-product cell by an anion selective membrane and from the product cell by a cation selective membrane whereby when d.c. voltage of adequate polarization is applied to the electrodes of said multi-cell stack, the ions of said first and second aqueous feed solutions pass through the separating membranes to produce the product solute in the product cell and calcium chloride in the by-product cell.

4,009,089

FILTERING PROCESS

James H. Crissman, Kiskiminetas Township, and G. Ray Fritzsche, Bradford Woods, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 15, 1975, Ser. No. 613,257

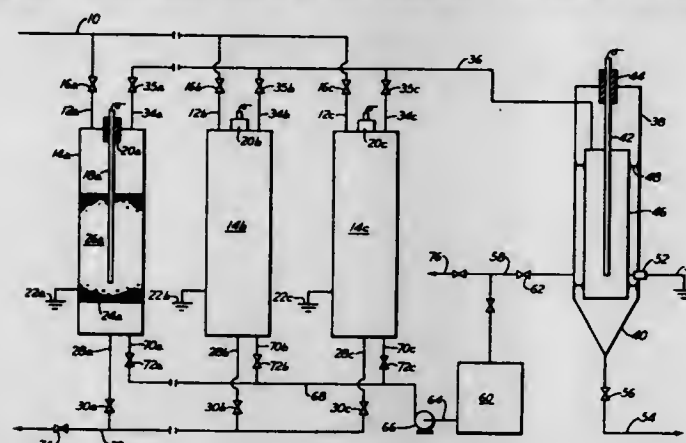
Int. Cl.² B03C 5/00

U.S. Cl. 204-188

11 Claims

1. A method of separating finely divided solid particles having a nominal diameter less than 5 microns from a nonconductive liquid comprising maintaining a voltage gradient of

5-20 kilovolts per inch in a permeable bed of smooth ceramic spheres having a diameter of one-eighth inch to one-fourth inch supported within a filter casing, passing the nonconductive liquid through the permeable bed whereby solid particles in the liquid are deposited on the ceramic spheres, discharging filtered product from the filter, discharging the filter by discontinuing the voltage gradient through the filter bed when the amount of solids deposited increases above a desired range, flowing a backflush liquid upwardly through the de-charged permeable bed at a rate adapted to remove deposited



solids from the spheres, discharging from the filter backflush liquid with entrained solids removed from the spheres, delivering the backflush liquid and entrained solids into an electrothickener containing spaced-apart electrodes with unobstructed space between the electrodes, applying a voltage gradient of 10-30 kilovolts per inch to the backflush liquid in the electrothickener, holding the backflush liquid in the electrothickener to allow settling of solid particles from the backflush liquid in the electrothickener, withdrawing settled solids from the bottom of the electrothickener, and separately withdrawing backflush liquid from the electrothickener.

4,009,090

SPUTTER-COATING OF GLASS SHEETS OR OTHER SUBSTRATES

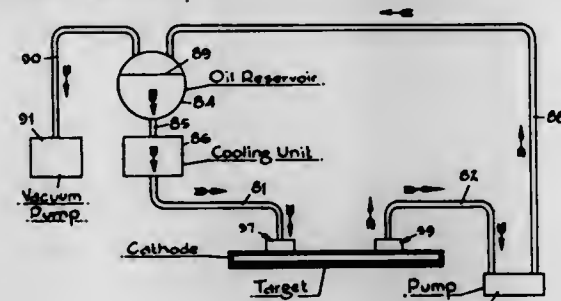
Neil D. Veigel, Novi, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Dec. 3, 1975, Ser. No. 637,281

Int. Cl.² C23C 15/00

U.S. Cl. 204-192

11 Claims



1. In the method of sputter-coating glass sheets and other substrates with a thin film of a selected coating material applied by transport from a surface of a sputtering cathode provided with a chamber through which a cooling medium is circulated, the improvement which comprises circulating an oil under a constant head pressure through a closed system in which the cathode is interposed, and continuously withdrawing air and other gases from said system to reduce the pressure differential across the walls of the cathode as the oil circulates through the cathode chamber at less than atmospheric pressure.

6. In apparatus for sputter-coating glass sheets and other substrates with a thin film of a selected coating material, a cathode which includes a housing having a chamber therein, said housing adapted to have a sheet of the coating material

applied to a surface thereof, means for internally cooling said cathode comprising a closed cooling system in which the cathode is interposed, said system including means for circulating an oil under constant heat pressure through the chamber in said cathode, and means for continuously withdrawing air and other gases from said system such that the pressure differential across the walls of the cathode chamber is less than atmospheric pressure.

4,009,091

SKIPPING SINE WAVE PULSE PLATER SYSTEM

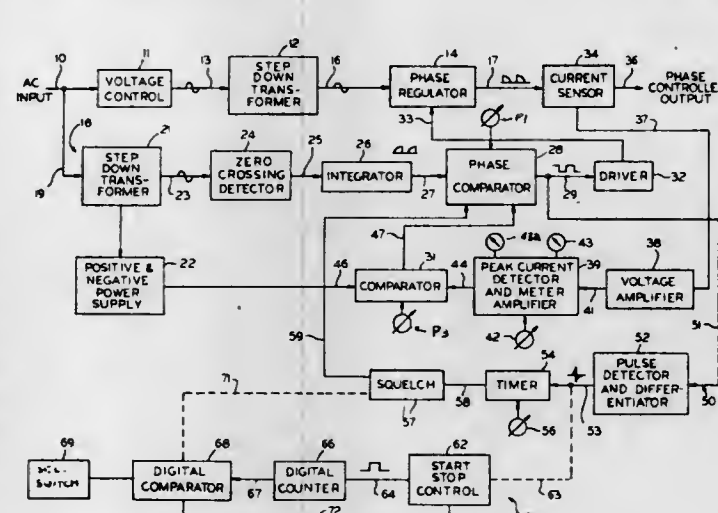
Harold Washington, Countryside, and Martin Kozi, Berwyn, both of Ill., assignors to Instrumentation & Control Systems, Inc., Addison, Ill.

Filed Apr. 27, 1976, Ser. No. 680,727

Int. Cl.² C25B 15/02; C25D 21/12

U.S. Cl. 204-228

10 Claims



1. A skipping sine wave pulse plating system for providing power from an alternating current source to electrodes in an electroplating bath, said system comprising voltage control means for controlling the amplitude of the power provided to said electrodes, duty cycle control means for controlling the duty cycle of the power applied to said electrodes by conducting only during prescribed phases of said alternating current, means for connecting said duty cycle control means to said electrodes, power sensing means in said connecting means for determining the power provided to said electrodes, drive circuit means for controlling said duty cycle control means, phase comparator means associated with said drive circuit means for setting said duty cycle by controlling the prescribed phases, drive circuit control means operated responsive to said power sensing means for controlling said drive circuit means to maintain the duty cycle as set, and squelching means for controlling the output of said drive circuit means to enable reducing the duty cycle to a condition of less than 25 percent while still maintaining a constant output amplitude.

4,009,092

SUBSTITUTED LITHIUM PHOSPHATES AND SOLID ELECTROLYTES THEREFROM

Barry Edward Taylor, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

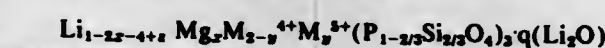
Filed Feb. 27, 1976, Ser. No. 662,003

Int. Cl.² C25B 9/00; H01M 6/04

U.S. Cl. 204-242

16 Claims

1. A lithium phosphate of the formula:



wherein

M^{+} is at least one of zirconium and hafnium;

M^{+} is at least one of niobium and tantalum;

x is 0 to about 0.15;

y is 0 to about 0.5;

z is 0 to about 0.3;

q is 0 to about 0.2; and

$2x+y-z$ is at least -0.1 and at least one of x , y and z is not equal to 0.

4,009,093

PLATABLE POLYMERIC COMPOSITION

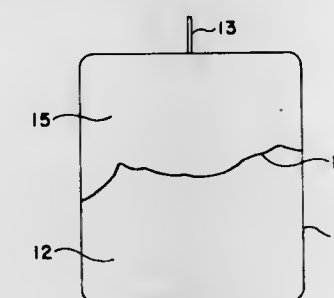
Daniel Luch, Warwick, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 408,410, Oct. 23, 1973, Pat. No. 3,865,699. This application Nov. 27, 1974, Ser. No. 527,532

Int. Cl.² C25B 11/04

U.S. Cl. 204-291

2 Claims



1. A cathode adapted to be employed in a process of electrodeposition wherein metal of Group VIII of the periodic table is electrodeposited directly thereon comprising a structure formed from a composition comprising a polymer from the group of polyethylene, polypropylene and mixtures and copolymers thereof and, in percent by weight of the total composition, about 15% to about 60% of carbon black and a material from the group of sulfur and sulfur donors in an amount equivalent in sulfur content to about 1% to about 10% of dipentamethylenethiuram hexasulfide, said carbon black being in an amount sufficient to provide in said composition of matter in massive form an electrical volume resistivity of less than about 1000 ohm-centimeters, the sulfur and carbon black being present in said composition of matter in cooperative amounts sufficient to induce rapid coverage of said composition of matter with Group VIII metal when said cathode is employed in a Group VIII metal electrodeposition bath.

4,009,094

STABILIZING PYROLYSIS NAPHTHA

Edward L. Cole, Fishkill, and John T. Nolan, Jr., Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,759

Int. Cl.² C10G 9/14, 35/02

U.S. Cl. 208-48 AA

8 Claims

1. A process for reducing reactive olefinic and diolefinic unsaturation of pyrolysis naphtha, which process comprises:

- mixing pyrolysis naphtha with water in a liquid volume ratio of from about 0.5/1 to about 3/1 pyrolysis naphtha to water;
- mixing the pyrolysis naphtha-water mixture of step (a) with residuum oil to form a pyrolysis naphtha-water-residuum oil mixture comprising not more than about 10 liquid volume percent pyrolysis naphtha-water mixture;
- treating the pyrolysis naphtha-water-residuum oil mixture of step (b) at conditions for delayed coking of said residuum oil; and
- recovering a naphtha product fraction, substantially free of reactive olefinic and diolefinic unsaturation from treating step (d).

4,009,095

MIXED-PHASE FLUID DISTRIBUTION FOR PACKED CHAMBERS

Don B. Carson, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 414,555, Nov. 9, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,285

Int. Cl.² B01J 13/00; C10G 13/00

U.S. Cl. 208-108

10 Claims

1. In the catalytic treatment of hydrocarbons wherein a mixture of hydrocarbon liquid and a gas is passed through a bed of solid particulate catalyst at conversion conditions, the improvement which comprises generating foam from said mixture and introducing said foam to the bed of solid catalyst.

4,009,096

HYDROPROCESSING OF HYDROCARBONS

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 648,544, Jan. 12, 1976, Pat. No. 3,992,464, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application June 4, 1976, Ser. No. 693,059

Int. Cl.² C07G 13/04; B01J 23/62

U.S. Cl. 208-111

6 Claims

1. A hydrocarbon process which comprises reacting a hydrocarbon with hydrogen at conditions selected to effect chemical consumption of hydrogen, and in contact with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt.% platinum group metal, about 0.5 to about 5 wt.% cobalt, about 0.01 to about 5 wt.% tin and about 0.1 to about 3.5 wt.% halogen, wherein the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the tin is present in an oxidation state above that of the elemental metal, and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions.

4,009,097

SEPARATION PROCESS

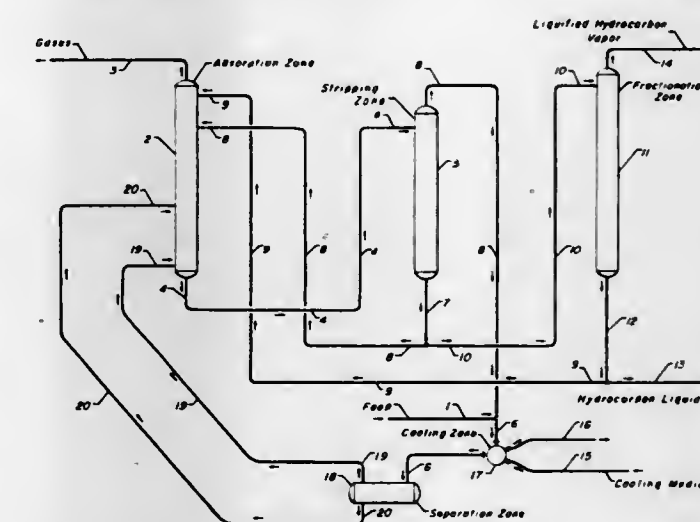
Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 453,656, March 21, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,888

Int. Cl.² C10G 5/04

U.S. Cl. 208-342

3 Claims



1. A process for the recovery of selected hydrocarbon liquid and vapor constituents from a feed stream containing said constituents, which comprises the steps of:

- commingling said feed stream with a stripped vapor formed as hereinafter set forth;

- b. cooling the resultant mixture sufficiently to effect partial condensation thereof;
- c. separating the thus cooled mixture into a liquid phase and a vapor phase;
- d. introducing said vapor phase into the lower portion of an absorption zone and introducing said liquid phase to said zone at a higher elevation than the vapor phase;
- e. passing a rich oil from the lowermost point of the absorption zone to a stripping zone and therein stripping absorbed components therefrom;
- f. commingling resultant stripped components with said feed stream as said stripped vapor;
- g. introducing a portion of the stripped oil from the stripping zone to the absorption zone at higher elevation than said liquid phase;
- h. fractionating another portion of the stripped oil from the stripping zone to separate hydrocarbon vapors therefrom; and
- i. supplying at least a portion of the resultant fractionation bottoms to said absorption zone at a higher elevation than the first-mentioned portion of said stripped oil from the stripping zone.

4,009,098

WASTE TREATMENT PROCESS

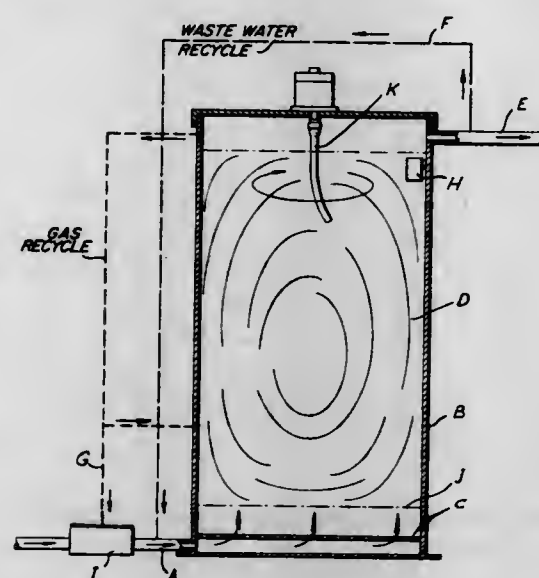
John S. Jeris, Yonkers, N.Y., assignor to Ecolotrol, Inc., Bethpage, N.Y.

Filed Feb. 16, 1973, Ser. No. 333,394

Int. Cl.² C02C 1/04

U.S. Cl. 210-3

8 Claims



1. Process for removing biochemical oxygen demand from waste water by passing the waste water through a bed of microorganisms adapted to oxidize biochemical oxygen demand under aerobic conditions, said bed adapted to pass suspended solids present in said waste water therethrough, comprising:

- a. generating an upflow fluidized bed of solid particulate carrier having a cultured layer of said microorganisms seeded thereon by passing waste water upwardly through said bed at a flow rate of at least about 6 gallons per minute per square foot of bed to impart to said microorganism attached particles movement within said bed;
- b. providing about 0.1 to 1.5 milligrams of oxygen per milligram of biochemical oxygen demand removed from said waste water in the waste water to allow said microorganisms to reduce the biochemical oxygen demand of the waste water passing therethrough; and
- c. removing excess microorganism growth from said bed particles in order to increase the specific gravity of said particles such that significant amounts of biochemical oxygen demand are reduced from a volume of waste water passing through said bed in 30 minutes or less and floc produced by removal of excess growth is carried

from the process without interfering with the efficient operation thereof.

4,009,099

APPARATUS AND PROCESS FOR REMOVING AMMONIA NITROGEN FROM WASTE WATER

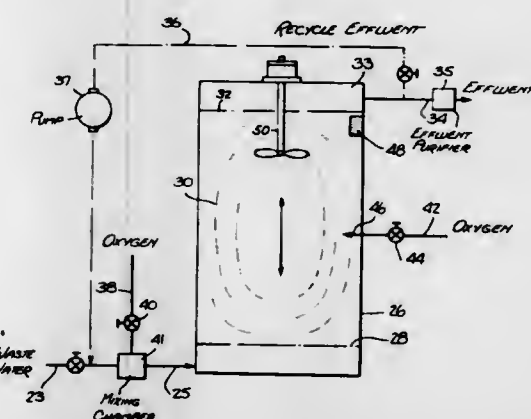
John S. Jeris, Yonkers, N.Y., assignor to Ecolotrol, Inc., Bethpage, N.Y.

Continuation of Ser. No. 487,972, July 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 333,394, Feb. 16, 1973. This application Jan. 14, 1976, Ser. No. 648,895

Int. Cl.² C02C 1/04

U.S. Cl. 210-3

23 Claims



1. A biological process for removing ammonia nitrogen from waste water, which comprises forming a fluidized bed of a solid particulate carrier having a cultured layer of nitrifying microorganisms seeded thereon, continuously passing waste water to be treated through said fluidized bed, adding oxygen to said fluidized bed, retaining said waste water in said fluidized bed for a sufficient period of time while maintaining said fluidized bed at a sufficient temperature and while maintaining said fluidized bed under aerobic conditions to biologically convert substantially all of the ammonia nitrogen to be removed from the waste water to oxidized forms of nitrogen, water and cellular material, and continuously withdrawing said oxidized forms of nitrogen and water from said fluidized bed, and removing excess of said cellular material from said particulate carrier.

16. Apparatus for biologically removing ammonia nitrogen from waste water, the combination comprising an elongated, substantially vertically disposed container, a manifold disposed towards the bottom of said container, inlet means for said manifold for receiving waste water to be processed, a fluidized bed of a solid particulate carrier having a cultured layer of nitrifying microorganisms seeded thereon, said bed being disposed in said container above said manifold, means for adding oxygen to said fluidized bed, said fluidized bed being arranged to receive said waste water from said manifold and biologically convert substantially all of the ammonia nitrogen to be removed from the waste water to oxidized forms of nitrogen, water and cellular material, outlet means for said container for continuously withdrawing the so processed waste water, oxidized forms of nitrogen, and means for removing excess cellular material from said particulate carrier.

4,009,100

METHOD OF TREATING WASTE WATER WITH JET NOZZLES

Klaus Hess; Richard Stickel, both of Bad Duerkheim; Otto Nagel, Neustadt; Richard Sinn, Ziegelhausen, and Hans Daucher, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

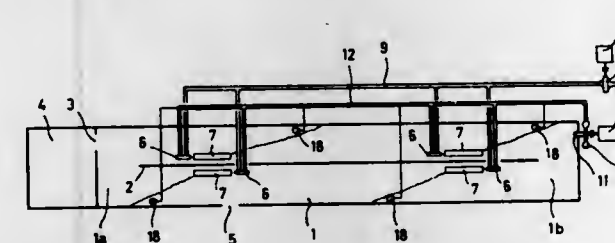
Filed Jan. 27, 1975, Ser. No. 544,307

Claims priority, application Germany, Jan. 30, 1974, 2404289

Int. Cl.² C02C 1/08

U.S. Cl. 210-14

11 Claims



1. A process for the treatment of waste water in activated-sludge systems by means of one or more aerating nozzles which comprises introducing from a nozzle or nozzles submerged in a body of waste water and activated sludge in a reservoir a gas stream of air or a high-oxygen gas or parallel, contiguous streams of air or a high oxygen gas and a propellant liquid into a small impulse exchange tube positioned contiguous to and axially downstream of said nozzle or nozzles, said nozzle or nozzles being positioned asymmetrically to the center of gravity of a transverse, cross sectional plane of said body of waste water and activated sludge and near the bottom of said body, producing a directional flow from the environment of the nozzle or nozzles in the reservoir by impulse exchange between the mass flow leaving the nozzle or nozzles at an average impulse density of from 10^3 to 10^4 N/m² and the mixture of waste water and activated sludge in said body flowing more slowly at an average impulse density of from 50 to 10^3 N/m², and superimposing on said directional flow a rotary motion by the column of ascending bubbles emerging from the impulse exchange tube or tubes asymmetrically to said center of gravity and near the bottom of said body to provide a screw type flow of the mixture of waste water and activated sludge.

4,009,101

RECYCLE TREATMENT OF WASTE WATER FROM NICKEL PLATING

Toshio Hayashi, Inuyama, Japan, assignor to Kayabakogyo-Kabushiki-Kaisha, Tokyo, Japan

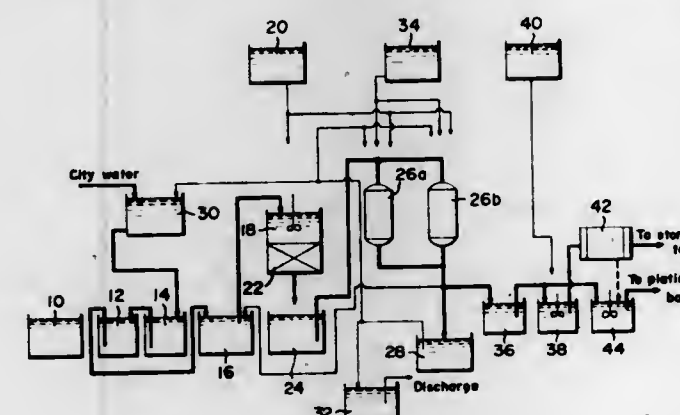
Continuation of Ser. No. 403,768, Oct. 5, 1973, abandoned. This application Sept. 15, 1975, Ser. No. 613,086

Claims priority, application Japan, Mar. 29, 1973, 48-35992; Mar. 29, 1973, 48-35995

Int. Cl.² B01D 15/04

U.S. Cl. 210-28

8 Claims



1. A method of treating acidic nickel plating waste water for recycling to nickel plating baths, comprising the steps of;

adding an alkaline substance to a body of nickel plating waste water which includes dissolved nickel and other dissolved metallic components which can be precipitated as hydroxides, so as to increase the pH of said body to a level of about 7.5 at which said other metallic components precipitate as hydroxides but at which substantially all of said nickel remains in solution; separating said waste water from the resulting precipitate; adsorbing nickel from said waste water subsequent to said separation by contacting said waste water with a cation exchange resin maintained at a pH value of about 11.5; desorbing adsorbed nickel from said resin by contacting the resin with sulfuric acid thereby obtaining an acidic nickel-containing solution; dividing said solution into a first portion and a second portion; adding an alkali to said first portion to raise the pH value thereof to about 10 for precipitating nickel hydroxide from said first portion; recovering said nickel hydroxide; combining at least part of said recovered nickel hydroxide with said second portion of said solution to react with excess parts of said sulfuric acid so as to reduce the amount of free sulfuric acid in said second portion and form a nickel sulfate solution suitable for recycling to nickel plating baths; and recycling said solution to nickel plating baths.

4,009,102

CONTAINERIZED WATER REFINER EXCHANGE SYSTEM

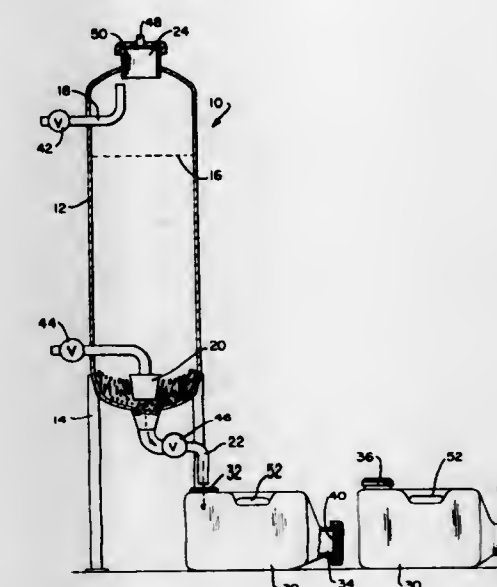
Stephen H. Davis, Dayton, Ohio, assignor to Water Refining Company, Inc., Middletown, Ohio

Filed May 19, 1976, Ser. No. 688,041

Int. Cl.² C02B 1/16, 1/40, 1/76

U.S. Cl. 210-33

7 Claims



1. A containerized water refiner exchange system comprising: a fixed water refiner of relatively large size, said water refiner including a relatively large volume refining chamber for holding a relatively large supply of water treating granular material, a raw water inlet into said chamber, a refined water outlet from said chamber, a granular material discharge outlet from a lower portion of said chamber for gravity removal of granular material therefrom, a filling opening into said chamber for depositing granular material therein, a plurality of rigid, portable containers of small size relative to the size of said refining chamber, said plurality of portable containers having a combined volume no greater than the volume of said refining chamber, and

a receiving opening in each of said containers complementary to said discharge outlet from said chamber for receiving a portion of said granular material therefrom.

4,009,103

METHOD FOR IMPROVING THE FILTERABILITY OF ALUMINUM SALTS PRECIPITATED FROM AQUEOUS SOLUTIONS

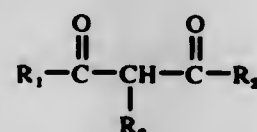
Noel I. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed July 12, 1976, Ser. No. 704,704
Int. Cl.² C02C 5/02

U.S. Cl. 210-51

5 Claims

1. A method for improving the filterability of aluminum salts precipitated from an aqueous solution containing soluble aluminum ions which method comprises adjusting the pH of the solution to between about 4 and 6, adding to the solution less than a stoichiometric amount based on the molar concentration of the aluminum ion of a 1, 3-dicarbonyl compound having the general formula



wherein R₁, R₂ and R₃ are selected from the group consisting of hydrogen, hydroxyl, alkoxy and alkyl groups to precipitate a portion of the aluminum ion as the insoluble aluminum dicarbonyl and then adding a sufficient amount of alkaline hydroxide to precipitate the remaining aluminum ion in the form of insoluble aluminum hydroxide to obtain a mixed aluminum salt precipitate which is easily filterable.

4,009,104

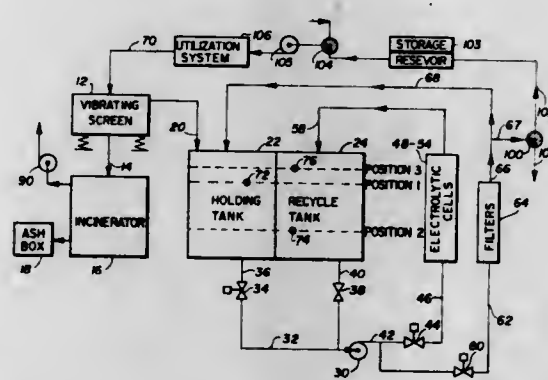
MARINE SANITATION METHOD AND DEVICE

George H. Behrendt, and Jesse L. Potter, both of Dallas, Tex., assignors to Filteron Systems Inc., Dallas, Tex.

Filed Aug. 21, 1975, Ser. No. 606,486
Int. Cl.² C02B 1/82, 3/10

U.S. Cl. 210-62

7 Claims



3. An automatic marine sewage treatment unit comprising:
 - a. storage means including a first tank and a second tank,
 - b. a sewage inlet channel leading to said first tank including a separator for removal of solids above a predetermined size from incoming salt water based sewage,
 - c. circulation means responsive to liquid levels in said tanks for batch transfer of liquids from said first tank to said second tank and for circulating a stream of liquids from and to said second tank while filling said first tank,
 - d. electrolytic treatment means in said circulation means for subjecting said stream to D.C. current flow, and
 - e. means to discharge treated liquids from said second tank when said first tank reaches a control level and for delivering a predetermined fraction of said treated liquids to said first tank.
4. An automatic marine sewage treatment method comprising the repetitive cycle:

- a. accumulating sewage laden salt water in a first tank while circulating sewage laden salt water from a second tank through an electrolytic cell and back to said second tank for build up of hypochlorite levels therein, and
- b. responsive to liquid levels in said tanks, batch transferring a minor fraction of liquid from said second tank to said first tank while eliminating a major fraction of liquids from said second tank and then batch transferring a major fraction of liquid in said first tank to said second tank.

4,009,105

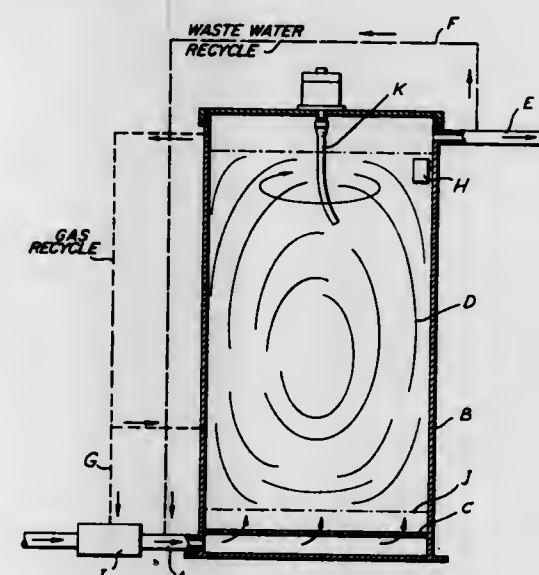
WASTE TREATMENT APPARATUS

John S. Jeris, Yonkers, N.Y., assignor to Ecolotrol, Inc., Bethpage, N.Y.

Division of Ser. No. 333,394, Feb. 16, 1973. This application
Nov. 5, 1974, Ser. No. 521,199
Int. Cl.² C02C 1/04

U.S. Cl. 210-107

10 Claims



1. Apparatus for biologically removing biochemical oxygen demand from waste water, comprising an elongated, substantially vertically disposed container, a manifold disposed towards the bottom of said container and adapted to control the passage of waste water therethrough, inlet means for said container for receiving waste water to be processed, a fluidized bed of a solid particulate carrier having a cultured layer of microorganisms adapted to oxidize biochemical oxygen demand seeded thereon, said fluidized bed being disposed in said container above said manifold, means for adding oxygen to said fluidized bed, said fluidized bed being arranged to receive said waste water from said manifold and to biologically convert substantially all said biochemical oxygen demand to be removed from the waste water to carbon dioxide, water and cellular material, outlet means for said container for continuously withdrawing the so processed waste water and carbon dioxide and means for removing excess cellular material from said particulate carrier.

4,009,106

CLARIFIER WITH OVERFLOW SCUM REMOVAL

George W. Smith, Waukesha, Wis., assignor to Envirex Inc.

Filed June 18, 1975, Ser. No. 588,114

Int. Cl.² B01D 21/10

U.S. Cl. 210-195 S

10 Claims

1. A sewage treatment clarifier comprising
 1. a circular outer wall having a series of submerged ports through which the feed is introduced into the clarifier,
 2. a steep conical bottom defining a lower sludge collection zone,
 3. a sludge return line from the lowermost portion of said zone,
 4. a circular overflow launder which establishes the normal liquid level within the clarifier and which includes a valve-controlled effluent line from said launder,

4,009,108

DIALYZER CONSTRUCTION

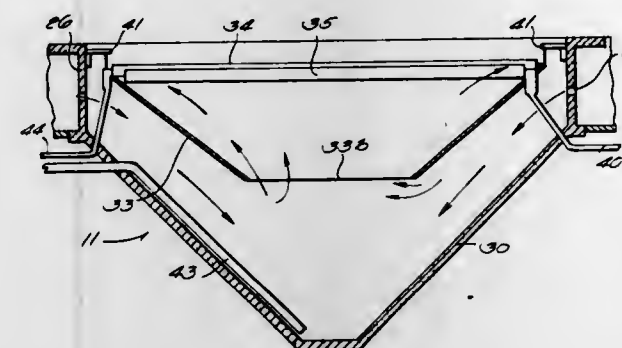
Jimmy L. Miller, Waukegan; Burton Salkin, Schaumburg, and William J. Schnell, Arlington Heights, all of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 8, 1975, Ser. No. 620,614

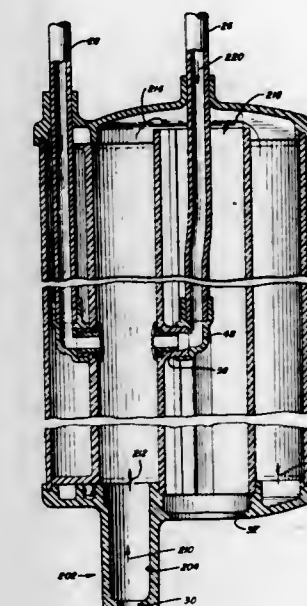
Int. Cl.² B01D 13/00

U.S. Cl. 210-321 B

13 Claims



a scum collection zone above said ports and a scum and sludge separation zone below said ports, said scum trough being disposed adjacent to said scum separation zone closing of said effluent line and nominal raising of the liquid level within the clarifier is effective to lift the scum so that it overflows into the scum trough from which it is then discharged.



4,009,107

MULTI-LEVEL SUPPORT MEMBER FOR USE WITH SEMIPERMEABLE MEMBRANE

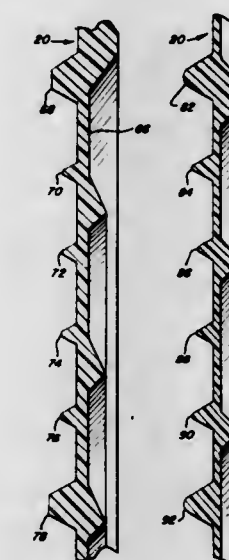
Jimmy L. Miller, Waukegan; Burton Salkin, Schaumburg; William J. Schnell, Arlington Heights, and Ludwig Wolf, Jr., Barrington, all of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 8, 1975, Ser. No. 620,541

Int. Cl.² B01D 13/00

U.S. Cl. 210-321 B

2 Claims



1. An elongated flexible support member for use in a coil dialyzer to support an elongated, tubularly shaped, semipermeable membrane, said support member comprising: an elongated imperforate fluid impermeable web; means on at least one side of said web defining a plurality of elongated, generally parallel, membrane engaging ribs for supporting said membrane and for maintaining said membrane in spaced relation to said web, said rib means being arranged in generally angular relation to the length of said member, said ribs including a plurality of high ribs spaced from each other, and a plurality of lower ribs positioned between each pair of adjacent high ribs, said lower ribs being of at least two different heights so as to provide a support member having ribs of at least three different height.

1. A coil dialyzer adapted for upright positioning which includes:

- a hollow centrally positioned core assembly,
- a blood inlet conduit extending axially upwardly from within said core assembly and coupled to said core assembly,
- a tubular semipermeable membrane coupled adjacent one end to said core assembly for communication with said inlet conduit,
- a support member positioned to engage said membrane and wound about said core with said membrane,
- an outlet jack assembly coupled to the said membrane adjacent the other end thereof,
- a blood outlet conduit extending axially upwardly from said outlet jack assembly and coupled to said outlet jack for receiving flow from said membrane,
- a housing having a body within which said core assembly, said membrane, said support member and jack assembly are positioned, and
- said housing including bottom cap means which define a central dialysis solution outlet generally aligned with said hollow core and means which define a dialysis solution inlet offset with respect to said dialysis solution outlet and aligned with said wound membrane and support member, and means adjacent the upper end of the dialyzer for providing fluid communication between the top of said wound membrane and support member and the top of said hollow core assembly so as to define a dialysis solution flow path upwardly through said dialysis solution inlet, through said wound membrane and support member, into the top of said core and downwardly through said core to said dialysis solution outlet.

4,009,109

FLUID FILTER FLOW ARRANGEMENT

Leo D. Tullier, 4727 Bayou Vista, Houston, Tex. 77018, and John F. Vignone, 8282 61 Drive, Flushing, N.Y. 11379

Filed Dec. 15, 1975, Ser. No. 641,098

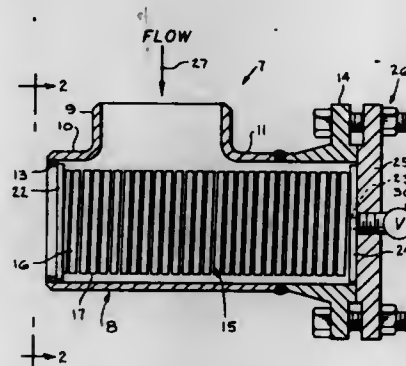
Int. Cl.² C02C 1/14

U.S. Cl. 210-447

5 Claims

1. An arrangement for filtering fluid flow in a conduit comprising:

- a. a T connection having a body including a hollow projection and a pair of aligned hollow projections extending laterally therefrom for forming flow passages and to form a filter receiving section of uniform size throughout its longitudinal extent;
- b. an inwardly extending annular flange formed on one of said aligned hollow projections and projecting radially inwardly of said aligned hollow projections to define one end of the filter receiving section;
- c. an external annular flange formed on the other of said projections;
- d. a hollow annular filter member positioned in the filter receiving section formed by said lateral projections, said annular filter member including:
 1. a core formed of coils spaced a predetermined amount;
 2. a plurality of circumferentially spaced ribs extending longitudinally of said core;



3. said ribs having a surface secured to said core;
4. an annular flange formed on one end of said core for seating on said inwardly extending annular flange and to retain said core in uniform spaced relation inwardly relative to said pair of aligned hollow projections;
5. an annular flange formed by the other end of said core to retain said core in uniform spaced relation inwardly relative to said pair of aligned hollow projections; and
- e. a flange secured with said external annular flange and engaging said annular flange formed by the other end of said core for closing said other end of said core and retaining said core seated on said inwardly extending flange and spaced inwardly uniformly of said pair of aligned hollow projections throughout the extent of said uniform sized filter receiving section.

4,009,110

COPOLYMERS OF MALEIC ANHYDRIDE, DIKETENE AND ALKYL ETHERS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

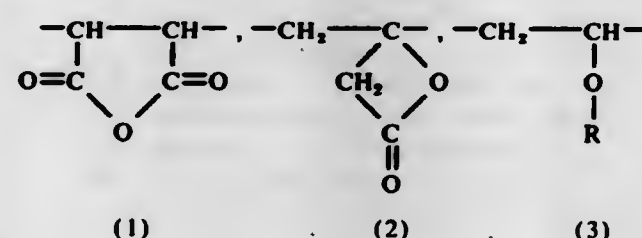
Rosemarie Topf, Dornach, and Richard Von Rutte, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 26, 1975, Ser. No. 590,544

Claims priority, application Switzerland, July 16, 1974, 9765/74

Int. Cl.³ D06T 1/00; C08F 2/46; C08G 2/00, 2/26
U.S. Cl. 252-8.9

1. Copolymers which contain recurring units of the formulae



(1)

(2)

(3)

wherein R represents alkyl of 1 to 22 carbon atoms, each

molecule containing on average together 6 to 300 units of the formulae (1), (2) and (3) and the ratio of the units of the formulae (1), (2) and (3) in the molecule is 1: (0.7 to 0.9): (0.3 to 0.1), or the hydrolysis products thereof, which are obtained by polymerisation of maleic anhydride, diketene and a vinyl alkyl ether the alkyl moiety of which contains 1 to 22 carbon atoms, in an organic solvent which is inert to the reactants, in the presence of radical initiators or under the influence of electromagnetic waves at temperatures of -20° to $+100^\circ$ C, and said copolymers are optionally hydrolysed partially or completely.

4,009,111

MAGNETIC RECORDING MEDIUM

Yasuo Tamai, Masashi Aonuma, Matsuaki Nakamura, Hiroshi Agawa, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 498,337, Aug. 19, 1974, Pat. No. 3,943,012. This application Oct. 20, 1975, Ser. No. 624,017

Claims priority, application Japan, Aug. 18, 1973, 48-92721
The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.³ B22F 3/00; H01F 1/02; C22C 1/04
U.S. Cl. 252-62.55

1. A magnetic recording medium comprising a support having thereon a magnetic recording layer comprising a binder and a ferromagnetic alloy powder, said magnetic recording layer having a coercive force of about 700 to 1500 oersteds in the oriented direction of the ferromagnetic powder and a residual magnetic flux density of about 1500 gauss or higher, the residual magnetic flux density of which after storage for 160 hours in an atmosphere of 60° C and 90% RH is 85% or higher of the initial value thereof before said storage, and said ferromagnetic alloy powder comprising the reaction product of reducing a mixed solution containing Fe, Co and Cr ions with a borohydride compound reducing agent, said mixed solution containing metal ions ranging from 0.01 to 0.5 mole/liter in concentration, such that said ferromagnetic alloy powder comprises about 65 to 89% Fe, about 7 to 34% Co, and about 0.5 to 5% Cr, said percentages being by weight, and wherein the reducing in mixed solution to prepare said ferromagnetic alloy powder is conducted at -10° C to about 40° C.

4,009,112

PELLETIZED RECTIFIER FOR MOLTEN NEUTRAL SALT BATHS AND METHOD

Robert W. Foreman, Bloomfield Hills, Mich., assignor to Park Chemical Co., Detroit, Mich.

Filed Sept. 5, 1975, Ser. No. 610,619

Int. Cl.³ C09K 3/00; C21D 1/00
U.S. Cl. 252-71

5. A method of rectifying molten neutral salt baths comprising introducing into said bath a pellet product means for rectifying molten neutral salt baths and being made from a composition comprised of in weight percent,

- a. about $\frac{1}{4}\%$ to about 75% of ammonium chloride to yield HCl upon thermal degradation,
- b. about 25% to about 99 $\frac{1}{2}\%$ of at least one non-alkaline neutral binder material means for maintaining said product in a generally pellet form, said material being selected from at least one of the group consisting of alkali metal and alkaline earth metal chlorides, fluorides, and bromides,

said molten neutral salt baths being of the type which are generally maintained at a temperature between about 1300° F. and 2300° F.,

said pellet product means being capable of acting as a generally non-sludge forming rectifier when introduced into a molten neutral salt bath and acting to rectify undesirable materials of the oxides type which tend to form in the neutral salt bath, and
said pellet product means being operative to dissolve in the neutral salt bath after being introduced therein.

4,009,113

PROTECTION OF MATERIALS

Robin John Green, Birkenhead, and Richard Shaw Johnson, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 247,127, April 24, 1972, abandoned.
This application Feb. 25, 1974, Ser. No. 445,753

Claims priority, application United Kingdom, Apr. 30, 1971, 12379/71

Int. Cl.³ C11D 9/42
U.S. Cl. 252-95

1. An alkali stable, water dispersible, precursor-containing body for use in an alkaline powder detergent composition, consisting essentially of:

- a. about 40% to about 80% by weight of the body of a finely divided, particulate precursor compound capable of reacting with hydrogen peroxide in an aqueous medium that will form a peracid bleaching species below 60° C, said particulate precursor compound being capable of passing through a mesh screen of about 0.15 mm; and
- b. an inert carrier material of lauric acid, sodium dodecyl hydrogen phthalate, sodium dodecyl hydrogen succinate, sodium lauryl sulphate, or liquid paraffin, said carrier material being substantially evenly distributed with said precursor compound to form a composite particle having an outer protective, non-deliquescent, coherent layer of polyvinyl alcohol, a polyacrylamide, a starch, a water-soluble cellulose ether or a water-soluble gum for preventing aqueous alkaline attack on said precursor compound; said precursor-containing body having a diameter of from about 0.3 mm to about 3.00 mm.

4,009,114

NON-PHOSPHATE DETERGENT COMPOSITION

Joseph A. Yurko, Bayonne, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 508,229, Sept. 23, 1974, abandoned, which is a continuation of Ser. No. 323,829, Jan. 15, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,151

Int. Cl.³ C11D 1/22, 3/08, 3/10
U.S. Cl. 252-109

1. A detergent composition devoid of phosphate or nitrogen-containing builders comprising

- a. about 12-16% by weight of a linear alkyl aryl sulfonate having an average alkyl chain length of about 10 to 16 carbon atoms;
- b. about 8-12% by weight of a soap selected from water-soluble salts of higher fatty acids or resin acids;
- c. about 12-25% by weight of citric acid or a water-soluble salt of citric acid; and
- d. about 45-75% by weight of a builder salt mixture of alkali metal silicates and alkali metal carbonates, wherein the ratio of silicate to carbonate is 1:0.25-4.

4,009,115

COMPOSITION AND METHOD FOR CLEANING ALUMINUM AT LOW TEMPERATURES

Robert Eric Blinn, Roslyn, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 442,726, Feb. 14, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,154
Int. Cl.³ C11D 7/08, 1/72

U.S. Cl. 252-142

1. An aqueous cleaning composition for removing and dissolving aluminum fines and cleaning lubricating oils from aluminum surfaces comprising of from about 1 to about 10 grams/liter of sulfuric acid and from about 0.005 to about 0.1 grams/liter of hydrofluoric acid.

2. The composition of claim 1, wherein the pH is from about 1.0 to about 1.8.

6. An aqueous cleaning composition for removing and dissolving aluminum fines and cleaning lubricating oils from aluminum surfaces consisting essentially of about 3 to about 5 grams/liter of sulfuric acid, from about 0.01 to about 0.03 grams/liter of hydrofluoric acid, and from about 0.1 to about 10 grams/liter of an alkyl polyethoxylated ether nonionic surfactant.

4,009,116

PROCESS OF PREPARING SUBSTANTIALLY ORGANIC WASTE LIQUIDS CONTAINING RADIOACTIVE OR TOXIC SUBSTANCES FOR SAFE, NON-POLLUTIVE HANDLING, TRANSPORTATION AND PERMANENT STORAGE

Werner Bühr, Speyer; Stefan Drobnik, Blankenloch; Werner Hild, Hochstetten; Reinhard Kroebe, Leopoldshafen; Alfred Meyer, Cologne, and Günter Naumann, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany
Filed Dec. 20, 1974, Ser. No. 534,772

Claims priority, application Germany, Dec. 20, 1973, 2363474

Int. Cl.³ G21F 9/16
U.S. Cl. 252-301.1 W

1. In the process of preparing a substantially organic waste liquid containing a radioactive or toxic substance for safe, non-pollutive handling, transportation and permanent storage by solidifying the liquid with a hardening material, the improvement which comprises mixing the liquid with a polymerizable mixture consisting essentially of at least one monomeric monovinyl compound, at least one monomeric polyvinyl compound and a polymerization catalyst and then polymerizing the resulting mixture into a solid homogeneous block at a temperature of from 15° to 150° C., the waste liquid being employed in an amount of from 20 to 75% by weight, based on the total weight of the waste liquid and the polymerizable mixture, the monovinyl compound being employed in an amount of 70 to 99% by weight, based on the total weight of the monomers, the polyvinyl compound being employed in an amount of from 1 to 30% by weight, based on the total weight of the monomers, and the polymerization catalyst being used in an amount of from 0.05 to 6% by weight, based on the total weight of the monomers.

4,009,117

METHOD OF MAKING INVERT WATER-IN-OIL EMULSION

Thomas D. Newingham, West Chester, and Alexander D. Rechulte, Boothwyn, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

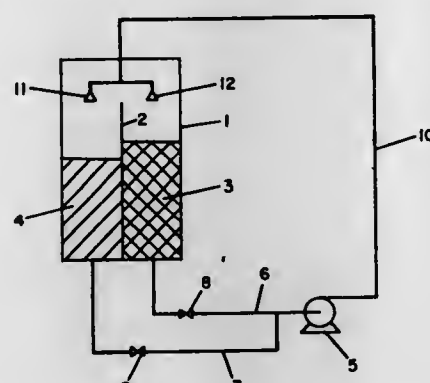
Filed Nov. 5, 1975, Ser. No. 628,853

Int. Cl.³ B01J 13/00
U.S. Cl. 252-309

1. Method of making an invert water-in-oil emulsion in a predetermined water to oil volume ratio (W:O) in the range of 0.25:1 to 1.5:1 which comprises:

- a. providing containers for water and for oil containing a surface active agent;

- b. rapidly supplying the water to the oil containing the surface active agent and supplying the water and oil mixture to the suction side of an open-face centrifugal pump while maintaining the resulting oil-water mixture in said pump at a temperature of 50°-140° F, the rate at which the water is supplied to the oil being such that the time for the water addition is not greater than three times the time required to pump the total water-oil volume through the pump;



- c. circulating the effluent from the pump through a nozzle having a cross-sectional area smaller than the discharge of said pump to provide additional shearing action on said oil-water mixture;
- d. repeating steps (b) and (c) as many times as necessary until an emulsion of the water in the oil is achieved wherein said emulsion has a particle size of less than 2 microns.

4,009,118

METHOD AND APPARATUS FOR USING FROTH PREVENTIVES

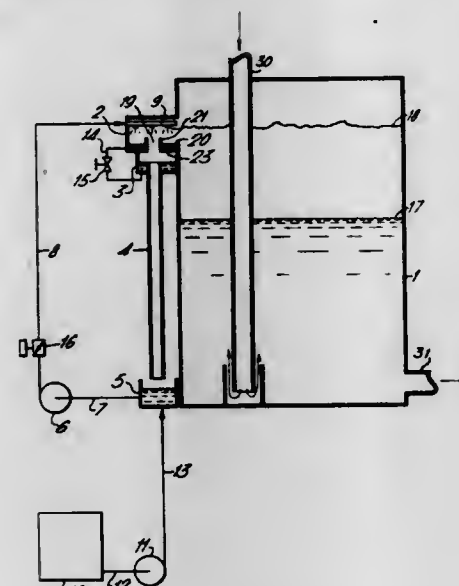
Reino Laiho, Pori, Finland, assignor to Rauma-Repola Oy., Finland

Filed Aug. 14, 1975, Ser. No. 604,876

Int. Cl.² B01D 19/04

U.S. Cl. 252-321

10 Claims



1. A method for distinguishing foam on a body of foam-forming liquid and for rendering said liquid non-foaming and suitable for handling or subsequent treatment, said method comprising:

- a. forming a first treating mixture containing a catalyst-like foam preventive agent and a member of the group consisting of a foam-forming liquid, liquid formed from extinguished foam of said foam-forming liquid, and mixtures of said foam-forming liquid and extinguished foam;
- b. collecting a foamed body of said foam-forming liquid in a reservoir zone, said body of liquid having a layer of foam floating thereon;

- c. transferring a portion of said floating foam from said reservoir zone to a treating zone, said treating zone and said reservoir zones comprising separate liquid-handling systems;
- d. contacting said transferred foam in said treating zone with said first treating mixture to extinguish said foam to form a second treating mixture in said treating zone diluted with respect to foam preventive agent, said second treating mixture comprising said first treating mixture and liquid formed from said extinguished foam;
- e. repeatedly circulating at least a portion of said foam preventive-containing treating mixtures within said treating zone while contacting said treating mixture with successive bodies of fresh foam withdrawn from the surface of the liquid in the reservoir zone, thereby extinguishing said foam while forming a succession of circulating treating mixtures within said treating zone containing progressively diluted foam preventive agent in said mixtures thereby diminishing the effectiveness of said foam preventive agent;
- f. withdrawing portions of said circulating treating mixture containing diluted foam preventive agent from said treating zone;
- g. adding said withdrawn portions of the body of liquid in said reservoir zone; and
- h. adding fresh foam preventive agent to the remaining circulating treating mixture in the treating zone in an amount sufficient to regain an effective foam extinguishing concentration.

8. Apparatus for extinguishing foam floating on a body of foam-forming liquid comprising:

- a. a reservoir for receiving a body of foam-forming liquid having a layer of foam thereon;
- b. a first receptacle having communicating means connecting said first receptacle with an upper part of said reservoir for receiving overflow of foam from said reservoir;
- c. a second receptacle disposed beneath said first receptacle having first connecting means for permitting gravity flow of liquid between said first and second receptacles, said first connecting means having edges extending upward into said first receptacle to form trough-like means for collection of liquid therein, the edges of said first connecting means being at a higher level than the communicating means between said reservoir and said first receptacle;
- d. elongated discharge means extending generally vertically downward from said second receptacle, said elongated discharge means being of sufficient diameter to permit gravity flow of foam and liquid therethrough, said elongated discharge means also extending upward into said second receptacle;
- e. nozzle means in said first receptacle for directing foam extinguishing composition into foam overflowing from the reservoir;
- f. a third receptacle disposed beneath said elongated means to receive a liquid mixture of foam extinguishing agent and extinguished foam; and
- g. means for recycling said liquid mixture to said nozzle means.

4,009,119

AQUEOUS ANTIFOAMING EMULSIONS

Franz Poschmann, Limburgerhof, and Wolfram Bergold, Heidelberg, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 307,536, Nov. 17, 1972, abandoned.

This application Mar. 20, 1975, Ser. No. 560,118

Claims priority, application Germany, Nov. 17, 1971, 2157033

Int. Cl.² B01D 19/04

U.S. Cl. 252-358

5 Claims

1. In an aqueous antifoaming emulsion containing from

about 50 to 80% by weight of water and from about 20 to 50% by weight of non-aqueous water-insoluble components, said non-aqueous water-insoluble components including at least 50% by weight of fatty alcohols of from 12 to 22 carbon atoms or fatty acid esters of dihydric or trihydric alcohols of from 12 to 22 carbon atoms in the fatty acid component or mixtures of said fatty alcohols and esters as defoamers, said emulsion further containing from about 2 to 20% by weight, based on the weight of said non-aqueous components of a surface-active anionic, cationic or non-ionic emulsifier, the improvement wherein the average particle size of the emulsified water-insoluble portions is from 4 to 9 μ .

4,009,120

PROCESS FOR THE REGENERATION OF A SOLID BED METAL PHTHALOCYANINE CATALYST SYSTEM

Lee Hillman, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 18, 1975, Ser. No. 605,798

Int. Cl.² B01J 31/40; C10G 19/00

U.S. Cl. 252-413

12 Claims

1. In a process for the regeneration of a catalyst system comprising a metal phthalocyanine impregnated charcoal support which is deactivated as a result of the treatment of a petroleum distillate with caustic and oxygen or air in the presence of said support wherein mercaptans are substantially converted to disulfides, said process comprises washing said charcoal support with liquid water and a carboxylic acid at a temperature of about 200° to about 350° F. to extract caustic and hydrocarbonaceous materials at a pressure of from about 1 atmosphere to about 100 atmospheres, the improvement which comprises treating said washed charcoal support with superheated steam at a temperature of about 650° to about 1,000° F. at a pressure of from 1 atmosphere to about 100 atmospheres and reimpregnating the steam-treated charcoal support at reimpregnation conditions with from about 0.001 weight percent to about 10.000 weight percent of a metal phthalocyanine compound.

4,009,121

METHOD OF TEMPERATURE CONTROL IN CATALYST REGENERATION

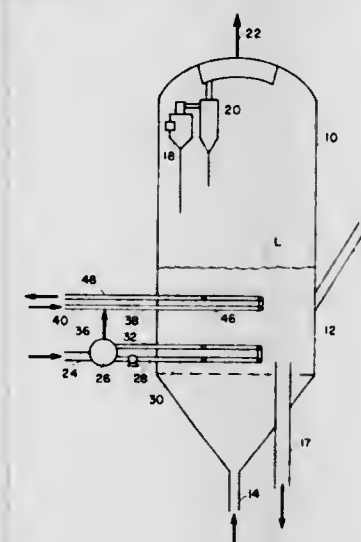
Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 26, 1975, Ser. No. 607,764

Int. Cl.² B01J 37/14, 21/20; F27B 15/16

U.S. Cl. 252-417

5 Claims



1. A method for removing heat from a bed of fluidized solid catalyst particles undergoing regeneration in a regenerator of a fluid catalytic conversion unit wherein excess heat is liberated by combustion of carbonaceous deposits from the catalyst surface with an oxygen-containing gas, which comprises the steps of generating steam in a first tubular coil located in said bed of fluidized catalyst by indirect heat exchange be-

tween water and said bed of fluidized catalyst undergoing regeneration; maintaining the pressure in said first tubular coil such as to maintain the inner surface of said first tubular coil essentially wet, the pressure in said first tubular coil ranging from about 50 to about 800 psig and the total surface area of said first tubular coil ranging from about 100 square feet to about 5,000 square feet; injecting water drops into the steam effluent of said first tubular coil, and introducing the resulting mixture of steam and water drops into a second tubular coil located in said bed of fluidized solid catalyst particles, said second tubular coil being maintained at a lower pressure than said first tubular coil, said lower pressure being such as to maintain the inner surface of said second tubular coil essentially dry, the pressure in said second tubular coil ranging from about 20 to about 650 psig and the total surface area of said second tubular coil ranging from about 200 square feet to about 15,000 square feet.

4,009,122

NOVEL GLYCOL SOLUBLE MOLYBDENUM CATALYSTS AND METHOD OF PREPARATION

Ellwood L. Lines, Westville; John A. Herbst, Madison, and Robert J. Fairbrother, Wallingford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed June 23, 1975, Ser. No. 589,346

Int. Cl.² B01J 31/02

U.S. Cl. 252-431 N

22 Claims

1. A method of preparing a molybdenum catalyst comprising:

reacting at elevated temperatures between about 70° and about 160° C an oxygen-containing molybdenum compound selected from the group consisting of molybdenum dioxide, molybdenum sesquioxide, molybdenum trioxide, the ammonium salt of molybdic acid, and mixtures of these, with about 1.5 to about 20 moles of an alkylene glycol per mole of molybdenum and about 0.1 to about 4 moles of an amine per mole of molybdenum, the amine being selected from the group consisting of:

- a. a compound of the formula $R_1R_2R_3N$ wherein R_1 , R_2 and R_3 are each independently selected from the group consisting of hydrogen, unsubstituted alkyls having about 1 to about 10 carbon atoms, and unsubstituted aryls having about 5 to about 10 carbon atoms, with the proviso that at least one of R_1 , R_2 , and R_3 is not hydrogen, and
- b. an N-oxide of a tertiary amine compound of the above formula.

4,009,123

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710.

This application Nov. 14, 1975, Ser. No. 632,041

Int. Cl.² B01J 27/06

U.S. Cl. 252-441

13 Claims

1. An acidic catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.5 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the cobalt and tin is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in an oxidation state above that of the elemental metal; and wherein substantially all of the cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions.

to 50 percent by weight of an aqueous dispersion of a polymer of at least one olefinically-unsaturated monomer, said dispersion having a pH value greater than 7, a solids content of about 50 percent by weight, and being prepared by an aqueous emulsion polymerization of said monomer or monomers.

4,009,136

MULTICOLOR COATING COMPOSITIONS

Edward W. Lewandowski, Ottsville, Pa., and Frank Koebert, Normandy, Mo., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 5, 1974, Ser. No. 476,508

Int. Cl.² C08L 29/14

U.S. Cl. 260—29.6 RB

12 Claims

1. A process for the preparation of a sprayable, brushable, and rollable multicolor coating composition consisting essentially of the steps of a) forming a viscous solution of a pigmented polyvinyl acetal resin dissolved in an organic solvent, and b) adding one or more of said solutions with controlled agitation to an aqueous polymer latex, whereby solvent migration from the mix to the latex causes an increase in viscosity of the mix thereby forming pigmented shear resistant droplets or globules in the latex.

4,009,137

INTUMESCENT FLAME-RETARDANT COATING COMPOSITIONS

Franz-Josef Dany, Erfstadt Lechenich; Joachim Wortmann, Turnich, and Joachim Kandler, Erfstadt Lechenich, all of Germany, assignors to Hoechst Aktiengesellschaft, Cologne, Germany

Filed Nov. 26, 1974, Ser. No. 527,446

Claims priority, application Germany, Nov. 30, 1973, 2359699

Int. Cl.² C08L 31/04

U.S. Cl. 260—29.6 MP

5 Claims

1. An improved intumescent flame-retardant coating composition comprising

- a film-forming binder selected from the group consisting of an aqueous polyvinyl acetate dispersion, an aqueous dispersion of a vinyl acetate-dibutylmaleate copolymer and a solution of a urea-formaldehyde resin in a solvent blend of butanol and xylene,
- about 5-25 weight %, based on the total weight of the composition, of an ammonium polyphosphate,
- a substance carbonizing under the action of heat selected from the group consisting of dicyanamide, pentaerythritol, melamine and mixtures thereof, and
- a dispersing agent, the improved coating composition containing as the b) component an ammonium polyphosphate of the formula



wherein n is an average whole number of about 600-800 and the ratio of m/n is about 1.

4,009,138

PROCESS FOR PRODUCING STABLE EMULSION OF POLYMER

Toshiyuki Kobashi, and Kenichi Masuhara, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Japan

Filed Apr. 3, 1975, Ser. No. 564,892

Claims priority, application Japan, Apr. 6, 1974, 49-39153

Int. Cl.² C08L 33/02

U.S. Cl. 260—29.6 RW

10 Claims

1. A process for preparing a stable polymer emulsion characterized by polymerizing a radical-polymerizable monomer having unsaturated bond by using a water-soluble catalyst in an aqueous medium and in the presence of a water-soluble polymer containing chemically bonded monomeric units of methacrylic acid or its salt and monomeric units of ethyleni-

cally unsaturated sulfonic acid or its salt, said polymerization being conducted at a pH of 4 or lower.

4,009,139

OPACIFYING AGENTS

Rudi Widder, Leimen; Paul Diessel, Mannheim, and Dieter Distler, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 22, 1975, Ser. No. 579,884

Claims priority, application Germany, June 24, 1974, 2430301

Int. Cl.² C08L 25/06, 25/14; C11D 3/37

U.S. Cl. 260—29.6 RW

6 Claims

1. Opacifying agents for liquid detergent, cleaner and cosmetic compositions and which are stable in compositions containing detergents and electrolytes consisting essentially of an aqueous dispersion having a solids content of 30 to 50% by weight and a particle size of 0.2 to 1 μ m and produced by the free radical polymerization of styrene or styrene with up to 50% by weight, based on the resultant copolymer, of an alkyl acrylate or an alkyl methacrylate respectively having 1-5 carbon atoms in the alkyl group in aqueous emulsion in the presence of 1 to 10% by weight, based on the total monomers, of sodium polyacrylate having a K value according to H. Fikentscher of from 15 to 35 and from 1 to 8% by weight of the sarcoside of an unsaturated carboxylic acid having from 12 to 20 carbon atoms in the hydrocarbon radical, the solid particles in said dispersion having a softening point of above 90°C.

4,009,140

CLEAR ETHYLENE POLYMER EMULSIONS HAVING LIGHT TRANSMISSION OF AT LEAST 95% AND POLISHES CONTAINING THE SAME

Glenn E. Teer; Jerry G. Higgins, and George D. Warren, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Division of Ser. No. 540,848, Jan. 14, 1975. This application Aug. 22, 1975, Ser. No. 606,835

Int. Cl.² C08L 23/16

U.S. Cl. 260—29.6 XA

17 Claims

1. A clear latex comprising emulsion polymerized polymer particles selected from polymers and copolymers of ethylene which have an average size no larger than about 100 angstrom units, and which are suspended within an aqueous medium comprising water and an anionic emulsifier, and are prepared under greater than atmospheric pressure and at a temperature of from about 70°C to about 150°C in the presence of said anionic emulsifier, a water soluble salt of persulfuric acid and an alkyl mercaptan, said latex having a light transmission of at least about 95%.

4,009,141

ELECTRICAL INSULATING COMPOSITIONS OF EPOXY RESINS, ZIRCONIUM SILICATE AND ALUMINA

Frank S. Nichols, Pittsfield; Charles H. Bliss, Hancock, and Robert J. Londergan, Pittsfield, all of Mass., assignors to General Electric Company, New York, N.Y.

Filed July 7, 1972, Ser. No. 269,771

Int. Cl.² C08L 63/00

U.S. Cl. 260—37 EP

6 Claims

1. The method of making a hardenable epoxy resin composition which comprises providing a first mixture comprising a cycloaliphatic epoxy resin compound and a finely divided filler material comprising zirconium silicate and hydrated alumina, providing a second mixture comprising an anhydride curing agent for said epoxy resin compound and a finely divided filler material comprising zirconium silicate, and thereafter mixing together said first mixture and said second mixture for curing said epoxy resin compound.

4,009,142

SULFONSUCCINIC ACID SEMI-ESTERS, PROCESS FOR THEIR PREPARATION AND THEIR USE IN PIGMENT PREPARATIONS FOR AQUEOUS FLEXO PRINTING PASTES

Reinhold Deubel, Altenhain, Taunus; Max Grossmann, Frankfurt am Main; Volker Hemmerling, Schwalbach, Taunus, and Heinz Uhrig, Steinbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 458,523, May 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 267,513, June 29, 1972, abandoned. This application Feb. 27, 1975, Ser. No. 553,633

Claims priority, application Germany, June 30, 1971, 2132404

Int. Cl.² C08R 9/04

U.S. Cl. 260—38

1 Claim

1. Pigment preparations containing as a dispersing agent 0.1 to 0.2 parts by weight, based on one part by weight of dry pigment powder, of a sulfosuccinic acid semiester obtained by acid condensation of a monoalkylphenol containing an alkyl group with 6 to 14 carbon atoms with formaldehyde in a molar ratio of from 2 : 1 to 10 : 9, oxalkylating the novolac thus obtained with 2 to 25 moles of 1,2-propylene oxide or ethylene oxide per phenolic hydroxy group, reacting the oxalkylate thus obtained with maleic acid anhydride and reacting the maleic acid semi-ester thus obtained with an alkali metal or alkali earth metal sulfite, bisulfite or pyrosulfite.

4,009,143

PROCESS FOR PRODUCING CARBONACEOUS SUBSTANCES FOR USE IN SYNTHETIC-GRAPHITE AND GRAPHITE-LIKE BODIES

Hartmut Lublich, Duren; Hubertus Nickel, Julich; Peter Pflaum, Julich, and Francesco Dias, Julich, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung, Julich, Germany

Filed June 29, 1972, Ser. No. 267,480

Claims priority, application Germany, June 30, 1971, 2132492

Int. Cl.² C08K 3/04

U.S. Cl. 260—38

4 Claims

1. A process for producing a carbonaceous mass for the production of shaped bodies, comprising the steps of: slurring particles of a carbonaceous filler selected from the group which consists of graphite, coke and carbon black in a binder at least partly dissolved in a solvent and selected from the group which consists of phenol-formaldehyde resin to produce a slurry of binder-coated particles; continuously dispersing said slurry by supplying it from a nozzle continuously into a codirectionally-flowing continuous stream of a liquid in which said binder is at most slightly soluble and which is miscible with said solvent to form discrete binder-coated grains of the filler; and decanting excess quantities of said liquid from said discrete binder-coated grains to form said mass.

4,009,144

SPRAYABLE DECORATIVE COATING COMPOSITION

Sidney Offerman, Great Neck, N.Y., assignor to Grow Chemical Corporation, New York, N.Y.

Division of Ser. No. 338,601, March 6, 1973, Pat. No. 3,929,692. This application Aug. 21, 1975, Ser. No. 606,450

Int. Cl.² C08K 3/00; C08L 67/00

U.S. Cl. 260—40 R

4 Claims

1. A pre-mix additive composition for a sprayable liquid coating material for unfinished concrete to seal the same and enhance the acoustical and flame retardant properties thereof comprising calcium carbonate, synthetic fibrous material selected from the group consisting of polyamides and polyesters and silicates selected from the group consisting of magnesium silicate and calcium silicate.

4,009,145

FILLING COMPOUNDS

Thomas Hunt, Llancarfan, near Barry, Wales, assignor to BP Chemicals International Limited, England

Filed July 28, 1975, Ser. No. 599,403

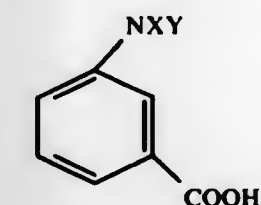
Claims priority, application United Kingdom, Aug. 5, 1974, 34390/74

Int. Cl.² C08K 3/00; C08L 67/06

U.S. Cl. 260—40 R

8 Claims

1. An unsaturated polyester filling compound which comprises an unsaturated polyester, a monomer that is copolymerizable therewith, a filler, an accelerator and an aromatic tertiary amine promoter having the formula



in which X and Y may be the same or different and represent alkyl of 1 to 6 carbon atoms or alkylol of 1 to 6 carbon atoms, or esters thereof.

4,009,146

METHOD OF AND MIXTURE FOR ALUMINIZING A METAL SURFACE

Frank Cork, Alvaston; David Frederick Bettridge, Chaddesden; and Philip Charles Clarke, Derby, all of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Aug. 14, 1974, Ser. No. 497,470

Claims priority, application United Kingdom, Sept. 19, 1973, 44032/73; Apr. 19, 1974, 17163/74

Int. Cl.² C08K 3/08

U.S. Cl. 260—42.22

7 Claims

1. A coating mixture suitable for use in aluminizing a metal surface comprising 5 to 50% by weight of an organic resin binder evaporatable at high temperatures, 2 to 25% by weight of one or more inorganic halides and the balance being finely divided particles of an alloy having a melting point of at least 1100°C, said alloy containing 40 to 60% by weight of aluminum, the balance of said alloy comprising one or more metals selected from the group consisting of iron, cobalt, nickel and zirconium, and at least one solvent to adjust the viscosity of the coating mixture to that required for the particular method chosen of application of the mixture to the metal surface to be aluminized, the coating mixture providing, in use, a reaction with the inorganic halide or halides with the aluminum forming volatilized aluminum halide in the vicinity of the coated metal surface to be aluminized and providing a substantially uniform aluminized layer deposited on the metal surface.

4,009,147

COMPOSITION OF ANTIOXIDANTS OF REDUCED VOLATILITY

Bernard J. Lyons, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 481,740, June 21, 1974, Pat. No. 3,986,981, which is a continuation-in-part of Ser. No. 150,831,

June 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 660,198, Aug. 14, 1967, abandoned. This application July 7, 1975, Ser. No. 593,643

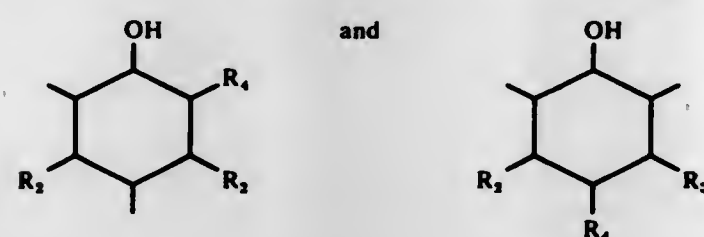
Int. Cl.² C08K 5/37, 5/13

U.S. Cl. 260—45.95 B

47 Claims

1. A polymer composition comprising a normally oxidizable polymer and an effective antioxidant amount of an antioxidant composition comprising a mixture of bisphenolic polymers of the formula $H-[Z-Y-X]_n-H$ wherein n is an integer of from 2 to about 12 and wherein Y is independently chosen from the group consisting of sulfur, methylene and butylidene,

and for each bisphenolic repeating unit $-Z-Y-X-Z$ and X are independently selected from the group consisting of



R_1 and R_2 being independently selected from the group consisting of hydrogen and alkyl, cycloalkyl, aryl and alkaryl groups having from 1 to 8 carbon atoms, R_4 being an alkyl group of from 4 to 8 carbon atoms.

4,009,148
HIGH MOLECULAR WEIGHT POLYCARBONATES OF
 $\alpha,\alpha,\alpha',\alpha'$ -HEXAKISARYL-1,3-AND/OR
-1,4-DIMETHYL BENZENES

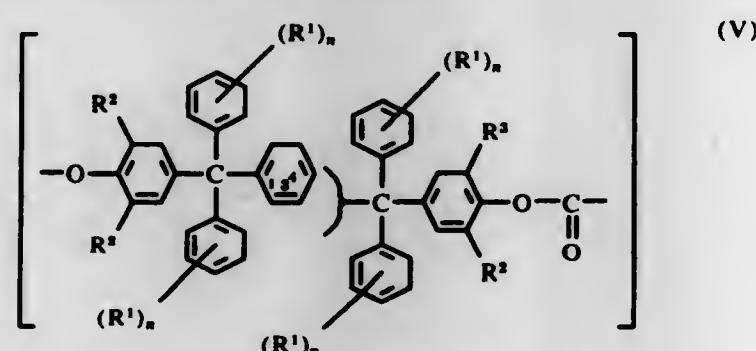
Dieter Neuray, Rumein-Kaldenhausen; Erhard Tresper, Krefeld, and Dieter Freitag, Krefeld-Traar, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed May 21, 1975, Ser. No. 579,532

Claims priority, application Germany, May 24, 1974, 2425291

Int. Cl.² C08G 17/13

U.S. Cl. 260-47 XA 10 Claims

1. High molecular weight polycarbonates based on aromatic dihydroxy compounds containing from 5 mol % to 100 mol %, based on incorporated dihydroxy compounds, of structural units corresponding to the formula (V):



in which

R^1 represents C_1-C_4 alkyl, halogen or H;

$n = 1, 2$ or 3 ; and

R^2 and R^3 , independently of one another, represents C_1-C_3 alkyl, halogen or H.

4,009,149
AMORPHOUS THERMOPLASTIC AROMATIC
POLYSULPHONE

Terence King, New Barnet, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

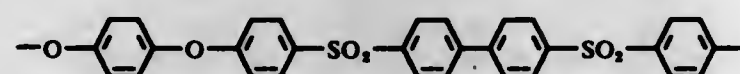
Filed Jan. 17, 1973, Ser. No. 324,430

Claims priority, application United Kingdom, Nov. 8, 1972, 51441/72; Dec. 22, 1972, 59313/72

Int. Cl.² C08G 75/23

U.S. Cl. 260-49 1 Claim

1. An amorphous thermoplastic aromatic polysulphone consisting of repeating units having the formula



and having a T_g of about 260°C .

4,009,150
TIME-LAPSE FREE-RADICAL POLYMERIZABLE
COMPOSITION

Parry McWhinnie Norling, Memphis, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 457,385, April 2, 1974, abandoned. This application Apr. 2, 1975, Ser. No. 564,482
Int. Cl.² C08F 20/10, 120/14

U.S. Cl. 260-63 UY 10 Claims

1. A polymerization medium which comprises
 - a. free-radical polymerizable compound which is an ethylenically unsaturated monomers;
 - b. polymerization initiator soluble in the polymerization medium selected from the group consisting of
 - a. diacyl peroxides,
 - b. ketone peroxides,
 - c. alkyl peroxy esters,
 - d. dialkyl peroxides, and
 - e. inorganic persulfates
2. in the amount of 10^{-4} to 10^{-1} mole of polymerization initiator per mole of free radical polymerizable compound;
3. reducible metal chelate soluble in the polymerization medium selected from the group consisting of iron and copper chelates in which the chelating agent is selected from the group consisting of
 - a. β -dicarbonyl compounds having an enol content of at least 4 percent and a dicarbonyl angle of not greater than 120° , and
 - b. β -hydroxy nitrogen-heterocyclic fused aromatics in which the hydroxyl group is attached to a carbon beta to the nitrogen in an adjacent ring in the amount of 10^{-4} to 10^{-1} mole of reducible metal chelate per mole of free radical polymerizable compound;
4. organic reducing agent soluble in the polymerization medium which is capable of reducing ferric ions to ferrous ions or cupric ions to cuprous ions in the amount of 10^{-3} to 10^3 moles of reducing agent per mole of reducible metal chelate, and
5. excess chelating agent selected from the group consisting of
 - a. β -dicarbonyl compounds having an enol content of at least 4 percent and a dicarbonyl angle of not greater than 120° , and
 - b. β -hydroxy nitrogen-heterocyclic fused aromatics in which the hydroxyl group is attached to a carbon beta to the nitrogen in an adjacent ring, in the amount of 10^{-4} to 2.5 moles of excess chelating agent per mole of reducible metal chelate.

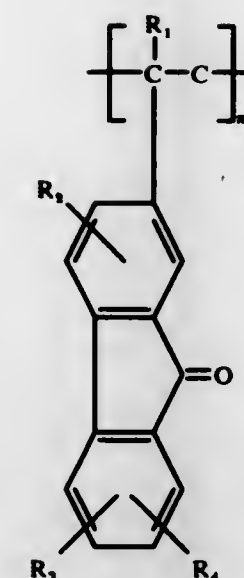
4,009,151
POLYMERS OF 2-VINYL-FLUORENONE AND
DERIVATIVES THEREOF

James M. Pearson, Webster, and John F. Yanus, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 494,014, Aug. 1, 1974, abandoned, which is a division of Ser. No. 411,577, Oct. 31, 1973. This application Oct. 30, 1975, Ser. No. 627,167

Int. Cl.² C08G 2/16, 2/18

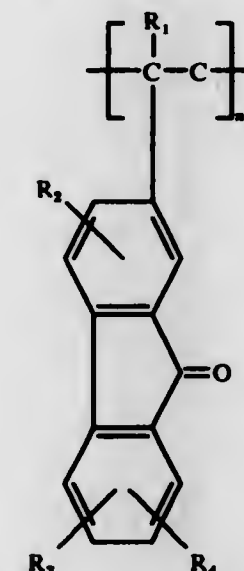
U.S. Cl. 260-63 K 5 Claims

1. A homopolymeric composition consisting of repeating units characterized by the structural formula:



wherein R_1 is hydrogen or methyl, R_2 , R_3 and R_4 are hydrogen or aliphatic groups containing from 1 to 4 carbon atoms and n is a number representing the degree of polymerization.

5. A copolymeric composition consisting of units characterized by the structural formula:



wherein R_1 is hydrogen or methyl, R_2 , R_3 and R_4 are hydrogen or aliphatic groups containing from 1 to 4 carbon atoms and N is a number representing the degree of polymerization which are copolymerized with another vinyl monomer selected from the group consisting of styrene, vinyl chloride, methyl methacrylate, vinyl carbazole, vinyl naphthalene, isoprene, butadiene, a substituted styrene, acrylonitrile, vinyl pyridine and vinyl acetate.

4,009,152
DIISOCYANATO-DIKETENES

Werner Mormann, and Kuno Wagner, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

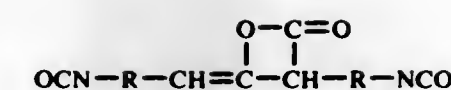
Filed Aug. 22, 1975, Ser. No. 606,914

Claims priority, application Germany, Sept. 5, 1974, 2442426

Int. Cl.² C07D 305/12; C08G 18/06

U.S. Cl. 260-77.5 AT 6 Claims

1. Diisocyanato-diketenes corresponding to the following general formula:



wherein

R represents a straight or branched-chain aliphatic hydrocarbon radical with from 3 to 10 carbon atoms.

4,009,153
VAPOR-PHASE PREPARATION OF AROMATIC
POLYAMIDES

Hyunkook Shin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Filed Mar. 4, 1975, Ser. No. 555,244

Int. Cl.² C08G 69/32

U.S. Cl. 260-78 R 8 Claims

1. A process for the preparation of film-forming aromatic polyamides by direct vapor phase condensation of one or more aromatic diamines and one or more aromatic diacid halides which comprises vaporizing the diamine(s) and diacid halide(s), mixing the vaporized diamine and diacid halide in the presence of an inert diluent gas and reacting the mixture in a reaction zone at a temperature between about 150°C and 500°C for at least 0.01 second, and collecting the aromatic polyamide.

4,009,154
PROCESS FOR PREPARING AROMATIC POLYAMIDES
WITH SODIUM CARBONATE HYDRATE AS ACID
ACCEPTOR

Takashi Noma, Hino; Hiroshi Fujie, Iwakuni, and Shuji Ozawa, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 29, 1975, Ser. No. 582,403

Claims priority, application Japan, June 3, 1974, 49-61786; Aug. 1, 1974, 49-87490

Int. Cl.² C08G 69/48, 69/28

U.S. Cl. 260-78 SC 5 Claims

1. A process for preparing a fiber-forming aromatic polyamide, which comprises contacting (I) a solution or dispersion, in a polar, non-basic and inert organic liquid medium, of a low molecular weight aromatic polyamide having an inherent viscosity of no greater than 0.2 as measured in a solution of 0.5 gram of the polyamide in 100 ml. of concentrated sulfuric acid at 30°C , with (II) an aqueous slurry consisting of a dispersion in water of a sodium carbonate hydrate in a concentration of at least 5% by weight, said solution or dispersion (I) being a product obtained by reacting an aromatic diamine and an aromatic dicarboxylic acid halide in said liquid medium.

4,009,155
P-CARBOXYPHENYL-AZOXYCARBONITRILE AND ITS
METHYL ESTER

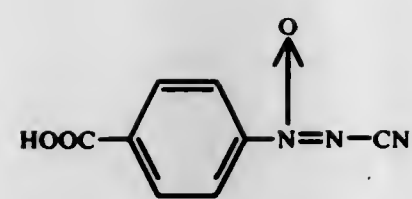
Hamao Umezawa; Tomio Takeuchi; Hiromobu Imuma, all of Tokyo, and Osamu Tanabe, Kowata Ugi, all of Japan, assignors to Zaidan Hojin Bioelbutsu Kagaku Kenkyu Kai, Japan
Filed Sept. 5, 1974, Ser. No. 503,553

Claims priority, application Japan, Sept. 14, 1973, 48-103200; Oct. 29, 1973, 48-120705

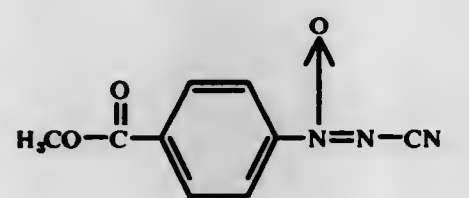
Int. Cl.² C07C 105/00

U.S. Cl. 260-141 5 Claims

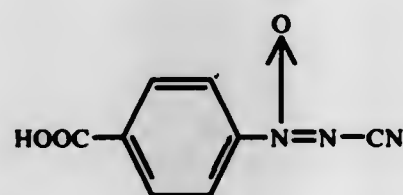
1. The compound having the formula



4. The methyl ester of calvatic acid having the formula



5. The process for producing the compound of claim 4 which comprise reacting the compound having the formula



with diazomethane.

4,009,156

HYDROXYNAPHTHALENE TRISAZO DYESTUFFS

Hans Kramb, Barcelona, Spain, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 25, 1975, Ser. No. 571,865

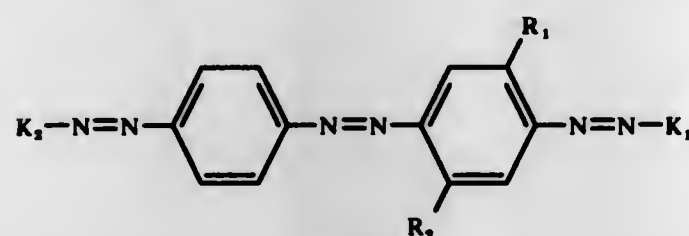
Claims priority, application Germany, May 4, 1974, 2421654

Int. Cl.² C09B 31/22, 31/28, 33/20, 35/38

U.S. Cl. 260-169

3 Claims

1. Trisazo dyestuff which in the form of the free acid corresponds to the formula



wherein

K₁ is 2,8-dihydroxynaphthalene-6-sulfonic acid, coupled in alkaline medium, or 2-amino-8-hydroxynaphthalene-6-sulfonic acid, coupled in acidic medium,

K₂ is hydroxyphenyl, 2-sulpho-hydroxyphenyl, 2-methylhydroxyphenyl, 4-methylhydroxyphenyl, 1,3-dihydroxyphe-

nyl, 3-aminohydroxyphenyl,

R₁ is hydrogen or methoxy, and

R₂ is hydrogen or methyl, with the proviso that the total number of sulfonic acid groups is 1 or 2.

4,009,157

PRIMARY-ALIPHATIC α-HYDROXY AZOALKANES

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

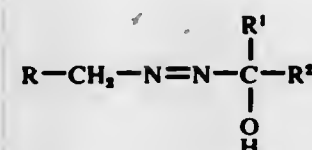
Filed Mar. 21, 1974, Ser. No. 453,448

Int. Cl.² C07C 107/2; C08J 9/00; C08F 118/00, 120/00

U.S. Cl. 260-192

12 Claims

1. Primary aliphatic-α-hydroxyazoalkane having the formula:



wherein

R is hydrogen, alkyl of 1 to 11 carbons, cycloalkyl of 3 to 12 carbons, bicycloalkyl of 3 to 12 carbons, tricycloalkyl of 3 to 12 carbons, aralkyl of 7 to 12, carbons, aryl of 6 to 14 carbons, alkaryl of 7 to 12 carbons;

R¹ is the same as R except R¹ is not hydrogen;

R² is the same as R except R² is neither hydrogen, aryl, nor alkaryl;

R¹ and R² taken together form an alkylene of 3 to 11 carbons.

4,009,158

MIXTURES OF AZO COMPOUNDS HAVING A 2-NITRO-4-PHENYLSULFAMOYLDIPHENYL AMINE NUCLEUS

Ruedi Altermatt, Tecknau, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 204,382, Dec. 2, 1971, Pat. No. 3,865,805, which is a continuation of Ser. No. 851,444, Aug. 19, 1969, abandoned. This application Jan. 3, 1975, Ser. No. 538,397

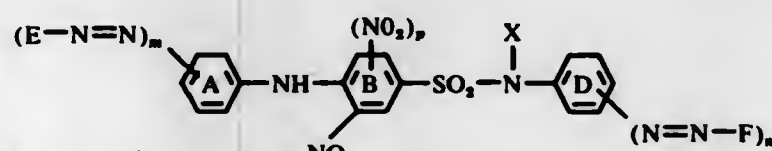
Claims priority, application Switzerland, Aug. 30, 1968, 13051/68; Dec. 19, 1968, 18944/68; Dec. 19, 1968, 18943/68

Int. Cl.² C09B 43/00

U.S. Cl. 260-205

8 Claims

1. A mixture of at least two compounds of the formula



wherein

E is phenyl, substituted phenyl, naphthyl or methylsulfonyl-naphthyl,

wherein each substituent of substituted phenyl is independently chloro, bromo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, cyano, thiocyno, phenoxy, formyl, acetyl, benzoyl, lower alkylsulfonyl, lower hydroxyalkylsulfonyl, benzylsulfonyl, sulfamoyl, lower alkylsulfamoyl, cyanoethylsulfamoyl, hydroxyethylsulfamoyl, dilower alkylsulfamoyl, N,N-di(cyanoethyl)sulfamoyl, N,N-di(hydroxyethyl)sulfamoyl, phenylsulfamoyl, formamido, lower alkanoylamino, chloropropionamido, benzamido, lower alkylsulfonylamino, lower alkoxy carbonyl, benzyloxycarbonyl, lower alkoxy carbonylamino, carbamoyl, lower alkylcarbamoyl, dilower alkylcarbamoyl or phenylcarbamoyl,

F is phenyl, substituted phenyl, naphthyl or methylsulfonyl-naphthyl,

wherein each substituent of substituted phenyl is independently chloro, bromo, lower alkyl, lower alkoxy, phenoxy, trifluoromethyl, thiocyno, cyano, nitro, hydroxy, formyl, acetyl, benzoyl, lower alkylsulfonyl, hydroxyethylsulfo-

nyl, benzylsulfonyl, sulfamoyl, lower alkylsulfamoyl, cyanoethylsulfamoyl, hydroxyethylsulfamoyl, dilower alkylsulfamoyl, N,N-dicyanoethyl)sulfamoyl, N,N-di(hydroxyethyl)sulfamoyl, phenylsulfamoyl, lower alkylamino, cyanoethylamino, dilower alkylamino, N,N-di(cyanoethyl)amino, N-ethyl-N-cyanoethylamino, N,N-di(hydroxyethyl)amino, formamido, lower alkanoylamino, chloropropionamido, benzamido, methylsulfonylamino, lower alkoxy carbonyl, benzyloxycarbonyl, lower alkoxy carbonylamino, carbamoyl, lower alkylcarbamoyl, dilower alkylcarbamoyl or phenylcarbamoyl,

X is hydrogen, lower alkyl or substituted lower alkyl wherein each substituent is independently chloro, bromo, hydroxy, cyano, lower alkanoyloxy, benzoyloxy, lower alkoxy carbonyloxy, lower alkoxy carbonyl, carbamoyl, benzyloxycarbonyloxy, lower alkoxy, phenoxy, phenyl, methylcarbamoyloxy, dimethylcarbamoyloxy or phenylcarbamoyloxy,

Ring A is further unsubstituted or further substituted, with the proviso that each further substituent on Ring A is independently chloro, bromo, lower alkyl, lower alkoxy, formamido, lower alkanoylamino, benzamido, lower alkoxy carbonylamino, benzyloxycarbonylamino or chloropropionamido,

Ring D is further unsubstituted or further substituted, with the proviso that each further substituent on Ring D is independently chloro, bromo, lower alkyl, lower alkoxy, phenoxy, hydroxy, cyano, nitro, thiocyno, hydroxyethoxy, lower alkanoyloxyethoxy, formamido, lower alkanoylamino, benzamido, lower alkylsulfonyl, benzylsulfonyl, phenylsulfonyl, sulfamoyl, lower alkylsulfamoyl, methoxypropylsulfamoyl, dilower alkylsulfamoyl, acetyl, benzoyl, carbamoyl, lower alkylcarbamoyl, dilower alkylcarbamoyl or methoxypropylcarbamoyl,

m is 1 or 1,

n is 0 or 1,

with the proviso that m + n is 1, and

p is 0 or 1;

4,009,159

HALOGENATED PENAM DERIVATIVES AND THE PREPARATION THEREOF

Takashi Kamiya, Saita; Yoshihisa Saito, Takarazuka; Tsutomu Teraji, Hirakata; Osamu Nakaguti, Osaka; Teruo Oku, Kyoto; Hitoshi Nakamura, and Masashi Hashimoto, both of Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Japan

Continuation-in-part of Ser. No. 266,470, June 26, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,232

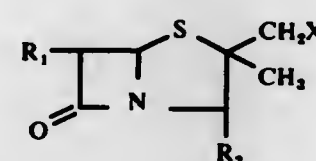
Claims priority, application Japan, June 24, 1971, 46-46158; Aug. 14, 1971, 46-61776; Aug. 14, 1971, 46-61777; Aug. 18, 1971, 46-62687; Aug. 21, 1971, 46-63885; Aug. 21, 1971, 46-63886; Sept. 9, 1971, 46-70018; Dec. 23, 1971, 46-2516

Int. Cl.² C07D 499/44, 499/46, 499/48, 499/64

U.S. Cl. 260-239.1

18 Claims

1. Penam derivatives having the formula



wherein X represents a halogen atom, and wherein R₁ represents acylamino wherein said acyl substituent is selected from the group consisting of formyl, acetyl, propionyl, butyryl, isobutyryl, valeryl, isovaleryl, pivaloyl, acryloyl, crotonoyl, 2-methylacryloyl, cyclopentylcarbonyl, cyclohexylcarbonyl, cycloheptylcarbonyl, cyclohexylacetyl, cycloheptylacetyl, cyclohexylpropionyl, cycloheptylpropionyl, dihydrobenzoyl, 2,4,6-cycloheptatrienylacetyl, dihydrophenylacetyl, methox-

yacetyl, methylthioacetyl, 2-propenylthioacetyl, cyclohexylthioacetyl, cyclohexyloxyacetyl, dihydrophenoxycarbonyl, dihydrophenylthioacetyl, cyclopentylloxycarbonyl, cyclohexyloxycarbonyl, dihydrophenoxycarbonyl, cycloheptyloxycarbonyl, benzoyl, toluoyl, naphthoyl, α-methylnaphthoyl, phthaloyl, tetrahydronaphthoyl, phenylacetyl, phenylpropionyl, phenylbutyryl, tolylacetyl, xylylacetyl, naphthylacetyl, tetrahydronaphthylacetyl, phenoxyacetyl, benzyloxycarbonyl, xylyloxycarbonyl, naphthoxycarbonyl, phenoxy carbonyl, 2-phenoxypropionyl, 2-phenoxybutyryl, 1H-tetrazolylacetyl, 2H-tetrazolylacetyl, thienylacetyl, thienylpropionyl, furylacetyl, piperazinylacetyl, pyrrolidinylacetyl, pyrrolidinylpropionyl, benzothiazolylacetyl, oxazolylacetyl, benzoxazolylacetyl, pyridylmethoxycarbonyl, 2-furyloxycarbonyl, 8-quinolyloxycarbonyl, trichloroethoxycarbonyl, tribromoethoxycarbonyl, 1-cyclopropylethoxycarbonyl, chloroacetyl, 2-chloropropionyl, trifluoroacetyl, phenylglycyl, p-amino-phenylacetyl, p-nitrobenzyloxycarbonyl, o-bromo-benzyloxycarbonyl, o-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, 3,4-dimethoxybenzyloxycarbonyl, p-hydroxyphenylacetyl, 2,5-dimethoxybenzoyl, 3-phenyl-5-methyl-4-oxazolylcarbonyl, 3-(2-chlorophenyl)-5-methyl-4-oxazolylcarbonyl, 3-(2,6-dichlorophenyl)-5-methyl-4-oxazolylcarbonyl, 3-(2-chloro-6-fluorophenyl)-5-methyl-4-oxazolylcarbonyl, 2-cyanoacetyl, 2-(p-hydroxyphenyl)-2-(1-cyclopropylethoxy-carbonylamino)acetyl, 2-(sydonone-3-yl)acetyl and 3-(2-chlorophenyl)-5-methylisoxazole-4-carbonyl; wherein the amino of said acyl substituent containing an amino is protected with a protective group selected from the group consisting of trichloroethoxycarbonyl, tribromoethoxycarbonyl, benzyloxycarbonyl, p-toluenesulfonyl, p-nitrobenzyloxycarbonyl, o-bromobenzyloxycarbonyl, o-nitrophenylsulfonyl, chloroacetyl, tribromoacetyl, formyl, tert-butoxycarbonyl, p-methoxybenzyloxycarbonyl, 3,4-dimethoxybenzyloxycarbonyl, 4-phenylazobenzyloxycarbonyl, 4-(4-methoxyphenylazo)benzyloxycarbonyl, pyridine-1-oxide-2-methoxycarbonyl, 2-pyridylmethoxycarbonyl, 2-furyloxycarbonyl, diphenylmethoxycarbonyl, 1,1-dimethylpropoxycarbonyl, isopropoxycarbonyl, 1-cyclopropylethoxycarbonyl, phthaloyl, succinyl, 1-adamantylloxycarbonyl, 8-quinolyloxycarbonyl, trityl, 2-nitrophenylthio, 2,4-dinitrophenylthio, 2-hydroxybenzylidene, 2-hydroxy-5-chlorobenzylidene, 2-hydroxy-1-naphthylmethylene, 3-hydroxy-4-pyridylmethylene, 1-methoxycarbonyl-2-propylidene, 1-ethoxycarbonyl-2-propylidene, 3-ethoxycarbonyl-2-butylidene, 1-acetyl-2-propylidene, 1-benzoyl-2-propylidene, 1-[N-(2-methoxyphenyl)carbamoyl]-2-propylidene, 1-[N-(4-methoxyphenyl)carbamoyl]-2-propylidene, 2-ethoxycarbonylcyclohexylidene, 2-ethoxycarbonylcyclopentylidene, 2-acetylcyclohexylidene, 3,3-dimethyl-5-oxocyclohexylidene, monosilyl and disilyl; wherein the hydroxy of said acyl substituent containing a hydroxy is protected with a protective group selected from the group consisting of benzyloxycarbonyl, 4-nitrobenzyloxycarbonyl, 4-methoxybenzyloxycarbonyl, 3,4-dimethoxybenzyloxycarbonyl, 4-phenylazobenzyloxycarbonyl, 4-(4-methoxyphenylazo)benzyloxycarbonyl, tert-butoxycarbonyl, 1,1-dimethylpropoxycarbonyl, isopropoxycarbonyl, diphenylmethoxycarbonyl, 2-pyridylmethoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, 2,2,2-tribromoethoxycarbonyl, 3-iodopropoxycarbonyl, 2-furfuryloxycarbonyl, 1-adamantylloxycarbonyl, 1-cyclopropylethoxycarbonyl, 8-quinolyloxycarbonyl, trifluoroacetyl, trifluoroacetyl, trityl, methoxymethyl, 2-nitrophenylthio, and 2,4-dinitrophenylthio, and R₂ represents a radical selected from the group consisting of

1. carboxy;

2. carboxy esters selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, tert-butyl, cyclohexyl, cycloheptyl, vinyl, 1-propenyl, 2-propenyl, 3-butenyl, phenyl, xylyl, tolyl, naphthyl, benzyl, phenethyl, methoxymethyl, ethoxymethyl, methylthioethyl, methylthiomethyl, dimethylaminoethyl, diethylaminoethyl, phenoxymethyl, phenylthiomethyl, methylsulfenylmethyl, phenylsulfenylmethyl, benzoylmethyl, toluoylmethyl, chloromethyl, bromomethyl, trichloroethyl, cyano-

methyl, p-nitrophenyl, 2,4,5-trichlorophenyl, 2,4,6-trichlorophenyl, pentachlorophenyl, p-methanesulfonylphenyl, 4-phenylazophenyl, 2,4-dinitrophenyl, p-chlorobenzyl, o-nitrobenzyl, p-methoxybenzyl, p-nitrobenzyl, 3,4,5-trimethoxybenzyl, bis(p-methoxyphenyl)methyl, pentachlorobenzyl, trichlorobenzyl, 3,5-di(tert)butyl-4-hydroxybenzyl, p-nitrophenylthiomethyl, p-nitrobenzoylmethyl, p-chlorobenzoylmethyl, esters of a thioalcohol, esters of a substituted thioalcohol, N-hydroxysuccinimide, N-hydroxyphthalimide, tetrahydrofuran, 1-cyclopropylethanol, 1-phenyl-3-methyl-5-pyrazolone, 3-hydroxypyridine, 2-hydroxymethylpyridine-1-oxide, 1-hydroxy-2(1H)-pyridine, dimethylhydroxyamine, diethylhydroxyamine, glycolamide, 88-hydroxy-quinoline, 2-hydroxymethylquinoline-1-oxide, oxime, methoxyacetylene, ethoxyacetylene, tert-butylethynyl dimethylamine, tert-butylethynyl diethylamine, ethylethynyl diethylamine and 2-ethyl-5-(3-sulfophenyl)isoxazolium hydroxide inner salt;

- acid amides selected from the group consisting of N-methyl acid amide, N-ethyl acid amide, N,N-dimethyl acid amide, N,N-diethyl acid amide, N-methyl-N-ethyl acid amide, the acid amide with imidazole and the acid amide with 4-substituted imidazole;
- acid anhydrides selected from the group consisting of a dialkyl phosphate, dibenzyl phosphate, phosphoric acid, sulfuric acid, alkyl carbonate and aliphatic carboxylic acids selected from the group consisting of pivalic acid, pentanoic acid, isopentanoic acid, 2-ethylbutanoic acid, chloroacetic acid, crotonic acid, valeric acid, propionic acid, 3-chloro-3-pentanoic acid, 3-bromo-2-butenic acid, phenylacetic acid, phenoxycetic acid, furanacetic acid, thiophenacetic acid and aromatic carboxylic acids;
- acid halides selected from the group consisting of acid chloride and acid bromide;
- acid azide;
- carboxy salts of a metal selected from the group consisting of sodium, potassium and magnesium; and
- carboxy salts of an amine selected from the group consisting of methylamine, diethylamine, triethylamine, aniline, pyridine, picoline and N,N-dibenzylethylenediamine.

4,009,160

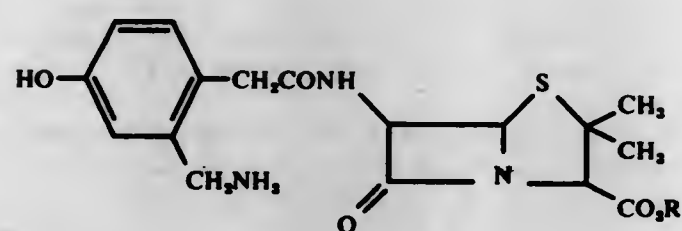
AMINOMETHYLARYLMETHYLPENICILLIN DERIVATIVES

James W. McFarland, Lyme, and Colin Thomson, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.
Division of Ser. No. 523,024, Nov. 12, 1974, Pat. No. 3,966,710. This application Feb. 17, 1976, Ser. No. 658,489
Int. Cl.² C07D 499/58

U.S. Cl. 260—239.1

6 Claims

- A compound selected from the group consisting of:



and the pharmaceutically acceptable salts thereof wherein R is selected from the group consisting of hydrogen, 1-(alkanoyloxy)alkyl, said alkanoyl having 2 to 8 carbon atoms and said alkyl having from 1 to 3 carbon atoms, and phthalidyl.

4,009,161

6-METHYL-2H-1,3-OXAZIN-2,4(3H)-DIONE-3-SULFOHALIDES

Hartmut Pietsch, Hoffheim, Taunus; Karl Clauss, Rossert, Taunus; Erwin Schmidt, Kellheim, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed July 16, 1975, Ser. No. 596,227

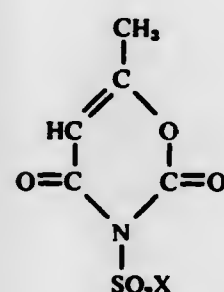
Claims priority, application Germany, July 18, 1974, 2434563

Int. Cl.² C07D 265/100, 273/00, 295/00

U.S. Cl. 260—244 R

3 Claims

- A 3-sulfohalide of 6-methyl-2H-1,3-oxazin-2,4(3H)-dione of the formula



in which X represents fluorine or chlorine.

4,009,162

BASIC OXAZINE DYESTUFFS

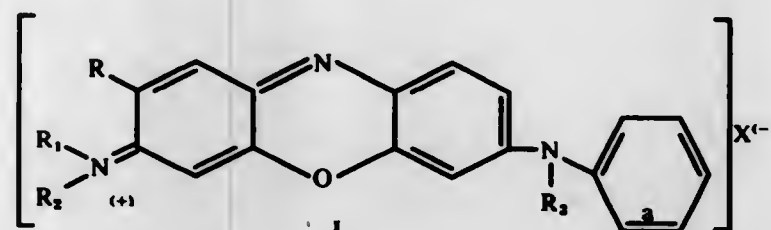
Eberhard Mundlos, Heusenstamm; Reinhard Mohr, and Luis Herz, both of Offenbach, Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Continuation of Ser. No. 415,683, Nov. 14, 1973, abandoned, which is a continuation of Ser. No. 153,805, June 16, 1971, abandoned. This application Mar. 19, 1975, Ser. No. 560,095
Claims priority, application Germany, June 18, 1970, 2030028

Int. Cl.² C07D 265/00, 265/12, 273/00, 295/00

U.S. Cl. 260—245

1 Claim

- A basic oxazine dyestuff of the formula I



in which R is hydrogen or lower alkyl, R₁ is hydrogen or lower alkyl substituted by halogen, lower alkoxy, cyano or hydroxy, R₂ and R₃ each is hydrogen or lower alkyl or lower alkyl substituted by halogen, lower alkoxy, cyano or hydroxy, or R₁ and R₂ form together with the nitrogen atom the pyrrolidino, piperazino, piperidino or morpholino ring, and the phenyl nucleus a is substituted by lower alkyl, lower alkoxy, acetyl, cyano, halogen, phenoxy or trifluoromethyl, and X⁽⁻⁾ is an anion.

4,009,163

AMIDINOUREAS AND AMIDINOTHIOUREAS

Royal A. Cutler, Sand Lake, and Samuel Schalit, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.
Division of Ser. No. 391,473, Aug. 24, 1973, which is a division of Ser. No. 79,266, Oct. 8, 1970, Pat. No. 3,798,269, which is a division of Ser. No. 749,986, Aug. 5, 1968, Pat. No.

3,652,766, which is a continuation-in-part of Ser. No. 556,897, June 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 462,077, June 7, 1965, abandoned. This application

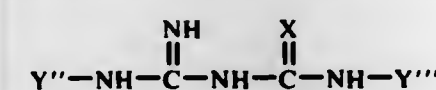
June 9, 1975, Ser. No. 585,447

Int. Cl.² C07D 295/12

U.S. Cl. 260—247.2 A

3 Claims

- A compound having the structural formula



wherein X is oxygen or sulfur; one of Y'' and Y''' is morpholinoalkyl containing 6–10 carbon atoms and the other of Y'' and Y''' is a member of the group consisting of alkyl containing 1–18 carbon atoms, alkenyl containing 3–18 carbon atoms, alkoxyalkyl containing 3–17 carbon atoms, alkylthioalkyl containing 3–17 carbon atoms, cycloalkyl containing 3–8 carbon atoms, di(lower alkyl)aminoalkyl containing 4–10 carbon atoms and morpholinoalkyl containing 6–10 carbon atoms; and Y'' also is hydrogen when Y''' is morpholinoalkyl containing 6–10 carbon atoms.

4,009,164

NOVEL 2-SUBSTITUTED-1,2,4-THIADIAZOLO-[2,3-a]-BENZIMIDAZOLES AND PROCESS FOR THEIR PREPARATION

Colin C. Beard, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

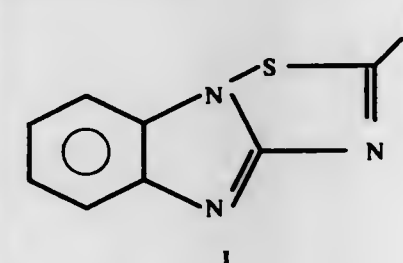
Division of Ser. No. 622,932, Oct. 16, 1975, Pat. No. 3,976,654, which is a division of Ser. No. 523,765, Nov. 14, 1974, Pat. No. 3,946,031, which is a division of Ser. No. 403,474, Oct. 4, 1973, Pat. No. 3,880,874. This application Apr. 5, 1976, Ser. No. 675,040

Int. Cl.² C07D 417/14

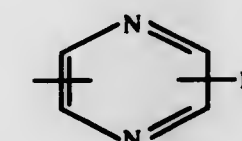
U.S. Cl. 260—250 BN

3 Claims

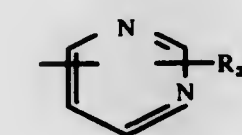
- A compound represented by the formula:



wherein R is



and



in which

R₂ is hydrogen, lower alkoxy, halo, nitro, or lower alkyl; or the pharmaceutically acceptable salts thereof.

4,009,165

NAPHTHOLACTAM DYES

Ernst Schefczik, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed May 5, 1975, Ser. No. 574,401

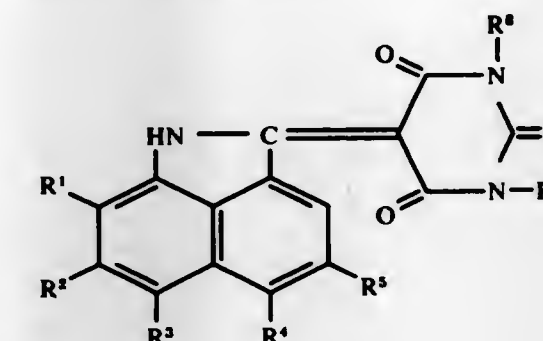
Claims priority, application Germany, June 11, 1974, 2428198

Int. Cl.² C07D 403/04

U.S. Cl. 260—256.4 C

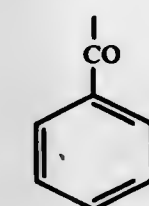
5 Claims

- A compound of the formula



in which

R¹ is hydrogen, chloro, bromo, C₁- to C₄-alkyl, methoxy, ethoxy or nitro,
R² is hydrogen or chloro,
R³ is chloro, bromo, C₁- to C₄-alkyl, methoxy, ethoxy, nitro, acetylaminio, propionylaminio, benzoylaminio, C₂- to C₄-alkanoyl, benzoyl or benzoyl substituted by chloro, bromo, methyl, ethyl, methoxy or ethoxy,
R⁴ is hydrogen, chloro, methoxy or ethoxy,
R³ and R⁴ together are



R⁵ is hydrogen, chloro, methoxy or ethoxy and
R⁶ and R⁷ are independently C₁- to C₈-alkyl, C₂- to C₈-alkyl substituted by hydroxy, cyano, C₁- to C₄-alkoxy or C₁- to C₄-alkoxycarbonyl, phenyl, or phenyl substituted by chloro, methyl or methoxy.

4,009,166

PYRIDO(2,3-d) PYRIMIDINONES

Kanji Noda, Chikushino; Akira Nakagawa, Tosu; Toshiharu Motomura, Tosu; Satoru Miyata, Tosu, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Japan

Filed June 2, 1975, Ser. No. 582,889

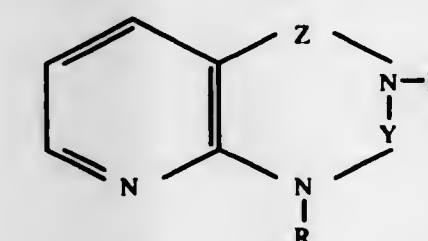
Claims priority, application Japan, June 12, 1974, 49-67791; July 5, 1974, 49-80367

Int. Cl.² C07D 471/04

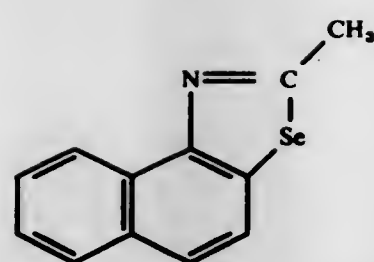
U.S. Cl. 260—256.4 F

30 Claims

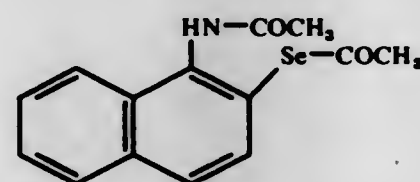
- A compound of the formula:



wherein R is selected from the group consisting of phenyl,



which comprises hydrolyzing with potassium hydroxide, sodium hydroxide or a mixture containing potassium hydroxide and potassium carbonate, 2-aminonaphtho [1,2-d] selenazole in the presence of an alkali metal borohydride or ammonium borohydride at a temperature of over 130° C in a high-boiling inert solvent medium and acetylating the resultant hydrolysis product in situ with acetic anhydride in the presence of acetic acid, thus producing the compound of the formula



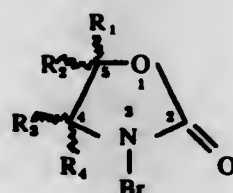
isolating this compound and closing the ring by refluxing it in the presence of acetic anhydride to form the 2-methylnaphtho [1,2-d] selenazole.

4,009,177 COMPOUND

2-(2-THIAZOLYL)-5,6-DIMETHOXYINDAZOLES
Thomas J. Schwan, Norwich, and Charles S. Davis, Norwich;
Le Roy J. Honkomp, Oxford, all of N.Y., assignors to
Morton-Norwich Products, Inc., Norwich, N.Y.
Division of Ser. No. 472,719, May 23, 1974, Pat. No.
3,966,760. This application Feb. 25, 1976, Ser. No. 661,343
Int. Cl.² C07D 513/04
U.S. Cl. 260—306.8 R 1 Claim
1. The compound 2-(2-thiazolyl)-5,6-dimethoxyindazole.

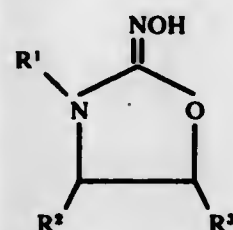
4,009,178
BROMINATING AND OXIDIZING AGENT AND METHOD
OF USING SAME
Nicolae S. Bodor, and James J. Kaminski, both of Lawrence,
Kans., assignors to Interx Research Corporation, Lawrence,
Kans.

Filed June 16, 1975, Ser. No. 587,143
The portion of the term of this patent subsequent to Jan. 6,
1993, has been disclaimed.
Int. Cl.² C07D 263/22
U.S. Cl. 260—307 C 7 Claims
1. A compound of the formula:



wherein R₁ and R₂ which may be the same or different, each represent a member selected from the group consisting of hydrogen and a C₁-C₂₂ straight or branched alkyl, and wherein R₃ and R₄ represent a C₁-C₂₂ straight or branched alkyl.

4,009,179
DI- AND TRI-SUBSTITUTED OXAZOLIDIN-2-ONE
OXIMES
Stephen David Ziman, Richmond, Calif., assignor to E. I. Du
Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 15, 1975, Ser. No. 622,673
Int. Cl.² C07D 263/28
U.S. Cl. 260—307 FA 8 Claims
1. A compound of the formula

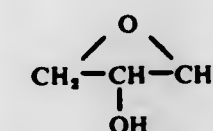


wherein
R¹ and R² individually are H, alkyl of 1-3 carbons, alkenyl
of 2-3 carbons, phenyl or benzyl; and
R³ is H, alkyl of 1-3 carbons, benzyl, pyridyl, indolyl having
up to one methyl or phenyl substituent, or phenyl or
naphthyl having up to one nitro or methylenedioxy sub-
stituent or up to two substituents of halogen, alkyl of 1-3
carbons or alkoxy of 1-3 carbons.

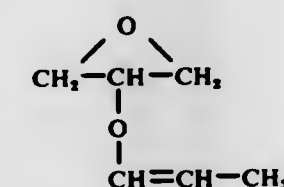
4,009,180
CONTINUOUS PROCESS FOR PREPARING COPPER
PHTHALOCYANINE
Walter Deucker, Neuenhain, Taunus; Ernst Spietschka, Obe-
rauroff, Taunus, and Dieter Steidl, Sulzbach, Taunus, all of
Germany, assignors to Hoechst Aktiengesellschaft, Frank-
furt am Main, Germany
Filed Nov. 14, 1973, Ser. No. 415,633
Claims priority, application Germany, Nov. 16, 1972,
2256170
Int. Cl.² C09B 47/04 4 Claims
1. A method of making copper phthalocyanine which com-
prises preparing an intimate mixture of phthalodinitrile and a
copper salt, continually feeding said mixture to a tubular
vibration mill containing heat-conductive metal bars, said
vibration mill having a heating zone and reaction zone and
said mixture being passed successively through said heating
zone and said reaction zone, vibrating said mill to further mix
and grind said mixture, causing said mixture to be heated to a
temperature above 150° C. in said heating zone to cause the
components of said mixture to react exothermically in said
reaction zone to form copper phthalocyanine, causing said
heat-conducting metal bars to conduct heat generated in said
reaction zone to the mixture in said heating zone and remov-
ing copper phthalocyanine from said reaction zone of said
vibration mill.

4,009,181
CYCLOPENTA[b]INDOLE-2-CARBOXYLIC ACIDS AND
DERIVATIVES THEREOF
Leo Berger, Montclair, and Alfred John Corraze, Wayne, both
of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 325,764, Jan. 22, 1973, Pat. No.
3,868,387, which is a continuation of Ser. No. 133,738, April
15, 1971, abandoned, which is a continuation-in-part of Ser.
No. 40,443, May 25, 1970, abandoned. This application Dec.
12, 1974, Ser. No. 532,112
Int. Cl.² C07D 209/70 2 Claims
U.S. Cl. 260—326.27
1. 7-chloro-cyclopenta[b]indole-2-carboxylic acid or a salt
thereof with a pharmaceutically acceptable base.

4,009,182
PROCESS FOR PREPARING 3-HYDROXYOXETANE
Alan E. Ardis, North Haven, and John A. Wojtowicz, East
Haven, both of Conn., assignors to Olin Corporation, New
Haven, Conn.
Division of Ser. No. 557,377, June 14, 1966, Pat. No.
3,446,819. This application Aug. 22, 1968, Ser. No. 798,473
Int. Cl.² C07D 305/08 1 Claim
U.S. Cl. 260—333
1. A process for the preparation of a hydroxyoxetane of the
formula:



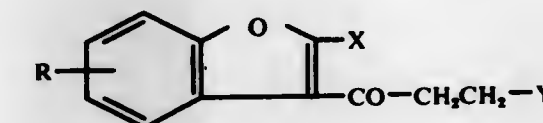
which comprises reacting chlorine with a compound of the
formula:



at a temperature of from about -20° to about 50° C in the
presence of a water-acetone mixture and in the presence of
calcium carbonate.

4,009,183
PROCESS FOR THE PREPARATION OF ALKYLENE
CARBONATES
Carlo Fumagalli, Sirono (Como); Giuseppe Caprara, Milan,
and Paolo Roffia, Mantova, all of Italy, assignors to Montedi-
son Fibre S.p.A., Milan, Italy
Filed Sept. 30, 1975, Ser. No. 618,201
Claims priority, application Italy, Sept. 30, 1974, 27870/74
Int. Cl.² C07D 317/38, 317/36 7 Claims
U.S. Cl. 260—340.2
1. Process for the direct preparation of alkylene carbonates,
characterized in that cyclic olefines, linear olefines and having
from 2 to 15 carbon atoms is made to react in a liquid phase
with carbon dioxide in the presence of a catalytic system
consisting of:
a. iodine in a form selected from the group consisting of
elementary iodine, alkali metal iodides, alkaline earth
metal iodides, iodides of a metal selected from the group
consisting of group IB, IIB, IIIA, IIIB, IVA, VA, VIIB, and
VIII of the periodic table and iodohydrines of the olefine
reactant, and of
b. an oxygen conveyor consisting of manganese dioxide;
at temperatures comprised between 30° and 120° C., and at
pressures comprised between atmospheric pressure and 100
atm., at a pH value comprised between 3 and 8.

4,009,184
AMINO CARBONYL DERIVATIVES OF BENZOFURANS,
PROCESSES FOR THEIR PRODUCTION, AND
PHARMACEUTICAL COMPOSITIONS CONTAINING
THE SAME
2-PHENYL-3-[3-DIALKYLAMINOPROPANOYL]BEN-
ZOFURAN COMPOUNDS
Wilhelm Kaupmann, Hannover-Kirchrode; Klaus-Wolf von
Eickstedt, Berlin, and Salah-Eldin Rahman, Warnsdorf, all
of Germany, assignors to Kali-Chemie Aktiengesellschaft,
Hannover, Germany
Filed June 6, 1974, Ser. No. 477,091
Int. Cl.² C07D 307/81 10 Claims
U.S. Cl. 260—346.2 R
1. An amino carbonyl benzofuran of the group consisting of
compounds having the formula



in which R is hydrogen, halogen, or alkyl containing up to 4
carbon atoms, X is phenyl, halophenyl, alkylphenyl, or alkoxy-
phenyl, the alkyl moieties of which contain up to 4 carbon
atoms, and Y is a dialkylamino radical, the alkyl moieties of
which contain up to 4 carbon atoms, and pharmaceutically
acceptable acid addition salts thereof.

4,009,185
CONVERSION OF DIPHENYLEETHERS TO
DIBENZOFURANS USING CATALYSTS CONTAINING
CERIA
Norman A. Fishel, Olivette, Mo., assignor to Monsanto Com-
pany, St. Louis, Mo.
Filed Aug. 8, 1975, Ser. No. 603,065
Int. Cl.² C07D 307/91 6 Claims
U.S. Cl. 260—346.2 M
1. Process for the production of a dibenzofuran compound
which comprises contacting an aromatic ether compound
feedstock comprising a diphenyl oxide having at least one
unsubstituted ortho position in each of the phenyl rings which
have no substituents other than alkyl, hydroxy, aryl, aralkyl,
and alkyaryl, including forms in which an aryl ring is fused to
the phenyl ring to form polycyclic aromatic groups said aromatic
ether compound being capable of vaporization under the
reaction conditions, in the vapor phase at a temperature of
300° to 700° C at a gas hourly space velocity of from 1 hr⁻¹ to
2,000 hr⁻¹ over a catalyst essentially composed of a member
of the class of ceria, and combinations of ceria with an oxide
of a metal of the group consisting of aluminum, silicon, mag-
nesium, titanium, zirconium, hafnium, calcium, potassium,
sodium, lanthanum, neodymium, praseodymium, samarium,
thorium, and uranium and mixtures thereof, to produce a
dibenzofuran compound.

4,009,186
PROCESS FOR THE PREPARATION OF MALEIC
ANHYDRIDE FROM MALEIC ACID IN THE PRESENCE
OF SULFOLANE
Jean-Marie Lietard, Gent, and Guido Matthijs, Mariakerke,
both of Belgium, assignors to U. C. B., Societe Anonyme,
Brussels, Belgium
Filed July 10, 1975, Ser. No. 594,672
Claims priority, application United Kingdom, July 12, 1974,
30938/74
Int. Cl.² C07D 307/60 11 Claims
U.S. Cl. 260—346.8 M
1. A process for the preparation of maleic anhydride by
dehydration of maleic acid, which comprises heating maleic
acid at a temperature of from about 100° to about 210° C

under a pressure of about 30 to about 760 mm Hg in the presence of sulfolane.

4,009,187

8-(5-FORMYL-2-FURYL)-OCTANOIC ACID

Rune Eliasson, Spanga, Sweden, and Poul Nedenskov, Birkerød, Denmark, assignors to Aktieselskabet Grindstedvaerket, Arhus, Denmark

Filed Mar. 15, 1973, Ser. No. 341,627

Claims priority, application United Kingdom, Mar. 20, 1972, 12940/72

Int. Cl.² C07D 307/46

U.S. Cl. 260—347.3

1 Claim

1. 8-(5-Formyl-2-furyl)-octanoic acid.

4,009,188

CONTINUOUS PROCESS FOR RECOVERY OF GLYCID

Wolfgang Heim, Bruchkobel; Axel Kleemann, Hanau; Heinz Kolb, Hanau, and Gerd Schreyer, Hanau, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

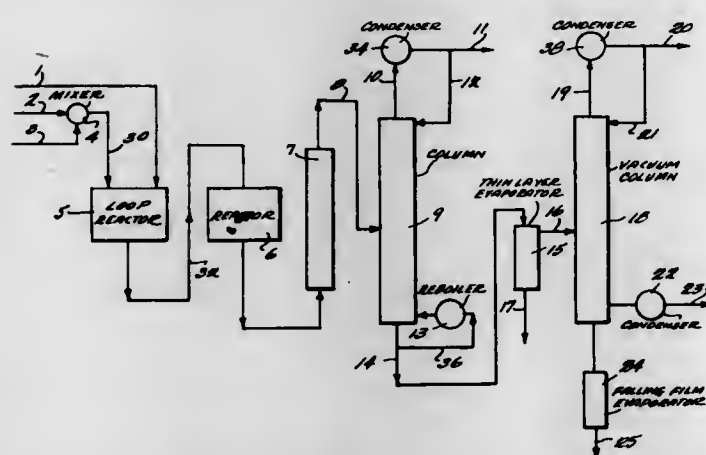
Filed Feb. 19, 1975, Ser. No. 551,015

Claims priority, application Germany, Feb. 25, 1974, 2408948

Int. Cl.² C07D 301/12; B01D 3/10, 3/28

U.S. Cl. 260—348.5 L

3 Claims



1. In a process for preparing glycid by reacting allyl alcohol with aqueous hydrogen peroxide employing a tungsten compound as a catalyst, (1) distilling off from the reaction mixture produced excess alcohol and the predominate part of the water, then taking the sump mixture from said distillation and (2) distilling it at 110°–220° C. and 5 and 60 torr into a volatile portion which is predominantly glycid, high boiling byproducts and the residual part of the water and a sump portion of glycerine, polyglycerine and catalyst, the improvement comprising taking said volatile portion and immediately after said distillation at 110°–220° C., before the volatile portion has cooled substantially, separating said volatile portion at 5 to 60 torr by distilling off the water in a column having a sump, recovering glycid by drawing it off at a point above the sump of said column and removing the high boiling byproducts from the sump.

4,009,189

BASIC ANTHRAQUINONE DYES, THEIR PRODUCTION AND USE

Emilio Baserga, Zurich, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 357,114, May 4, 1973, abandoned, which is a continuation of Ser. No. 32,381, April 27, 1970, abandoned. This application June 9, 1975, Ser. No. 584,814

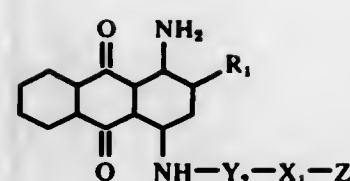
Claims priority, application Switzerland, May 21, 1969, 7690/69; June 6, 1969, 8646/69

Int. Cl.² C07C 97/25; C09B 1/16

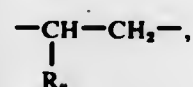
U.S. Cl. 260—381

8 Claims

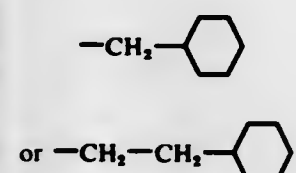
1. A compound of the formula



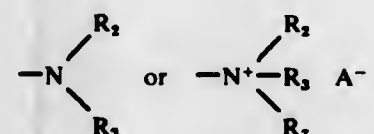
wherein

R₁ is chlorine or bromine,Y₂ is

X₁ is the direct linkage or —CH₂—, —C₂H₄— or —OC₂H₄—

R₄ is —CH₃, —C₂H₅, —C₃H₇,

Z is



R₂ and R₃ are, independently, alkyl, cyclohexyl, phenyl, or naphthyl,
R₇ is alkyl or phenyl,
A⁻ is an anion,
and any alkyl group contains 1 to 6 carbon atoms.

4,009,190

BROMOALKYL ALKANESULFONATE

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 293,721, Sept. 29, 1972, abandoned, which is a division of Ser. No. 100,771, Dec. 22, 1970, abandoned. This application Feb. 11, 1974, Ser. No. 441,691

Int. Cl.² C07C 143/68

U.S. Cl. 260—456 R

6 Claims

1. A compound corresponding to the generic formula:



wherein R is selected from the group consisting of iso-butyl, n-butyl and n-hexyl, n is 2 or 3.

4,009,191

BROMOETHYL DIESTER OF SULFOACETIC ACID

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 441,606, Feb. 11, 1974, abandoned, which is a division of Ser. No. 293,721, Sept. 29, 1972, abandoned, which is a division of Ser. No. 100,771, Dec. 22, 1970, abandoned. This application Oct. 9, 1974, Ser. No. 513,363

Int. Cl.² C07C 143/68

U.S. Cl. 260—456 R

1 Claim

1. The compound

4,009,194

CATALYTIC AMMOXIDATION OF OLEFINS TO NITRILES

Sumio Umemura; Kyoji Ohdan; Tokuo Matsuzaki; Yasuo Nakamura, and Masao Sawazi, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Apr. 22, 1975, Ser. No. 570,499

Claims priority, application Japan, June 4, 1974, 49-62512 Int. Cl.² C07C 120/14

U.S. Cl. 260—465.3

5 Claims

1. A process for producing acrylonitrile or methacrylonitrile by catalytic ammoxidation of propylene or isobutylene, which comprises contacting a feed-gas mixture comprising propylene or isobutylene, ammonia and oxygen in the vapor phase at a temperature of 300° C to 550° C for a period of 0.3 to 20 seconds with a catalyst consisting essentially of as the sole catalyst a predominant amount of oxides each containing two or more metals and a minor amount of simple oxides each containing a single metal, said catalyst having the composition defined by the following formula Mo_aBiCo_bFe_cZr_dO_e, wherein each of a, b, c, and d is a positive number indicating an atomic ratio of the respective metal to bismuth and falling within the following ranges, a = 5.0 to 15.0, b = 2.0 to 8.0, c = 0.5 to 4.0 and d = 0.1 to 2.0, and e is a positive number falling within the range of 6 to 86 and satisfying the average valency of the respective metals; and said catalyst being the calcined residue of a mixture formed by mixing in an aqueous system the respective metal-containing compounds, said respective metal-containing compounds being in the form of oxide, salt or a mixture thereof.

4,009,192

O-AMINOSULFONYLGLYCOLIC AMIDES

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, heiress-at-law); Hanspeter Hansen, Ludwigshafen, and Wolfgang Rohr, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 16, 1975, Ser. No. 587,355

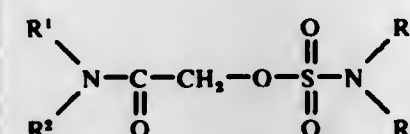
Claims priority, application Germany, July 1, 1974, 2431582

Int. Cl.² C07C 143/68

U.S. Cl. 260—456 A

13 Claims

1. A substituted O-(aminosulfonyl)-glycolic amide of the formula



where R¹ is alkyl of 1 to 8 carbon atoms, alkenyl of 3 to 8 carbon atoms or alkynyl of 3 to 8 carbon atoms, R² is alkyl of 1 to 8 carbon atoms or alkenyl of 3 to 8 carbon atoms, R³ is hydrogen, alkyl of 1 to 8 carbon atoms or haloalkyl of 1 to 8 carbon atoms and R⁴ is hydrogen, alkyl of 1 to 8 carbon atoms or haloalkyl of 1 to 8 carbon atoms.

4,009,193

BISSTYRYLARYL COMPOUNDS

Horst Scheuermann, Ludwigshafen, and Walter Stitz, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 12, 1974, Ser. No. 532,192

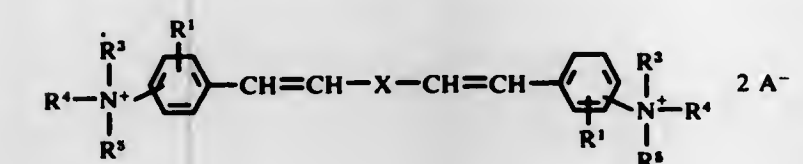
Claims priority, application Germany, Dec. 22, 1973, 2364396

Int. Cl.² C07C 141/04, 87/68, 121/60

U.S. Cl. 260—459 A

3 Claims

1. A compound of the formula



wherein

X is 1,4-phenylene, 1,4-phenylene substituted by chloro, methyl or methoxy or 4,4'-diphenylene,

R¹ is hydrogen, chloro, methyl, methoxy, ethoxy, cyano or methoxycarbonyl,

R² and R³ are alkyl of 1 to 4 carbon atoms, chloro-, methoxy-, β-ethoxy-, β-acetoxy- or β-cyanoethyl, benzyl or phenylethyl,

R⁴ is alkyl of 1 to 4 carbon atoms, hydroxyalkyl of 2 to 3 carbon atoms, β-hydroxy-γ-chloropropyl, β-cyanoethyl or alkoxyalkylethyl of 1 to 4 carbon atoms in the alkoxy, and

A⁻ is the chloride, bromide, iodide, methosulfate, ethosulfate, benzenesulfonate or p-toluenesulfonate anion where R⁵ is said alkyl of 1 to 4 carbon atoms, or A⁻ is the formate, acetate, propionate or benzoate anion where R⁶ is said hydroxyalkyl of 2 to 3 carbon atoms, β-hydroxy-γ-chloropropyl, β-cyanoethyl or alkoxyalkylethyl of 1 to 4 carbon atoms in the alkoxy.

4,009,195

PROCESSES OF PREPARING OLIGOMERS

Norman A. Leister, Huntingdon Valley, and Richard J. Piccolini, Newtown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

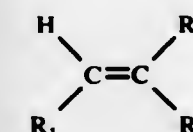
Division of Ser. No. 180,142, Sept. 13, 1971, Pat. No.

3,968,148. This application June 12, 1975, Ser. No. 586,475 Int. Cl.² C07C 67/30

U.S. Cl. 260—465.4

4 Claims

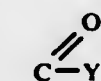
1. An oligomerization process which comprises the continuous and concurrent addition of:
a. from about 1 to about 35 percent by weight of a derivative of acrylic acid having the formula



wherein

R₁ is selected from H, CO₂H or CO₂R₂,R₂ is selected from H or CH₃,R₃ is (CH₂)_nX₁,

n is an integer ranging from 0 to 8

X₁ is selected from a halogen, CO₂H, CO₂R₄, C = N or

R₄ is an alkyl group having one to four carbon atoms, R₅ is selected from any alkyl group having one to four carbon atoms or a polar moiety containing ether or sulfide or sulfinyl or hydroxyl or amine or amide groups or combinations thereof, containing as many as 12 carbon atoms, Y is selected from -NZ'Z'' O(CH₂)_m-NZ'Z'', O(CH₂)_m-C-NZ'Z'', -NHNZ'Z'' or -N⁺N⁺Z₃'', m is an integer from 1 to 12, Z' is hydrogen or an alkyl group, straight or branched, of 1 to 20 carbon atoms, Z'' is hydrogen or an alkyl group of 1 to 20 carbon atoms,

4,009,202

2(OR 3)-METHYL-1-ACETOXY-4-ALKOXY (OR PHENOXY)-1,3-BUTADIENES

Joachim Paust, Neuhausen, and Horst Schumacher, Bobenheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed May 25, 1973, Ser. No. 363,861

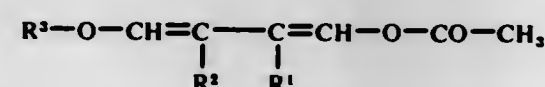
Claims priority, application Germany, May 26, 1972, 2225612; Feb. 28, 1973, 2309885

Int. Cl.² C07C 69/145

U.S. Cl. 260—488 CD

7 Claims

1. Substituted methyl-1-acetoxy-1,3-butadienes of the formula I



in which R¹ and R² are different and denote hydrogen or methyl and R³ denotes an alkyl radical of from 1 to 4 carbon atoms or phenyl.

4,009,203

CONVERSION OF OLEFINS TO ESTERS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 27, 1975, Ser. No. 544,595

Int. Cl.² C07C 67/04

U.S. Cl. 260—497 R

10 Claims

1. A process for the production of an ester which comprises reacting an olefinic hydrocarbon with a carboxylic acid selected from the group consisting of aliphatic, aromatic, alkenic and halogenated aliphatic and aromatic acids in the presence of the pre-formed acyloxystannic trihalide reaction product of a tin halide selected from the group consisting of stannic chloride, bromide and iodide with a carboxylic acid selected from the group consisting of aliphatic, aromatic, alkenic and halogenated aliphatic and aromatic acids, and recovering the resultant ester.

4,009,204

PROCESS OF PRODUCING CRYSTALLINE NITRIL TRIS-(METHYLENE PHOSPHONIC ACID)

Friedrich Krueger, Edingen, and Lieselotte Bauer, Bad Duerkheim, both of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen am Rhein, Germany

Filed Mar. 18, 1971, Ser. No. 125,852

Claims priority, application Germany, Mar. 20, 1970, 2013372

Int. Cl.² C07F 9/38

U.S. Cl. 260—502.5

8 Claims

1. In a process of producing substantially pure, crystalline nitrilo tris-(methylene phosphonic acid), the steps which comprise

- slowly adding a phosphorus trihalogenide selected from the group consisting of phosphorus trichloride, phosphorus tribromide, and phosphorus triiodide to an aqueous solution of formaldehyde and a lower aliphatic acid amide selected from the group consisting of formamide and oxamide at room temperature, while stirring, the proportion of formaldehyde to phosphorus trihalogenide to acid amide calculated for one acid amide group being about 3:3:1,
- slowly increasing the temperature of the resulting reaction mixture to at least the temperature of the boiling water bath,
- heating the reaction mixture at a temperature between about 100° and about 140° C. to complete reaction,
- cooling the reaction solution to room temperature, and
- separating the resulting crystallized nitrilo tris-(methylene phosphonic acid) precipitated from the reaction solution on cooling.

4,009,205

PROCESS FOR PREPARING 4-AMINO-3-METHYL-N-SUBSTITUTED OR UNSUBSTITUTED ALKYLANILINES

Shiro Kimura; Hideo Nagasawa; Yasuo Kato; Yasuyoshi Nakamura; Shoji Miki, and Yumiko Ishikawa, all of Tokyo, Japan, assignors to Sanko Chemical Company Ltd., Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,787

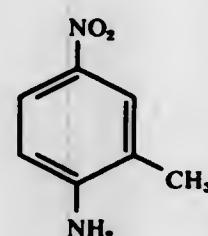
Claims priority, application Japan, Nov. 14, 1973, 48-127373

Int. Cl.² C07C 143/75, 143/58, 143/64; G03C 5/30

U.S. Cl. 260—556 A

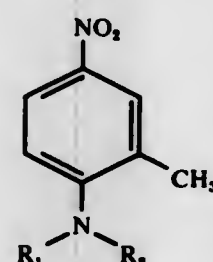
11 Claims

1. A process for the preparation of 4-amino-3-methyl-N-substituted or unsubstituted alkylanilines comprising acylating or sulfonylating or acylating and difonylating 4-amino-3-methyl-nitrobenzene have the formula (I)



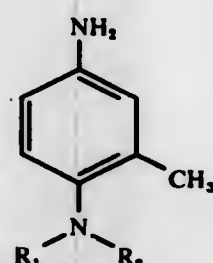
(I)

with an acylation or sulfonylation or acylation and sulfonylation agent to obtain a compound having the general formula (II)



(II)

wherein R₁ represents a hydrogen atom or an acyl group, R₂ represents an acyl group or a sulfonyl group, or R₁ and R₂ can combine as a difunctional acyl group; reducing the nitro group of the compound having the general formula (II) with hydrogen in the presence of a metal hydrogenation catalyst to obtain a compound having the general formula (III)



(III)

wherein R₁ and R₂ are as above defined; alkylating the amino group of the compound having the general formula (III) with one or more alkylation steps each using an alkylation agent selected from the group consisting of an alkyl halide, a substituted alkyl halide, an alkyl aldehyde, a dialkyl sulphate and an alkylene oxide to obtain a compound having the general formula (IV)

4,009,208

N,N'-HEPTAMETHYLENEBIS(4-METHOXYBENZAMIDE)

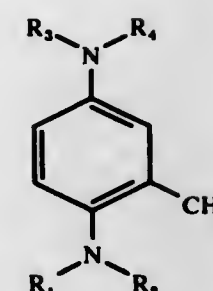
George Y. Leshner, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

(IV) Division of Ser. No. 62,186, Aug. 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 756,373, Aug. 30, 1968, abandoned. This application Nov. 21, 1972, Ser. No. 308,498
Int. Cl.² C07C 103/82

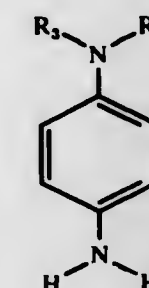
U.S. Cl. 260—559 R

1 Claim

1. N,N'-heptamethylenebis(4-methoxybenzamide).



wherein R₁ and R₂ are as above defined, R₃ represents an alkyl group having 1 to 3 carbon atoms or an alkyl group having 2 to 3 carbon atoms and substituted by a hydroxy, a β-methyl-sulfonamido as a SO₃H group and R₄ represents a hydrogen atom, an alkyl group having 1 to 3 carbon atoms or an alkyl group having 2 to 3 carbon atoms substituted by a hydroxy group; hydrolyzing the compound having the general formula (IV) to obtain a compound having the general formula (V)



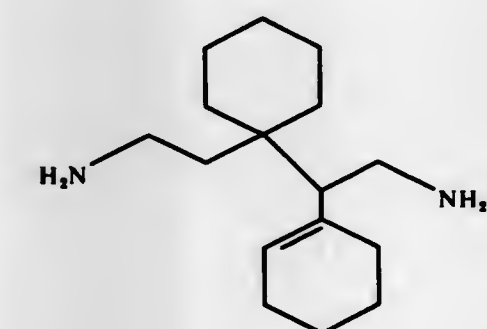
(V)

Int. Cl.² C07C 87/34

U.S. Cl. 260—563 P

9 Claims

1. 1,5-diamino-2-(1-cyclohexenyl)-3,3-pentamethylene-pentane of the formula



4,009,210

PROCESS FOR MANUFACTURING**3,5-DITERT-BUTYL-4-HYDROXYBENZALDEHYDE BY FORMYLATION OF 2,6-DITERT-BUTYLPHENOL**

Roger P. Cahoy, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 7, 1975, Ser. No. 575,555

Int. Cl.² C07C 45/00

U.S. Cl. 260—600 R

3 Claims

1. The method of manufacturing 3,5-ditert-butyl-4-hydroxybenzaldehyde comprising reacting a mixture consisting of 2,6-ditert-butylphenol with 2 to 3 molar equivalents of hexamethylenetetramine in at least 80 volume percent aqueous acetic acid at reflux temperature under atmospheric pressure.

4,009,211

BETA,BETA-DIALKYLETHYLMERCAPTOETHOXY-LATE AS NEW COMPOUNDS

Anatoli Onopchenko, Monroeville, and Johann G. D. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

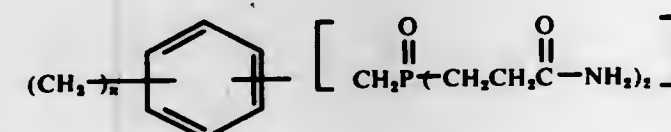
Filed July 29, 1975, Ser. No. 600,150

Int. Cl.² C07C 149/18

U.S. Cl. 260—609 R

2 Claims

1. Novel beta,beta-dialkylethylmercaptoethoxylates of the following structural formula:



wherein n is a whole, positive integer of 1-4, inclusive.

4,009,206

N-(SUBSTITUTED PHENYL AND BENZYL)ABIETAMIDES

Hiromu Murai; Katsuya Ohata; Hiroshi Enomoto; Kenji Sempuku; Koji Kitaguchi; Yukio Fujita; Yoshiaki Yoshikuni; Kohel Kura; Katsuhide Saito; Tamiki Mori, and Yasuo Yasutomi, all c/o Nippon Shinyaku Co., Ltd., 14 Kisshoin Nishinosho Monguchicho, Minami Kyoto, Japan

Filed Aug. 13, 1975, Ser. No. 604,308

Claims priority, application Japan, Aug. 28, 1974, 49-99386; Nov. 9, 1974, 49-129295

Int. Cl.² C07C 101/18, 101/453, 103/19; A61K 31/16

U.S. Cl. 260—557 B

15 Claims

1. An N-(substituted phenyl) or N-(substituted benzyl)amide of an acid selected from the group consisting of abietic, dehydroabietic, dihydroabietic and tetrahydroabietic acids wherein said phenyl or benzyl is substituted with from one to three substituents independently selected from the group consisting of halo, nitro, lower alkyl, haloalkyl, hydroxyl, lower alkoxy, carboxyl or carbalkoxy.

4,009,207

CARBAMOYLALKYL SUBSTITUTED POLY(PHOSPHINE OXIDE) FLAME-RETARDANTS

Joseph Adrian Hoffman, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 603,463, Aug. 11, 1975, Pat. No.

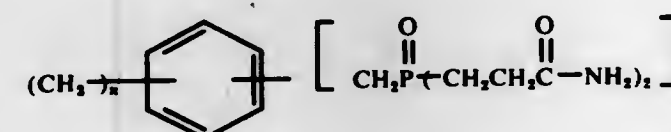
3,976,685. This application Apr. 15, 1976, Ser. No. 677,338

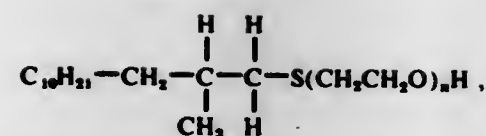
Int. Cl.² C07C 103/75

U.S. Cl. 260—558 A

5 Claims

1. A compound having the formula





wherein n is an integer from 8 to 16.

4,009,212

METHOD FOR THE PREPARATION OF META DIHYDROXYBENZENES

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

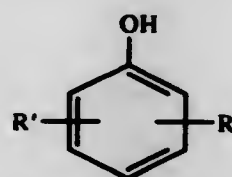
Continuation-in-part of Ser. No. 334,270, Feb. 21, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,767
Int. Cl.² C07C 37/04

U.S. Cl. 260—628

5 Claims

1. A process for the preparation of dihydroxybenzenes wherein the hydroxyl radicals are in meta position to each other, the said process comprising:

A. heating in the presence of sulfuric acid and at a temperature between 25° and 120° C. a hydroxybenzene having the formula



in which R and R' are each selected from the group consisting of hydrogen and an alkyl radical having inclusively from one to four carbon atoms in the alkyl chain, the total number of carbon atoms in radicals R and R' being at most four, thereby forming a mixture of sulfonic acid isomers;

B. isomerizing the said mixture in the presence of sulfuric acid at a temperature of between 130° and 200° C. to obtain an isomeric mixture containing the isomer wherein the sulfonic acid group is meta with respect to the hydroxyl group;

C. selectively hydrolyzing in an aqueous medium at a temperature between about 100° and 150° C. in the said mixture those sulfonic acid isomers in which the sulfonic acid group is in a position other than meta with respect to the hydroxyl group to produce thereby the selected hydroxybenzene of step A;

D. caustically fusing the unhydrolyzed meta sulfonic acid remaining in the aqueous medium; and

E. acidifying the resultant salt of the meta dihydroxybenzene to liberate the desired meta dihydroxybenzene.

4,009,213

CONTINUOUS PROCESS FOR THE SEPARATION OF MIXTURES OF FATTY SUBSTANCES OF DIFFERENT MELTING POINTS

Werner Stein, Erkrath-Unterbach, and Helmut Hartmann, Langenfeld, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Continuation-in-part of Ser. No. 521,915, Nov. 7, 1974, Pat. No. 3,953,485, which is a division of Ser. No. 300,895, Oct. 26, 1972, Pat. No. 3,870,735. This application Mar. 9, 1976, Ser. No. 600,215

Claims priority, application Germany, Nov. 11, 1971, 2155988

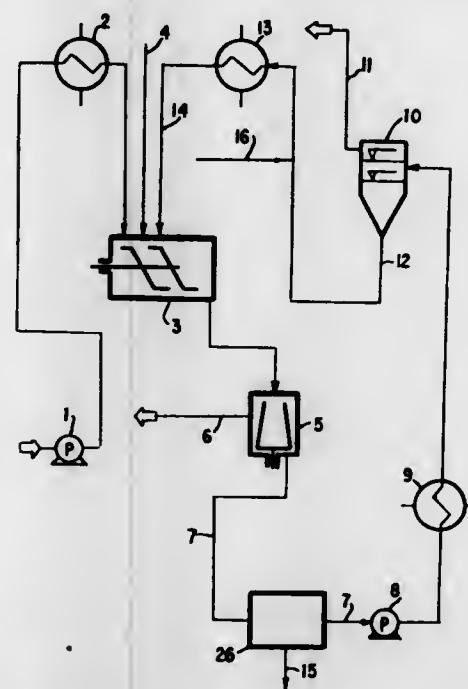
Int. Cl.² C07C 29/24

U.S. Cl. 260—643 D

8 Claims

1. A continuous process for the separation of mixtures of fatty alcohols into fatty alcohol mixtures of different melting points by the steps of continuously dispersing said mixture of fatty alcohols consisting of an oily phase and a solid phase in

a recycling aqueous wetting agent solution at a temperature whereby a dispersion of liquid fatty alcohol and solid fatty alcohol particles is obtained, continuously separating said dispersion into two phases of different specific gravities, a lighter phase consisting substantially of liquid fatty alcohol fractions and a heavier phase consisting substantially of solid fatty alcohol particles dispersed in said aqueous wetting agent solution, continuously withdrawing said liquid fatty alcohol fractions, continuously separating said solid fatty alcohol particles from 10% to 70% by weight of said aqueous wetting agent solution, continuously withdrawing said separated aqueous



4,009,214

SEPARATION OF HYDROGEN FLUORIDE FROM HYDROGEN CHLORIDE GAS

Morgan C. Sze, Upper Montclair, and John E. Paustian, Whippany, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Apr. 25, 1975, Ser. No. 571,805

Int. Cl.² C07C 17/15, 17/38, 7/08, 7/22

U.S. Cl. 260—653.7

8 Claims

1. A process for separating an impurity from hydrogen chloride gas containing at least one member selected from the group consisting of hydrogen fluoride and silicon tetrafluoride, comprising:

contacting at a temperature of from 0° to 90° C said hydrogen chloride gas with calcium chloride supported on activated alumina in an amount of from 1 to 30 weight percent based on activated alumina and calcium chloride to reduce the content of said at least one member to less than 50 ppm.

8. In a process for producing chlorofluoromethanes by oxychlorination of methane by contact with a molten salt mixture comprising the higher and lower valent chlorides of a multivalent metal and the oxychloride thereof and a member selected from the group consisting of hydrogen chloride, chlorine and mixture thereof to produce chlorinated methanes, contacting chlorinated methane with hydrogen fluoride

to produce chlorofluoromethanes and hydrogen chloride and recovering hydrogen chloride containing an impurity selected from the group consisting of hydrogen fluoride and a mixture of hydrogen fluoride and silicon tetrafluoride, the improvement comprising:

contacting at a temperature of from 0° to 90° C the hydrogen chloride containing said impurity with calcium chloride supported on activated alumina in an amount of from 1 to 30 weight percent based on activated alumina and calcium chloride to reduce the content of the impurity to less than 50 ppm; and employing said hydrogen chloride having less than 50 ppm of said impurity in said oxychlorination of methane.

4,009,215

PREPARATION OF CCL₂F AND CCL₂F₂ FROM FLUORSPAR AND CCL₄

Edmund Odon Banas, Brackenville Road R.D. No. 1, P.O. Box 327, Hockessin, Del. 19707, and Wesley Gerald Schindel, Valley Court Apts., Apt. D-7, Pennsville, N.J. 08070

Filed Mar. 16, 1976, Ser. No. 667,372

Int. Cl.² C07C 17/10, 19/08

U.S. Cl. 260—653.8

5 Claims

1. In the process of bringing into contact, under reaction conditions and at a temperature of about from 300° to 650° C, calcium fluoride and carbon tetrachloride to form a mixture of CCL₂F and CCL₂F₂, the improvement which comprises contacting the reactants countercurrently in at least one reaction vessel with axial plug flow and radial shear mixing.

4,009,216

PREPARATION OF ISOPROPYL CHLORIDE

Johann Grolig, Leverkusen; Manfred Martin, Cologne, and Gerhard Scharfe, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 418,142, Nov. 21, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,641
Claims priority, application Germany, Dec. 9, 1972, 2260336

Int. Cl.² C07C 17/08

U.S. Cl. 260—663

6 Claims

1. In the preparation of isopropyl chloride wherein propylene and hydrogen chloride are reacted at elevated temperature in the gaseous phase in the presence of aluminum oxide as catalyst, the improvement which comprises effecting the reaction at a pressure of about 3 to 8 atm, at a temperature of about 50° to 200° C, and in the presence of aluminum oxide having an internal surface area of about 200 to 500 m²/g.

4,009,217

PROCESS FOR PRODUCTION AND DEHYDROGENATION OF ETHYLBENZENE

Kenneth D. Utti, Bensenville, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 6, 1975, Ser. No. 574,985

Int. Cl.² C07C 15/00, 15/10

U.S. Cl. 260—669 R

4 Claims

1. A combination process for the manufacture of an alkylaromatic hydrocarbon by the alkylation of benzene with an olefinic compound and the subsequent catalytic dehydrogenation of a resultant alkylaromatic hydrocarbon, which comprises:

a. passing a feed stream comprising benzene, the olefinic compound and a boron trifluoride into an alkylation zone maintained at alkylation conditions and effecting the formation of a first effluent stream comprising benzene, the alkylaromatic hydrocarbon and a polyalkylated aromatic hydrocarbon;

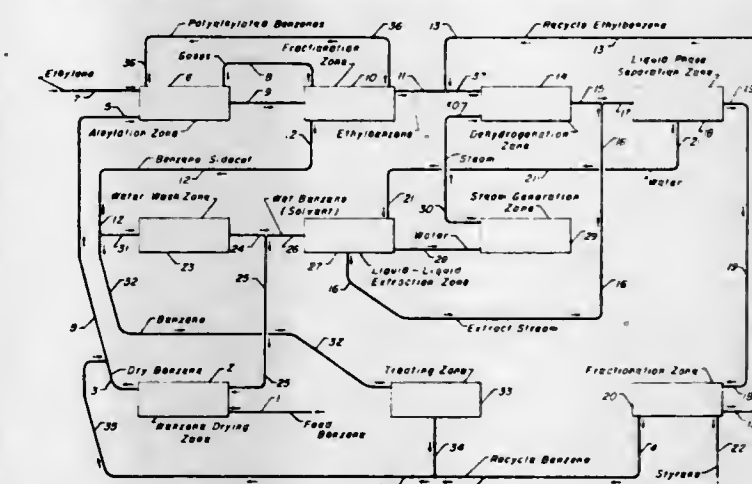
b. separating the first effluent stream in a first fractionation zone and effecting the formation of a first distillate stream comprising the alkylaromatic hydrocarbon and a second distillate stream comprising benzene and a volatile com-

plex formed by admixing a boron trifluoride stream charged to the first fractionation zone with boron oxide hydrates contained in the first effluent stream;

c. passing at least a portion of the second distillate stream into a water wash zone and effecting the removal of the volatile complex from the second distillate stream by contact with water and the formation of a solvent stream comprising benzene and dissolved water;

d. admixing the first distillate stream with superheated steam and passing a resultant admixture into a dehydrogenation zone maintained at dehydrogenation conditions including the presence of a fixed bed heterogeneous dehydrogenation catalyst, and effecting the formation of a second effluent stream comprising the alkenylaromatic hydrocarbon;

e. condensing hydrocarbons in the second effluent stream having more than five carbon atoms per molecule, and then passing the second effluent stream into a liquid phase separation zone and separating the second effluent stream into an aqueous phase and a liquid hydrocarbon



phase comprising the alkenylaromatic hydrocarbon and the alkylaromatic hydrocarbon;

f. removing said liquid hydrocarbon phase from the liquid phase separation zone and passing said liquid hydrocarbon phase into a second fractionation zone, and effecting the formation of a product stream comprising the alkenylaromatic hydrocarbon;

g. removing said aqueous phase comprising the alkenylaromatic hydrocarbon and the alkylaromatic hydrocarbon from the liquid phase separation zone and contacting said aqueous phase with said solvent stream in a liquid-liquid extraction zone, and effecting the transfer of at least a portion of the alkenylaromatic hydrocarbon and the alkylaromatic hydrocarbon in the aqueous phase to said solvent stream and the formation of an extract stream comprising benzene, dissolved water, the alkenylaromatic hydrocarbon and the alkylaromatic hydrocarbon; and

h. admixing the extract stream with the second effluent stream.

4,009,218

ALKYLAROMATIC HYDROCARBON DEHYDROGENATION PROCESS

Kenneth D. Utti, Bensenville, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 6, 1975, Ser. No. 574,986

Int. Cl.² C07C 15/00, 15/10

U.S. Cl. 260—669 R

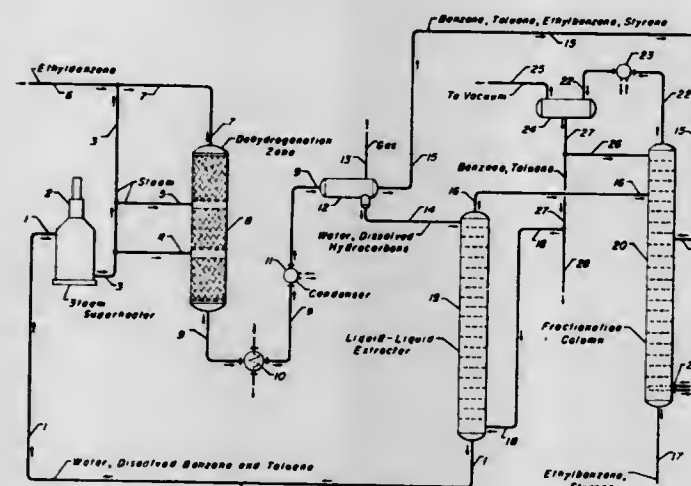
3 Claims

1. A process for the dehydrogenation of ethylbenzene which comprises in cooperative combination the steps of:

a. admixing a feed stream comprising ethylbenzene with steam and contacting the resulting admixture with a heterogeneous fixed-bed dehydrogenation catalyst within a reaction zone maintained at dehydrogenation conditions and effecting the formation of an effluent stream comprising styrene, ethylbenzene and steam;

b. effecting a partial condensation of the effluent stream by passage through a condensing zone;

- c. passing the effluent stream into a phase separation zone and effecting the formation of a hydrocarbonaceous phase comprising styrene, ethylbenzene, toluene and benzene and an aqueous phase comprising styrene;
- d. passing a first water stream comprising at least a portion of the aqueous phase into a liquid-liquid extraction zone and effecting a removal of substantially all of the styrene from the first water stream by contact with a solvent stream comprising benzene, and effecting the formation of a second water stream which is substantially free of styrene;



- e. passing at least a portion of the second water stream into a steam generation zone and effecting the formation of steam which is fed into the reaction zone;
- f. passing the hydrocarbonaceous phase comprising styrene, ethylbenzene, toluene and benzene into a fractionation zone and effecting a separation of the benzene and toluene from the styrene and ethylbenzene, and effecting therein the formation of a solvent stream comprising benzene which is substantially free of styrene and ethylbenzene; and
- g. passing at least a portion of the solvent stream comprising benzene into the liquid-liquid extraction zone as the solvent stream.

4,009,219
TOTAL SYNTHESIS OF BENZENE FROM
NON-HYDROCARBON MATERIALS
 Murry A. Tamers, Nova University College Ave., Fort Lauderdale, Fla. 33314

Filed Apr. 28, 1975, Ser. No. 572,165
 Int. Cl.² C07C 3/02, 11/24

U.S. Cl. 260—673

10 Claims

1. The process of producing benzene comprising:
- reacting non-hydrocarbon carbonaceous material in a sealed, substantially leak-free reactor with lithium in the form of lithium metal, lithium hydroxide or lithium oxide at a temperature of at least 500°C in the strict absence of air and moisture to produce lithium carbide;
 - hydrolyzing said lithium carbide to produce acetylene and lithium in at least one of said forms;
 - cyclizing said acetylene to produce benzene;
 - and recycling through step (a) said lithium produced in step (b).

4,009,220
DEHYDROCYCLIZATION WITH AN ACIDIC
MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
 Continuation-in-part of Ser. No. 538,240, Jan. 2, 1975, Pat. No. 3,957,624. This application Mar. 24, 1976, Ser. No. 670,015

Int. Cl.² C07C 3/04; B01V 23/62

U.S. Cl. 260—673.5

27 Claims

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

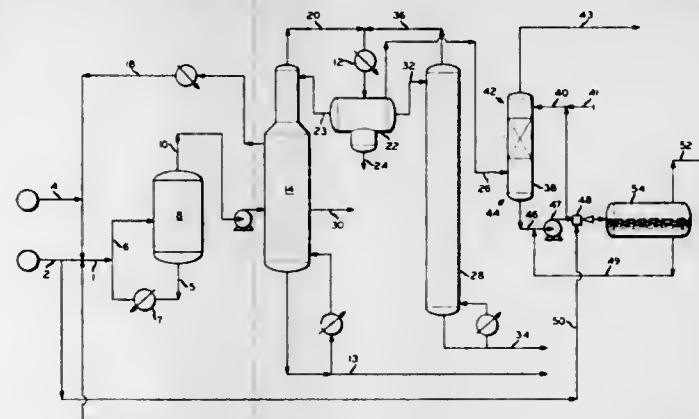
4,009,221
HF RECOVERY WITH ALKYL FLUORIDE FORMATION
AND UTILITY IN ALKYLATION

Cecil O. Carter, Wann, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 327,734, Jan. 29, 1973, Pat. No. 3,906,051. This application June 19, 1975, Ser. No. 588,558
 Int. Cl.² C07C 3/54

U.S. Cl. 260—683.48

3 Claims



1. A process for the production of an alkylate comprising:
- introducing an isoparaffin selected from the group consisting of isobutane, isopentane and mixtures thereof and an olefin selected from the group consisting of propylene, butylene, isobutylene, amylene and mixtures thereof and an HF catalyst into an alkylation reaction zone;
 - reacting the materials introduced into said alkylation reaction zone to form an effluent comprising an alkylate;
 - separating said effluent into an HF catalyst phase and a hydrocarbon phase;
 - passing said hydrocarbon phase into a fractionation zone;
 - withdrawing said alkylate from said fractionation zone as a liquid;
 - withdrawing a vapor comprising light hydrocarbons and HF from said fractionation zone;
 - contacting said vapor from said fractionation zone with water to form a vapor stream of light hydrocarbons substantially free of HF and a stream of a liquid first mixture comprising HF and water;
 - reacting said stream of a liquid first mixture with an olefin selected from the group consisting of propylene, isobutyl-

- ene, cis-butene-2, trans-butene-2, butene-1, amylene and mixtures thereof to form an alkyl fluoride comprising reaction product,
- i. separating said alkyl fluoride from said reaction product, and
- j. introducing said alkyl fluoride into the alkylation reaction zone.

4,009,222
RECOVERY OF GASEOUS HYDROGEN FLUORIDE
STREAM IN ALKYLATION PROCESS

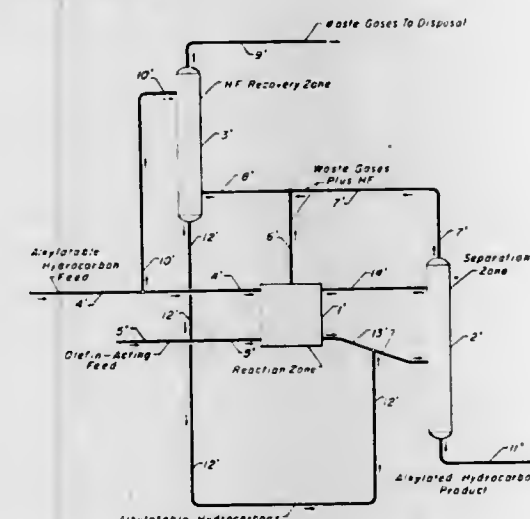
Michael Z. Mikulicz, Palatine; William G. Boney, Rolling Meadows, and Bipin V. Vora, Buffalo Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 520,811, Nov. 4, 1974, Pat. No. 3,957,902. This application Oct. 22, 1975, Ser. No. 624,626

Int. Cl.² C07C 3/54

U.S. Cl. 260—683.48

2 Claims



1. An alkylation process which comprises the steps of:
- reacting an olefin with an alkylatable hydrocarbon in contact with hydrogen fluoride catalyst in a reaction zone;
 - passing the resultant HF and hydrocarbons from said reaction zone to a fractionation zone;
 - fractionating said HF-containing hydrocarbons in said fractionation zone to separate a stream of gaseous hydrogen fluoride from said hydrocarbons therein;
 - removing a stream of alkylated hydrocarbon product from said fractionation zone;
 - separating a stream of admixed unreacted alkylatable hydrocarbon and hydrogen fluoride from said fractionation zone and supplying said stream to said reaction zone;
 - passing said gaseous hydrogen fluoride stream from said fractionation zone to an absorption zone;
 - passing at least a portion of said alkylatable hydrocarbon to said absorption zone and therein contacting the same with said gaseous hydrogen fluoride stream to absorb hydrogen fluoride into said alkylatable hydrocarbon; and
 - passing said alkylatable hydrocarbon containing absorbed hydrogen fluoride from said absorption zone to said fractionation zone.

4,009,223
THIN FILM ELECTROSTATIC EPOXY COATING
POWDER

Charles M. Noonan, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,336
 Int. Cl.² C08L 63/00

U.S. Cl. 260—830 TW

23 Claims

1. A coating powder made by
- A. dry mixing a composition which comprises:

- a first diglycidyl ether of bisphenol A having an E.E.W. of about 400 to about 900 and a melting point of about 70° to about 110° C;
 - a second diglycidyl ether of bisphenol A having an E.E.W. of about 750 to about 1400 and a melting point of about 100° to about 130° C, where said second diglycidyl ether is different from said first diglycidyl ether and the weight ratio of said first diglycidyl ether to said second diglycidyl ether is about 1 to 1 to about 12 to 1;
 - about 10 to about 60% by weight based on the weight of the total composition of an epoxy ester, the epoxy portion of said ester being derived from a diglycidyl ether of bisphenol A having an E.E.W. of about 400 to about 900 and a melting point of about 70° to about 110° C, and the ester portion being derived from a dibasic acid having the formula $\text{HOOC}-(\text{CH}_2)_m-\text{COOH}$, where m is about 18 to about 54; and
 - about 2 to about 8 phr of a curing agent for said diglycidyl ethers;
- B. extruding said composition;
- C. cooling said composition to form a solid; and
- D. grinding said composition into a powder having a particle size of about 15 to about 74 microns.

4,009,224
EPOXY RESIN POWDER INCLUDING ETHYLENE VINYL
ACETATE

Gerald H. Warnken, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
 Filed Aug. 11, 1975, Ser. No. 603,702

Int. Cl.² C08G 45/04

U.S. Cl. 260—837 R

6 Claims

1. A homogeneous free-flowing powder which is shelf-stable and when heated to 185°–250° C in contact with a metal article fuses and then gels to provide a tough protective coating, said powder comprising
- a polyglycidyl ether of a polyhydric phenol having a softening point of 70°–150° C,
- a normally solid latent hardening agent for epoxy resin,
- a latent catalyst for accelerating reaction between the polyglycidyl ether and the hardening agent when melted together,
- which powder is characterized by the feature that it incorporates per 100 parts of the polyglycidyl ether 3–30 parts by weight of one or more copolymers of monomers comprising by weight 2–50% vinyl acetate and 5–75% ethylene, which copolymer or copolymers have a melt index or combined melt index of 5–400 and impart extraordinarily good flexibility to cured coatings of the powder without undue effect upon other properties of the coatings.

4,009,225
LOW PROFILE PIGMENTED SHEET MOLDING
PROCESS AND PRODUCT

John M. Maxel, St. Charles, Ill., assignor to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 403,935, Oct. 5, 1973, abandoned.
 This application July 10, 1975, Ser. No. 594,651
 Int. Cl.² B29C 1/04; C08F 43/08

U.S. Cl. 260—862

8 Claims

1. A process of preparing a low profile uniformly pigmented sheet molding which comprises preparing a mixture of an unsaturated cross linkable polyester of a dicarboxy acid and a dihydric alcohol, a chemically inert powdered filler, a thermoplastic polymer, a cross linking monomer capable of cross linking with said polyester to produce a thermosetting resin, a tertiary butyl perbenzoate catalyst for the cross linking reaction, a para-benzoquinone high temperature inhibitor for the cross linking reaction, a mold release compound and a pigment, the amount of filler being sufficient to prevent phase separation of the polymer, thereafter adding a thickening

reactant to said mixture, stirring the resultant mixture until thickening occurs but said mixture is still pourable, forming said mixture into a thick layer on a strippable carrier sheet, adding cut bundles of glass filaments to the top of said layer, superimposing a second strippable carrier sheet over the top of said layer, and kneading said layer between said strippable sheets to cause said cut bundles of glass filaments to be distributed uniformly in the interior of said layer, stripping said strippable sheets from said layer, cutting said layer into segments of a size suitable for molding a predetermined article, placing said segments in a mold between solid smooth heated male and female dies which are three-dimensional, and molding said article between said dies at temperatures sufficiently high to cause cross linking to occur between said polyester and said cross linking monomer, the amount of said catalyst being substantially larger than conventionally used for catalyzing said cross linking reaction and being at least about 1.5% by weight of the total resin-forming components and the amount of said inhibitor being at least 300 parts per million by weight of the total resin-forming components and being sufficient to hold back the cross linking reaction until the pigmented sheet, after removal of said strippable sheets, is placed in a mold and allowed to fill the mold.

4,009,226

ABS MOULDING COMPOSITIONS

Karl-Heinz Ott; Gert Humme, both of Leverkusen; Dietmar Kranz, Cologne, and Harry Rohr, Gross Koenigsdorf, all of Germany, assignors to Bayer Aktiengesellschaft, Germany
Filed Apr. 22, 1975, Ser. No. 570,350

Claims priority, application Germany, Apr. 26, 1974, 2420358

Int. Cl.² C08L 55/02

U.S. Cl. 260—876 R

6 Claims

1. A moulding composition comprising:

A. 6 to 30 parts, by weight, of a graft polymer of from 20 to 60 parts, by weight, of a mixture of styrene and acrylonitrile in a weight ratio of from 95 : 5 to 60 : 40 on from 80 to 40 parts, by weight, of a butadiene homo- or copolymer having a butadiene content of at least 30%, an average particle diameter of from 0.26 to 0.65 μ and a grafting degree of from 0.15 to 0.7;

B. 14 to 45 parts, by weight, of a graft polymer of from 40 to 60 parts, by weight, of a mixture of styrene and acrylonitrile in a weight ratio of from 95 : 5 to 60 : 40 on from 60 to 40 parts, by weight, of a butadiene homo- or copolymer having a butadiene content of at least 30%, an average particle diameter of from 0.05 to 0.25 μ and a grafting degree of from 0.4 to 0.9; and

C. 25 to 80 parts, by weight, of a copolymer of styrene and/or α -methyl styrene with acrylonitrile in a weight ratio of from 80 : 20 to 60 : 40 having an average molecular weight of from 50,000 to 200,000 and a molecular heterogeneity of from 4.5 to 1.0

4,009,227

ABS MOULDING COMPOSITIONS

Karl-Heinz Ott, Leverkusen; Harry Rohr, Gross Koenigsdorf; Gert Humme, Leverkusen, and Las Maphäizer, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany
Filed Apr. 22, 1975, Ser. No. 570,996

Claims priority, application Germany, Apr. 26, 1974, 2420357

Int. Cl.² C08L 55/02

U.S. Cl. 260—876 R

8 Claims

1. A moulding composition comprising:

A. 5 to 70 parts, by weight of a graft polymer of from 20 to 60 parts, by weight, of a mixture of styrene and acrylonitrile in a weight ratio of from 95 : 5 to 60 : 40 on from 80 to 40 parts, by weight, of a butadiene homo- or copolymer having a butadiene content of at least 30%, an average particle diameter of from 0.26 to 0.65 μ and a grafting degree of from 0.15 to 0.7;

B. 0 to 50 parts, by weight, of a graft polymer obtained by polymerising from 40 to 60 parts, by weight, of a mixture of styrene and acrylonitrile in a weight ratio of from 95 : 5 to 60 : 40 onto from 60 to 40 parts, by weight, of a butadiene homo- or co-polymer having a butadiene content of at least 30%, and average particle diameter of from 0.05 to 0.25 μ and a grafting degree of from 0.4 to 0.9; and

C. 25 to 95 parts, by weight of a copolymer of styrene and/or α -methyl styrene with acrylonitrile in a weight ratio of from 80 : 20 to 60 : 40 having an average molecular weight of from 50,000 to 200,000 and a molecular heterogeneity of from 4.5 to 1.0; such that

D. the ratios, by weight, of styrene (including α -methyl styrene, if present) to acrylonitrile satisfy the following conditions:

$$\frac{\text{polymerised styrene in (A)}}{\text{polymerised acrylonitrile in (A)}} :$$

$$\frac{\text{polymerised styrene in (C)}}{\text{polymerised acrylonitrile in (C)}} > 1$$

and

$$\frac{\text{polymerised styrene in (B)}}{\text{polymerised acrylonitrile in (B)}} :$$

$$\frac{\text{polymerised styrene in (A)}}{\text{polymerised acrylonitrile in (A)}} < 1$$

4,009,228

PRIMARY AMINE-MODIFIED ANHYDRIDE RESIN

James J. Tazuma, Stow, and Joel Muse, Medina, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 12, 1975, Ser. No. 576,409

Int. Cl.² C08L 23/36

U.S. Cl. 260—878 R

13 Claims

1. The resinous composition prepared by the method which comprises reacting (A) about 1 to about 2 amine equivalents of a primary amine selected from at least one of the group consisting of aliphatic and aromatic amines and diamines with, correspondingly, (B) about 2 to about 1 equivalents of a maleic anhydride-modified piperylene/methyl branched monoolefin backbone resin at a temperature in the range of about 25° to about 350° C where said anhydride-modified resin is prepared by the method which comprises the steps of (1) reacting about 30 to about 60 parts by weight maleic anhydride, or reacting about 10 to about 25 parts by weight maleic anhydride if an organoperoxide catalyst is used, at a temperature in the range of about 150° to about 250° C with

100 parts by weight of a hydrocarbon-derived resin having a softening point in the range of about 10° to about 50° C prepared by polymerizing in the presence of a catalyst selected from boron trifluoride and boron trifluoride etherate, a monomer mixture which comprises about 40 to about 70 weight percent piperylene, and correspondingly, about 60 to about 30 weight percent of at least one monoolefin selected from methyl branched chain α or β monoolefins containing 4 to 6 carbon atoms, where the weight ratio of piperylene to said branched chain monoolefin is about 0.8/1 to about 2.0/1 and (2) removing unreacted maleic anhydride, if any, preferably by distillation.

4,009,229

APPARATUS FOR HEAT- AND MASS TRANSFER BETWEEN LIQUIDS AND GASES

László Szűcs; Csaba Tasnádi, and István Lindner, all of Budapest, Hungary, assignors to Patentbureau Danubia, Budapest, Hungary

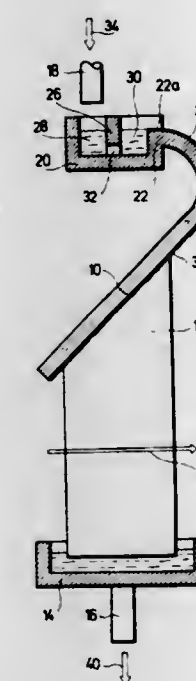
Continuation of Ser. No. 435,985, Jan. 23, 1974, abandoned.

This application July 31, 1975, Ser. No. 600,650

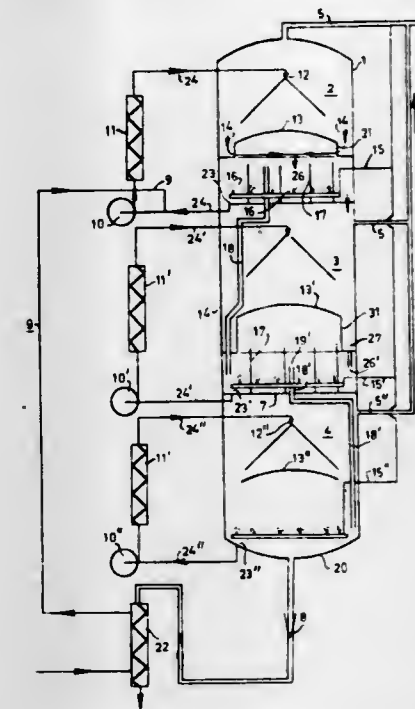
Int. Cl.² F28C 1/00

U.S. Cl. 261—72 R

7 Claims



part of said section into a liquid spraying member, overflow means for passing liquid oil from an upper section to a lower section, the bottom of at least one section being provided with



partition means and delivering means for delivering the collected sprayed oil particles at a distance from the opening of the overflow means to prevent passing of oil immediately to the next section through the overflow means.

4,009,231

POWDER BARRIER BONDING TECHNIQUE

Bernard Wasserman, and William H. Thielbahr, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1975, Ser. No. 560,077

Int. Cl.² C06B 21/00

U.S. Cl. 264—3 R

6 Claims

1. In a method for loading a rocket motor which comprises casting and curing a solid propellant within a combustion chamber which is lined with a layer of cured silicone rubber insulator material, the improvement residing in casting and curing a barrier layer on said layer of insulator material before casting and curing the propellant grain to prevent materials in the propellant grain from migrating into the insulator layer as the propellant grain cures.

4,009,232

METHOD FOR THE PRODUCTION OF CARBON MICROSPHERES 1-20 μ IN DIAMETER

Zenya Shiki; Masaaki Nakao, and Kunihiko Katori, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of Japan

Filed Mar. 12, 1974, Ser. No. 450,397

Claims priority, application Japan, Mar. 13, 1973, 48-28577

Int. Cl.² B01J 2/06

U.S. Cl. 264—9

13 Claims

1. A method for the production of discrete carbon microspheres having a particle size of 1-20 μ comprising:

a. mixing a pitch having a softening point of 70°-250° C, a nitrobenzene-insoluble content of not more than 25% and a H/C ratio of 0.2-1.0 with a water-insoluble aromatic solvent having a boiling point of 70°-250° C to produce a homogeneous pitch/solvent mixture of more than 50% by weight pitch, said mixing being conducted at a temperature of 100°-200° C to maintain a viscosity of 200-5000 cps;

b. dispersing said pitch/solvent mixture with agitation in an

4,009,230

DEVICE FOR VACUUM TREATMENT OF LIQUIDS BY MEANS OF A GASEOUS STRIP-MEDIUM

Johannes Jacobus Smorenburg, Abcoude, Netherlands, assignor to Stark Amsterdam NV, Netherlands

Division of Ser. No. 258,574, June 1, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,495

Claims priority, application Netherlands, June 1, 1971, 7107525

Int. Cl.² B01D 3/10, 3/26

U.S. Cl. 261—148

2 Claims

1. A device for treating liquids with a gaseous stripping fluid, for deodorizing oils and fats, comprising a column having at least two vertically arranged non-packed sections, each section being provided with a vacuum line connected to a vacuum source, a supply line for stripping fluid opening into each section in the vicinity of the bottom, a liquid supply line for spraying the liquid into the upper part of a section, a discharge line for purified liquid, at least one of said sections being provided with a recycling line having pumping means in said recycling line, said recycling line opening into the upper

- aqueous solution of a surface active agent to form an aqueous dispersion of said pitch/solvent mixture in the form of microspheres, said solution being at a temperature sufficient to retain said viscosity of said pitch/solvent mixture at 200-5000 cps;
- c. cooling said aqueous dispersion to solidify said microspheres;
- d. separating said solidified pitch/solvent microspheres having a particle size of 1-20 μ from said aqueous solution and from particles having diameters smaller than 1 μ ;
- e. extracting said aromatic solvent from said microspheres by contacting said microspheres with an organic solvent compatible with said aromatic solvent, but incompatible with said pitch;
- f. contacting said microspheres with an oxidizing agent to render said microspheres infusible; and
- g. heating said microspheres in an inert gas atmosphere to produce carbon microspheres having a particle size of 1-20 μ .

4,009,233

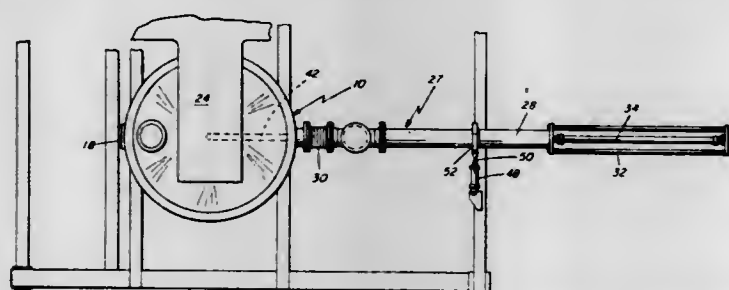
METHOD FOR PRODUCING ALLOY PARTICLES

Thomas S. Cloran, East Liverpool, Ohio; Vernon R. Thompson, Greentree, and Russell C. Buehl, Brighton Township, Beaver County, both of Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 473,110, May 24, 1974, abandoned. This application Apr. 27, 1976, Ser. No. 680,645 Int. Cl.² B01J 2/02

U.S. Cl. 264-10

3 Claims



1. A method of producing particles from reactive metal and reactive metal alloy article, comprising:
- a. hydriding at least a surface portion of a reactive metal article under conditions to form a metal hydride therein, said hydrided portion of said article having a hydrogen content of at least 0.05%;
- b. heating said article in an inert atmosphere to a temperature and rate of heating in a localized area thereof to locally melt said hydrided portion of said article and to liberate hydrogen gas from said hydride therein, said gas liberation causing immediate atomization of said melt into droplets thereof;
- c. cooling said droplets at a rate sufficient to form discrete particles thereof while protected from oxidation and contamination; and
- d. collecting said particles.

4,009,234

METHOD FOR HIGH SPEED SINTER MOLDING

Paul M. Erlandson, Palos Park, and Richard R. Szatkowski, Western Springs, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 335,274, Feb. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 73,936, Sept. 21, 1970, abandoned, which is a division of Ser. No. 790,283, Jan. 10, 1969, Pat. No. 3,570,055. This application Sept. 15, 1975, Ser. No. 613,377

Int. Cl.² B29D 23/03; B29F 5/02

U.S. Cl. 264-24

1 Claim

1. A method of sinter molding an article, comprising the steps of:
- continuously transporting each of a pair of female mold

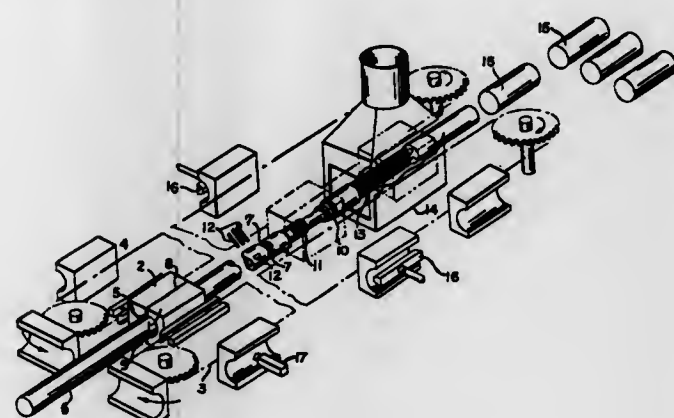
halves open at opposite ends thereof in an endless path in one direction relative to the respective path;

bringing the paths together along a common portion thereof substantially coincident with a stationary elongate treating core;

engaging the mold halves at a first end of the common path portion proximate a first end of the core to provide a female mold open at opposite ends thereof and surrounding the periphery of the core in spaced relation thereto, whereby the mold cavity forms a passage for the core;

maintaining the engagement of the mold halves as they are transported along the common portion of the respective paths to cause the mold to traverse the core from end to end thereof;

electrostatically charging a fusible powder to a different potential from that of the mold;



- spraying the charged powder from a nozzle provided on the core onto a surface within the mold as the mold traverses the nozzle, causing the powder to adhere to the surface by electrostatic attraction;
- heating the powder until it fuses;
- cooling the fused powder to solidification in the mold;
- separating the paths at a second end of the common portion thereof beyond a second end of the core opposite the first end thereof;
- whereby the mold halves are separated to eject the article from the mold as they are transported past the second end of the common path portion;
- and controlling the temperature of each mold half as it is transported along the respective path.

4,009,235

METHOD FOR RECLAIMING EXTRUDED PLASTIC RESINS

Thomas W. Bober, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 14, 1975, Ser. No. 595,644

Int. Cl.² B29C 17/02, 17/14

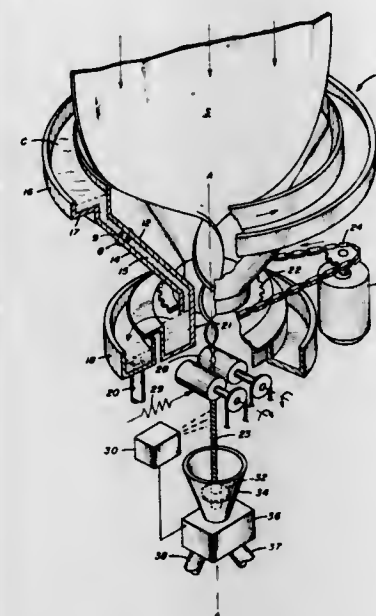
U.S. Cl. 264-40.2

11 Claims

1. A method for reclaiming a sheet of hot extruded plastic material comprising the steps of:
- directing the hot material into the large end of a vertically oriented rotating, funnel-shaped device which engages the material and twists it about a longitudinal axis into a rope-like shape;
- the material momentarily adhering to the walls of the device

when engaged thereby drawing the material to and through the small end of said funnel-shaped device; and

with a third foam insulation layer thereover; and again repeating the steps by arranging over additional short staple glass fibers a third net of less widely spaced crossing wires and smaller mesh than said second mesh and foaming a layer of plastic thereover and thereafter forming a primary liquid-tight layer as the innermost layer of the tank.



concurrently cooling the material as it passes through said device.

4,009,236

METHOD OF MAKING INSULATED TANK FOR LOW TEMPERATURE SERVICE

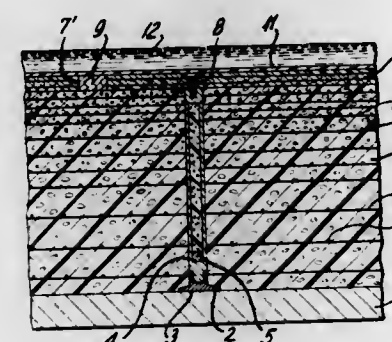
Kihei Katsuta, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 369,135, June 12, 1973. This application Oct. 2, 1974, Ser. No. 511,164

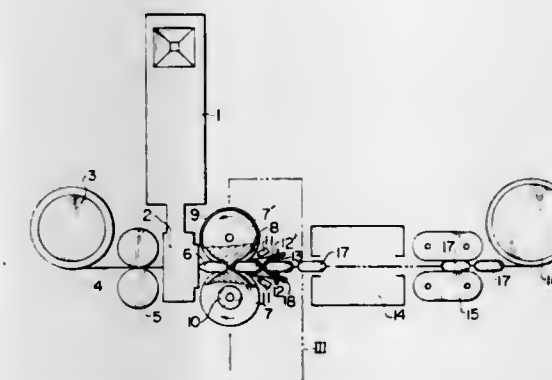
Int. Cl.² B29D 3/02, 9/00, 27/00

U.S. Cl. 264-45.3

7 Claims



1. A method of making a heat-insulation lined tank for low temperature liquids, comprising: depositing foamable plastic material onto an inner surface of a tank to be heat insulated and foaming it onto said inner surface to form a first foam heat insulation layer; then depositing short staple glass fibers on said first heat insulation layer; subsequently forming a first wire layer by stretching spaced crossing wires over said short staple glass fibers on said first foam insulation layer and temporarily securing said wires to said first insulation layer by spot bonding said wires to said insulation layer; thereafter spraying additional foamable plastic material onto said wires and onto said glass fibers to form a second layer of plastic material and foaming said second layer of plastic material, thus forming a second foam insulation layer, said crossing wires preventing excessive displacement of the glass fibers by the plastic foam during foaming; then repeating the foregoing steps by depositing additional short staple glass fibers onto said second insulation layer, forming a subsequent net of less widely spaced crossing wires defining a second mesh smaller than said large mesh, temporarily securing the second mesh to said second insulation layer and subsequently spraying foamable plastic onto said wires and forming it to cover said second wire net



1. A process for the continuous production of a shaped synthetic resin article varying in cross-sectional area and in its shape of longitudinal cross section along at least a part of its length, which comprises
- extruding a molten polyethylene resin composition from an extruder die as an expanded polyethylene about a rope and between a pair of rolls rotating in the direction of extrusion so that the rolls of each pair contact each other on their periphery, the peripheral surfaces of the rolls being engraved so as to form a cavity into which the extrusion takes place and corresponding to the shape of said shaped article when the rolls contact each other while being rotated,
- remolding in said cavity the expanded molten resin composition into an article having the desired shape, and at the same time, cutting off the surplus resin overflowing from said cavity by the edges of said cavity on the rolls, the edges of the cavity on one of the pair of rolls having a knife edge shape having an edge-width of 1 mm or less, and
- then immediately quenching the thus molded article to solidify the same by blowing air or a mixture of air and water at 20° C or lower against the article.

4,009,238

PROCESS FOR THE PRODUCTION OF CERAMIC SUBSTRATES FOR THIN LAYER CIRCUITS

Karl Niedermeier, Aich, and Manfred Wintzer, Unterplaffenhofen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 11, 1974, Ser. No. 449,751

Claims priority, application Germany, Mar. 29, 1973, 2315797

Int. Cl.² B29D 7/22

U.S. Cl. 264-61

4 Claims

1. In a process for the production of ceramic substrates for thin layer circuits in which a cast compound is produced and poured out in the form of a coating on a base in order to dry so that a leather-like tough, green substrate layer is formed

4,009,245

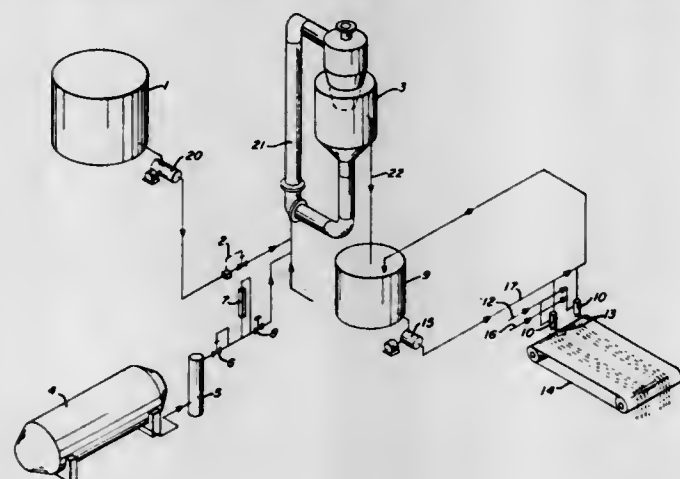
PROCESS FOR THE MANUFACTURE OF MONOAMMONIUM PHOSPHATE

John W. Hudson, and Robert A. Pendergrast, both of Atlanta, Ga., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1975, Ser. No. 554,298
Int. Cl.² C05B 19/00; C01B 25/28

U.S. Cl. 423-313

16 Claims



16. Method of making ammonium phosphate having a mole ratio of N:P of about 0.8:1 to 1.2:1 comprising
- generating a slurry by reacting ammonia with phosphoric acid in a mole ratio of N:P of from about 1.35 to about 1.45 under agitation of the heat of reaction;
 - reacting said slurry with phosphoric acid to produce a reactant mixture having a mole ratio of N:P of from about 0.8:1 to about 1.2:1; and
 - passing the reactant mixture, while still undergoing an exothermic reaction, through at least one orifice onto a surface, said surface being located from about 6 to about 36 inches from said orifice to thereby produce a highly porous, easily friable ammonium phosphate product.

4,009,246

MANUFACTURE OF NITRATES

Martin Maurice Wendel, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 24,643, April 1, 1970, abandoned. This application Mar. 6, 1972, Ser. No. 232,179
Int. Cl.² C01B 21/50

U.S. Cl. 423-385

8 Claims

1. A process for the preparation of inorganic nitrites which consists essentially of forming a gaseous mixture comprising in parts by volume based upon the total parts of the gaseous mixture 0-10 parts oxygen, 2-12 parts nitrogen oxides at a state of oxidation of less than 50%, 15-20 parts water vapor and 83-58 parts inert gas at a pressure in the range 2-150 psig and a temperature above the dew point of said mixture and in the range 300°-500° C., rapidly quenching said mixture to a temperature less than about 120° C., said quenching being conducted in an absorption device by dispersing the mixture under the surface of and into intimate contact with an aqueous solution containing 1-73% by weight of a base selected from the class consisting of ammonia and alkali and alkaline earth metal hydroxides and carbonates, said gaseous mixture being maintained at a temperature above its dew point until it contacts said aqueous solution; and thereafter contacting the gaseous mixture from the quenching step with additional amounts of said aqueous solution of said base in an absorption tower while maintaining a covering of said aqueous solution of base over all surfaces of said tower exposed to parts of said gaseous mixture having a dew point above the temperature of said surfaces up to a height in the tower where at least about 90% by weight of the nitrogen oxides originally present in said mixture are absorbed in said aqueous solution; said state of oxidation being defined as

$$\frac{\text{moles } e \text{ NO}_2}{\text{moles NO} + \text{moles } e \text{ NO}_2} \times 100$$

wherein $e \text{ NO}_2$ is determined by adding two times the number of moles of N_2O_4 to the number of moles of NO_2 .

4,009,247

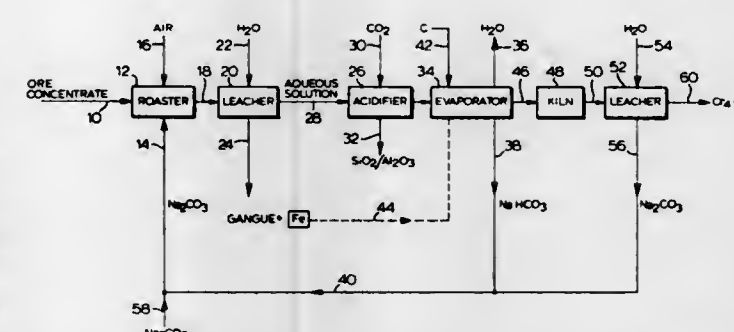
PRODUCTION OF METAL CARBIDES

Allan M. Smellie, Mississauga, and Hans G. Brandstatter, Welland, both of Canada, assignors to Ontario Research Foundation, Sheridan Park, Canada

Continuation-in-part of Ser. No. 480,829, June 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 386,019, Aug. 6, 1973, abandoned. This application Jan. 7, 1975, Ser. No. 539,246
Int. Cl.² C01B 31/34

U.S. Cl. 423-440

15 Claims



1. A process for the production of a chromium carbide, which comprises forming an intimate admixture of finely-divided carbon and sodium dichromate or sodium chromate, and reducing said sodium dichromate or sodium chromate with said carbon in a reaction zone to form a chromium carbide by an in situ solid state reaction at a temperature of about 1025° C to about 1425° C while carbon monoxide formed in said solid state reaction is removed from said reaction zone.

4,009,248

PROCESS FOR PRODUCING CARBON FIBERS

Soichiro Kishimoto, and Saburo Okazaki, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

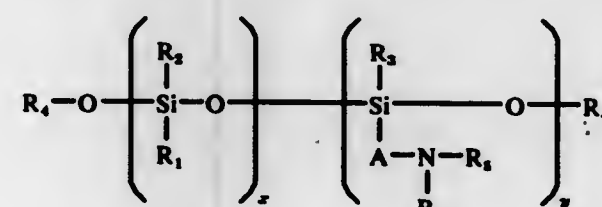
Filed Mar. 31, 1976, Ser. No. 672,534

Claims priority, application Japan, Apr. 4, 1975, 50-41400
Int. Cl.² D01F 9/12

U.S. Cl. 423-447.4

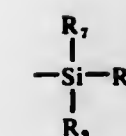
12 Claims

1. In a process for producing carbon fibers which comprises heating acrylonitrile fibers made from an acrylonitrile homopolymer or an acrylonitrile copolymer containing at least 85 mole % acrylonitrile, the improvement wherein the acrylonitrile fiber contains at least 0.01%, based on the weight of the fiber, of an aminosiloxane of the formula:



wherein

- R_1 is hydrogen or a lower alkyl or aryl group,
 R_2 and R_3 are lower alkyl or aryl groups,
 R_4 is hydrogen or a group of



wherein

- R_7 and R_8 are lower alkyl groups,
 R_9 is hydrogen or a lower alkyl group,
 R_2 and R_3 are hydrogens or lower alkyl groups,
 A is an alkylene group having two to five carbon atoms or a phenylene group,
 x and y are positive integers and the molecular weight of the aminosiloxane is not more than 100,000.

4,009,249

PREPARATION OF RED AMORPHOUS SELENIUM

David A. Buckley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 495,242, Aug. 6, 1974, Pat. No. 3,954,951. This application Jan. 16, 1976, Ser. No. 649,960

Int. Cl.² C01B 19/00

U.S. Cl. 423-510

3 Claims

1. A process for producing stable red amorphous selenium containing a halogen in particles of less than about 5 microns which comprises:
- dissolving a sufficient amount of selenious acid in a mixed solution of methanol or ethanol containing hydrazine, the amount of hydrazine being at least stoichiometrically equivalent to the amount of selenious acid in the solution, and containing not more than about 50 percent by weight water at a temperature between about -20° C. and the freezing point of the solution;
 - then maintaining the solution between about -13° C. and -3° C. until the yellow-orange amorphous precipitate formed by the reduction of the selenious acid by the hydrazine changes to red amorphous selenium;
 - then filtering the solution;
 - then washing the precipitate with methanol or ethanol and drying; and
 - then adding from about 10 parts per million to 10,000 parts per million of a halogen.

4,009,250

CONTACT METHOD OF PRODUCING SULPHURIC ACID

Vasily Nikolaevich Novozhilov, ulitsa Novatorov, 22, kv. 30, Moscow, U.S.S.R.; Boris Vladimirovich Nekrasov, Ferganskaya ulitsa, 24, kv. 83, Moscow, U.S.S.R.; Pavel Alexeevich Semenov, deceased, late of Moscow, U.S.S.R.; Vera Vasilievna Semanova, administratrix, Yartsevskaya ulitsa, 27, korpus 6, kv. 61, Moscow, U.S.S.R.; Irina Pavlovna Semanova, administratrix, Banny pereulok, 7, korpus 2, kv. 38, Moscow, U.S.S.R., and Sergei Pavlovich Semenov, administrator, ulitsa Gertsena, 5/7, kv. 2, Moscow, U.S.S.R.

Continuation of Ser. No. 452,467, March 18, 1974, abandoned. This application May 21, 1975, Ser. No. 579,590
Int. Cl.² C01B 17/72, 17/68; B01D 53/00

U.S. Cl. 423-522

2 Claims

1. In a contact method of producing sulphuric acid comprising the steps of roasting a stock material selected from the group consisting of sulphur and pyrite to form a gaseous mixture containing sulphurous acid anhydride and having a moisture content not higher than 0.02 percent by volume, oxidizing the sulphurous acid anhydride in said gaseous mixture into sulphuric anhydride, and successively contacting said gaseous mixture at a temperature of from 30°-125° C with at least one separate batch of a 92-98 percent sulphuric acid solution in relative quantities, sufficient to absorb from said gaseous mixture a substantial portion of the sulphuric anhydride remaining therein while increasing the sulphuric acid concentra-

tion of each batch of solution so contacted; the improvement whereby the sulphuric acid fog content in the gaseous mixture exhaust is maintained at a maximum of 0.15 g/cu.m, comprising the steps of limiting the quantity of each separate batch of sulphuric acid solution so contacted to from about 0.45 to about 1.47 kg per kg of said gaseous mixture being contacted while maintaining the flow velocity of said gaseous mixture at from about 13.4 to about 15.2 normal meters per second.

4,009,251

PROCESS FOR THE REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS STREAMS BY CATALYTIC OXIDATION OF HYDROGEN SULFIDE TO SULFUR WHILE INHIBITING THE FORMATION OF SULFUR OXIDES

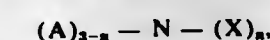
Walter C. Meuly, Piscataway Township, Middlesex County, N.J., assignor to Rhodia, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 391,922, Aug. 27, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 549,576
Int. Cl.² B01D 53/34; C01B 17/04

U.S. Cl. 423-573 G

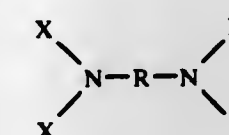
19 Claims

1. A cyclic process for the removal of hydrogen sulfide and alkyl mercaptans contained in gaseous streams, and the substantially quantitative catalytic conversion thereof to elemental sulfur and dialkyl disulfides, respectively, while inhibiting the formation of acidic sulfur oxides, which comprises contacting the gaseous stream with an aqueous solution consisting essentially of a water-soluble polyvalent metal chelate catalyst retaining the metal in soluble form in the aqueous solution and having a pH within the range from about 3 to about 11, the chelate catalyst comprising a chelating amino acid selected from the group consisting of:



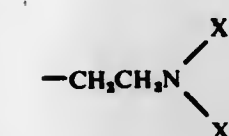
wherein

- n is a number from 1 to 3;
 X is selected from the class consisting of acetic and propionic acid groups;
 A is 2-hydroxy ethyl, 2-hydroxy propyl, or an alkyl group having from one to about four carbon atoms.



wherein

- from two to four of the groups X are selected from the class consisting of acetic and propionic acid groups;
from zero to two of the groups X are selected from the class consisting of 2-hydroxy ethyl, 2-hydroxy propyl, and



- R is ethylene, propylene or isopropylene or alternatively cyclohexane or benzene where the two hydrogen atoms replaced by nitrogen are in the 1,2-position;
and an alkali metal, alkaline earth metal, ammonium or amine salt of an acid other than the chelating amino acid having a pK within the range from about 1.2 to about 6 in an amount within the range from 1 to 14 equivalents calculated as Fe equivalents; contacting aqueous polyvalent metal chelate catalyst solution with free oxygen gas to regenerate the catalyst for contact with another portion of the gaseous stream; and separating the sulfur and any dialkyl disulfides from the aqueous metal chelate solution.

4,009,252

PROCESS FOR PREPARING HYDROGEN PEROXIDE
Yasuke Izumi, Shinnanyo; Hidetaka Miyazaki, and Shin-ichi Kawahara, both of Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Japan

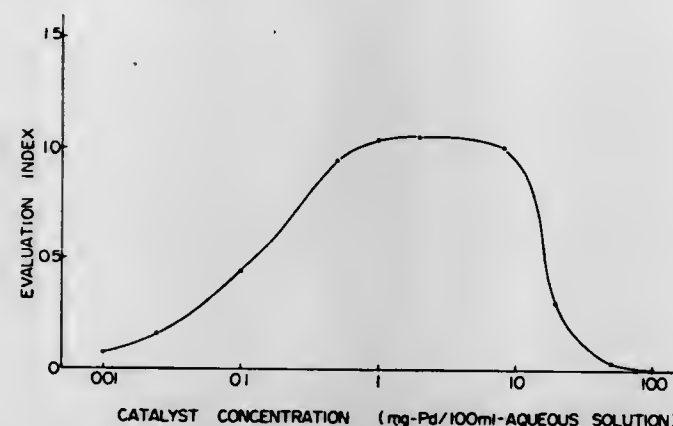
Filed June 23, 1975, Ser. No. 589,776

Claims priority, application Japan, July 2, 1974, 49-75040

Int. Cl.² C01B 15/02

U.S. Cl. 423-584

9 Claims



1. A process for preparing hydrogen peroxide which comprises reacting hydrogen with oxygen in an aqueous medium containing a platinum-group catalyst, characterized in that the partial pressure of hydrogen and the partial pressure of oxygen in the gaseous phase of the reaction system are maintained at at least 0.5 atmosphere and at least 1.0 atmosphere respectively, and in that the ratio of the partial pressure of oxygen to that of hydrogen in the gaseous phase of the reaction system is maintained within the range of 1.5 to 20, and the platinum group catalyst is caused to be present in an amount, calculated as metal, of at least a minimum effective catalyst amount up to 30 mg per 100 ml. of said aqueous medium.

4,009,253

4-CYCLOHEXYL-4-METHYL-2-PENTANONE USEFUL AS A MALODOR COUNTERACTANT

Alfred A. Schleppink, St. Louis, Mo., and Steve G. Vanata, Midland Park, N.J., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 413,082, Nov. 5, 1973, abandoned.

This application Mar. 17, 1975, Ser. No. 558,574

Int. Cl.² A61L 9/04, 13/00

U.S. Cl. 424-45

4 Claims

1. A method of treating malodors to alleviate their offensive odors which comprises treating the air containing the malodor with an amount of 4-cyclohexyl-4-methyl-2-pentanone which is effective to counteract the malodor.

4,009,254

TOPICAL COMPOSITIONS

Adolph Renold, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 467,024, May 6, 1974, abandoned, which is a continuation of Ser. No. 137,678, April 26, 1971, abandoned. This application Feb. 25, 1976, Ser. No. 661,203

Int. Cl.² A61K 7/42, 7/44, 31/08

U.S. Cl. 424-59

10 Claims

1. A human skin treating composition consisting essentially of a sunscreen agent and, 5 to 99.8% of an unsymmetrical ether of the formula R_1-O-R_2 , wherein R_1 is alkyl or alkenyl of 8 to 20 carbon atoms and R_2 is C_{1-3} alkyl or C_{2-3} alkenyl, and said ether being present in an amount effective to enhance penetration of said agent into the skin.

8. A method comprising treating human skin with a composition containing an unsymmetrical ether of the formula R_1-O-R_2 , wherein R_1 is alkyl or alkenyl of 8 to 20 carbon atoms and R_2 is C_{1-3} alkyl or C_{2-3} alkenyl in an amount which readily penetrates and lubricates the skin.

4,009,255

HAIR TREATING COMPOSITIONS CONTAINING CATIONIC SURFACE ACTIVE AGENTS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Mitry-Mory, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 187,151, Oct. 6, 1971, Pat. No. 3,879,464, which is a continuation-in-part of Ser. No. 655,336, July 24, 1967, abandoned. This application Feb. 6, 1975, Ser. No. 547,465

Claims priority, application Luxembourg, July 26, 1966, 51645; May 12, 1967, 53667

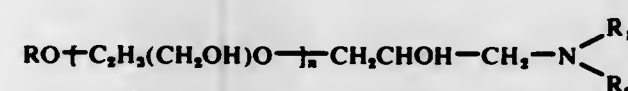
Int. Cl.² A61K 7/06

U.S. Cl. 424-70

19 Claims

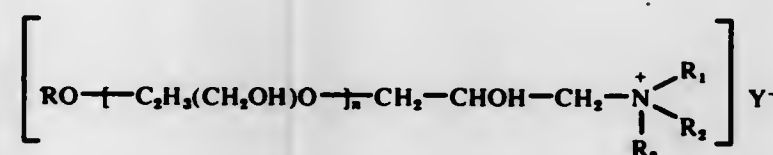
1. A cosmetic composition for treating the hair comprising an aqueous solution of a cationic surface active agent selected from the group consisting of

1. a mixture of compounds having the formula

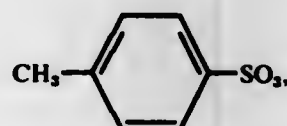


wherein R is selected from the group consisting of alkyl having 8-22 carbon atoms, alkenyl having 8-22 carbon atoms and alkyl phenyl having 8-22 carbon atoms, R_1 and R_2 each independently are selected from the group consisting of lower alkyl having 1-4 carbon atoms and hydroxy lower alkyl having 1-4 carbon atoms or together with the nitrogen atom to which they are attached form a ring selected from the group consisting of morpholine and piperidine, and n has a statistical average value of 0.5-10 and

2. a mixture of compounds which are the quaternary ammonium salts of (1) having the formula



wherein R, R_1 , R_2 and n have the meanings given above, R_3 is selected from the group consisting of methyl and ethyl and Y is an anion selected from the group consisting of Cl, Br, I, SO_4CH_3 , $SO_4C_2H_5$, CH_3SO_3 and



said cationic surface active agent being present in amounts of about 0.1 to 10 percent by weight thereof.

4,009,256

NOVEL SHAMPOO COMPOSITION CONTAINING A WATER-SOLUBLE CATIONIC POLYMER

Frank A. Nowak, Jr., Bound Brook; Albert L. Micchelli, Middletown, and Gerard J. Legato, Stirling, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 417,260, Nov. 19, 1973, abandoned. This application Nov. 13, 1975, Ser. No. 631,519

Int. Cl.² A61K 7/06

U.S. Cl. 424-70

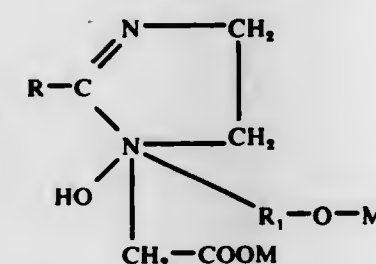
5 Claims

1. A shampoo composition comprising an aqueous solution of:

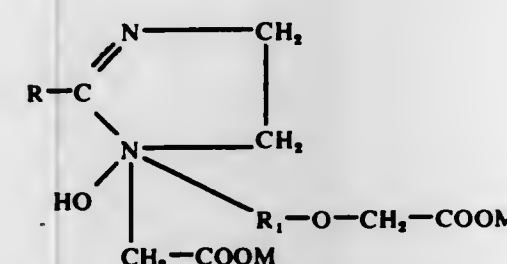
A. from 0.1 to 10.0 percent, by weight, of the total solution of a water-soluble acid salt of an aminoalkyl ester of a cationic polymer having a molecular weight of 5,000 to

250,000 and selected from the group consisting of amino-alkyl esters of (a) a homopolymer of a homopolymerizable unsaturated carboxylic acid having 3 to 5 carbon atoms, (b) a copolymer of a copolymerizable mixture of unsaturated carboxylic acids having 3 to 5 carbon atoms, and (c) a copolymer of at least one of said acids having 3 to 5 carbon atoms and at least one copolymerizable ethylenically unsaturated comonomer selected from the group consisting of vinyl acetate, vinyl propionate, vinyl methyl ether, vinyl ethyl ether, the C_1-C_{18} alkyl half esters of maleic and fumaric acids, amides of acrylic and methacrylic acids, and the C_1-C_{18} alkyl and C_2-C_4 hydroxyalkyl esters of acrylic and methacrylic acids, wherein the copolymers of group (c) are prepared with at least 50 mole percent of the unsaturated carboxylic acid component, B. from 1 to 25 percent, by weight, of the total solution of an amphoteric detergent selected from the group consisting of

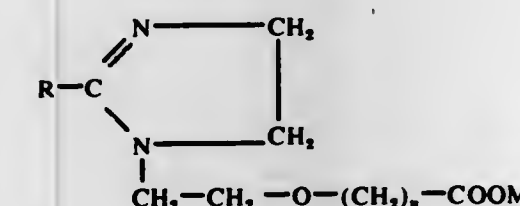
a. an imidazoline derivative corresponding to the formula



b. an imidazoline derivative corresponding to the formula

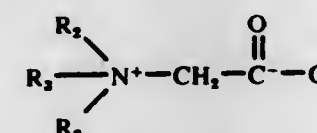


c. an imidazoline derivative corresponding to the formula



wherein R is an alkyl group having 8-18 carbon atoms, R_1 is a bivalent lower alkyl group having 2-4 carbon atoms, M is selected from the group consisting of alkali metals and hydrogen, and n is an integer from 3 to 9,

d. higher alkyl and higher alkyl amide betaines corresponding to the structure



wherein R_2 is selected from the group consisting of C_8-C_{18} alkyl groups, C_8-C_{18} amido groups, C_8-C_{18} alkyl groups substituted with ether or ester linkages or hydrogen substituted groups and R_2 is a C_1-C_{18} alkyl group,

e. an N-alkyl-beta-aminopropionic acid wherein the alkyl group contains 8-18 carbon atoms,

f. C_8-C_{18} amino sulfonates, and
g. the sulfonated alkyl amides wherein the alkyl groups contain 8 to 18 carbon atoms; and
C. from 0 to 20 percent, by weight of the total solution, of at least one surfactant selected from the group consisting of nonionic surfactants, ionic surfactants and combinations thereof other than amphoteric detergents of part B wherein any plurality of ionic surfactants utilized consists of those of the same ionogenic class.

4,009,257

PREPARATION OF IMMUNOSUPPRESSIVE MATERIALS
Derek Thomas, West Wickham, and Heddy Zola, Rugby, both of England, assignors to Burroughs Wellcome, Inc., Research Triangle Park, N.C.

Filed Feb. 24, 1971, Ser. No. 118,532

Claims priority, application United Kingdom, Feb. 27, 1970, 9647/70

Int. Cl.² A61K 35/14, 35/26

U.S. Cl. 424-85

11 Claims

1. A method of preparing an immunosuppressive and non-toxic antilymphocytic serum, comprising the immunisation of a mammal other than man with an immunogenically effective amount of a soluble immunogenic extract of human blood lymphocytes so as to immunise said mammal, removal of blood from said mammal, isolation of said serum from said blood, and the rendering of said serum sterile and isotonic; said extract comprising primarily a mixture of macromolecular components, each having a molecular weight between 10,000 and 1,000,000, a particle size not greater than 0.22 micron, a protein content of between 50 and 100%, a lipid content below 30% and a carbohydrate content below 20%, said percentage values being by weight of dry weight of said extract excluding salts, the solubility of said extract being such that 10 mg. of the extract in 1 ml. of 0.85% w/v aqueous sodium chloride solution is visually a clear solution.

4,009,258

INFLUENZA VACCINE CONTAINING A RECOMBINANT, ANTIGENICALLY HYBRIDIZED VIRUS AND METHOD OF USING THE SAME

Edwin D. Kilbourne, Ridgewood, N.J., assignor to The Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Continuation of Ser. No. 291,797, Sept. 25, 1972, abandoned.

This application Aug. 5, 1974, Ser. No. 494,716

Int. Cl.² A61K 39/12; C12K 5/00, 7/00

U.S. Cl. 424-89

8 Claims

1. A method of influenza immunization comprising administering to a human or an animal subject to infection by natural means by naturally occurring influenza virus, by injecting an effective amount of a vaccine which comprises as an active ingredient, a recombinant, antigenically hybridized virus which contains a hemagglutinin antigen which has substantially no crossreactivity with a challenge natural contemporary or naturally infective wild type influenza virus and a neuraminidase antigen which has substantial cross-reactivity with such a challenge influenza virus, said recombinant being derived from viruses which are not neurovirulent, the concentration of said virus in said vaccine being sufficient to immunize the human or animal.

4,009,259

IMMERSION METHOD FOR TREATING AQUATIC ANIMALS

Roland W. Ament, Arvada, Colo., and Daniel C. Fender, Seattle, Wash., assignors to Wildlife Vaccines, Inc., Wheat Ridge, Colo.

Filed Oct. 3, 1975, Ser. No. 619,434
Int. Cl.² A61K 39/12, 39/02, 33/42

U.S. Cl. 424—89

22 Claims

1. The method of treating water-living animals to impart a health and/or welfare enhancing agent thereto, which comprises contacting the water-living animals with a hyperosmotic solution and thereafter contacting the water-living animals with a health and/or welfare enhancing agent for a sufficient period of time for the water-living animals to absorb the said agent.

4,009,261

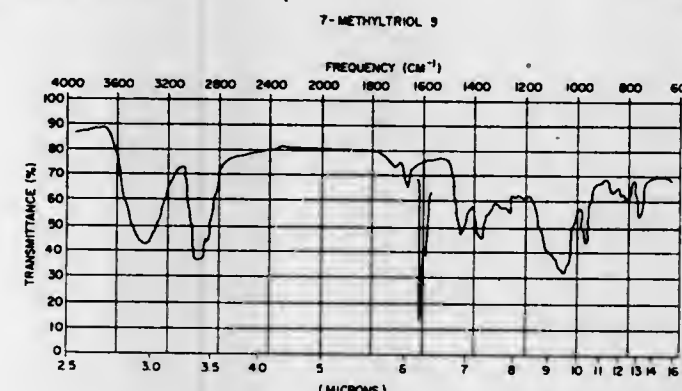
7-SUBSTITUTED TRIOL DERIVATIVES OF ACID S, AN ANTIBIOTIC PRODUCED BY POLYANGIUM CELLULOSUM VAR. FULVUM

David T. Connor, Parsippany; Samuel M. Ringel, Rockaway, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 7, 1975, Ser. No. 602,606
Int. Cl.² A61K 35/74

U.S. Cl. 424—121

3 Claims



1. An antifungal substance, 7-methyltriol S, having the following characteristics:
Empirical formula: $C_{23}H_{40}O_5$
Molecular weight: 474.7
Infrared Spectrum as shown in FIG. 1: ν max 3500–3200- cm^{-1}
Mass Spectrum:
Observed molecular ion 474.3290
Calculated for $C_{23}H_{40}O_5$ 474.3345
m/e (relative intensity) 474 (8), 456 (8), 445 (10), 438 (4), 379 (2), 361 (6), 279 (100), 193 (50) and 165 (52).

4,009,262

ANTIBIOTIC A-28086 RECOVERY PROCESS

LaVerne D. Boeck, Indianapolis, and David H. Berg, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 21, 1975, Ser. No. 569,712
Int. Cl.² A61K 35/00

U.S. Cl. 424—123

10 Claims

1. The process of recovering an antibiotic selected from the group consisting of antibiotic A-28086 factor A, antibiotic A-28086 factor B, antibiotic A-28086 factor D, and salinomycin, which process comprises acidifying the whole fermentation broth in which said antibiotic is produced to a range of from about pH 2.0 to about pH 4.0 and separating the culture solids containing said antibiotic.

4,009,263

ENERGIZED COBALT-CONTAINING ANIMAL FEED

LaVerne Shafer, R.F.D., Cleghorn, Iowa 51041

Filed Feb. 15, 1974, Ser. No. 442,854
Int. Cl.² A61K 33/24

U.S. Cl. 424—131

33 Claims

1. An animal feed supplement comprising an animal feed-stuff selected from the group consisting of solid and liquid sacchariferous substances and containing cobalt in polarized form.
31. An animal feed supplement comprising the reaction product of a cobalt compound and lactic acid in the temperature range 75°–98° F., the cobalt in said reaction product being in polarized form.

4,009,260

FRACTIONATION OF SPERM

Ronald J. Ericsson, Sausalito, Calif., assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Continuation-in-part of Ser. No. 391,471, Aug. 24, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,728
Claims priority, application Germany, Apr. 19, 1973, 2321000

Int. Cl.² A61K 35/52; C12K 9/00

U.S. Cl. 424—105

37 Claims

1. A process for increasing the proportion of Y-sperm in mammalian sperm, which comprises the steps of a) maintaining at least the sperm portion of progressively motile sperm-containing semen, either as such or suspended in an aqueous suspending vehicle physiologically acceptable to the sperm, as an upper layer in vertical interfacial contact, at a temperature at which the motile sperm are motile, with a lower discrete layer of a first aqueous contacting medium physiologically acceptable to the sperm and in which the motile sperm migrate downwardly at a slower rate than in the upper layer, until a portion only of the motile sperm of the semen having migrated downwardly into the contacting medium, thereby producing a contacting medium containing a higher proportion of Y to X sperm than in the starting sperm, and b) repeating the step at least once, employing in the upper layer the motile sperm which have migrated to the first aqueous contacting medium and as the lower layer a second aqueous contacting medium physiologically acceptable to the sperm and in which the motile sperm migrate downwardly at a slower rate than in the first contacting medium.

4,009,264

COMPLEXES OF POLYSACCHARIDES OR DERIVATIVES THEREOF WITH REDUCED GLUTATHIONE AND PROCESS FOR PREPARING SAID COMPLEXES

Akihiro Mizutani, Tenjin, Japan, assignor to Meito Sangyo Kabushiki Kaisha, Japan

Filed Apr. 1, 1975, Ser. No. 564,212

Claims priority, application Japan, Mar. 3, 1975, 50-24969; Mar. 3, 1975, 50-24970

Int. Cl.² A61K 37/00; C07C 103/52

U.S. Cl. 424—177

4 Claims

3. A pharmaceutical composition for protection against radiation damage, which comprises a complex of a polysaccharide with reduced glutathione, said complex having an infrared absorption spectrum without an absorption peak at about 2500 cm^{-1} , which peak appears in the infrared absorption spectrum of said reduced glutathione;
said polysaccharide being a member selected from the group consisting of dextran, hydrogenated dextran, hydroxyalkyl dextran, carboxyalkyl dextran and dextran sulfate; and a pharmaceutically acceptable carrier or diluent;
said complex being present in an amount effective to prevent radiation damage.

4,009,265

METHODS AND FORMULATIONS FOR THE TREATMENT OF OBESITY

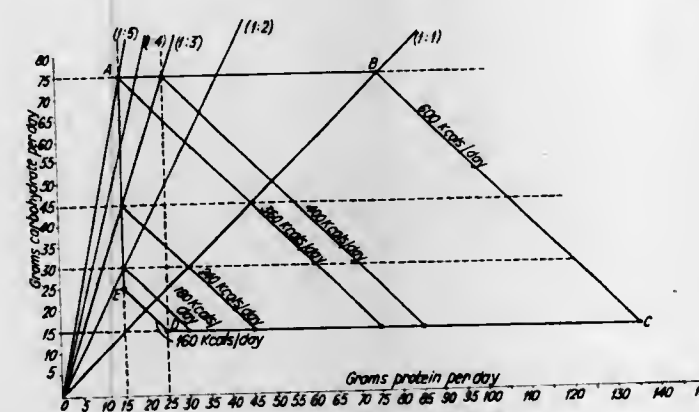
Alan Norman Howard, 10 Topcliffe Way, Cambridge, England
Filed Mar. 5, 1973, Ser. No. 338,257

Claims priority, application United Kingdom, Mar. 6, 1972, 10439/72

Int. Cl.² A01N 9/00, 9/28

U.S. Cl. 424—177

20 Claims



1. A method for treating obesity in which an individual ingests on a daily basis a dietary formulation which comprises:
 - a. all the minerals required by man;
 - b. proteinaceous material selected from at least one member of the class consisting of:
 - i. a mixture of monomeric L-aminoacids, and
 - ii. natural proteins, and
 - iii. natural proteins reinforced with at least one monomeric L-aminoacid; and
 - c. digestible carbohydrate;
 characterized in that the smallest amount of the dietary formulation containing at least the minimum daily requirements of each of the minerals required by man, including at least 800 mg calcium, 800 mg phosphorous, 140 μg iodine, 10 mg iron and 350 mg magnesium, also contains:
 - A. at least 15 g of said proteinaceous material which must include at least the minimum daily requirements for man of all the essential L-aminoacids required by man; and
 - B. from 15 to 75 g of said carbohydrate, and further characterized in that the total caloric value of said smallest amount of dietary formulation is in the range of from 160 to 600 Kcals.
 and wherein the amount of said dietary formulation ingested

daily by said individual is such that it provides said individual with: at least 15 g of said proteinaceous material; from 15 to 75 g of said carbohydrate; and 160 to 600 Kcals.

4,009,266

METHOD OF TREATMENT OF NEMATODE PARASITE INFECTIONS IN DOMESTIC ANIMALS

Liyew Ayalew, 275 Seigneurial West, Apt. 10, St. Bruno, Quebec, Canada

Filed June 26, 1975, Ser. No. 590,781

Claims priority, application Canada, July 10, 1974, 204497
Int. Cl.² A61K 37/32, 37/24, 31/56

U.S. Cl. 424—177

7 Claims

1. A method of treatment for the control of gastrointestinal nematode parasites in domestic animals infected with inhibited or inhibition-prone larvae of such parasites which comprises administering successively or concurrently from 1 microgram to 500 micrograms per kilogram of animal weight of a lactogenic substance and from 10 milligrams to 750 milligrams per kilogram of animal weight of an anthelmintic agent.

4,009,267

CROSS-LINKED ORGOTEIN

Wolfgang Huber, Atherton; Mark G. Saifer, Berkeley, and Lewis D. Williams, Menlo Park, all of Calif., assignors to Diagnostic Data, Inc., Mountain View, Calif.

Filed Sept. 9, 1975, Ser. No. 611,658

Int. Cl.² A61K 37/02, 37/14; C07G 7/04

U.S. Cl. 424—177

12 Claims

1. A water-soluble, injectable cross-linked orgotein having a molecular weight of up to 500,000, wherein an orgotein molecule is intermolecularly cross-linked by at least one organic bridging group with at least one molecule of a watersoluble, injectable non-antigenic protein, said organic bridging group being formed by the reaction of orgotein or a mixture of orgotein and another water-soluble, injectable non-antigenic protein, with an organic difunctional cross-linking agent.
12. A pharmaceutical composition having antiinflammatory activity comprising, in admixture with a pharmaceutically acceptable carrier, an antiinflammatorily effective unit dosage amount of the cross-linked orgotein of claim 1.

4,009,268

COMPOSITION AND METHOD FOR REDUCING THE INCIDENCE OF SCOURS IN NEO-NATAL RUMINANTS

Bartley P. Cardon, and Howard M. Frederick, both of Tucson, Ariz., assignors to Arizona Feeds, Tucson, Ariz.

Continuation-in-part of Ser. No. 326,629, Jan. 26, 1973, Pat. No. 3,911,114. This application Oct. 6, 1975, Ser. No. 619,904

Int. Cl.² A61K 31/715, 33/00

U.S. Cl. 424—180

12 Claims

1. The method of reducing the incidence of scours in neo-natal ruminant animals, comprising feeding to the animal an aqueous mixture containing an effective amount of pregelatinized starch.

4,009,269

ANTIBIOTIC COMPOSITIONS AND METHODS FROM MICROMONOSPORA PURPUREA JI-20

Jan Ilavsky, Livingston; Aris P. Bayan, New Brunswick; William Charney, Montclair, and Hans Reimann, Wayne, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.
Division of Ser. No. 414,492, Nov. 9, 1973, Pat. No. 3,903,072, which is a continuation-in-part of Ser. No. 261,753, June 12, 1972, abandoned. This application June 9, 1975, Ser. No. 584,791

Int. Cl.² A61K 31/71

U.S. Cl. 424—181

6 Claims

1. A composition having antibiotic activity, said composition consisting essentially of a mixture of gentamicin, Antibiotic JI-20A and Antibiotic JI-20B.

4,009,270

METHOD FOR TREATING SPINAL CORD INJURY

James V. Gainer, Jr., Kingwood, W. Va., assignor to The University of Virginia, Charlottesville, Va.

Filed Nov. 21, 1975, Ser. No. 634,149

Int. Cl.² A61K 35/78, 31/70, 31/045

U.S. Cl. 424-195

5 Claims

1. A method for the treatment of spinal cord injuries comprises administering to a host inflicted with injury or expected to be inflicted with injury resulting in a traumatized, ischemic spinal cord, an effective dose of a water-soluble carotenoid sufficient to reduce secondary necrosis of neural tissue.

4,009,271

6-AZA-3H-1,4-BENZODIAZEPINES

Walter von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 460,525, April 12, 1974, Pat. No. 3,941,775. This application June 25, 1975, Ser. No. 590,285

590,285

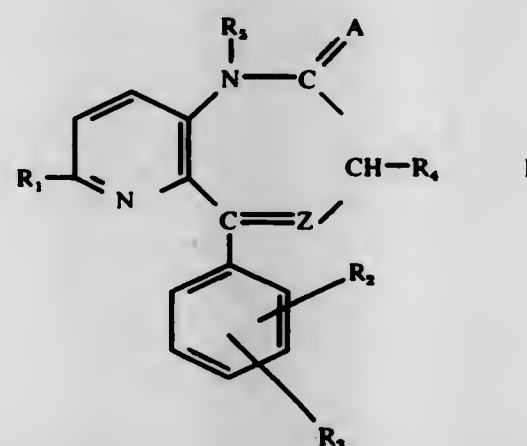
The portion of the term of this patent subsequent to Feb. 1, 1989, has been disclaimed.

Int. Cl.² C07D 471/04; A61K 31/44

U.S. Cl. 424-248.57

12 Claims

1. A 6-aza-3H-1,4-benzodiazepine or 6-aza-1,2-dihydro-3H-1,4-benzodiazepine of the formula:



wherein:

R_1 is the group $-NR_2R_3$ or $N^+R_2R_3R_4X^-$ where R_2 and R_3 are hydrogen, alkyl groups of 1 to 6 carbon atoms, benzyl, or alkyl groups of 1 to 6 carbon atoms substituted by a single hydroxy, and R_4 is alkyl of 1 to 6 carbon atoms with the proviso that when R_2 is present R_3 and R_4 are both alkyl of 1 to 6 carbon atoms and wherein the group $-NR_2R_3$ also can be morpholino, pyrrolidino, piperidino, homopiperidino, piperazino or N-alkyl piperazino having 1 to 6 carbon atoms in the alkyl group; X^- is a halide, sulfate, acetate, citrate or p-toluene sulfonate;

R_2 and R_3 are hydrogen, halogen, trifluoromethyl, nitro, nitrile, hydroxy, lower alkyl or lower alkoxy;

R_4 is hydrogen;

Z is a nitrogen atom or the NO group;

R_5 is hydrogen, lower alkyl, lower alkenyl, aminoalkyl of 2 to 4 carbon atoms, mono or di lower alkyl substituted aminoalkyl of 2 to 4 carbon atoms; and

A is oxygen, and compounds where the $-N(R_2)-C(=A)$ group in formula I is replaced by the tautomeric form $-N=C(AR_2)$, and pharmaceutically acceptable salts and quaternary ammonium and alkyl ammonium compounds thereof.

10. A method of inducing a psychosedative or anxiety relieving effect in a mammal comprising administering to the mammal an amount of the compound of claim 1 sufficient to induce such effect.

4,009,272

PENICILLINS

Hans-Bodo König, Wilfried Schrock, and Karl-Georg Metzger, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 502,956, Sept. 3, 1974, Pat. No. 3,974,142, which is a continuation-in-part of Ser. Nos. 299,246, Oct. 20, 1972, abandoned, and Ser. No. 300,776, Oct. 20, 1972, abandoned. This application Aug. 18, 1975, Ser. No. 605,742

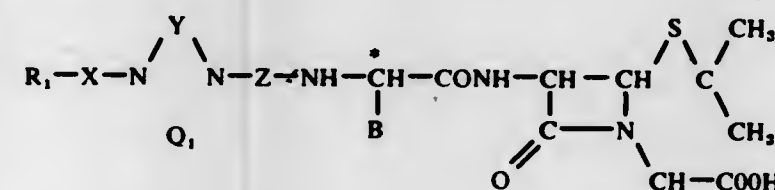
Claims priority, application Germany, Oct. 23, 1971, 2152967; Oct. 23, 1971, 2152968

Int. Cl.² A61K 31/505

U.S. Cl. 424-251

60 Claims

56. The method of combatting bacterial infections in animals and humans which comprises administering to said animal or human an antibacterially effective amount of a compound selected from the group consisting of a penicillin of the formula:



wherein the carbon atom designed by * constitutes a center of chirality;

X is $-CO-$, $-CS-$ or $-SO_2-$; each of Y and Z , independently of the other, is $-CO-$ or $-CS-$;

B is thienyl, cyclohexenyl, cyclohexa-1,4-dien-1-yl, phenyl or phenyl substituted by one or two members selected from the group consisting of halo, nitro, hydroxy, methoxy, methylthio and alkyl of 1 to 5 carbon atoms;

Q_1 is ethylene or trimethylene unsubstituted or substituted by one or two methyl groups; and

R_1 is alkyl of 1 to 10 carbon atoms; and the pharmaceutically acceptable salts thereof.

4,009,273

SUBSTITUTED 10,11-DIHYDRO-5,10-IMINO-[5H] DIBENZO (a,d)-CYCLOHEPTENE

Lucien Nedelec, Le Raincy, and Daniel Frechet, Paris, both of France, assignors to Roussel-UCLAF, Paris, France

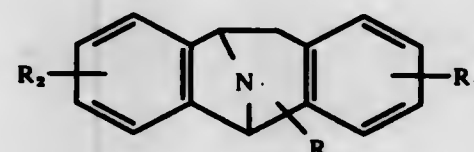
Division of Ser. No. 328,006, Jan. 30, 1976, Pat. No. 3,892,756. This application Apr. 14, 1975, Ser. No. 568,148

Claims priority, application France, Feb. 4, 1972, 72.03778 Int. Cl.² C07D 471/08

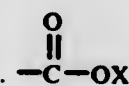
U.S. Cl. 424-258

12 Claims

1. A compound selected from the group consisting of racemates and optically active isomers of a compound of the formula

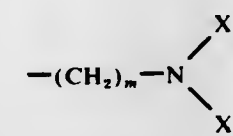


wherein R is selected from the group consisting of $-(CH_2)_n-COCH_3$ where n is 0 or 1,

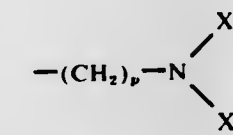


wherein X is selected from the group consisting of lower alkyl, phenyl, nitro-phenyl, phenylalkyl of 7 to 8 carbon atoms,

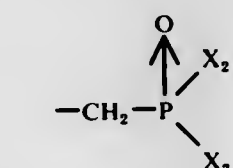
acyl of a saturated aliphatic mono carboxylic acid of 1 to 6 carbon atoms optionally substituted with



where m is an integer from 0 to 6 and X_1 is selected from the group consisting of hydrogen and lower alkyl,

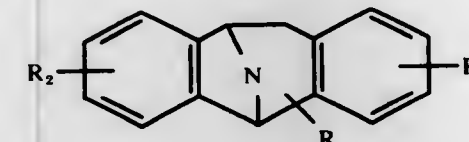


where p is an integer from 1 to 6 and X_1 is as before,

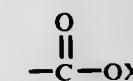


wherein X_2 is lower alkyl, and R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, CF_3- and diloweralkylamino and the non-toxic, pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

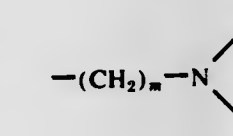
9. A composition for stimulating the central nervous system comprising an amount sufficient to stimulate the central nervous system of a compound selected from the group consisting of a compound of the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl optionally substituted with hydroxy or halogen, lower alkenyl, lower alkynyl, $-(CH_2)_nCOCH_3$ where n is 0 or 1,

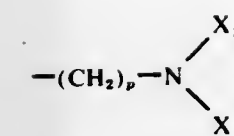


wherein X is selected from the group consisting of lower alkyl, phenyl, nitro-phenyl, phenylalkyl of 7 to 8 carbon atoms, acyl of a saturated aliphatic mono carboxylic acid of 1 to 6 carbon atoms optionally substituted with

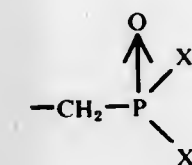


where m is an integer from 0 to 6 and X_1 is selected from the group consisting of hydrogen and lower alkyl,

955 O.G.-50

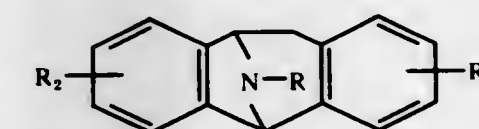


where p is an integer from 1 to 6 and X_1 is as before,

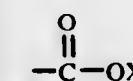


wherein X_2 is lower alkyl, and R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, CF_3- and diloweralkylamino and the non-toxic, pharmaceutically acceptable acid addition and quaternary ammonium salts thereof and an inert pharmaceutical carrier.

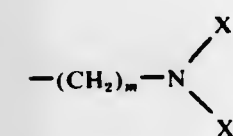
10. A method of stimulating the central nervous system of warm-blooded animals comprising administering to a warm-blooded animal a central nervous system stimulating amount of a compound selected from the group consisting of a compound of the formula



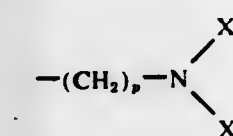
wherein R is selected from the group consisting of hydrogen, lower alkyl optionally substituted with hydroxy or halogen, lower alkenyl, lower alkynyl, $-(CH_2)_nCOCH_3$ where n is 0 or 1,



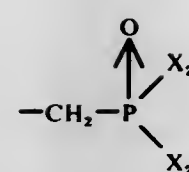
wherein X is selected from the group consisting of lower alkyl, phenyl, nitro-phenyl, phenylalkyl of 7 to 8 carbon atoms, acyl of a saturated aliphatic mono carboxylic acid of 1 to 6 carbon atoms optionally substituted with



where m is an integer from 0 to 6 and X_1 is selected from the group consisting of hydrogen and lower alkyl,



where p is an integer from 1 to 6 and X_1 is as before,



wherein X_2 is lower alkyl, and R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, CF_3 - and diloweralkylamino and the non-toxic, pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

4,009,274

CERTAIN 3-PYRIDINECARBONITRILES, DERIVATIVES THEREOF AND ANTI-ULCER COMPOSITIONS CONTAINING SAME

Adrian Charles Ward Curran, North Humberstone, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 468,726, May 10, 1974, Pat. No. 3,981,878, which is a continuation-in-part of Ser. No. 299,995, Oct. 24, 1972, Pat. No. 3,845,064. This application Feb. 19, 1976, Ser. No. 659,433

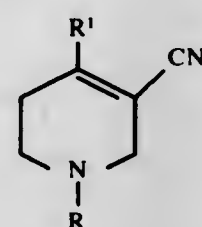
Claims priority, application United Kingdom, Oct. 29, 1971, 50431/71

Int. Cl.² A61K 31/34; C07D 213/57

U.S. Cl. 424-263

5 Claims

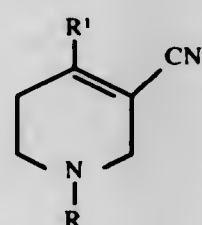
1. An anti-ulcer composition comprising an effective amount of a compound of formula



(I)

wherein R is phenylloweralkyl and R' is loweralkyl or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier.

4. A compound of formula



wherein R is phenylloweralkyl and R' is lower alkyl or a pharmaceutically acceptable acid addition salt thereof.

4,009,275

PHENOXYPROPYLAMINE DERIVATIVES

Isamu Maruyama, Minoo; Masaru Nakao; Kikuo Sasajima, both of Toyonaka, Japan; Shigeo Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Feb. 28, 1975, Ser. No. 553,932

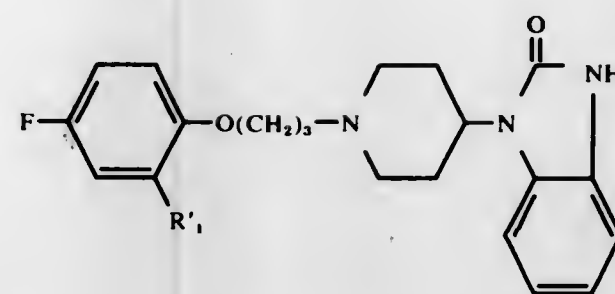
Claims priority, application Japan, Feb. 28, 1974, 49-24501; May 9, 1974, 49-51921; Oct. 9, 1974, 49-116614

Int. Cl.² C07D 401/04

U.S. Cl. 424-267

3 Claims

1. A phenoxypropylamine derivative of the formula:



wherein R_1 is a chlorine atom or an allyl group, and pharmaceutically acceptable salts thereof.

4,009,276

OXADIAZOLINE DERIVATIVES

John Warkentin, Burlington; Kotteth Ramakrishnan, Hamilton; Rup C. Jain, and Frank W. Wandelmaier, both of Montreal, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

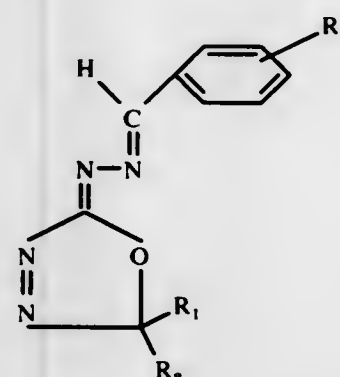
Filed Nov. 3, 1975, Ser. No. 628,223

Int. Cl.² C07D 271/06

U.S. Cl. 424-272

10 Claims

1. Benzylidenehydrazono-oxadiazoline compounds of the formula:



wherein R_1 and R_2 are both lower alkyl or form with the heterocyclic ring carbon-atom, a cyclopentyl or cyclohexyl ring; and R_3 when present is selected from halogen, lower alkyl and lower alkoxy.

4,009,277

1,2-DIALKYL-3,4,5-TRISUBSTITUTED PYRAZOLIUM SALTS AS FUNGICIDAL AGENTS

Bryant Leonidas Walworth, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

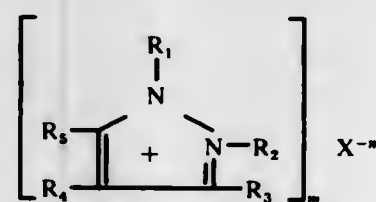
Continuation-in-part of Ser. No. 541,900, Jan. 17, 1975, abandoned. This application July 23, 1975, Ser. No. 598,527

Int. Cl.² A01N 9/22

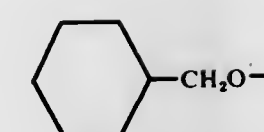
U.S. Cl. 424-273

18 Claims

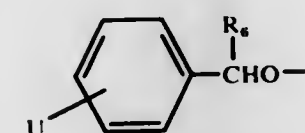
1. A method for protecting living beneficial plants from fungi comprising applying to the foliage of said plants a fungicidally effective amount of a compound having the formula:



wherein R_1 and R_2 each represent C_1 - C_3 alkyl or benzyl; R_3 and R_4 each represent a member selected from the group consisting of phenyl, halophenyl and tolyl; R_4 represents a member selected from the group consisting of C_1 - C_{16} alkoxy, C_3 - C_4 alkenyloxy, C_3 - C_4 alkynyloxy, C_3 - C_4 haloalkenyloxy,



and



where R_6 represents hydrogen or methyl, U represents a member selected from the group consisting of hydrogen, methyl, methoxy, halogen, cyano, trifluoromethyl, nitro and 2,4-dinitro; X represents an anion with a charge of from 1 to 3; and m represents an integer from 1 to 3.

4,009,278

ANTIMICROBIAL COMPOSITION AND METHOD CONTAINING N-(3,5-DIHALOPHENYL)-IMIDE COMPOUNDS

Akira Fujinami, Ashiya; Toshiaki Ozaki, Toyonaka; Shigehiro Ooba, Takarazuka; Sigeo Yamamoto, Toyonaka; Katsuji Nodera, Nishinomiya; Katsutoshi Tanaka, Takarazuka; Keiichi Akiba, Ikeda; Tadashi Oishi, Minoo, and Nobuyuki Kameda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 322,169, Jan. 9, 1973, Pat. No. 3,903,090, which is a division of Ser. No. 17,339, March 6, 1970, Pat. No. 3,745,170. This application Apr. 24, 1975, Ser. No. 571,104

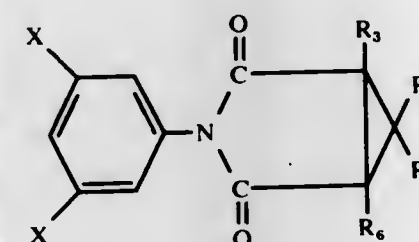
Claims priority, application Japan, Mar. 19, 1969, 44-21529

Int. Cl.² A01N 9/22

U.S. Cl. 424-274

9 Claims

1. A microbiocidal composition containing as an active ingredient an anti-microbiocidally effective amount of an N-(3,5-dihalophenyl)imide compound represented by the formula,



wherein X represents, Cl, Br or I; R_3 , R_4 and R_5 each represent hydrogen or methyl; and R_5 represents hydrogen or methyl and a carrier.

4,009,279

METHODS FOR CONTROLLING INSECTS AND ACARINA

Roger Williams Addor; James Byron Lovell, both of Pennington, and Sidney Kantor, Trenton, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

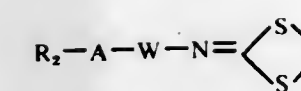
Division of Ser. No. 493,944, Aug. 14, 1974, Pat. No. 3,928,382, which is a division of Ser. No. 235,397, March 16, 1972, abandoned. This application Sept. 25, 1975, Ser. No. 616,792

Int. Cl.² A01N 9/00

U.S. Cl. 424-277

10 Claims

1. A method for controlling insects and acarina comprising contacting the ova of said insects and acarina with an ovicidal amount of a compound having the formula:



wherein W is selected from the group consisting of methylene, ethylene, lower alkyl (C_1 - C_5) substituted methylene and lower alkyl (C_1 - C_5) substituted ethylene; A is oxygen or sulfur; and R_2 is selected from the group consisting of C_1 - C_{12} alkyl, monocyclic alkyl (C_3 - C_{12}) and bicyclic alkyl (C_3 - C_{12}), phenyl, mono and diloweralkyl (C_1 - C_4) phenyl, mono and dihalophenyl, furfuryl, tetrahydrofurfuryl, alkenyl of 2 to 8 carbon atoms, and lower alkoxy (C_1 - C_4) lower alkyl (C_2 - C_3).

4,009,280

POWDER COMPOSITION FOR INHALATION THERAPY

Donald Ross Macarthur, and David Ernest Smith, both of Loughborough, England, assignors to Fisons Limited, London, England

Continuation of Ser. No. 277,233, Aug. 2, 1972, abandoned.

This application June 9, 1975, Ser. No. 584,888

Claims priority, application United Kingdom, Aug. 10, 1971, 37456/71

Int. Cl.² A01N 9/28

7 Claims

1. A powder composition for inhalation therapy which comprises from 10 to 75% by weight of the di-sodium salt of 1,3-bis(2-carboxy-chromon-5-yloxy)propan-2-ol having a mass median diameter in the range of 2.8 to 3.9 microns, and from 90 to 25% by weight of a solid, pharmaceutically acceptable, watersoluble inhalation powder carrier which is chemically inert to the said di-sodium salt which carrier is acceptable in the lungs and has a particle size in the range of from 30 to 150 microns.

4,009,281

FUMIGANT COMPOSITION CONTAINING D-ALLETHRONYL D-TRANS-CHRYSANTHEMATE

Yoshitoshi Okuno, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 459,934, April 11, 1974, abandoned.

This application Sept. 29, 1975, Ser. No. 617,711

Claims priority, application Japan, Apr. 21, 1973, 48-45513

Int. Cl.² A01N 9/24

U.S. Cl. 424-306

2 Claims

1. An insecticidal material consisting essentially of an insecticidally effective amount of d-2-allyl-3-methyl-cyclopent-2-ene-1-one-4-yl d-trans-chrysanthemate absorbed on a fibrous support suitable for use on an electrically heated plate.

4,009,282

TREATMENT OF PROLIFERATING SKIN DISEASES WITH PROSTAGLANDINS

John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 425,099, Dec. 17, 1973, abandoned, and a continuation-in-part of Ser. No. 324,012, Jan. 16, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,577

Int. Cl.² A61K 31/19, 31/215

U.S. Cl. 424-317

6 Claims

1. A process for treating proliferating skin diseases comprising the administration of an effective amount of PGE_1 , PGE_2 , PGE_3 or the alkyl ester thereof containing from 1 to 8 carbon atoms, inclusive, or 13,14-dihydro PGE_1 , or the alkyl esters thereof containing from 1 to 8 carbon atoms inclusive, in association with a pharmaceutical carrier to a human or animal.

4,009,283

ANTIINFLAMMATORY AND ANTITHROMBOTIC COMPOSITIONS AND METHOD OF USE

Milton E. Herr, Dektona, Fla., and Roy A. Johnson, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 413,647, Nov. 7, 1973, Pat. No. 3,957,861.

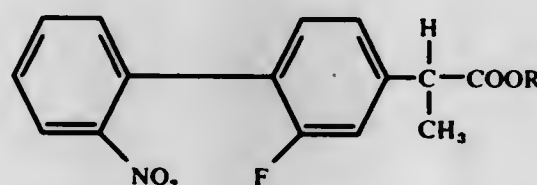
This application Feb. 6, 1976, Ser. No. 655,897

Int. Cl.² A61K 31/19, 31/235

U.S. Cl. 424—317

12 Claims

1. A pharmaceutical composition which comprises an anti-inflammatory effective amount of a compound of the formula



wherein R is hydrogen or alkyl of one to six carbon atoms, inclusive, in association with a pharmaceutical carrier.

4,009,284

GASTROINTESTINALLY ACTIVE THIOUREAS

Peter L. De Benneville, Jack N. Moss, both of Philadelphia, Pa., and Esam Z. Dajani, Chicago, Ill., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 553,354, Feb. 26, 1975, Pat. No.

3,950,537, which is a continuation-in-part of Ser. No. 374,852,

June 29, 1973, abandoned, which is a division of Ser. No.

175,373, Aug. 26, 1971, abandoned. This application Dec. 3,

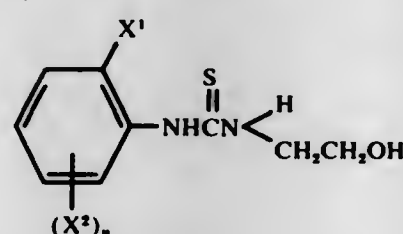
1975, Ser. No. 637,241

Int. Cl.² A61K 31/17

U.S. Cl. 424—322

6 Claims

1. A method for treating a mammal suffering from gastrointestinal disturbances which comprises administering to said mammal in an amount effective to reduce gastric secretions, a compound of the formula:



wherein X¹ is methyl or ethyl; X² is 3,4 or 6-methyl; 3,4 or 5-chloro or bromo and n is an integer of 0-2.

4,009,285

METHOD FOR PRODUCING CHAMPAGNE

James E. Spooner, 3260 A 46th St., Los Alamos, N. Mex. 87544

Filed Sept. 6, 1973, Ser. No. 394,742

Disclosure was also published under second Trial Voluntary

Protest Program on Apr. 13, 1976

Int. Cl.² C12G 1/06

U.S. Cl. 426—8

3 Claims

1. A fermentation process for producing champagne which comprises placing a fermentable liquid in a pressure sealable receptacle and introducing in said receptacle a yeast held within a container having a porous wall membrane, said container being out of contact with said liquid, causing said fermentable liquid to contact the contained yeast and thereby causing fermentation to take place, said porous wall membrane having openings of a mean pore size sufficient to retain the yeast cells having a diameter greater than the pores in the

membrane while permitting the interchange of the liquid components and passage therethrough in the membrane and small enough to bar the passage of any solid yeast and solid fermentation byproducts, and removing the container and retained solids after the fermentation has been effected to the desired stage, the fermentable liquid being a wine and sugar solution, and a secondary fermentation process being carried out under secondary fermentation conditions of temperature and for a period of time sufficient to produce champagne.

4,009,286

CONTINUOUS PRODUCTION OF FERMENTED LIQUIDS

Manfred Moll, Vandoeuvre; Gilbert Durand, Toulouse, and Henri Blachere, Talant, all of France, assignors to Groupement d'Interet Economique, France

Filed July 1, 1974, Ser. No. 484,868

Claims priority, application France, Oct. 19, 1973,

73.38385

Int. Cl.² C12C 11/04, 11/12, 11/14

U.S. Cl. 426—13

13 Claims

1. A process for the continuous production of a fermented liquid wherein all constituents participating in said production are sterilized prior to being introduced into said process comprising the steps of flash sterilizing a mixture of wort and bitter substances by direct injection of steam into said mixture, boiling said mixture so as to complete the transformation of the bitter substances incorporated in said wort, decanting the precipitates formed in said wort under aeration of said wort by sterile compressed air or oxygen, fermenting said wort by bringing said wort into contact with yeast fed from an external supply in sterile condition, said yeast being fixed on an inert support by physical-chemical bonds, storing the fermented wort in the presence of yeast under sterile conditions and passing said fermented wort through a treatment zone in contact with sterile protease fixed on a support, all steps of said process being carried out in zones provided with means for avoiding the introduction of foreign microorganism therein so that a permanently sterile medium is provided throughout said process.

4,009,287

CONTAINERS FOR PACKAGING LIQUIDS

Kenneth Clarke, Knebworth, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 385,736, Aug. 6, 1973, abandoned.

This application July 31, 1975, Ser. No. 600,801

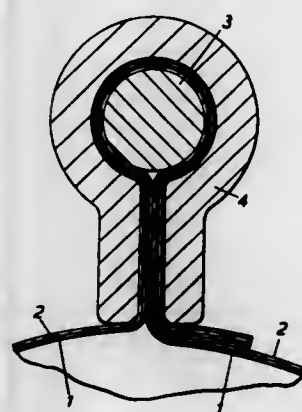
Claims priority, application United Kingdom, Aug. 24,

1972, 39413/72

Int. Cl.² B65D 85/72, 77/14

U.S. Cl. 426—106

10 Claims



1. A package containing a carbonated beverage at superatmospheric pressure and made from a length of flexible tubular thermoplastics film sealed at each end by a gas-tight enclosure such that the greater the internal pressure in the container the greater is the sealing pressure upon the film within the enclosure, said gas-tight closure includes a flattened end of the tubular film folded transversely through 180° around a rod

and a strip of malleable material of U-shape cross-section crimped over the folded film along the fold around the rod and enclosing tightly and continuously the turned over end of the film and clamping it firmly between the rod and the malleable strip, the length of the strip and the rod being at least as great as the width of the tubular film when in the lay-flat condition.

4,009,288

METHOD OF PREPARING INSTANT WONTONS CONTAINING A FILLER

Kiyoshi Fukagawa, Hino, Japan, assignor to Toyo Suisan Kaisha Ltd., Tokyo, Japan

Filed Apr. 6, 1976, Ser. No. 674,180

Int. Cl.² A21D 13/00

U.S. Cl. 426—297

7 Claims

1. A method of producing instant wontons containing a filler which comprises the steps of preparing raw wontons consisting of a filler wrapped in a skin of dough consisting mainly of wheat flour and containing 28 to 33% by weight of water; preliminarily frying the raw wontons in oil heated to a temperature ranging between 105° and 120° C for a predetermined period sufficient to reduce the water content of the skin of the raw wontons thus fried to 16 to 20% by weight; and finally frying the preliminarily fried wontons in oil heated to 125° to 140° C for a predetermined period sufficient to decrease the water content of the skin of the wontons thus fried to 4 to 8% by weight.

4,009,289

METHOD FOR PREVENTING THE FORMATION OF TURBIDITY AND/OR DEPOSITS IN NON-ALCOHOLIC BEVERAGES CONTAINING SUCROSE AND CONCENTRATES FOR SUCH BEVERAGES

Robert Roos, Amsterdam, and Peter J. Kühn, Bussum, both of Netherlands, assignors to Naarden International, N.V., Naarden, Netherlands

Continuation of Ser. No. 441,343, Feb. 11, 1974, abandoned.

This application Feb. 9, 1976, Ser. No. 656,721

Claims priority, application Netherlands, Feb. 12, 1973,

7301958

Int. Cl.² A23L 2/00

U.S. Cl. 426—330.3

13 Claims

1. A method for preventing the formation of turbidity and/or deposits in clear non-alcoholic beverages which are free of floccules and other deposits and containing sucrose as the main sweetening agent and clear liquid concentrates for these beverages, consisting essentially of adding thereto at most 0.25% by weight of gum arabic, calculated as dry substance on the weight of the sucrose and at least an amount of gum arabic sufficient to prevent the formation of turbidity and/or deposits in said beverage.

12. A clear non-alcoholic beverage which is free of floccules and other deposits and containing sucrose as the main sweetening agent or a clear liquid concentrate for such a beverage, consisting essentially of at most 0.25% by weight of gum arabic, calculated as a dry substance on the weight of the sucrose present and at least an amount of gum arabic sufficient to prevent the formation of turbidity and/or deposits in said beverage.

4,009,290

METHOD FOR PREPARING EDIBLE OIL

Toshio Okumori, Sagami-hara; Yoza Tadokoro, Yokohama; Yoshiyuki Takagi, Yokohama, and Nobuo Yoshida, Yokohama, all of Japan, assignors to Nisshin Seiyu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 441,497, Feb. 11, 1974, abandoned. This application Apr. 6, 1976, Ser. No. 674,121

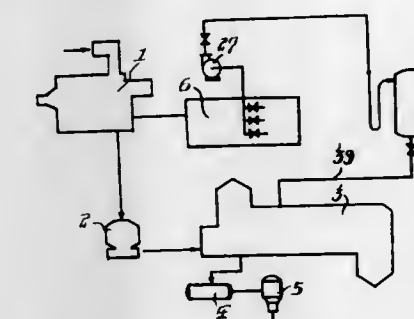
Int. Cl.² C11B 1/06, 1/10

U.S. Cl. 426—489

6 Claims

1. A process of extracting oil from vegetable seeds comprising the steps of

mechanically expelling crude oil from the vegetable seeds to produce vegetable seed cakes and mechanically expelled crude oil, separating the mechanically expelled crude oil from the cakes,



passing the separated mechanically expelled crude oil through a layer of the separated cakes produced in the expelling step to filter sediment from the mechanically expelled crude oil, and chemically extracting crude oil from the cakes after said passing step is performed by flowing a solvent through the layer of cakes.

4,009,291

COLD WATER SOLUBLE STABLE BULKED STARCH

William A. Mitchell, Lincoln Park, N.J.; William C. Seidel, Monsey, and George E. Orozovich, Flushing, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,055

Int. Cl.² A23L 1/195

U.S. Cl. 426—548

16 Claims

1. A process for producing a starch having the cold water solubility, low-hazing low viscosity and film-forming properties of a dextrin comprising:

- selecting a water insoluble granule starch having been hydrolyzed to a degree such that the starch has little or no reducing sugars present, has a DE of less than about 1 and when heated above a temperature of about 65° C, forms a clear, low viscosity solution;
- gelatinizing the modified granule starch without modification of the starch molecule; and
- drying the starch, the resultant starch material demonstrating a bland taste, low-hygroscopicity, low bulk density, low viscosity and film-forming properties in addition to the ability to both produce clear solutions and hold at higher levels numerous types of food materials.

4,009,292

EFFERVESCENT DIPEPTIDE SWEETENER TABLETS

Thomas P. Finucane, Hartsdale, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,416

Int. Cl.² A23L 1/236

U.S. Cl. 426—548

14 Claims

9. A process for producing an effervescent dipeptide sweetener tablet which is readily soluble and has enhanced sweetness and stability which comprises combining a soluble form of a dipeptide sweetener, formed by homogenizing a slurry of hydrolyzed cereal solids and a dipeptide sweetener and drying, with a stable dry carbonation system containing calcium carbonate, said calcium carbonate present in an amount sufficient to give a total calcium ion concentration in a fluid beverage of less than 0.10% such that the volume of CO₂ gas released per volume of the final liquid beverage is appreciably less than 1, and consequently not sufficient to lend a carbonated property to the beverage, and anhydrous citric acid, the amount of sweetener present being effective to impart sweetness to the tablet, the amount of dry carbonation system present being effective to increase the solubility of the dipeptide sweetener without imparting an off taste to the resultant

tablet; and the amount of anhydrous citric acid present being effective to react with the calcium carbonate.

4,009,293

SUGAR CONTAINING FOODSTUFFS

Lionel Alan Walter Hayward, 40 Hyde Park Square, London, W.2., England

Filed Dec. 27, 1974, Ser. No. 537,013

Claims priority, application United Kingdom, Jan. 7, 1974, 580/74

Int. Cl.² A23G 3/00

U.S. Cl. 426-659

8 Claims

1. A process for preparing sugar-containing foodstuffs which consists of partially de-proteinating and evaporating raw cane sugar juice or raw aqueous beet sugar extract under such conditions wherein no other components except protein present in the cane sugar juice or aqueous beet extract are removed from the solution to produce an unrefined sugar-containing syrup and incorporating the syrup so-produced directly into a foodstuff.

4,009,294

PROCESS OF PREPARING FIRE-RETARDANT NATURAL AND SYNTHETIC FIBERS

James C. W. Chien, Amherst, Mass., and Frederick George Schappell, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

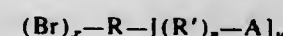
Division of Ser. No. 541,182, Jan. 15, 1975, Pat. No. 3,957,835. This application Apr. 18, 1975, Ser. No. 569,251

Int. Cl.² B05D 3/06

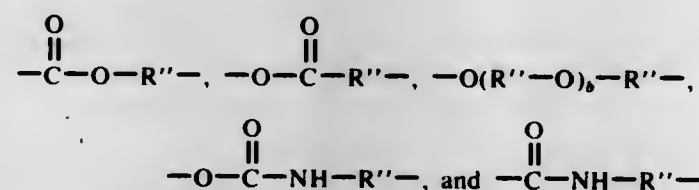
U.S. Cl. 427-35

21 Claims

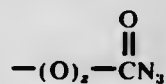
1. The process of preparing fire-retardant natural and synthetic fibers and films comprising contacting the fiber or film with a brominated azido fire-retardant having the formula



where R is selected from alkylene, polyalkylene, cycloalkylene, alkylene cycloalkylene, arylene, alkylene arylene, poly(alkenyl arylene), alkylene-oxy-alkylene, poly(alkylene oxide), alkylene-oxy-arylene, alkylene-oxy-cycloalkylene, cycloalkylene-oxy-cycloalkylene, poly(cycloalkylene oxide), cycloalkylene-oxy-arylene, arylene-oxy-arylene, poly(arylene oxide), arylene carboalkoxy, alkylene carboaryloxy, alkyl alkylene carboxylate, aryl alkylene carboxylate, alkylene carbonyl alkylene, alkylene carbonyl arylene, cycloalkylene carbonyl cycloalkylene and arylene carbonyl arylene radicals, where the alkyl and alkylene groups contain 1 to 18 carbon atoms; R' is selected from



where R'' is selected from alkylene, cycloalkylene, alkylene cycloalkylene, arylene, alkylene arylene, and the foregoing radicals with bromo substituents, where the alkylene groups contain 1 to 20 carbon atoms, and b is an integer from 1 to 10; A is selected from



and $-SO_2N_3$ where z is 0 or 1; x is at least 3; n is 0 or 1; and y is an integer from 1 to 100; and initiating a reaction of the fire-retardant with the fiber or film by irradiation at a wavelength of from about 2,000 Å to about 4,000 Å.

4,009,295

PRINTABLE ANTI-BLOCKING RESINOUS BLOCK COPOLYMER

John H. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 460,936, April 15, 1974, Pat. No.

3,896,068. This application Feb. 3, 1975, Ser. No. 546,818

Int. Cl.² B05D 3/06

U.S. Cl. 427-40

4 Claims

1. A process for forming a coated substrate comprising forming a shaped substrate made of a resinous block copolymer of a monovinyl-substituted aromatic compound and a conjugated diene containing 0.1 to 20 weight percent based on the weight of said block copolymer of an anti-block agent and 0.1 to 1 weight percent based on the weight of said block copolymer of a normally solid olefin polymer having a crystallinity of at least 40 percent, thereafter subjecting at least one surface of said shaped substrate to a pretreatment selected from flame treatment, acid treatment, or corona discharge, and thereafter applying a coating selected from the group consisting of lacquer, enamel, and ink to said substrate.

4,009,296

METHOD FOR PRODUCING THE INSULATION OF A CONDUCTOR BUNDLE

Georg Löb, and Clemens Pfohler, both of Eberbach, Germany, assignors to Brown, Boveri & Cie. A.G., Mannheim, Germany

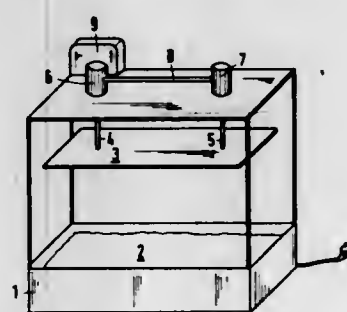
Filed Mar. 10, 1975, Ser. No. 556,925

Claims priority, application Germany, Mar. 12, 1974, 7408585[U]

Int. Cl.² H01B 13/00; C09J 5/00

U.S. Cl. 427-54

9 Claims



1. Method of producing the insulation of a conductor bundle having a plurality of flat metallic conductors spaced one from another which comprises immersing the conductor bundle of mutually spaced-apart uninsulated flat metallic conductors through an unobstructed path into a mass of insulating material heated to liquid state, and withdrawing the conductor bundle with each of the flat metallic conductors thereof coated at least partly with liquid insulating material through an unobstructed path out of the mass of liquid insulating material at a speed that is slower than the speed at which the liquid insulating mass drips from the conductor bundle.

4,009,297

GOLD DEPOSITION PROCEDURES AND SUBSTRATES UPON WHICH GOLD HAS BEEN DEPOSITED

John Peter Redmond, Mechanicsburg; Daniel Marshall Andrews, and Karl Edward Guyler, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1974, Ser. No. 553,047

Int. Cl.² B05D 3/06; C23C 11/02

U.S. Cl. 427-54

33 Claims

1. A process for depositing on a substrate gold from a solution, the process comprising:

a. introducing into a polar, non-aqueous solvent a ligand of the formula



wherein R is at least one of hydrogen, hydrocarbon group, an aliphatic group; cycloaliphatic; an aromatic group; substituted aromatic group, halogeno, or a heterocyclic group; L is phosphorous, arsenic, antimony, sulfur, or nitrogen, Au is replaceable with As or Sb, v is the valence of the Au group, X is an anion of F, Cl, Br, I, Cn, thiocyanate, a nitrate, chlorate, borohydride, or alkyl of 1 to 4 carbons; m is the number of anions and is from 1 to 3, y is equivalent to n or 1 or 2 and n is from 1 to 4;

b. adding to the solvent a reducing agent, and

c. introducing into said solvent in the presence of a nucleophile the substrate for depositing gold thereon.

4,009,298

METHOD OF CURING PLASTIC COATINGS ON BOTTLES

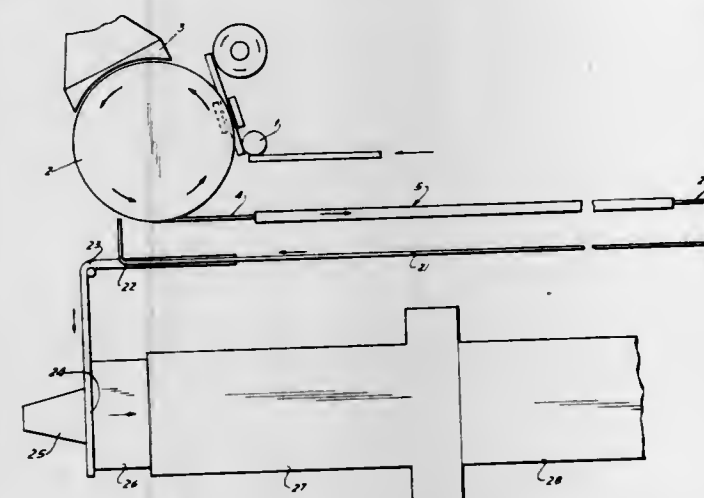
Joseph C. Cavanagh, Bay Shore, N.Y., assignor to Midland Glass Company, Inc., Cliffwood, N.J.

Filed Mar. 6, 1975, Ser. No. 555,852

Int. Cl.² B05D 3/06

U.S. Cl. 427-55

7 Claims



1. A process for curing of a plastic coating on a glass container comprising:

a. conveying a glass container, having a coating of uncured plastic at least on its rim portion, said rim portion including its heel portion and the lower portion of its sidewall, supported from the neck portion, through an area where high-intensity heat is applied to the rim portion of the container;

b. conveying said container through an area wherein said heated plastic portion is allowed to cool;

c. transferring said container to a conveyor which supports said container from its heel portion; and

d. conveying said container through an area where cure of the remainder of the plastic coating is accomplished.

4,009,299

TIN STRIP FORMULATION FOR METAL TO GLASS SEAL DIODES

Dervin L. Flowers, and Richard L. Greeson, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 22, 1975, Ser. No. 624,681

Int. Cl.² B05D 5/12; B23P 7/00

U.S. Cl. 427-82

3 Claims

1. A process for the reclamation of semiconductor devices comprising:

providing semiconductor devices having a defective tin plating thereon; and

immersing said devices, for about 5-10 minutes, in a solution of 5-20 percent by weight trichloroacetic acid, 0.1 to 5 percent by weight of a compound selected from the group consisting of cationic, anionic, nonionic surfactants, and the balance water.

4,009,300

PREPARATION OF GRADED COMPOSITION PROTECTIVE COATINGS

John H. Chaffin, III, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 16, 1974, Ser. No. 515,140

Int. Cl.² B05D 1/34; G02B 1/10

U.S. Cl. 427-162

11 Claims

1. In a method of vapor depositing an optical coating which is an alloy of at least a first and a second halide compound material, and wherein the vapor temperature of the first material is high enough to cause decomposition of the second material, the improvement comprising:

vapor depositing the first and second materials in the presence of a third vapor which does not chemically react or co-deposit with the first and second materials; wherein the third vapor is present in an amount sufficient to cause, as a result of collisions between the vapor of the first material and the third vapor, a reduction in the vapor temperature of the first material to a temperature which will not cause substantial decomposition of the second material.

4,009,301

METHOD FOR POWDER COATING

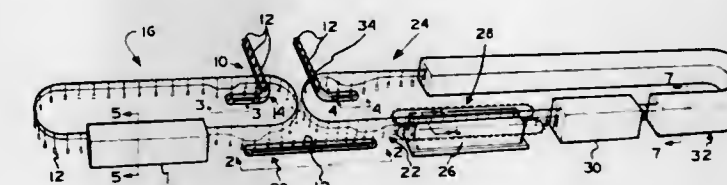
Russell W. Heckman, Perrysburg; Joseph S. Koluch, Northwood, and Roger R. Rhoads, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 5, 1974, Ser. No. 503,321

Int. Cl.² B44D 1/094

U.S. Cl. 427-195

5 Claims



1. The method of coating at least a selected portion of the external peripheral surface area of containers with an organic polymeric material in powdered form which comprises the steps of:

conveying the containers through a preheating zone, for increasing the temperature of said containers to a temperature of at least 150° F., in an upright position grasped at their upper end by chucks carried by a first chuck carrying conveyor;

completely releasing said containers from said first chuck carrying conveyor and simultaneously therewith;

depositing said heated containers on a moving transfer conveyor at an unloading zone;

transporting said heated containers in a spaced-apart single file on said transfer conveyor to a loading zone remote from said unloading zone;

moving the chucks of a second chuck carrying conveyor into general registry with said loading zone;

grasping, at said loading zone, each of the preheated containers with a chuck, substantially lower in temperature than the container temperature, of said second chuck carrying conveyor;

removing said containers from said transfer conveyor by the continued movement of said second chuck carrying conveyor;

conveying the preheated containers through a powder spraying apparatus;

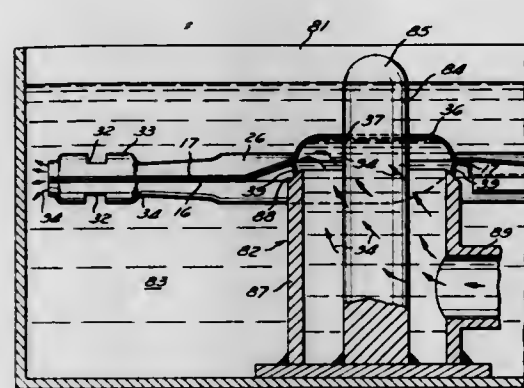
spraying said powdered organic polymeric material onto the selected portion of said preheated containers during their movement through said spraying apparatus; and

thereafter curing said sprayed organic polymeric material on said containers so as to produce a film-like organic polymeric layer overlying said selected portion thereof.

4,009,302

METHOD OF COATING A GAS RANGE TOP BURNER
William P. Biddle, and John J. Tacker, both of Athens, Tenn., assignors to Athens Stove Works, Inc., Athens, Tenn.
Division of Ser. No. 498,303, Aug. 19, 1974, Pat. No. 3,922,138. This application June 6, 1975, Ser. No. 584,655
Int. Cl.² F24C 3/10; C23D 5/02
U.S. Cl. 427—238

5 Claims



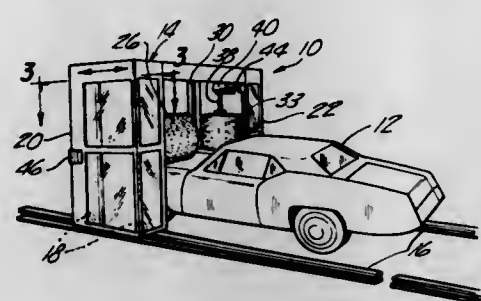
1. A method of applying ceramic frit to a sheet metal burner assembly base plate formed of a pair of joined overlying metal sheets having an integrally embossed air-gas duct formed therebetween, comprising the steps of substantially entirely immersing the joined metal sheets in a slurry of ceramic frit and simultaneously pressurizing a volume of slurry material at the exterior of the sheets whereby ceramic frit particles are forced into crevices existing between the sheets, removing the sheets from the slurry and subsequently firing the frit onto the sheets whereby the said particles driven into the crevices between the sheets are fused to seal said crevices.

4,009,303

METHOD FOR POLISHING PORTIONS OF VEHICLE SURFACES

Theodore P. Faris, 21720 Corsaut, Birmingham, Mich. 48010
Division of Ser. No. 556,002, March 6, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,750
Int. Cl.² B60S 3/06
U.S. Cl. 427—287

1 Claim



1. A method of polishing a vehicle having windows within an apparatus of the type having a pair of longitudinally disposed tracks spaced apart a sufficient distance to define an area in which the vehicle may be positioned; a carriage having a pair of upright members respectively movably mounted on said tracks and an overhead member connecting said upright members to define an opening thereinbetween of sufficient size to permit the carriage to pass over the vehicle disposed in said area; means for reciprocally moving said carriage on said tracks longitudinally at a selected speed; first rotating brushes carried by said upright members and displaceable relative to the vertical exterior surface of the vehicle disposed in said area; a second rotating overhead brush carried by said carriage and displaceable relative to the upper exterior surface of a vehicle disposed in said area; and means displacing said rotating first and second brushes into contact with the vertical and upper exterior surfaces of the vehicle as said carriage is reciprocally moved relative to the vehicle disposed in said area;

said method comprising the steps of:

- manually applying polish to selected portions of at least one exterior surface of the vehicle which is desired to be polished and not applying wax to the windows of the vehicle;
- permitting the polish to dry for a selected period of time;
- positioning the vehicle in the area defined between the longitudinally disposed tracks;
- selecting the speed at which said carriage will reciprocate on said tracks;
- passing the carriage back and forth along said vehicle such that said rotating brushes simultaneously contact the vertical and upper exterior surfaces of the vehicle while the vehicle is in a stationary position, the rotating brushes being passed front to rear and rear to front of the vehicle to polish said one exterior surface;
- terminating said reciprocating movement of said carriage and terminating the contact of the brushes with the vehicle exterior surfaces after said one exterior surface has been polished; and
- removing said polished vehicle from said area.

4,009,304

FLUORINATED POLYESTER TIRE REINFORCEMENT MATERIALS

Dale D. Dixon, Kutztown, and William Mayo Smith, Jr., Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 185,412, Sept. 30, 1971, abandoned, and a continuation-in-part of Ser. No. 285,831, Sept. 1, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 531,854
Int. Cl.² B05D 3/00

U.S. Cl. 427—322

5 Claims

1. In the process of forming polyester reinforced rubber goods, the improvement which comprises subjecting the polyester reinforcement material to a fluorine containing gas having less than about 5% by volume of elemental oxygen, and from 0.01-2.0% by volume of elemental fluorine for a treatment time of less than 2 minutes and recovering a material having a surface fluorinated from about 4×10^{-6} to 1×10^{-3} mg. F/cm.² and having at least 90% of the tensile strength of untreated material.

4,009,305

PROCESS FOR THE SURFACE TREATMENT OF CARBON FIBERS

Hirotu Fujimaki, Tokyo; Fumio Kodama, Choufu; Reiho Takabe, Kawasaki; Kiro Asano, Tokyo, and Koji Seguchi, Fuchu, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed Dec. 20, 1973, Ser. No. 426,567

Claims priority, application Japan, Dec. 22, 1972, 47-129062; Dec. 22, 1972, 47-129063

Int. Cl.² B05D 5/00

U.S. Cl. 427—399

5 Claims

1. A process for the surface treatment of a carbon fibre which comprises oxidizing the surfaces of said carbon fibre to form oxygen-containing functional groups on said surfaces and then reacting said oxygen-containing functional groups with a compound selected from the group consisting of ammonia, organic amine, lactam and aminocarboxylic acid at a temperature of 100°—500° C for a time period within the range of 1 minute to 5 hours.

4,009,306

ENCAPSULATION METHOD

Kazuo Yamashita, Kawanishi; Yoshikazu Yokose, Takarazuka; Masatake Akao, Katano, and Takashi Shibano, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 22, 1975, Ser. No. 615,702

Claims priority, application Japan, Sept. 26, 1974, 49-111273; Sept. 26, 1974, 49-111274; Sept. 26, 1974, 49-111275

Int. Cl.² B05D 1/38, 1/18, 5/12, 3/00

U.S. Cl. 427—374 C

9 Claims

1. An article encapsulation method comprising the steps of applying a first substance having thermosetting characteristics and able to provide requisite protection to an article when hardened around and into interior portions of the article to be encapsulated, said first substance being in a precured state during said application, whereby said first substance adheres to and covers surface portions of said article, immersing said article having said first substance adhering to said surface portions thereof in a second substance which is reversibly transformable from a solid to a liquid state, melts at a temperature which is between the primary curing temperature and final curing temperature of said first substance, is non-reactive with respect to said first substance and is in a liquid state upon immersion of said article therein, said first and second substances being mutually insoluble, cooling said second substance to below the solidification point thereof immediately subsequent to said immersion of said article therein, supplying heat to effect curing of said first substance, and moving said article out of contact with said second substance subsequent to hardening of said first substance during the curing thereof and after melting of said second substance.

4,009,307

POLYUREA-URETHANE COATINGS

J. Alden Erikson, and Ken W. Niederst, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

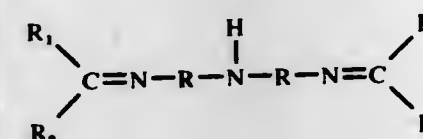
Filed July 24, 1975, Ser. No. 599,242

Int. Cl.² B05D 3/02

U.S. Cl. 427—377

28 Claims

- A coating composition comprising:
 - from about 2 percent to about 80 percent by weight of resin solids of an isocyanate-terminated polyurethane prepolymer consisting essentially of the reaction product of an organic diisocyanate and an organic diol, wherein said prepolymer is prepared at an NCO/OH ratio of from about 2:1 to about 4:3;
 - from about 2 percent to about 60 percent by weight of resin solids of an isocyanate-terminated polyurethane prepolymer consisting essentially of the reaction product of 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane and a mixture of aliphatic polyols, wherein said prepolymer is prepared at an NCO/OH ratio of at least 1.2:1 and wherein at least about 30 mole percent of the total hydroxyl groups supplied by said mixture of polyols is supplied by an aliphatic polyol having at least three hydroxyl groups; and
 - from about 20 percent to about 50 percent by weight of resin solids of a polyketimine material consisting essentially of the reaction product of a diketimine compound having the general formula:



wherein R is an alkylene group of 2 to 6 carbon atoms and R₁

and R₂ are hydrogen or organic radicals having from 1 to 8 carbon atoms, and a polyisocyanate material selected from the group consisting of an isocyanate-terminated prepolymer formed by reacting an organic diisocyanate and an organic diols at an NCO/OH ratio of from about 2:1 to about 4:3 or a mixture of an isocyanate-terminated prepolymer and unreacted organic diisocyanate formed by reacting an organic diisocyanate and an organic diol at an NCO/OH ratio of from about 3:1 to about 5:1, and wherein a sufficient amount of said diketimine is reacted with said prepolymer or said mixture to produce a polyketimine material containing no free NCO groups.

4,009,308

PROCESS FOR PRODUCING REFRACTORIES

Zenbutsu Tadashi; Asami Hajime, both of Bizen; Uemura Seichi, Kawasaki, and Hirose Takao, Kamakura, all of Japan, assignors to Shinagawa Refractories Co., Ltd. and Nippon Oil Company Ltd., both of Tokyo, Japan

Filed June 18, 1975, Ser. No. 587,970

Claims priority, application Japan, June 25, 1974, 49-71877

Int. Cl.² C04B 41/04

U.S. Cl. 427—443

14 Claims

1. A process for producing refractories of dolomite- or magnesia-type in which an impregnant is filled into open pores of said refractories, wherein said impregnant is a thermoplastic resinous material which is obtained by removing the light fraction having a boiling point of less than 200° C. under a reduced pressure of 100 mm Hg and having a benzene-insoluble fraction content of less than 10% by weight from at least one member selected from the group consisting of a heavy oil obtained by the steam cracking of petroleum and a polymerization product of said heavy oil.

4,009,309

METHOD OF MAKING STAINED GLASS EFFECT ARTICLES

John Frederick Dent Holt, 2 Ariel Court, Ashchurch Park Villas, London W.12, England

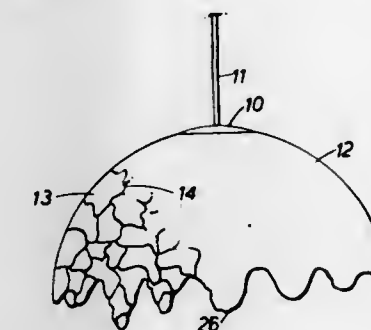
Division of Ser. No. 369,858, June 14, 1973, Pat. No. 3,876,483. This application Dec. 10, 1974, Ser. No. 531,295

Claims priority, application United Kingdom, Sept. 26, 1972, 44473/72

Int. Cl.² B44C 5/08; B44F 1/06

U.S. Cl. 428—38

3 Claims



- A simulated stained glass article comprising as a united structure, in combination:
 - a first rigid preform of translucent material of a shape and size of the finished article having a smooth first surface;
 - a prepatterned colored film on the first surface of the first preform and in register therewith;
 - a second rigid preform of translucent material of a shape and size of said finished article having a smooth first surface located in contact with the film and a second surface with channels formed therein in register with the boundaries of said colored prepattern of the film, the second surface being remote from said film and said channels extending only part-way through the thickness of said second preform;
 - a material in said channels which has a lead-like appearance; and

e. means sealing the free edges of the two preforms to one another.

4,009,310

METHOD OF IMPROVING ADHESION OF SECONDARY BACKINGS ON CARPETS

James Joseph Scobbo, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed July 1, 1976, Ser. No. 701,840

Int. Cl.² D03D 27/00; D04H 11/00

U.S. Cl. 428-95

12 Claims

1. The method which comprises coating the backing of a carpet comprising a plurality of fibers or tufts woven with a first fibrous backing with an aqueous curable adhesive composition and then applying with pressure a second fibrous backing material to said adhesive coated first fibrous backing to form a laminate, said adhesive being present in an amount sufficient to secure the ends of said fibers or tufts to said first backing material and to secure said second backing material to said first backing material, said second backing material at the time of application to said adhesive coated first backing material first having been treated with fluid H₂O at a temperature and for a time sufficient to wet said secondary backing, to relax the fibers of said secondary backing, to increase the amount of fibers protruding from the cords or strands of the secondary backing and to improve the penetration of said adhesive into said secondary backing, and then heating the resulting laminate at a temperature and for a time sufficient to dry said adhesive and said secondary backing and to cure said adhesive to bind the ends of the fibers or tufts of said carpet to said primary backing and said primary backing to said secondary backing together into a unitary laminate without adversely affecting the fibers or tufts of said carpet.

4,009,311

STARCH-BASED ALKALINE CURING CORRUGATING ADHESIVES CONTAINING, AS CROSSLINKING AGENT, THE REACTION PRODUCT OF A KETONE, FORMALDEHYDE AND A SECONDARY AMINE

Jules E. Schoenberg, Scotch Plains, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 19, 1975, Ser. No. 578,671

Int. Cl.² B32B 3/28; C08L 3/02

U.S. Cl. 428-182

15 Claims

1. A corrugating adhesive comprising (a) starch in a concentration of from about 10 to 40%, based on the total weight of the adhesive, wherein a minor portion of the starch is gelatinized and the remainder is ungelatinized; (b) an alkali in a concentration of from about 0.3 to 4%, based on the total weight of the starch; (c) a crosslinking agent in a concentration of from 0.3 to 10%, based on the total weight of the starch, comprising the reaction product of (i) a ketone selected from the group consisting of acetone, mesityl oxide and diacetone alcohol, (ii) formaldehyde and (iii) a secondary amine, wherein the reaction product comprises 2 to 5 moles formaldehyde and 0.25 to 1 mole secondary amine per mole ketone; and (d) from about 54 to 89% water, based on the total weight of the adhesive.

4,009,312

HEAT-ADHESIVE FILM LAMINATE

Ikuya Hayashi; Keiichi Uno, and Mikio Matsuoka, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jan. 23, 1974, Ser. No. 435,925

Claims priority, application Japan, Feb. 2, 1973, 48-13957

Int. Cl.² B32B 15/08, 27/36, 27/28

U.S. Cl. 428-213

12 Claims

1. A heat-adhesive film laminate consisting essentially of (A) a plastic film having excellent heat resistance and a melting point of 200°C or more made from a polyester, polyamide or polycarbonate which is in the form of a non-oriented film,

a uniaxially oriented film or a biaxially oriented film, said plastic film being laminated on one side of (B) a metal foil, and (C) a film of a resin comprising predominantly block copolyester selected from the group consisting of polyethylene terephthalate/polytetramethylene oxide block copolymer, polytetramethylene terephthalate/polytetramethylene oxide block copolymer, polyethylene terephthalate/isophthalate/polytetramethylene oxide block copolymer and polytetramethylene terephthalate/isophthalate/polytetramethylene oxide block copolymer, said block copolyester having a melting point higher than 140°C. but at least 20°C. lower than the melting point of the plastic film and a Young's modulus ϵ (dyne/cm²) and a breaking elongation $(\Delta l/l_0) \times 100$ (%) when measured at 20°C and 100°C being respectively

$$10^7 \text{ (dyne/cm}^2\text{)} < \epsilon < 10^{10} \text{ (dyne/cm}^2\text{)} \text{ and}$$

$$(\Delta l/l_0) \times 100 > 40(\%),$$

said film of resin being laminated on the other side of the metal foil.

4,009,313

ENZYMATICALLY DISPERSIBLE NON-WOVEN WEBS

George H. Crawford, Dellwood; Charles F. Nawrot, Eau Claire, and Ronald F. Ofstead, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1972, Ser. No. 285,084

Int. Cl.² B32B 27/04, 27/10

U.S. Cl. 428-290

17 Claims

1. A self-supporting, non-woven composite fibrous web which is readily dispersible in aqueous milieu containing enzyme, consisting essentially of a non-woven web of relatively short fibers having surfaces which confer only low wet-strength upon the web in the absence of a binder and in combination therewith a water-insoluble, normally solid, enzyme-disintegratable binder which consists of the reaction product of a polymer containing at least one ethylenically unsaturated monomer covalently bonded with a naturally occurring, enzyme-degradable, water-soluble polymeric material, said binder being present in effective amount ranging from about 0.3 percent to about equal amount by weight of said fibers in said non-woven web, sufficient to impart to said non-woven web wet-strength in the absence of enzyme of from about 0.5 to 10 kg/cm² and resistance to dispersion in water for at least 30 minutes, and to permit dispersion of said non-woven web in a period ranging from about 5 to 30 minutes in aqueous milieu containing enzyme capable of degrading said water-soluble polymeric material to disintegrate said binder and thereby to render said web dispersible.

4,009,314

COLORING GLASS FIBER ARTICLES AND PROCESS

Arthur L. Allewelt, West Chester, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 21, 1975, Ser. No. 624,360

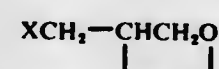
Int. Cl.² B32B 27/04, 27/20

U.S. Cl. 428-290

18 Claims

1. A glass fiber article treated with a coloring composition comprising a pigment and a polymeric binder, the amount of polymeric binder being effective to adhere the pigment to the article, said polymeric binder being selected from:

A. homopolymers and copolymers of a quaternary monomer prepared by reacting an epihalohydrin of the formula



with an amine salt of the formula $\text{H}_2\text{C}=\text{C}(\text{R})\text{C}(\text{O})\text{O---A---N}(\text{CH}_3)_2\text{HY}$; and

B. the reaction product of homopolymers or copolymers of said amine salt and said epihalohydrin; wherein R is hydrogen or methyl, X is iodine, bromine or chlorine, A is a $(\text{C}_2\text{---C}_6)$ alkylene group having at least two carbon atoms in a chain between adjoined O and N atoms or A may be a polyoxyethylene group of the formula $(\text{CH}_2\text{CH}_2\text{O})_x\text{CH}_2\text{CH}_2$ wherein x is at least 1, and Y is an anion.

4,009,315

CHEMICAL COMPOSITIONS AND PROCESS

Lawrence W. Healy, Johnsonville, S.C.; Wu Lan Wang, Newark, N.J., and Tsu-Huai Wang, Wilmington, Del., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation of Ser. No. 366,158, June 1, 1973, which is a continuation of Ser. No. 180,123, Sept. 13, 1971, which is a continuation of Ser. No. 68,010, Aug. 28, 1970, Pat. No. 3,665,471, which is a continuation-in-part of Ser. No. 562,532, July 5, 1966, abandoned. This application Feb. 3, 1975, Ser. No. 546,503

Int. Cl.² B32B 3/26

U.S. Cl. 428-310

5 Claims

1. A compressed, breathable, supple, fibrous sheet suitable as a replacement for natural leather wherein the composition of said sheet comprises an integral three-component system containing, by weight based on the total weight, from about 5% to 55% of synthetic organic or natural fibers from about 5% to 60% of flexible polyurethane foam, and from about 25% to 75% of a soft, resilient elastomeric filler; said fibers being of a denier of about 0.5 to 6 and at least one-half inch long; the fibers being needled into the foam and together with said foam comprising an interlocking network having void spaces therebetween, the fibers being distributed throughout the whole cross-section thereof; the filler being dispersed throughout said network and substantially but not completely filling said void spaces, the fibers being capable of restricted movement within said network.

4,009,316

SOIL HIDING, SOIL RESISTANT FIBER COMPRISING A RELATIVELY MAJOR AMOUNT OF A POLYAMIDE COMPONENT AND A MINOR AMOUNT OF AN ACRYLATE POLYMER COMPONENT

W. Hunter Wanger, Southampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 242,822, April 10, 1972, abandoned. This application Dec. 4, 1972, Ser. No. 312,156

Int. Cl.² B32B 27/02; C08L 77/00; D01D 5/12; D02G 3/00

U.S. Cl. 428-364

6 Claims

1. An opaque, cold drawn fiber comprising a melt-blend mixture of a nylon component and a second component, said components being present in the fiber in a weight ratio of from 97:3 to 70:30, said second component consisting essentially of a polymethacrylate, an acrylate-methacrylate copolymer or a methacrylic acidmethacrylate copolymer, said second component being thermally stable under fiber forming conditions and having a glass transition temperature substantially above that of the nylon component, said fiber characterized by a specific gravity less than that of the nylon component and a soil hiding ability substantially improved over that of fibers formed from the nylon component alone.

4,009,317

GLASS FIBER COATED WITH A SIZE COMPRISING EMULSIFIED CLAD PARTICLES OF POLY(METHYL METHACRYLATE)

Kenneth P. Chase; Harold L. Haynes, both of Newark, and Michael G. Roberts, Heath, all of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Nov. 14, 1973, Ser. No. 415,590

Disclosure was also published under second Trial Voluntary

Protest Program on Mar. 23, 1976

Int. Cl.² B32B 17/02; C08L 23/02

U.S. Cl. 428-378

18 Claims

1. Glass fibers coated with an aqueous dispersion containing emulsified clad particles of a film former which clad particles have a core that consists of poly alkyl methacrylate and containing at least 5% by weight of methyl methacrylate, and an outer shell of a film forming polymeric material having a Tg of approximately 10°C or less.

8. Glass fibers having a coating thereon comprising the following solids in approximate percentages by weight:

Emulsified clad particles having a core consisting solely of a poly alkyl methacrylate material of which at least 5% is methyl methacrylate	20-70
Additional film former	0-40
Cationic lubricant	2-5
Nonionic lubricant	3-70
Humectant	0-7

said clad particles having an outer shell of a film forming polymeric material having a Tg of approximately 10°C or less.

4,009,318

LAMINATED GLASS BODY WITH OPAL PHASE PRODUCED BETWEEN LAMINAE

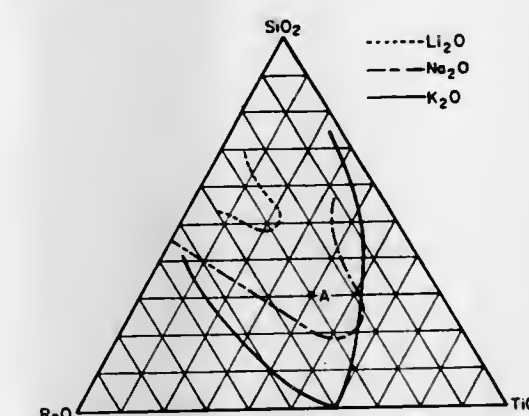
Thomas H. Elmer, Corning; Arthur E. Hillman, Elmira; Karl E. Hoekstra; Robert G. Howell, both of Corning; Herbert E. Rauscher, Painted Post, and Charles C. Smith, Jr., Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 15, 1974, Ser. No. 523,959

Int. Cl.² B32B 7/04, 17/06

U.S. Cl. 428-420

14 Claims



1. A laminated glass article consisting of a base glass lamina and a lamina selected from the group consisting of a source glass lamina and a sink glass lamina with an in situ layer of opalization at the interface between said laminac, said base glass being selected from the group of composition fields, expressed in weight percent on the oxide basis:

- 2.5-25% of at least one alkali metal oxide selected from the group consisting of Na₂O and K₂O, 2.5-45% RO, wherein RO consists of CaO, SrO, and BaO and 50-85% SiO₂, the sum of alkali metal oxide + RO + SiO₂ constituting at least 80% of the total composition;
- 5-70% of at least one alkali metal oxide selected from the group consisting of Na₂O and K₂O, 5-55% TiO₂, and 20-70% SiO₂, the sum of alkali metal oxide + TiO₂ + SiO₂ constituting at least 50% of the total composition;

c. 30-60% of at least one alkali metal oxide selected from the group consisting of Na_2O and K_2O , 10-30% Al_2O_3 , and 25-45% SiO_2 , the sum of alkali metal oxide + Al_2O_3 + SiO_2 constituting at least 80% of the total composition;
 c. 3-15% of at least one alkali metal oxide selected from the group consisting of Na_2O and K_2O , 30% B_2O_3 , 55-80% SiO_2 , and 1-15% F, the sum of alkali metal oxide + B_2O_3 + SiO_2 + F constituting at least 80% of the total composition; and
 e. 5-25% of at least one alkali metal oxide selected from the group consisting of Na_2O and K_2O , 3-45% RO, wherein RO consists of MgO , CaO , SrO , and BaO , 45-85% SiO_2 , and 0.5-5% F, the sum of alkali metal oxide + RO + SiO_2 + F constituting at least 80% of the total composition; said source glass being a lithium silicate composition containing at least 1% Li_2O , and said sink glass being an alkali metal-free silicate composition.

4,009,319

REGENERATED CELLULOSE FILM, ALUMINUM FOIL LAMINATES AND METHOD FOR PRODUCING SAME

Warren K. Cline, Brevard, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Mar. 1, 1976, Ser. No. 662,599

Int. Cl.² B32B 27/40, 15/00

U.S. Cl. 428-424

4 Claims

1. A laminated sheet material for use in making heat sealable packages having superior resistance to thermal delamination at crimp seal temperatures above 450° F, comprising a web of regenerated cellulose film that has been softened in the wet gel state with an aqueous softener solution consisting essentially of a lower alkylene polyalkylene glycol and water and thereafter dried to a moisture content of about 4 to 8% based on the weight of the dried cellulose in the film and a web of aluminum foil, said film and foil bonded together exclusively with a polyethylene phthalate ester-urethane adhesive in the absence of any synthetic polymer coating applied to either of the bonding surfaces of said film and said foil other than residual amounts of said softener that might remain on the surface of said film.

4,009,320

AIR DEPOLARIZATION CELL OR BATTERY

Gerard Gerbier, Poitiers, France, assignor to Sait-Societe des Accumulateurs Fixes et de Traction, Romainville and Compagnie Industrielle des Piles Electriques "Cipel", Levallois-Perret, both of France

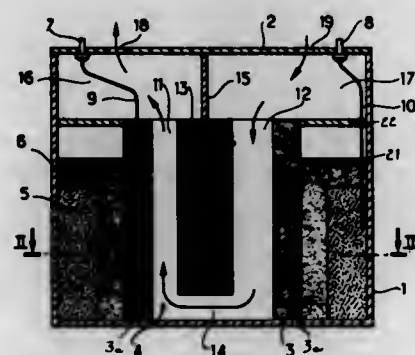
Filed Mar. 8, 1976, Ser. No. 664,817

Claims priority, application France, Mar. 11, 1975, 75.07550

Int. Cl.² H01M 4/06, 8/00

U.S. Cl. 429-27

8 Claims



1. Air depolarization cell comprising a negative electrode, an electrolyte and a positive electrode having at least one cavity via which it is fed with air, characterized in that the said cavity comprises at least two funnels formed directly in the mass of the positive electrode and extending substantially from top to bottom of the said positive electrode, each funnel

communicating with the outside air at its upper part, said funnels being separated from each other by a portion of the mass of the positive electrode, and a passageway for said funnels formed directly in the mass of said positive electrode and communicating with each other at their lower parts, the respective ratio between the area of the surface over which air flows through each funnel of the electrode and the volumes of air therein being different for the two funnels.

4,009,321

HIGH TEMPERATURE FUEL CELL ELECTROLYTE

Bernard S. Baker, Chicago, and Leonard G. Marianowski, South Holland, both of Ill., assignors to American Gas Association, Inc., Arlington, Va.

Continuation of Ser. No. 811,675, March 28, 1969, abandoned, which is a continuation of Ser. No. 506,844, Nov. 8, 1965, abandoned. This application Dec. 20, 1972, Ser. No. 316,983

Int. Cl.² H01M 8/14

U.S. Cl. 429-46

1 Claim

1. In an improved high temperature molten carbonate type fuel cell comprising in combination:

- a fuel chamber to which is fed a fuel mixture,
- an anode at which said fuel is anodically oxidized by reaction with carbonate ions,
- a cathode at which oxygen is galvanically reduced and reacted with carbon dioxide to produce carbonate ions,
- an oxidant chamber to which is fed a mixture of oxygen containing gas and carbon dioxide, and
- an electrolyte system disposed between said cathode and said anode and containing an electrolyte composition for transfer of carbonate ions from said cathode to said anode,

the improvement of said electrolyte system consisting essentially of:

- 40 to 70 weight per cent of a ternary alkali metal carbonate mixture wherein said alkali metal is sodium, potassium, and lithium, and
- 30 to 60 weight per cent of an inert carrier material consisting of alkali metal aluminates mixture as the only inert material in said electrolyte system, wherein said alkali metal is sodium, potassium and lithium, said inert carrier material being the product of reaction of finely divided, substantially silica-free, reactive alumina having a surface area of greater than about 400 square meters per gram with an excess of said ternary alkali metal carbonates mixture at a temperature above the melting point and below the decomposition temperature of said ternary carbonates mixture, until all of said reactive alumina is converted to said aluminates mixture.

4,009,322

BATTERY COVER FOR FACILITATING THE DRAINING OF LIQUID FROM THE BATTERY WHEN INVERTED

Alby Henry Wolf, Minneapolis, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Nov. 17, 1975, Ser. No. 632,352

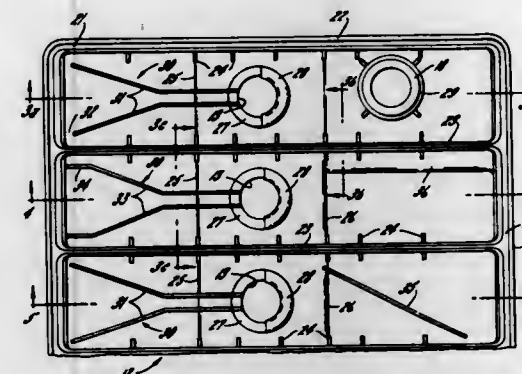
Int. Cl.² H01M 2/04

U.S. Cl. 429-175

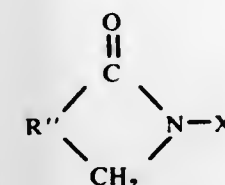
8 Claims

1. A cover for the case of an electric storage battery from which liquid is to be drained comprising means on the inside of the cover engageable with portions of the case for closing one or more cells, means defining a fill and vent opening extending through the cover into each cell area, each of said vent openings including an annular collar projecting into the cell, and guide means including at least one internal rib on the

inside of the cover within individual cell areas for concentrating and directing liquid over said collar and into the vent of an additive of the structure



opening when the battery case is inverted and rocked from side to side.



wherein X is chlorine, bromine, or iodine, and R'' is a divalent aliphatic hydrocarbon radical containing 1 to 12 carbon atoms.

4,009,325

PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING AN N-HALO URETHANE

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

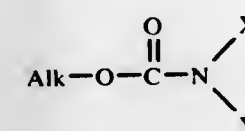
Division of Ser. No. 582,507, May 30, 1975, Pat. No. 3,968,095, Division of Ser. No. 453,911, March 22, 1974, Pat. No. 3,932,352. This application Apr. 2, 1976, Ser. No. 672,909

Int. Cl.² C08J 3/20

U.S. Cl. 526-6

2 Claims

1. A photodegradable composition comprising a polyolefin and about from 0.1 to 10%, based on the weight of polyolefin, of an additive of the structure



wherein X is chlorine, bromine, or iodine, Y is hydrogen, chlorine, bromine, or iodine, and Alk is a monovalent aliphatic hydrocarbon radical containing 1 to 18 carbon atoms.

4,009,326

PHOTOCONDUCTIVE POLYMER AND METHOD OF MANUFACTURE

Eugene V. Hort, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed July 31, 1975, Ser. No. 600,889

Int. Cl.² C08F 126/12, 26/12, 226/12

U.S. Cl. 526-47

7 Claims

1. The process for forming iodinated poly(vinyl carbazole) which comprises reacting a slurry of powdered poly(vinyl carbazole) in an acidic, nonaqueous diluent which is a nonsolvent for the poly(vinyl carbazole) with an alkali metal iodide selected from the group consisting of sodium iodide, potassium iodide and mixtures thereof and an alkali metal iodate selected from the group consisting of potassium iodate, sodium iodate and mixtures thereof, said powdered poly(vinyl carbazole) being prepared by precipitation polymerization and the amount of poly(vinyl carbazole) being regulated to

4,009,324

PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING AN N-HALO LACTAM

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 582,507, May 30, 1975, Pat. No. 3,968,095, which is a division of Ser. No. 453,911, March 22, 1974, Pat. No. 3,932,352. This application Apr. 2, 1976, Ser. No. 673,012

Int. Cl.² C08J 3/20

U.S. Cl. 526-6

2 Claims

1. A photodegradable composition comprising a polyolefin

form iodinated poly(vinyl carbazole) having a mol ratio of iodine to vinyl carbazole of about 0.05 to about 0.9.

4,009,327

POLYMERIZATION OF OLEFINS

Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 276,373, July 31, 1972, Pat. No. 3,875,079. This application Dec. 10, 1974, Ser. No. 531,397. The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

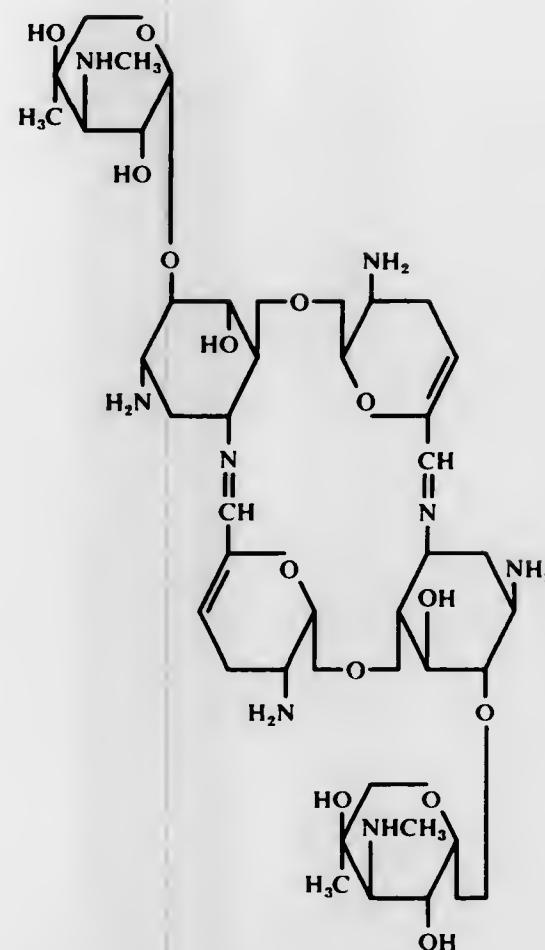
Int. Cl.² C08F 4/02, 4/24, 10/00

U.S. Cl. 526—96

9 Claims

1. A method for polymerizing olefins which comprises contacting an olefin-containing stream with a chromium oxide catalyst active for olefin polymerization and comprising a silica-containing composition prepared by:

- introducing an aqueous lithium silicate solution into an aqueous acid solution to form a hydrogel;
- aging the hydrogel;
- washing the hydrogel to reduce the alkali metal content of the hydrogel;
- contacting the hydrogel with a normally liquid, oxygen-containing, water-soluble organic compound to separate water from said hydrogel and to form a xerogel; and
- recovering the xerogel as the silica-containing composition.



and being free of substances co-produced therewith.

4,009,329

BIORESISTANT CELLULOSE ETHERS

William Charles Arney; Clarence Alfred Williams, both of St. Albans, and Joseph Edward Glass, Jr., Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 14, 1975, Ser. No. 631,944

Int. Cl.² C08B 11/00, 11/08

U.S. Cl. 536—84

11 Claims

1. In the method of preparing cellulose ethers by contacting the unsubstituted anhydroglucose units of cellulose with one or more etherification agents in the presence of a catalyst, the improvement which comprises using a mixture of sodium and lithium hydroxides as the catalyst with a weight ratio of total hydroxide:cellulose of about 0.1 to about 0.8 and a weight ratio of lithium hydroxide:sodium hydroxide of about 0.1 to about 10, whereby a cellulose ether which is resistant to enzyme catalyzed hydrolysis is obtained.

4,009,328

AMINOGLYCOSIDE 66-40C, METHOD FOR ITS MANUFACTURE, METHOD FOR ITS USE AS AN INTERMEDIATE IN THE PREPARATION OF KNOWN ANTIBIOTICS AND NOVEL ANTIBACTERIALS

Alan K. Mallams, West Orange, Richard W. Tkach, Linden, both of N.J., and David Huw Davies, Macclesfield, England; assignors to Schering Corporation, Kenilworth, N.J.

Filed May 2, 1975, Ser. No. 574,073

Int. Cl.² C07H 15/22

U.S. Cl. 536—17

11 Claims

1. Aminoglycoside 66-40C, having the following structural formula:

ELECTRICAL

4,009,330

CIRCUIT FOR SELECTING FRAMES INDICATIVE OF STILL PICTURES

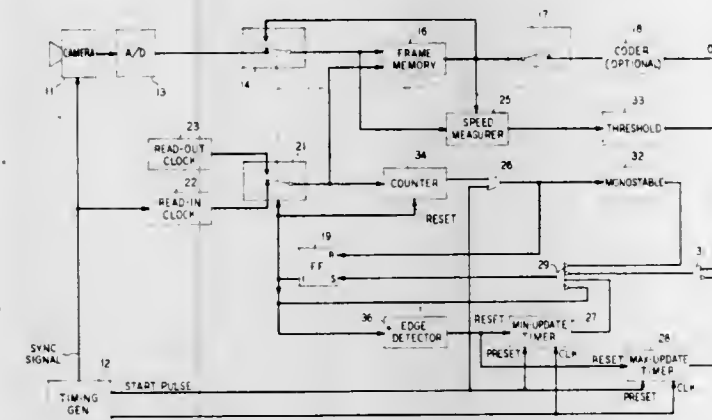
Cassius Chapin Cutler, Holmdel, and John Ormond Limb, Tinton Falls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1976, Ser. No. 673,631

Int. Cl.² H04N 7/12

U.S. Cl. 358—83

7 Claims



1. In combination, a signal source for supplying successive frames of a video signal including frames indicative of still objects and frames indicative of moving objects; storing means for retaining a frame of video signals; speed measuring means in circuit relationship with said storing means for determining the speed of movement between successive frames to indicate frames indicative of still objects, switching means responsive to said speed measuring means in circuit relationship with said storing means, said switching means controlling the application of the video signal to said storing means and completing an output signal path from said storing means, and said switching means and storing means cooperating by retaining frames indicative of still objects from the succession of frames for application to said output signal path and discarding frames indicative of moving objects.

4,009,331

STILL PICTURE PROGRAM VIDEO RECORDING COMPOSING AND PLAYBACK METHOD AND SYSTEM

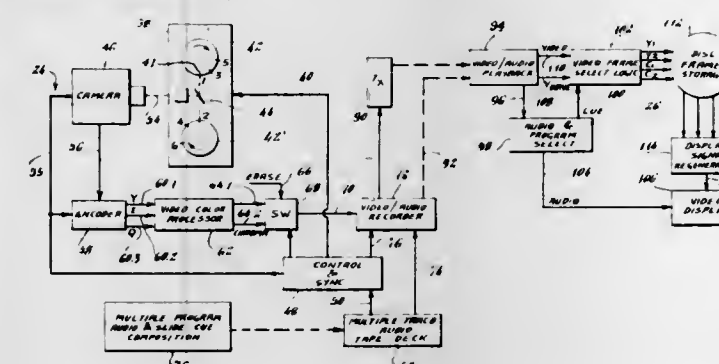
Peter C. Goldmark, Stamford; Donald T. Dolan, Ridgefield; Arvind C. Desai, Stamford, and John M. Hollywood, Old Greenwich, all of Conn., assignors to Goldmark Communications Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 536,189, Dec. 24, 1974, abandoned. This application June 6, 1975, Ser. No. 584,624

Int. Cl.² H04N 5/78

U.S. Cl. 358—127

39 Claims



1. A system for producing a video recording of a plurality of video programs formed of still pictures with associated audio comprising audio composing means for producing a magnetic audio

recording of a plurality of audio programs of individually determined duration with identifiable cue signals located to indicate when still pictures related to the audio programs are to be displayed; means for playing back the audio programs and cue signals from the audio recording; a video recorder to form said video recording on a video storage medium; audio recording means for simultaneously recording the plurality of played back audio programs on respectively separate tracks on the video storage medium; means actuated by the played back cue signals for recording video frames representative of still pictures for the audio program on said video storage medium in a sequence determined by the recording order of the plurality of audio programs on the video storage medium; and means responsive to the played back cue signals from the audio recording for identifying the video frames recorded on the video storage medium and initiate recording of successive video frames thereon.

4,009,332

MEMORY MANAGEMENT SYSTEM FOR AN INK JET COPIER

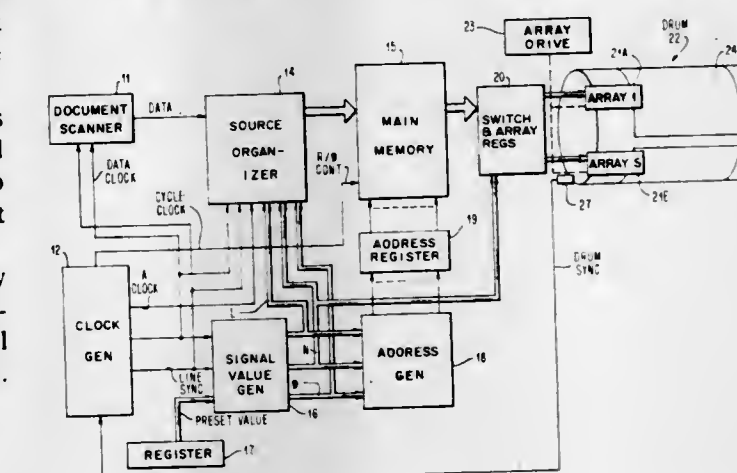
Danny Allen Van Hook, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1976, Ser. No. 700,631

Int. Cl.² H04N 1/40

U.S. Cl. 358—280

6 Claims



1. A data handling and storage system for connecting the video data output of a document line scanner to a document printer which includes a plurality (N) of print elements arranged to traverse a media simultaneously in two substantially orthogonal directions and in which the video data derived from the scanner is used to selectively modulate the printing elements to reproduce the scanned document on the media comprising:

clock means responsive to positional information from said document printer for providing first control signals one of which is supplied to the document scanner for controlling the scanning rate thereof; signal generator means responsive to the first control signals for providing second control signals (L), (W) and (N), each of which is a predetermined multiple of the first control signals; a source organizer means responsive to said first and second control signals and including, first means responsive to first control signals for storing alternate scan line data in first and second memory means each in a predetermined sequence, second means responsive to first and second control signals for alternately reading stored signals from said first and second memories as a predetermined function of the values of the said first and second control signals, said first and second means controlling said memories at different times to provide insertion of signals in one memory

under control of said first means and reading of signals from the other memory under control of said second means on a concurrent basis and vice versa; main random access memory means responsive to the first and second control signals for alternately reading data signals stored in addressable memory locations determined by the value of said first and second control signals and providing the said signals to the document printer for controlling selected print elements and for storing the data signals read by the said source organizer in addressable memory locations determined by the values of said first and second control signals; and gating means responsive to said (N) control signal for selectively connecting the signals supplied by said main memory when read to selected printed elements.

4,009,333

CHARGE TRANSFER IMAGE DEVICE

Jean-Luc Berger, and Daniel Woehr, both of Paris, France, assignors to Thomson-CSF, Paris, France

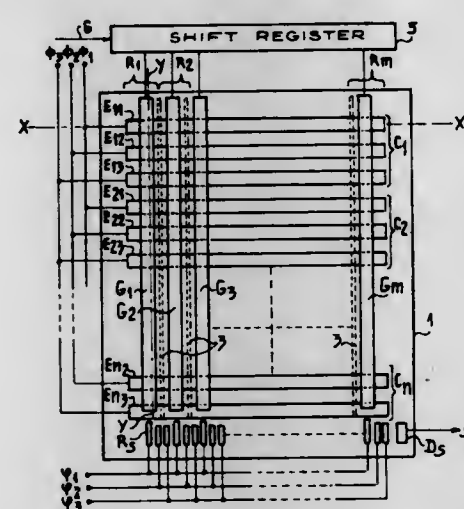
Filed Oct. 14, 1975, Ser. No. 621,749

Claims priority, application France, Oct. 18, 1974, 74.35146

Int. Cl.² H04N 3/02

U.S. Cl. 358—213

8 Claims



1. An image device of charge transfer type comprising: a matrix of m columns, each column constituting a linear transfer register of optical input type and including n charge coupled cells; first means for controlling transfer along said registers, said means being common to said m registers; second means for blocking said first means for controlling transfer, each of said m registers being provided with such a second means, and said second means being independently controlled for blocking transfer along $m-1$ of said m registers and not blocking it along the m^{th} register; and further means for sequentially extracting the n informations contained in the n cells of each of said m registers, in accordance with the m independent transfer operations realised by the m independent controls of said m second means.

4,009,334

VIDEO NOISE REDUCTION CIRCUIT

Richard Joseph Sypula, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 17, 1976, Ser. No. 667,739

Int. Cl.² H04N 5/21

U.S. Cl. 358—167

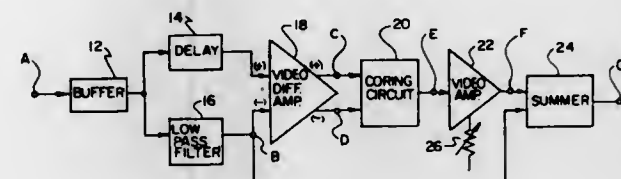
11 Claims

5. Apparatus for reducing the noise in a video signal comprising:

- means for extracting a relatively low-frequency component from the video signal;
- means for subtracting said relatively low-frequency component from the video signal to yield a relatively high-frequency component;

ponent from the video signal to yield a relatively high-frequency component;

- means for removing relatively low-amplitude portions from said relatively high-frequency component to yield a cored high-frequency component; and



d. means for combining said relatively low-frequency component with said cored high-frequency component to produce a noise reduced video signal.

4,009,335

GRAY SCALE DISPLAY SYSTEM EMPLOYING DIGITAL ENCODING

Robert A. Payne, Des Plaines; Gregory E. Slobodzian, Chicago; Stanley A. Zielinski, and Ralph M. Ravanese, both of Villa Park, all of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Aug. 9, 1973, Ser. No. 387,006.

Int. Cl.² H04N 5/66; G09F 9/32

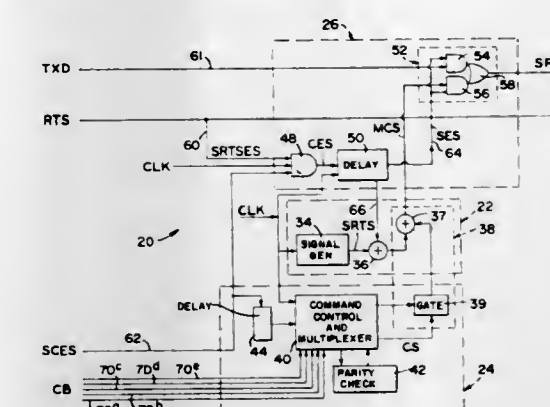
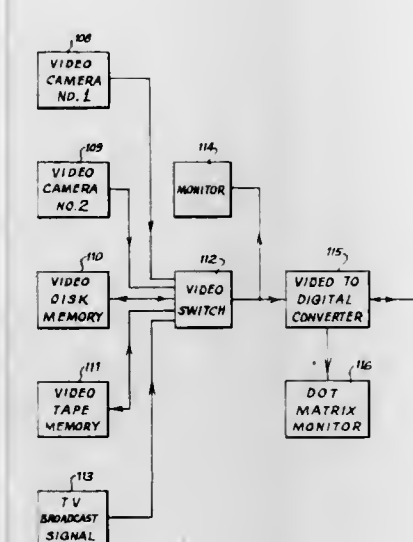
U.S. Cl. 358—240

30 Claims

1. A display system for displaying images comprising a matrix of display devices each capable of varying degrees of visual brightness, means for supplying a video signal for a complete video frame and representing an image, a converter receiving the video signal as its input and producing quantized signals representing more than two different amplitude levels in the video signal as its output, means for generating control synchronizing signals associated with the quantized signals to provide an indication with respect to each quantized signal as to what part of a video frame that quantized signal represents, means for encoding the quantized signals into digital signals having a fewer number of bits than the number of said amplitude levels, storage means capable of receiving and retaining encoded quantized signals for the entire matrix of display devices, means responsive to said control and synchronizing signals for storing the encoded quantized signals at specific locations in said storage means, means for extracting the encoded quantized signals from said storage means, means for directing the extracted encoded quantized signals to specific display devices corresponding to specific locations in said storage means, and means associated with each display device

and responsive to the extracted encoded quantized signal received by it to control the degree of visual brightness of that

to selectively control the transmission of said first and third digital output signals; signal recovery means including a carrier signal recovery means having means to receive said first and third digital output signals and generate a fourth digital



output signal in response thereto and command signal recovery means having circuitry to receive and detect said third digital output signal and generate said second digital output signal in response thereto.

4,009,337

STORED PROGRAM CONTROL TYPE ELECTRONIC EXCHANGE SYSTEM

Shigeo Sakai; Akira Ogishima; Akira Imada; Tetsuya Matsuno; Kazuo Suzuki, and Susumu Sugou, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

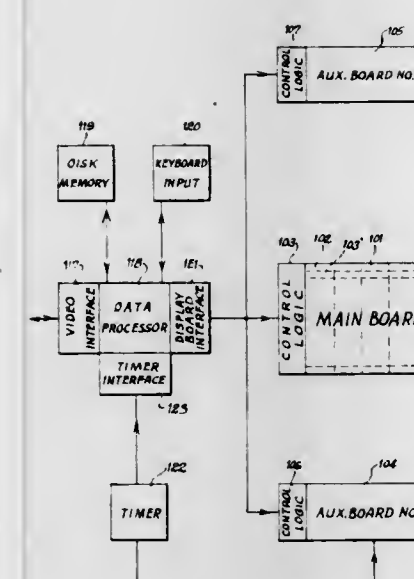
Filed Oct. 10, 1974, Ser. No. 513,815

Claims priority, application Japan, Oct. 16, 1973, 48-115363

Int. Cl.² H04Q 3/54; H04M 3/42

U.S. Cl. 179—18 ES

5 Claims



display device so that the matrix in its totality presents the image represented by the original video signal.

4,009,336

DIGITAL SIGNALING DEVICE

Thomas V. Saliga, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Apr. 7, 1975, Ser. No. 565,589

Int. Cl.² H04J 3/12

U.S. Cl. 179—15 BY

8 Claims

1. A digital signaling device for use in combination with a digital transmission network having electronic data processing equipment interconnected therewith by analog transmission network, said digital signaling device comprising: signal generator means including a carrier signal generator means, said carrier signal generator means comprising means to generate a first digital output signal for transmission over the digital transmission network, command signal generator means having means to generate a second digital output signal, signal modulator means coupled to said carrier signal generator means and said command signal generator means, said signal modulator means having means to modulate said first and second digital output signals to generate a third digital output signal for transmission over the digital transmission network, signal control means coupled to said signal modulator means

1. A stored program type electronic exchange system for use with equipment for generating dial signals, said system comprising a plurality of trunks, including at least an originating register trunk and an outgoing sender trunk for converting the dial signals between serial pulse signals and parallel character signals and communicating with a programmed computer, character by character, the rest of said trunks fulfilling various compound functions including counting, storing, supervising the timing, and other associated logic operations; a speech-path network having terminals of said trunks and subscriber lines connected thereto, and adapted to selectively interconnect said terminals; a scanner means scanning the status of said subscriber line terminals and said trunks; a switch controller means for controlling said speech-path network; a relay controller means for controlling said trunks; a central controller operating on the basis of a stored program so as to alternately monitor the status of the subscriber line terminals and the status of the trunks by means of said scanner

means, to temporarily halt the scanning, upon detection of any status change, for analyzing the status change thus detected, to successively execute a series of processes for realizing that stable status of the exchange system which is required by the analyzed status change, said series of processes being selected as a result of said analyzing the status change, and to resume the previously halted scanning upon completion of said series of processes; and a memory having memory area for storing the program and different data.

4,009,338

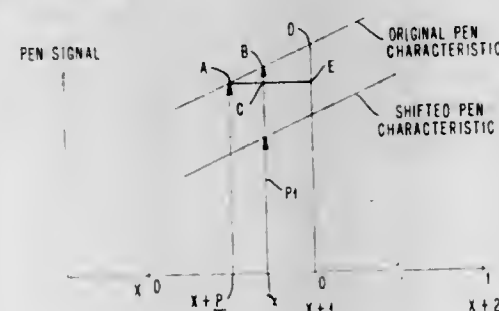
TABLET WITH IMPROVED PEN HEIGHT COMPENSATION

Herbert Dym; Paul Lowy, both of Poughkeepsie, and Greg Salyer, Wappingers Falls, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,470
Int. Cl.² G08C 21/00

U.S. Cl. 178-18

7 Claims



1. A method for operating a graphic tablet having X dimension wires and Y dimension wires, means for selecting one of said sets of wires to be given a pattern of activation in which a wire is given a fixed potential (designated 0) or is given an alternating voltage of a predetermined amplitude (designated 1), said wires being individually activatable to produce a 0-1 transition in the region of a selected pair of adjacent wires, and a pen for capacitively receiving a position signal from wires of the dimension selected for activation, the pen position signal for a predetermined height of the pen above the tablet surface being related to the position of the pen between said two adjacent wires by a characteristic curve that is closely linear in the region between said two adjacent wires and a portion of the space outside of said two adjacent wires, comprising,

producing a first activation pattern having said 0-1 transition in the region of the wires adjacent to the pen position and sampling a first pen position signal, said first pen position signal representing a locus on the pen characteristic curve at said pen position,

producing a second activation pattern in which said 0-1 transition is shifted from the position of said first activation pattern by the pitch, P, between wires and sampling a second pen position signal, said second pen position signal representing a locus on said pen characteristic curve at a second position shifted from said pen position by the value of said pitch between wires,

producing a third activation pattern and sampling a third pen position signal, said third pen position signal representing a locus on said pen characteristic curve at a third position on said pen characteristic curve, and

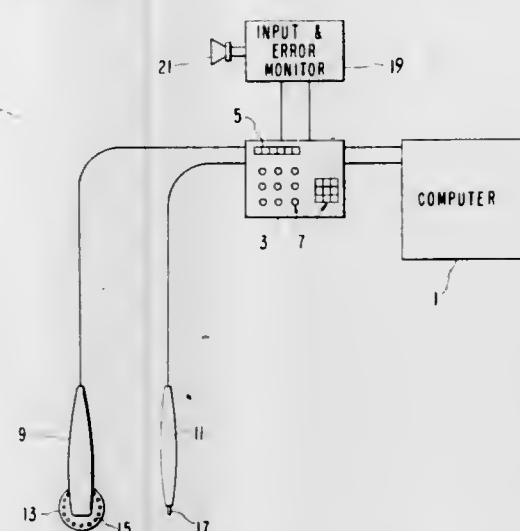
forming an address identifying the position of said pen with respect to one of said adjacent wires according to said value P and said first, second and third pen position signals.

4,009,339 DEVICE PROVIDING SENSIBLE OUTPUT INDICATING RECEIPT OF DATA BY COMPUTER

Richard C. Anderson, Los Altos, and Marc G. Mathers, Belmont, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Feb. 26, 1975, Ser. No. 553,405
Int. Cl.² G06F 11/00; G05B 1/03; G08C 21/00
U.S. Cl. 178-18

5 Claims



1. In a data processing system having a computer means for receiving, recording and performing mathematical operations upon data, and input means for receiving said data, said input means being connected between a source of said data and said computer means, said source of data being a humanly operable data transducer producing a plurality of discrete units of input data signal in response to the operation thereof by a human operator, THE IMPROVEMENT COMPRISING input monitor means connected to said input means for generating a humanly sensible data entry signal indicative of the receipt by said computer means of said input data signal from said input means, said humanly sensible data entry signal being produced coextensively in time with said input data signal from said source, such that for each said discrete unit of said input data signal a discrete unit of said humanly sensible data entry signal is produced, whereby said human operator is provided with a confidence check for the receipt of data being inputted to the system.

4,009,340 LOADING COIL ASSEMBLIES FOR COMMUNICATIONS CABLES

George Debortoli, and Peter McGivern Chase, both of Ottawa, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

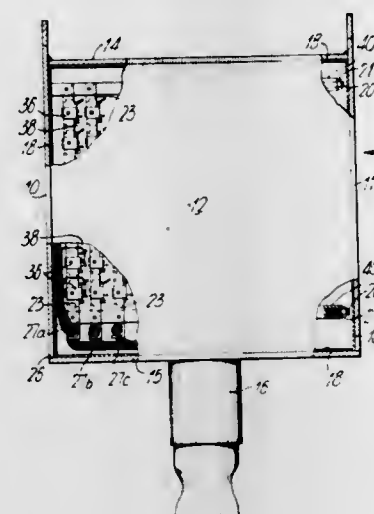
Filed Sept. 22, 1975, Ser. No. 615,549
Int. Cl.² H01F 17/08

U.S. Cl. 178-46

12 Claims

1. A loading coil case assembly comprising:
a case including base, front, back and side panels, the case of rectangular cross-section in a plane parallel to the base panel;
a cable end entry and a cable end exit in one of said panels, and a cable end in each of said entry and exit;
a support structure in said case for supporting a plurality of assembled loading coil magazines, conductors from said cable ends connected to loading coils in said magazines; said support structure comprising a plurality of rods each attached at one end to the same one of said panels and extending normal thereto across said case, said rods arranged in a rectangular array, and spaced apart in one direction a distance substantially equal to the length of a magazine, a plurality of support members mounted sequentially on each rod, and a plurality of beams supported at each end on a support member and extending

across said case normal to the axis of said rods and normal to said one direction to provide two spaced parallel series of beams each series in a plane parallel to the plane of the two related rods carrying the support members supporting the related beams, the beams forming opposed pairs;



a plurality of elongated magazines supported at each end by one of said opposed pair of beams, each magazine having a plurality of loading coils positioned side by side therein, the axes of said loading coils parallel to each other and extending normal to the longitudinal axis of the magazine, to provide a plurality of layers of loading coil magazines; expanded synthetic resin electrically insulating material filling spaces in said case between said magazine.

4,009,341

DEVICE FOR REGENERATING TELEGRAPHIC SIGNALS

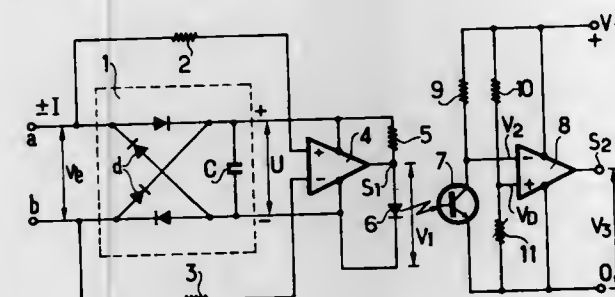
Michel Lemoussu, Palaiseau, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed May 9, 1975, Ser. No. 576,239
Claims priority, application France, May 27, 1974, 74.18283

Int. Cl.² H04L 25/02

U.S. Cl. 178-69 A

5 Claims



1. A device for regenerating telegraphic signals free of bias distortion, noise, and interference signals, said device comprising an input circuit receiving telegraphic signals to be regenerated, an output circuit comprising a decision circuit including an amplifier-comparator having a threshold decision level, said output circuit having an output with regenerated telegraphic signals produced thereat, means for coupling the input circuit and the output circuit, said input circuit including an amplifier-peak limiter receiving the telegraphic signals and effecting peak-limiting at a level close to zero, means for feeding said limiter with direct current voltage obtained from rectified incident telegraphic signals, said limiter having an output connected to the coupling means and at which a unipolar signal is produced which is a function of the amplitude of the telegraphic signals.

4,009,342

CIRCUIT ARRANGEMENT FOR COMMUNICATION FACILITIES WHEREIN TRANSMISSION PATHS CAN BE EMPLOYED FOR DIFFERENT TYPES OF MESSAGE SWITCHING

Franz Fahrenschon, Neuried; Horst Jäger, Munich; Hans Thinschmidt, Unterpfaffenhofen, and Alfred Meier, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

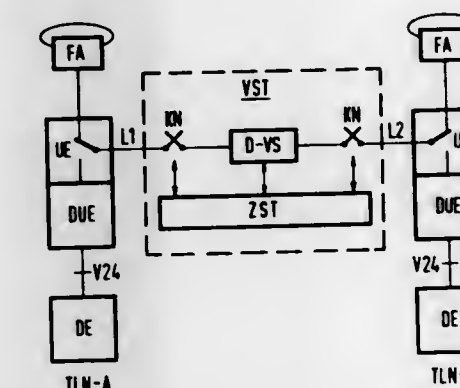
Filed Apr. 18, 1974, Ser. No. 462,030
Claims priority, application Germany, Apr. 19, 1973, 2320092

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H04M 11/00

U.S. Cl. 179-2 DP

4 Claims



1. Apparatus for telecommunication systems having transmission paths capable of accommodating different types of message signals produced through using different modes of communication wherein connector sets for a plurality of modes of communication are connectable to a connecting path and having changeover means for switching from one mode of communication to another mode of communication in a given connecting path, said changeover means including a mode selector for selecting either manual or automatic switching from one mode of communication to another, comprising:
means in said connector sets for communicating a first switching signal to a called subscriber station for causing changeover to another mode of communication during automatic operation,

first changeover means in said called subscriber station for switching responsive to said first switching signal, said called subscriber station from one mode of communication to another, said called subscriber station being in an automatic switching mode,

means in said called subscriber station for evaluating said first switching signal and responsive to the changeover from one mode of communication to another for transmitting a first acknowledgement signal upon completion of said mode of communication changeover in said called subscriber station,

first means in said connector sets for monitoring said first acknowledgement signal and for communicating a second switching signal to the calling subscriber station for causing changeover from said one mode of communication to another,

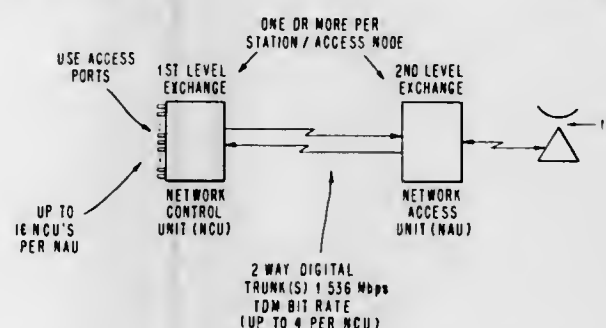
second changeover means in said calling subscriber station for switching, responsive to said second switching signal, said calling subscriber station from said one mode of communication to another, said calling subscriber station being in an automatic switching mode,

means in said calling subscriber station for monitoring said second switching signal and for producing a second acknowledgement signal upon completion of a changeover from said one mode of communication to another,

second means in said connector sets for monitoring said second acknowledgement signal and producing an indication thereof and

inquiry means in said connector sets for signalling, responsive to the monitored presence of said first and second acknowledgement signals, the occurrence of changeover from said one mode of communication to another at said calling and said called subscriber stations as an inquiry to said calling and called subscriber stations for the acceptance of the desired message signals and for monitoring the continuance of the readiness of data terminal equipment in said calling and called subscriber stations.

4,009,344
INTER-RELATED SWITCHING, ACTIVITY COMPRESSION AND DEMAND ASSIGNMENT
 Donald C. Flemming, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
 Filed Dec. 30, 1974, Ser. No. 537,212
 Int. Cl.² H04J 3/00
 U.S. Cl. 179—15 BS 18 Claims



1. In a time division multiple access demand assigned communication system including multiple digital exchange terminals linked for time division communication by a multiaccessible communication transmission facility, said exchange terminals serving to switchably link multiple space separated lines carrying digital data and digitalized voice telephone information traffic to time channels of said facility, said facility having fixed assigned order channels and demand assignable traffic channels in recurrent time division frames for respectively carrying supervisory information and line traffic information between said terminals, terminal apparatus comprising:

means for utilizing information exchanged with other terminals through said order channels for demand assigning a variable number of said traffic channels to the respective terminal;

means containing multiple buffer storage locations for temporary storage of traffic information in transit between multiple lines of the respective terminal and traffic channels demand assigned to the respective terminal;

first selective switching means operating in time coordination with said time division frames for passing traffic information between selected said storage locations and successive said assigned traffic channels in each frame; and

second selective switching means operating in time coordination with said first switching means for passing traffic information between said storage locations and lines variously paired with said locations.

4,009,345
EXTERNAL MANAGEMENT OF SATELLITE LINKED EXCHANGE NETWORK
 Donald C. Flemming, Rhinebeck, N.Y., and Harold G. Markey, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
 Filed Dec. 30, 1974, Ser. No. 537,281
 Int. Cl.² H04J 5/00
 U.S. Cl. 179—15 BA 7 Claims

1. In a communication system of multiple interactive multiplex switching stations inter-communicating in multiplex via a shared medium of communication to variably establish, administer and release call connection paths between subscriber ports linked to external user equipment, the management method comprising:

providing for certain said ports to be accessible for conducting external management data communications between said stations and external data processing equipment; establishing said variable connection paths between ports of said stations including said certain ports without external assistance;

restricting the selection of said connections in accordance with path specifying information erasably stored at said stations;

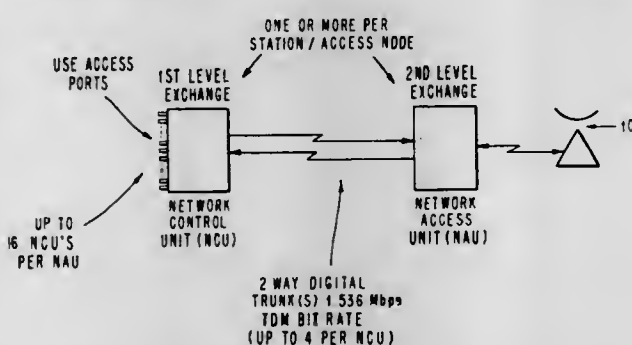
4,009,343
SWITCHING AND ACTIVITY COMPRESSION BETWEEN TELEPHONE LINES AND DIGITAL COMMUNICATION CHANNELS

Harold G. Markey, Raleigh, N.C., and Lynn P. West, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,211
 Int. Cl.² H04J 3/06

U.S. Cl. 179—15 BS

13 Claims



1. In a network of multiplex switching stations linked via cyclically recurrent channels of communication facilities, each said station having multiple ports attachable to separate telephone and data line circuits external to said network and providing varied time division connection links between said line circuits and said facilities, representing segments of virtual connections relative to ports of other stations, station apparatus comprising:

means for coupling communicatively with an ordered group of said recurrent channels;

random access storage means containing a group of storage locations accessible in ordered association with said group of channels;

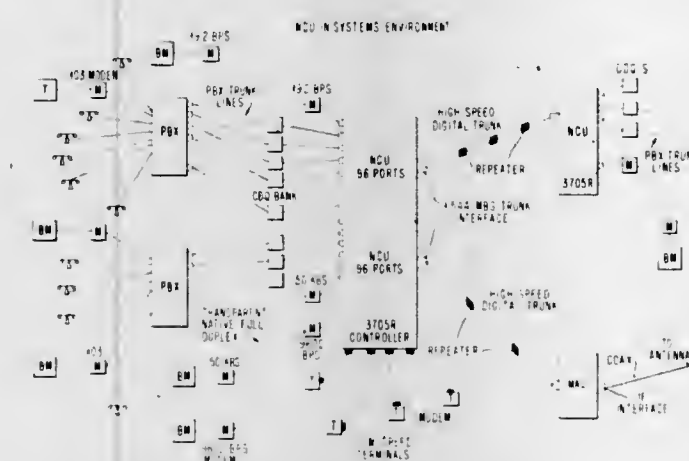
means coupled to said storage means and channel coupling means for operating in each said recurrence cycle to assign selected said storage locations to successive said channels for ordered communicative coupling with said channels;

multiplex switch means operating cyclically in coordination with said recurrence cycles and in cooperation with apparatus at other said stations for providing variable call connection links between said ports and storage locations;

means for monitoring activity context of voice and data signals being handled between said line circuits and said switch means; and

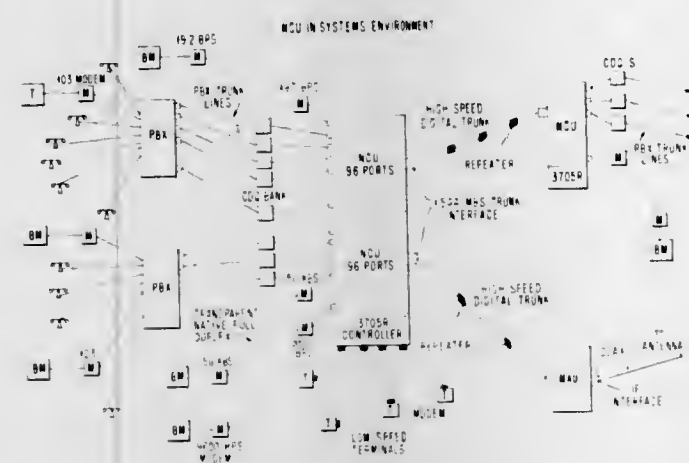
means supplying indications of said monitored activity to said channel assignment means in ordered association with locations receiving respective traffic for controlling selection of said locations by said channel assignment means.

utilizing communications conducted between said certain ports through said variable connection paths established, administered and released by said stations to inform said external data processing equipment of the operations of said system and to enable said external equipment to



process said information and supply related communications to said stations; and utilizing said related communications to vary said stored path specifying information and thereby to adapt the connection configuring restrictions at said stations to changes in system operating conditions.

4,009,346
DISTRIBUTIONAL ACTIVITY COMPRESSION
 Brian E. Parker, Poughkeepsie, N.Y., and Lynn P. West, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
 Filed Dec. 30, 1974, Ser. No. 537,501
 Int. Cl.² H04J 3/00
 U.S. Cl. 179—15 AQ 14 Claims



1. In a time division multiplex multiple access communication system, including a communication facility having multiple access nodes and terminal apparatus linking individual said nodes with multiple separate line circuits associated with individual voice telephone and data communication trunks representing origin (input) and destination (output) attachments to individual users of the system, terminal apparatus comprising:

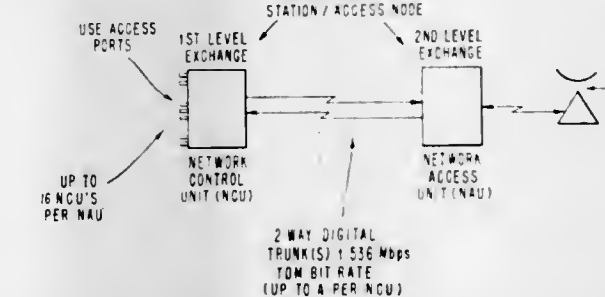
means linked to one said node for receiving a composite of time division signals representing activity compressed channels of information supplied, through other said nodes and said facility, from multiple said line circuits linked as input sources to said other nodes;

means linked to said receiving means for storing selected said channels of received information associated with output line circuits served by said system through said one node;

means coupled to said storing means for ordering said stored channels in time and space ordered associations with respective virtual channels and thereby with respective output line circuits served through said one node;

means for mapping said ordered channels into actual time division channels by activity compression; and means coupled to said last-mentioned means for distributing representations of said ordered and activity compressed channels through said actual time division channels to respective said output line circuits thereby completing switched virtual connections through said system with respective said input line circuits linked as sources to said other nodes.

4,009,347
MODULAR BRANCH EXCHANGE AND NODAL ACCESS UNITS FOR MULTIPLE ACCESS SYSTEMS
 Donald C. Flemming, Rhinebeck, N.Y.; Harold G. Markey, Raleigh; Ralph J. Metz, Cary, both of N.C., and Lynn P. West, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
 Filed Dec. 30, 1974, Ser. No. 537,502
 Int. Cl.² H04J 3/00
 U.S. Cl. 179—15 BS 11 Claims



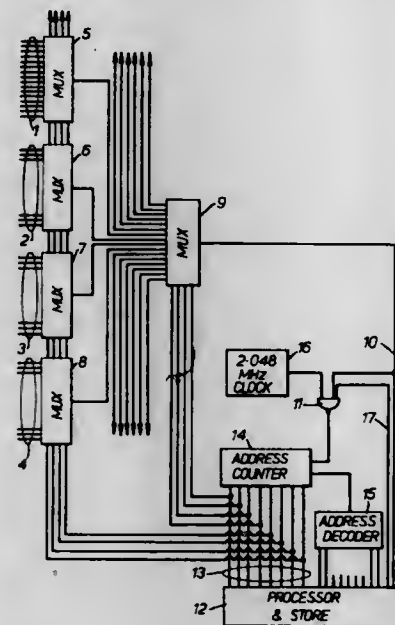
1. Modular data communication exchange terminal apparatus for communicatively linking space separated lines, carrying digital data and digitalized voice telephone information traffic, with associated remote lines through an access node of a time division multiple access communication facility comprising:

a first module serving multiple said lines and a second module providing time division links between said first module and said access node of said facility; said first module autonomously administering buffered time division connections, between time-ordered groups of n internal channels and various said lines, and selectively assigning up to m (less than n) of said internal channels of each internal group, in recurrent time frames, to be communicatively linked to respective channels in time-ordered groups of up to m external (intra-nodal) channels extending to said second module; said second module autonomously administering buffered time division connections between said external (intra-nodal) channels and respective groups of up to m variably available external (inter-nodal) channels of said facility.

4,009,348
FAULT BYPASS FOR A PROCESSOR ASSOCIATED SCANNER
 Michael Bernard Tate, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England
 Filed June 2, 1975, Ser. No. 582,976
 Claims priority, application United Kingdom, June 21, 1974, 27532/74
 Int. Cl.² H04M 3/12
 U.S. Cl. 179—15 BF 5 Claims

1. A processor equipment comprising a processor for receiving information from multiplexing means connected to a plurality of peripheral devices, an address counter for controlling said multiplexer means to scan the peripheral devices for processor interrupt signals, a clock generator controlling said address counter, and address lines connecting said address counter to said multiplexing means and said processor enabling the processor to receive the count contained in said

counter and to modify said count, the improvement wherein a gate circuit is provided with one clock and two blocking inputs and the clock input of the gate circuit is connected to the clock generator and its output is connected to the address counter, the output of said multiplexing means is connected both with the processor and with the first blocking input of the



gate circuit, the processor has a memory unit which stores the address of an interrupting peripheral device from the address counter, and the second blocking input is connected from the processor for inhibiting the gate circuit following an interrupt signal until the next valid address is written into the address counter by the processor.

4,009,349

SWITCHING STATION FOR PCM TELECOMMUNICATION SYSTEM

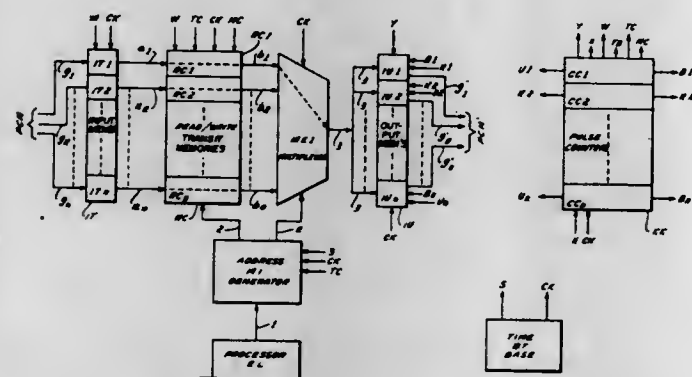
Piero Belforte, and Giovanni Perucca, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed Sept. 4, 1975, Ser. No. 610,377

Claims priority, application Italy, Sept. 4, 1974, 69678/74
Int. Cl.² H04Q 11/04

U.S. Cl. 179-15 AT

6 Claims



1. A switching station for a pulse-code-modulation telecommunication system wherein information is exchanged between a multiplicity of incoming channels and a multiplicity of outgoing channels, each of said channels consisting of a sequence of h-bit words, the words of a predetermined number p of channels being interleaved in respective time slots of h phases each forming part of a recurrent frame period, comprising:

- a set of receiving signal paths divided into n groups of m paths, each of said paths carrying a respective incoming frame;
- a set of transmitting signal paths divided into n groups of m paths, each of the latter paths carrying a respective outgoing frame;
- a set of n input memories respectively associated with said

groups of receiving signal paths, each of said input memories including m sections of h stages each;

- a set of n output memories respectively associated with said groups of transmitting signal paths, each of said output memories including m sections of h stages each;
- first multiplexing means between said groups of receiving signal paths and said input memories for reloading each input memory during every time slot by simultaneously transferring homologous bits from all said receiving signal paths to respective stages of corresponding sections of the associated input memories in the course of a single phase;
- second multiplexing means for sequentially transferring, during each time slot, the contents of all the sections of each input memory into respective sections of selected output memories communicating with certain of said transmitting signal paths, with simultaneous transfer of homologous bits from corresponding stages of all sections of said output memories during a single phase; and
- processor means for controlling the operation of said second multiplexing means.

4,009,350

LEVEL REGULATOR OF THE DIGITAL TYPE

Alain Cabet, Paris; Gaston Pinier, Longjumeau; Pierre Semur, Garches, and Marie-Annick Roy, Antony, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

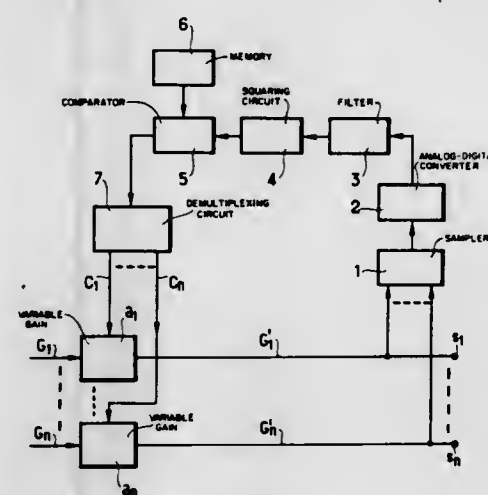
Filed Oct. 6, 1975, Ser. No. 620,134

Claims priority, application France, Oct. 8, 1974, 74.33786

Int. Cl.² H04J 1/16

U.S. Cl. 179-15 BP

5 Claims



1. Level regulator for n frequency division multiplex transmission systems comprising n variable gain networks for adjusting the transmission level of said multiplex systems respectively, from the amplitudes of n pilot waves contained in said systems, a sampling device connected to said variable gain networks and rhythmized by a clock for sequentially sampling the multiplex systems downstream from said networks and delivering the samples concerning said n systems, in a time division multiplex form, an analog-digital converter for sending out digital values of the samples coming from the sampling device, digital filtering means having a narrow band and operating on a time sharing basis for said n systems for sending out, successively, at each sampling period in response to the n digital values of the samples of said n systems respectively, n digital values y1 to yn representing respectively the sampled amplitudes of the pilot waves extracted from the multiplex systems downstream from the networks, a calculation circuit receiving at each sampling period the values y1 to yn and operating on a time sharing basis for elaborating new values z1 to zn which are, respectively, function of the levels of the pilot waves downstream from the variable gain networks over a time interval of several sampling periods, a comparison element for comparing at each sampling period each of said

values z1 to zn with a reference value and delivering as the results of these comparisons n values for the control of said n variable gain networks respectively, and a demultiplexing circuit connected to the output of said comparison element for applying said n values for the control to said n variable gain networks respectively.

4,009,351

SWITCHING ARRANGEMENT FOR TELECOMMUNICATION SWITCHING SYSTEMS

Helga Hofstetter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

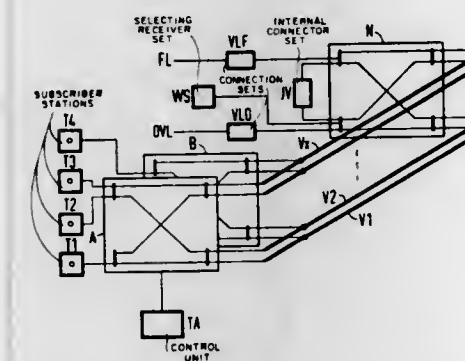
Filed Sept. 15, 1975, Ser. No. 613,639

Claims priority, application Germany, Sept. 13, 1974, 2443941

Int. Cl.² H04Q 3/68

U.S. Cl. 179-18 GE

2 Claims



1. In a telecommunication switching system having a switching arrangement wherein there is a switching network comprising a plurality of switching matrices forming a plurality of switching stages, said stages being interconnected in sequence by links, the trunks and all switching equipment necessary for the completion and monitoring of a connection being connected to the inputs of the first stage of said switching network, the outputs of the switching matrices of the first through next to last switching matrix stages being connected to the inputs, respectively, of the next succeeding switching matrix stage, the improvement comprising:

- pluralities of first and second types of switching network sections, each having a plurality of said switching stages interconnected by said links,
- control means for each said switching network section, inputs of said first type of switching network section being connected to subscriber lines,
- inputs of said type of switching network section being connected to interexchange lines and to said switching equipment and
- a number of coupling multiples corresponding to the number of different outputs per switching network section, corresponding outputs of each said switching network section being connected in parallel to an individual coupling multiple.

4,009,352

MULTIPLE LINK CIRCUIT FOR A PORT MULTIPLEXER

Barry C. Breen, Woodinville, Wash., assignor to Tel-Tone Corporation, Kirkland, Wash.

Filed Jan. 19, 1976, Ser. No. 650,303

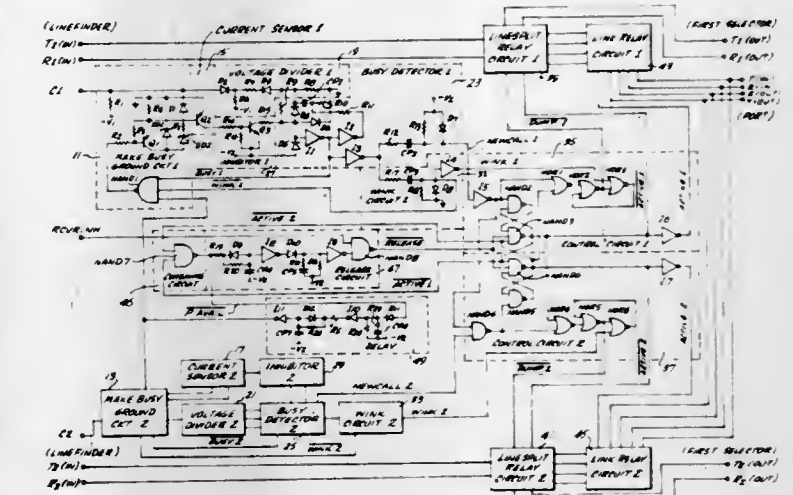
Int. Cl.² H04M 3/22

U.S. Cl. 179-18 FF

17 Claims

1. In a multiple link circuit for a port multiplexer including a plurality of links for: detecting the placing of busy status information on the C-leads of a telephone system extending between linefinder/first selector combinations; splitting related linefinder/first selector tip and ring leads; and, connecting the related linefinder/first selector tip and ring leads to a port, the improvement comprising:

detecting means, forming a portion of each of said plurality of links, for detecting said busy status information carried



by said C-leads, said detecting means being bridge connected to said C-leads.

4,009,353

ANALOG SIGNAL DETECTION

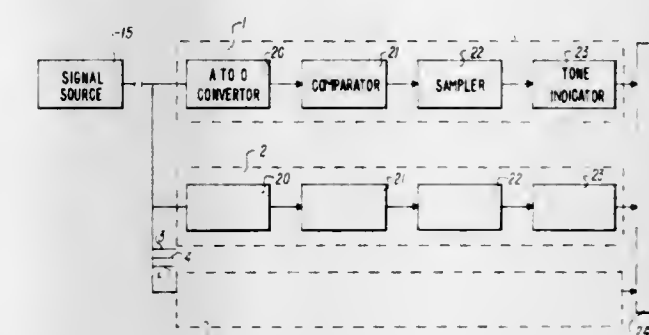
Randell Leland James, and James Thomas Padden, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,320

Int. Cl.² H04M 1/50

U.S. Cl. 179-84 VF

8 Claims



1. Electronic signal detection apparatus for detecting the presence of a complex waveform analog signal of known waveform characteristics from a source of signals of unknown waveform characteristics, said apparatus comprising:

- a. converter means coupled to said source for generating digital signals having digital formats respectively representative of the waveform characteristics of each of said signals of unknown waveform characteristics;
- b. comparator means coupled with said converter means and comprising first means defining a prespecified digital format representative of said known waveform characteristics, and second means generating a detect signal when the digital format of one of said digital signals matches said prespecified digital format;
- c. indicator means generating a signal at its output in response to said generated detect signal, and
- d. sampler means coupled between said comparator means and said indicator means for preventing the generation of a signal from said indicator means except upon the occurrence of a minimum number of detect signals from said second means during a prescribed time period.

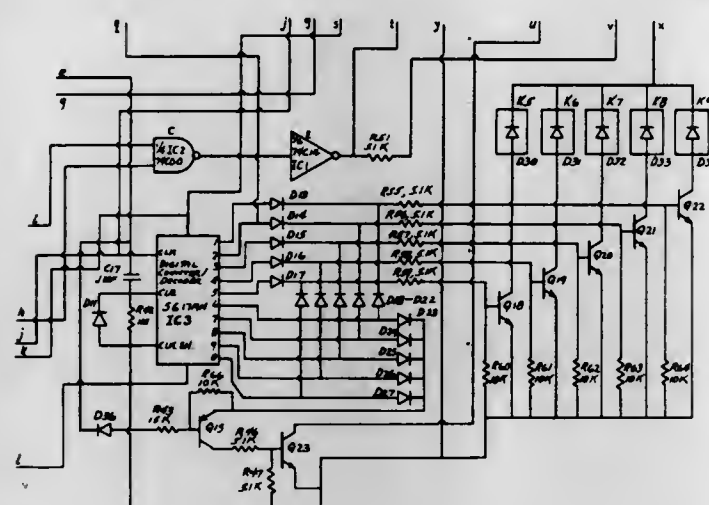
4,009,354

SIGNALLING DEVICE FOR KEY TELEPHONE SYSTEMS
Louis W. Champan, Kent, Wash., assignor to Melco, Bellevue, Wash.

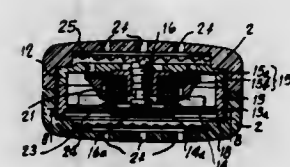
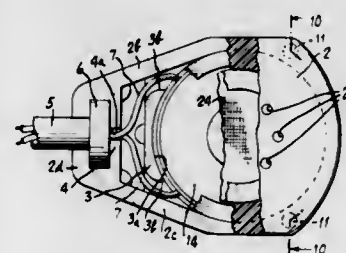
Filed Sept. 5, 1975, Ser. No. 610,853
Int. Cl.² H04M 1/72

U.S. Cl. 179-99

15 Claims



1. In a key telephone intercom circuit for operating with up to 19 stations, a calling system having a hook switch-controlled loop with keying means at a calling station to open and close the loop to generate a sequence of pulses, means to sense the closing of the loop when a calling telephone is placed off hook, pulse conditioning circuit means, means to pass the sequence of pulses to said pulse conditioning means, digital counter and decoding means connected to the output of said pulse conditioning circuit means and generating decoded decimal outputs in accordance with the numbers of sequential pulses, diode matrix means connected to the outputs of said counter and decoding means, means connected to said diode matrix means to sense said decoded decimal outputs, relay tree means connected to said diode matrix means through said last-named sensing means and having respective branches connected to indicators at the telephones of the system, and means to selectively energize the indicators in accordance with the activation of said relay tree means.



4,009,355

REVERSIBLE ANTI-NOISE MICROPHONE

Lech M. Poradowski, Yonkers, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Filed July 2, 1975, Ser. No. 592,632
Int. Cl.² H04R 1/02, 1/38

U.S. Cl. 179-121 D

4 Claims

1. A reversible anti-noise microphone, including:
 - a. a housing comprising two identical parts, each part including:
 1. a peripheral wall; and
 2. a transverse wall, each said transverse wall defining a face of the housing;
 - b. means fastening the housing parts together with said peripheral walls abutting and said transverse walls spaced apart and forming first and second opposite faces with at least one sound transmitting opening in each face;
 - c. a transducer enclosed in the housing including a diaphragm having opposite surfaces;
 - d. means defining a first acoustical path providing communication between the opening in the first face of the housing and a first surface of said diaphragm;
 - e. means defining a second acoustical path providing communication between the opening in the second face of the housing and a second surface of the diaphragm, said first path being acoustically longer than the second path;
 - f. first acoustical resistance means in the first path; and
 - g. second acoustical resistance means in the second path,

said second acoustical resistance means having a greater acoustical loss than the first acoustical resistance means, the losses being inversely related to the lengths of said paths so that the frequency response curves of the two paths are substantially the same.

3. A microphone including:
 - a. a housing comprising:
 1. two abutting parts of similar form, said housing having two opposed faces, at least one face having a sound transmitting opening therein, each said housing part including:
 - i. a peripheral wall, and a transverse wall, each transverse wall defining a face of the housing; and
 - ii. means fastening the housing parts together with the peripheral walls abutting;
 2. a transducer in the housing including two electrical terminals, and a diaphragm upon which sound passing through the opening impinges;
 - b. each of the two housing parts including first and second transverse septums;
 - c. each said peripheral wall including a first section having a part-cylindrical inner face greater than a semi-cylinder and second and third sections having flat inner surfaces

extending tangentially from the first section and converging to an end section;

- e. said first transverse septums having part-cylindrical surfaces cooperating with the inner faces of said first wall sections to define a cylindrical recess receiving the transducer;
- f. said second transverse septums extending between said second and third wall sections and cooperating therewith and with said first transverse septums to define a second recess;
- g. said second transverse septums cooperating with said end sections and said second and third wall sections to define a third recess receiving a conduit anchor, said end sections having cooperating notches defining a passage therein receiving a conduit;
- h. said second transverse septums having opposed notches receiving wires extending from said conduit;
- i. said first transverse septums having opposed notches at each end, each pair of opposed notches receiving a wire from said conduit; and
- j. said first and second transverse septums cooperating with said notches to define tortuous strain relieving passages for said wires.

4,009,356

DATA MODEMS HAVING DATA DROP-OUT AND DATA ECHO PROTECTION

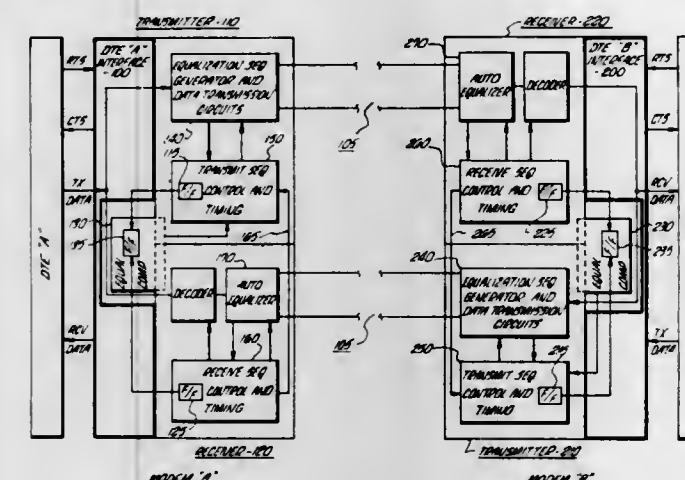
Richard Borysiewicz, Miami, and Charles W. Roedel, Miami Shores, both of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Division of Ser. No. 438,387, Jan. 31, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 600,958

Int. Cl.² H04L 25/08

U.S. Cl. 179-170.2

7 Claims



3. In a data communication system having first and second modems capable of communicating by line signals over telephone lines, the improvement comprising:

means at the transmitter of a first modem for transmitting line signals comprising data message signals preceded by a tone signal;

means at the receiver of the second modem for receiving said line signals;

means at said receiver responsive to the absence and reappearance of said line signals for sampling the reappeared line signal for the presence of said tone signal; and

means at said receiver responsive to said sampling means for emitting a line drop out indicating signal.

7. In a communication system having first and second modems capable of communicating by line signals over telephone lines, said modems operating over said telephone lines in a two wire half duplex mode, the improvement comprising:

means at the transmitter of a first modem for transmitting line signals comprising data message signals preceded by a tone signal;

means at the receiver of the second modem for receiving said line signals;

means at said receiver responsive to the absence and reappearance of said line signals for sampling the reappeared line signal for the presence of said tone signal; and

means at said receiver responsive to said sampling means for emitting a reflected data-indicating signal.

4,009,357

ANTI-STATIC KEYLOCK SWITCH

Herbert C. Naylor, Carpentersville, Ill., assignor to Oak Industries Inc., Crystal Lake, Ill.

Filed Oct. 1, 1975, Ser. No. 618,407

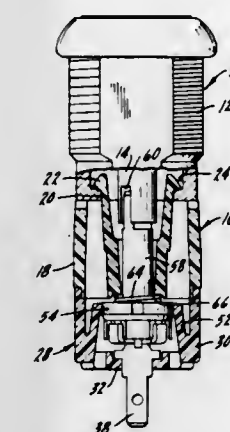
Int. Cl.² H01H 27/00

U.S. Cl. 200-42 R

13 Claims

1. An anti-static keylock assembly including a keylock device having a rotatable locking element, an adapter formed of an electrically non-conductive material, cooperating means on said adapter and keylock device forming an interlock therebetween, a terminal assembly formed of an electrically non-conductive material and cooperating means on said adapter and terminal assembly forming an interlock therebetween, a rotor assembly formed of an electrically non-conductive material positioned within said terminal assembly and having a shaft extending toward and interlocked with said rotatable locking element, a pair of electrical terminals ex-

tending outwardly from said terminal assembly, a rotor contact carried by said rotor assembly and rotatable to a



position to form an electrical connection between said terminals.

4,009,358

ELECTRIC CIRCUIT-BREAKER FOR ALTERNATING CURRENTS

Jean Louis Gratzmuller, 66 Boulevard Maurice Barres, Neuilly sur Seine, France (92200)

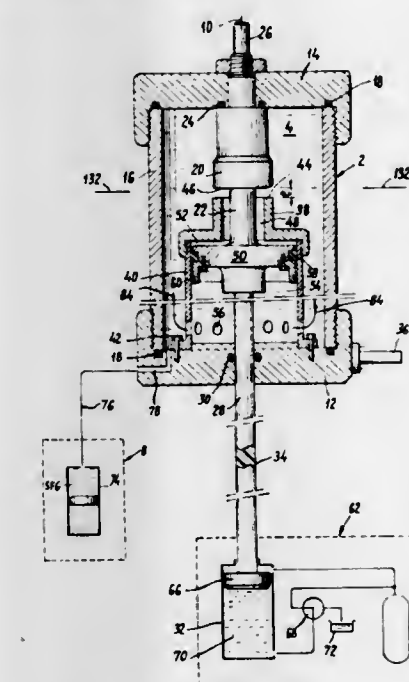
Filed May 21, 1975, Ser. No. 579,593

Claims priority, application France, May 22, 1974, 74.17800

Int. Cl.² H01H 33/68

U.S. Cl. 200-150 B

15 Claims



1. An electric circuit-breaker for alternating current and containing a liquid dielectric consisting of SF₆ gas liquefied under a pressure which is always higher than the critical pressure, wherein said circuit-breaker comprises a main chamber or interrupting chamber which contains the stationary and moving contacts as well as an auxiliary or arc-quenching cylinder divided into two compartments having volumes which are inversely variable by means of a piston actuated conjointly with the moving contact, the first compartment being adapted to communicate with the interrupting chamber through a duct in the form of a nozzle for centripetal radial quenching which has its opening in the vicinity of and between said contacts whilst the second compartment is in direct communication with the interrupting chamber.

4,009,359

METHOD AND APPARATUS FOR CONTROLLING MICROWAVE OVENS

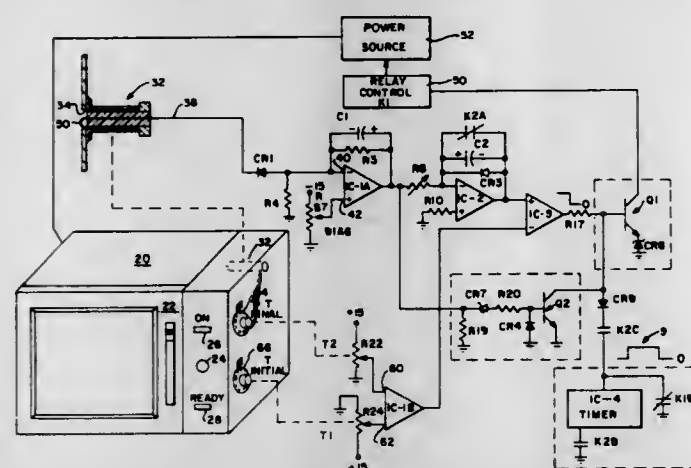
Gene E. Tallmadge, Palo Alto, and John E. Gerling, San Mateo, both of Calif., assignors to Chemetron Corporation, Chicago, Ill.

Filed Nov. 7, 1975, Ser. No. 629,915

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 B

5 Claims



3. Apparatus for controlling the temperature rise of material being heated in a microwave oven to which electromagnetic energy is applied comprising means for sensing the residual field strength of the electromagnetic field within the oven at a position outside of or remote from the material being heated, means for reducing the measured field strength by an amount sufficient to provide a reference value approaching zero reference level when said oven is maximally loaded, means for establishing an initial temperature T_1 of the material placed in said oven, means for selecting a final desired temperature T_2 of said material, means for comparing said temperatures T_1 and T_2 to develop a demand signal therefrom corresponding to the difference in temperature, means for integrating the sensed value of the intensity of said electromagnetic field as so reduced with respect to time and at a rate which corresponds to the power dissipation within the material within said oven to develop an integral signal increasing in time and correspondence with the temperature rise in said material, means for comparing the integral signal so derived with said demand signal and switching off the electromagnetic energy supplied to said oven when said integral signal reaches the value of said demand signal.

4,009,360

ORBITAL WELDING APPARATUS

Stanley Beetham, Washington, England, assignor to Clarke Chapman Limited, Gateshead, England

Filed Oct. 2, 1975, Ser. No. 618,983

Claims priority, application United Kingdom, Sept. 9, 1975, 36947/75

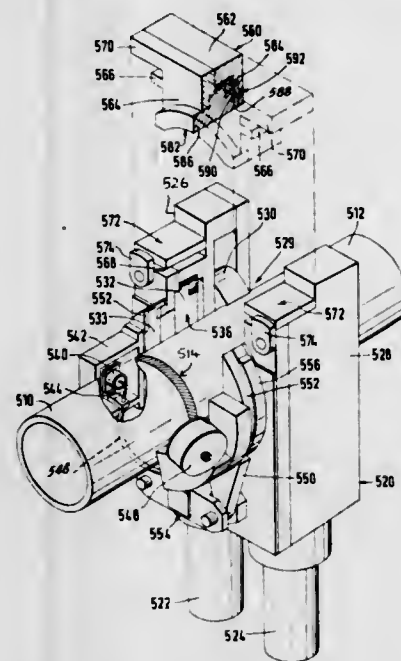
Int. Cl.² B23K 9/12

U.S. Cl. 219—60 A

5 Claims

1. Orbital welding apparatus comprising a main assembly including a support structure carrying first and second rotary drive means and being of generally U shape and having two opposed relatively fixed structure limbs to receive therebetween a tube to be welded; clamp jaws movable relative to said structure to release or grip a tube received between said structure limbs; a rotatable assembly carried by said support structure and comprising first and second relatively rotatable gear members rotatable about a common axis, said gear members each being of generally U shape and having two opposed relatively fixed limbs, said gear members being rotatable into like positions in which said gear limbs are positioned to receive said tube as it is received between said structure limbs, said first and second gear members being rotationally coupled to said first and second drive means, respectively, said rotatable assembly also comprising arc welding means including

wire feed roller mechanism mounted on and for rotation as a unit with said first gear member and a wire feed gear wheel meshing with said second gear member, said feed roller mechanism being in driving connection with said wire feed gear wheel and thus being operable by relative rotation of said first and second gear members; conductive means for supplying welding current to said arc welding means; and gas duct means



for supplying gas to said arc welding means; said rotatable assembly further comprising first and second auxiliary gear members removably locatable in bridging relationship to the respective gear limbs of said first and second gear members, said first and second rotary drive means each comprising but a single driven gear wheel in driving relationship with the respective gear member and respective auxiliary gear member.

4,009,361

ELECTRICAL DISCHARGE MACHINING APPARATUS WITH MONITORING CIRCUIT AND MEANS TO CHECK THE OPERABILITY OF THE MONITORING CIRCUIT

Anthony Howard Stanton, and Peter Laurence Taylor, both of Wetherby, England, assignors to Sparcatron Limited, England

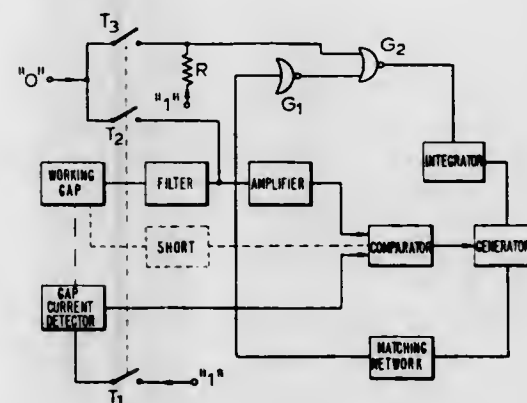
Filed Dec. 4, 1974, Ser. No. 529,508

Claims priority, application United Kingdom, Dec. 12, 1973, 56184/73; May 23, 1974, 23145/74

Int. Cl.² B23P 1/08

U.S. Cl. 219—69 C

9 Claims



1. A circuit for controlling an EDM process in EDM machines having a logical monitoring circuit for detecting a wrong discharge pulse out of the simultaneous occurrence and absence of certain electrical characteristics in the electrical discharge at a discharge gap, said circuit including means for effecting a short interruption of the EDM process, when such

wrong discharge pulses occur, the improvement comprising an input-device connected with the circuit for supplying to the monitoring circuit an arbitrary input of test signals which simulate a wrong discharge pulse, to thereby enable checking of the monitoring circuit.

4,009,362

PROCESS AND APPARATUS FOR WELDING SHEET METAL COATED WITH LAYERS

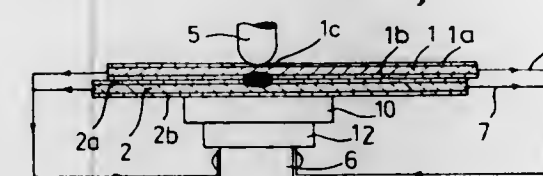
Otto Alfred Becker, Robert-Koch-Strasse 59, 66 Saarbruecken 6, Germany

Division of Ser. No. 181,149, Sept. 16, 1971, Pat. No. 3,798,407, which is a continuation-in-part of Ser. No. 823,077, May 8, 1969, Pat. No. 3,614,375. This application Feb. 25, 1974, Ser. No. 445,109

Int. Cl.² B23K 11/10

U.S. Cl. 219—92

18 Claims



1. An apparatus for the connection by electrical fusion of sheet metal panels at least one of which is coated on its lower, outer surface with an insulating layer, and at least one of said sheet metal panels being provided with a coated insulating layer which is disposed between said sheet metal panels when said sheet metal panels are superimposed, wherein the improvement comprises:

- a first electrode means contacting the top of the upper sheet metal panel;
- a first cable connecting the sheet metal of said upper panel to a counterelectrode means for supplying a pre-warming current only to said upper panel for melting said insulating layer disposed between said sheet metal panels; and
- a second cable connecting said counterelectrode means to said lower sheet metal panel, said second cable carrying current from said first electrode means through said upper sheet metal panel to said lower sheet metal panel for fusion of metal at the welding zone, whereby said outer insulating layer of said lower sheet metal panel remains undamaged.

4,009,363

VEHICLE SWITCH ATTACHMENT

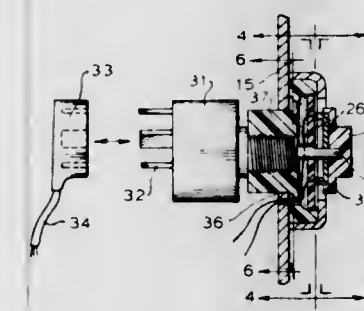
Ernest W. Binegar, 37 Indian Creek Road, New Smyrna Beach, Fla. 32069

Filed Jan. 19, 1976, Ser. No. 650,505

Int. Cl.² H01H 3/08

U.S. Cl. 200—336

9 Claims



1. A vehicle switch attachment comprising in combination: a decorative cover to fit over the protruding portion of a switch mounted to a vehicle dashboard, said protective cover having electrical contacts mounted therein; electrical conductors connected to said electrical contacts in said decorative cover and extending therefrom; and

a knob adapted to fit onto a switch shaft adjacent said decorative cover having electrical contacts therein, said knob electrical contacts being positioned to open and close a circuit between said decorative cover electrical contacts as said knob is moved between positions, whereby actuation of a vehicle switch will simultaneously actuate an accessory switch.

4,009,364

CURING OF PROTECTIVE COATINGS WITH IRASER BEAMS

Elmar Ladstädter, Graz, Austria, assignor to Vianova-Kunstharz, A.G., Vienna, Austria

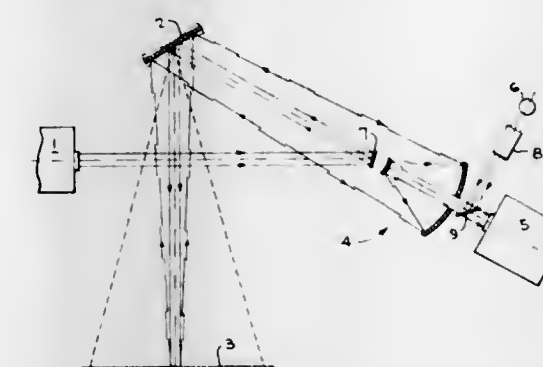
Filed Mar. 21, 1974, Ser. No. 453,561

Claims priority, application Austria, Mar. 28, 1973, 2700/73

Int. Cl.² B23K 27/00

U.S. Cl. 219—121 L

10 Claims



1. System for curing protective coating compositions over a large area with infrared radiation emitted by IRASERS comprising

- a composition to be cured;
- an IRASER source;
- fixed mirror means for receiving IRASER beams from said IRASER source;
- movable mirror means movable around two axes so constructed, arranged, and positioned with respect to said fixed mirror means and said composition so as to simultaneously receive IRASER beams reflected from said fixed mirror means; direct received IRASER beams to said composition to be cured in a scanning pattern; simultaneously receive heat rays from said composition and direct said received heat rays to temperature-responsive means, and
- temperature-responsive means for receiving and measuring the temperature of heat rays so constructed, arranged, and positioned with respect to said movable mirror means to receive said heat rays from said movable mirror means, said system providing uniform curing of said protective coating over a large area.

4,009,365

PULSED-DC ARC WELDING

Lyubomir Tzonev Kalev; Kostadin Zikov Zikov, and Ivan Kirilov Marvakov, all of Sofia, Bulgaria, assignors to Institut po Metaloznanie i Tehnologia na Metalite, Sofia, Bulgaria

Division of Ser. No. 533,713, Dec. 17, 1974. This application June 2, 1975, Ser. No. 592,364

Claims priority, application Bulgaria, Dec. 17, 1973, 27445

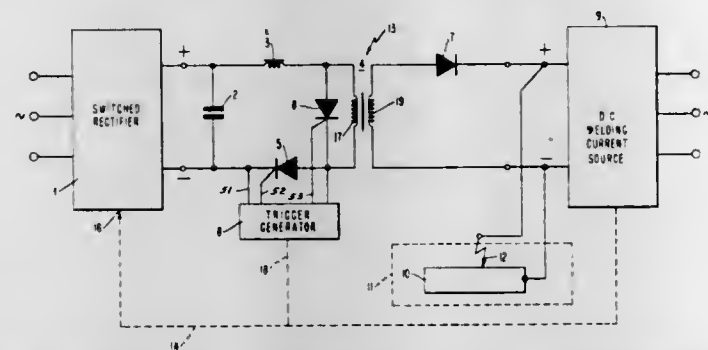
Int. Cl.² B23K 9/10

U.S. Cl. 219—135

6 Claims

1. In a welding apparatus powered from conventional AC mains for supplying a welding current to a consumable welding electrode that contacts the work to be welded in a protective atmosphere, the welding current having a steady DC component generated by a DC source whose output is coupled to the welding electrode, and a superimposed cyclic pulse component developed by a pulse-generating circuit, the im-

provement wherein the pulse-generating circuit comprises, in combination, a capacitor, a pulse transformer, a charging circuit coupled across the capacitor and operable to charge the capacitor, a discharge circuit including a choke, a primary winding of the pulse transformer and a normally disabled first thyristor coupled across the capacitor, the inductance of the discharge circuit cooperating with the capacitance of the capacitor to establish an oscillatory current flow through the first thyristor, means for coupling the secondary winding of



the pulse transformer across the DC source for applying pulses produced by the pulse-generating circuit to the welding electrode, a trigger generator coupled to the control electrode of the first thyristor and having a first output operable to cyclically enable the first thyristor at a first rate substantially independent of the frequency of the AC mains, means rendered effective upon the completion of an arc from the welding electrode to the work to be welded for operating the charging circuit and the trigger generator, and means operative upon the interruption of the arc for disabling the charging circuit.

4,009,366

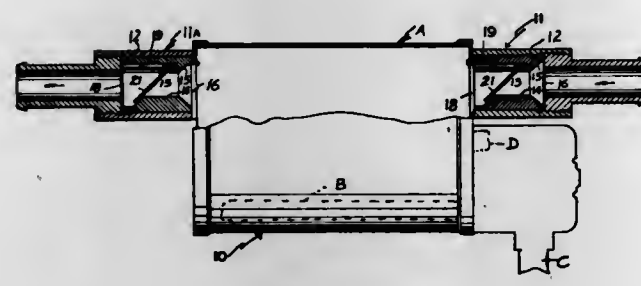
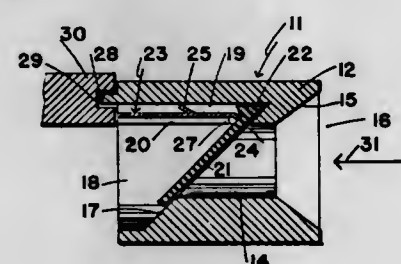
THERMAL PULSE TYPE HEATER AND VALVE THEREFORE

Russell D. Danell, Winnipeg, Canada, assignor to James B. Carter Limited, Winnipeg, Canada

Continuation-in-part of Ser. No. 608,876, Aug. 29, 1975, abandoned. This application Dec. 8, 1975, Ser. No. 638,376
Int. Cl.² F02N 17/04; F16K 15/14

U.S. Cl. 219-208

12 Claims



1. A thermal type pulse heater comprising in combination a body portion, an electric heater element therein, an inlet fluid passageway and an outlet fluid passageway situated adjacent either end of said body portion and adjacent the upper side thereof respectively, a flexible flap valve in at least one of said passageways, a valve seat in the wall defining said one passageway, said flap valve extending across said one passageway occluding same when engaged with said valve seating and

means detachably mounting said flap valve by one side thereof in said wall defining said one passageway, said last mentioned means including a retainer slot formed in the wall of said one passageway, a locking strip slidably engageable within said slot and engaging said flap valve by said one side thereof, overhanging means on said one side of said flap valve engaged by said locking strip and means to detachably retain said locking strip within said slot.

4,009,367

STEAM-PRODUCING CURLING IRON

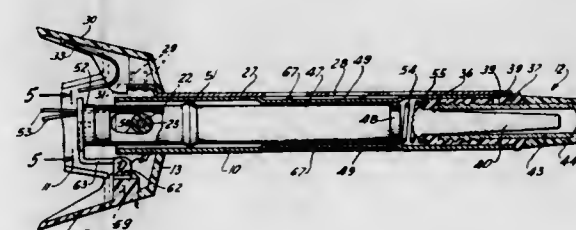
L. P. Rizzuto, Brooklyn, N.Y., assignor to Conair Corporation, Edison, N.J.

Filed Jan. 29, 1975, Ser. No. 545,053

Int. Cl.² H05B 1/00; A45D 1/04, 2/36, 7/02

U.S. Cl. 219-222

17 Claims



1. A steam-producing curling iron comprising:

- a. a tubular barrel of appropriate size and shape for having hair wound around it, said barrel having holes along at least a portion of its length, said holes extending through the wall of said barrel,
- b. an elongated heating member axially slidable within said barrel between an advanced position and a retracted position, said barrel having a plurality of elongated depressions for guiding the movement of said heating member,
- c. a handle at one end of said barrel,
- d. a liquid-containing means at the other end of said barrel, said liquid-containing means including a reservoir and a liquid-transmitting means communicating with said reservoir and exposed within said barrel in a region which communicates with said holes, said liquid-transmitting means being in the path of movement of said heating member and arranged to be contacted by said heating member, to produce steam, when said heating member is in its advanced position,
- e. a seal between said heating member and said barrel, said seal permitting sliding movement between said heating member and barrel, and a steam chamber being defined between said seal and said liquid-transmitting means, said holes permitting escape of steam from said chamber, and
- f. actuator means carried by said handle and operatively associated with said heating member for sliding said heating member between its advanced and retracted positions, said actuator means being movable with respect to said handle and being located so that it may be operated by the same hand of the user which grasps said handle, whereby when hair is wound around said barrel and said actuator means is manipulated to slide said heating member to its advanced position, steam produced within said barrel flows out of said barrel through said holes and is applied to the wound hair.

4,009,368

YOGHURT-MAKING MACHINE

Andre Faivre, Dijon, and Pierre Tanguy, Daix, both of France, assignors to Etud S.A., Dijon, France

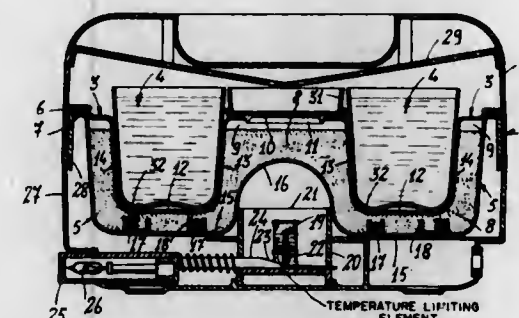
Filed Sept. 6, 1974, Ser. No. 503,919

Claims priority, application France, Sept. 25, 1973, 73.34316

Int. Cl.² H05B 1/02; A23C 3/02; F24C 15/34

U.S. Cl. 219-430

3 Claims



1. A yoghurt-making machine, comprising an enclosure having a cover, a receptacle having a bottom wall and a side wall disposed inside said enclosure, a basin fixed in said enclosure below said receptacle, said basin and said receptacle defining therebetween a space which is at least partly filled with a fusible material having a cooling curve exhibiting a solidification plateau at a temperature near to the optimum temperature of yoghurt formation, electrical heating means immersed in said fusible material, said basin having a bottom defining with the enclosure a closed chamber completely separated from said fusible material by said bottom of said basin, a temperature limiting element connected with the heating means and disposed in said chamber in spaced relation to the walls thereof so as to be responsive to only the temperature of the air within said chamber, said temperature limiting element being operative to stop the heating of said fusible material when the temperature in the chamber is significantly higher than that of the solidification plateau of said fusible material, the amount and the latent heat of solidification of said fusible material being sufficient for its solidification plateau to be maintained throughout the duration required for the formation of the yoghurt after heating has stopped.

4,009,369

POLYPHASE SCANNER FOR BAR CODE SYMBOLS

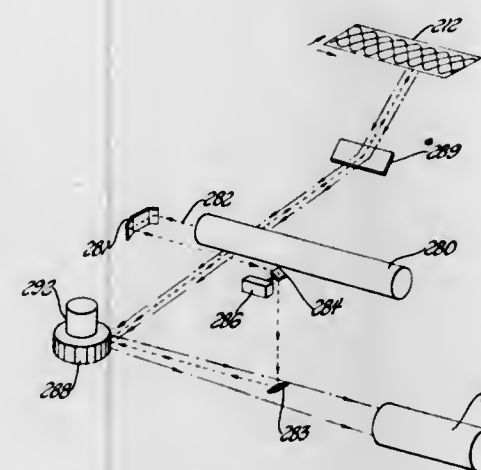
Thomas D. Hayosh, Bloomfield Hills, and John H. Carosella, Avon Township, both of Mich., assignors to Schiller Industries, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 466,769, May 3, 1974, abandoned. This application Apr. 16, 1975, Ser. No. 568,808

Int. Cl.² G06K 7/14; G02B 27/17; G06K 9/10

U.S. Cl. 235-61.11 E

34 Claims



1. In a code reader for encoded packages bearing bar code symbols and passing across a scanning window, the code

symbols having a rectangular code field, a scanner adapted to scan a reading field adjacent the window and having a transverse axis across which the code symbols are moved and having a longitudinal axis perpendicular to the transverse axis, said scanner comprising means for producing a light beam, deflection means, including optical means in the path of the light beam, first drive means operatively coupled with the optical means for cyclically deflecting the beam in the direction of the transverse axis as a linear function of time, and second drive means operatively coupled with the optical means for simultaneously cyclically deflecting the beam in the direction of the longitudinal axis as a sinusoidal function of time to produce a trace segment having a substantially sinusoidal waveform of uniform wavelength in the reading field for a cycle of deflection in the direction of the transverse axis, said deflection means including phase displacing means for displacing successive trace segments in the direction of the transverse axis by a controlled amount, whereby the trace segments produce a polyphase scan pattern on said window.

4,009,370

COUNTING OR INDICATING RING DEVICE

Kouichi Otsuka, Chiba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

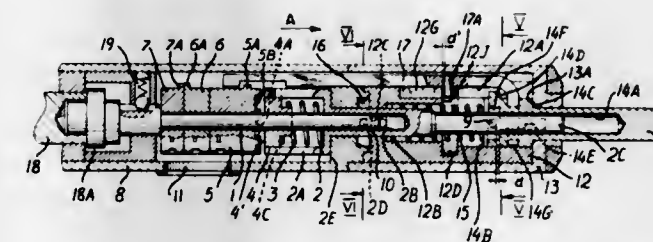
Filed June 10, 1975, Ser. No. 585,510

Claims priority, application Japan, June 10, 1974, 49-67188[U]

Int. Cl.² B43K 29/08; G06C 27/00, 15/42

U.S. Cl. 235-64

4 Claims



1. An indicating device comprising: indicating rings rotatably supported by a shaft, each of said rings having numerals or marks on a pitch circle thereof, step advancing means spaced adjacent to one of said rings to advance it step by step, operating means arranged parallel to the ring axis and longitudinally movable to operate said step advancing means relative to the indicating rings, a stopping bar arranged close to the indicating ring peripheries and engageable with a lug formed on the periphery of each of said indicating rings, means including a changeover sleeve for engaging and disengaging said operating means with the step advancing means, and means including a rotatable and slidable knob having two functions, one being to shift said stopping bar to stop the indicating rings in response to pushing-in of the knob so that said shaft can be rotated, accompanying the indicating rings with frictional torque, by rotation of the knob to effect an indicating ring resetting function, and the other being to rotate said change-over sleeve to an angular position to permit or prevent the engagement of said operating means with the step advancing means in response to rotation of the knob without pushing-in to effect a change-over function, said shaft being provided with a click-stop to stop the shaft at a predetermined angular position thereof thereby preventing the shaft from being rotated over with unexpected torque caused by knob misoperation or other accidents.

4,009,371

AVERAGING COUNTER

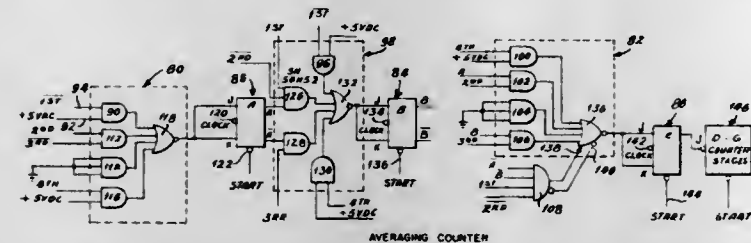
Robert H. Hamilton, and John L. Mohr, both of St. Louis County, Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 3, 1975, Ser. No. 554,750

Int. Cl.² H03K 21/30

U.S. Cl. 235—92 LG

12 Claims



1. Means to control a counter to simultaneously count and average comprising a multi-stage counter of M stages, each stage having input and output connections, said means including control gate means, the inputs of stage 1 through M having connections to said control gate means and the outputs of stages 1 through M-1 having connections to said control gate means, enable/inhibit means including start and stop inputs to enable or inhibit selected counter stages, said gate means and said enable/inhibit means, controlling the counter to cause the counter stages to count at a first preselected counting rate in response to receipt of a start signal at said start input, said enable/inhibit means connecting signals at said stop input thereof to said control gate means to effect a change in the counting rate of the multi-stage counter, said control gate means including means to selectively terminate the counting operation of predetermined counting stages upon receipt of a predetermined number of signals at said stop signal input.

4,009,372

MANUAL OVERRIDE USING A VARIABLE CLOCK FREQUENCY IN A CONTROL SYSTEM EMPLOYING A D/A CONVERTER TO TRANSLATE DIGITAL CONTROL SIGNALS FROM A DIGITAL COMPUTER TO ANALOG SIGNALS FOR OPERATING PROCESS CONTROL DEVICES

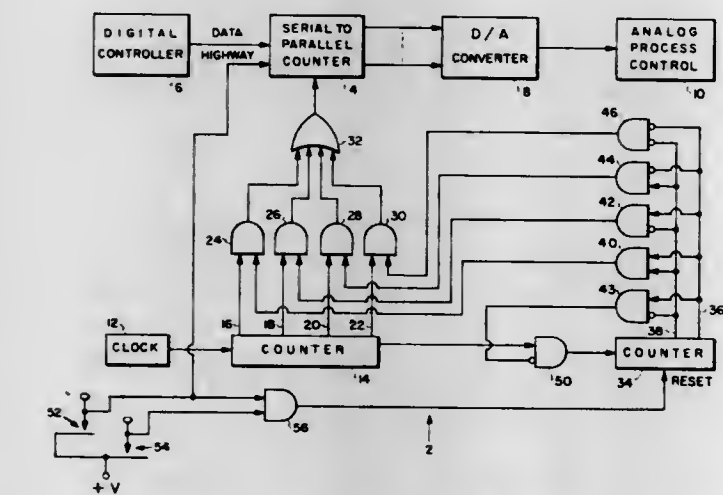
Frank J. Przybylski, Feasterville, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 12, 1975, Ser. No. 557,791

Int. Cl.² G06M 3/00

U.S. Cl. 235—92 CC

3 Claims



1. A variable speed analog signal incrementation circuit to provide a time dependent incrementation speed variation for a manual override in a control system comprising storage means for storing a digital word, input means for entering a digital word in said storage means, digital-to-analog signal converter means for converting the stored digital word to an analog output signal, and variable frequency signal generator means connected to

said storage means for selectively incrementing the stored digital word by applying a variable frequency output signal to said storage means, said variable frequency generator means having a variable frequency mode of operation, said variable frequency signal generator means including means for generating a plurality of differing fixed frequency output signals including a fixed frequency clock means and a counter means for counting output signals from said clock means to produce a plurality of subdivided fixed frequency output signals as the plurality of differing fixed frequency output signals, gating means for sequentially applying said plurality of fixed frequency output signals to said storage means according to a predetermined pattern encompassing said fixed frequency output signals and gating means including a second counter means arranged to count an output signal from said first counter means and means for decoding count states of said second counter means connected to said counter means and responsive to output signals from said counter means to produce control signals for said gating means to apply said variable frequency output signals to said storage means according to said pattern, and selectively operable reset means connected to said variable frequency signal generator means for selectively interrupting the operation of said signal generator means to terminate the incrementation of said stored digital word and for selectively restarting the operation of said generator means following such an interruption at a predetermined one of said fixed frequency output signals which is the lowest frequency signal of said fixed frequency output signals.

4,009,373

ELECTRO-MECHANICAL COUNTING REGISTER

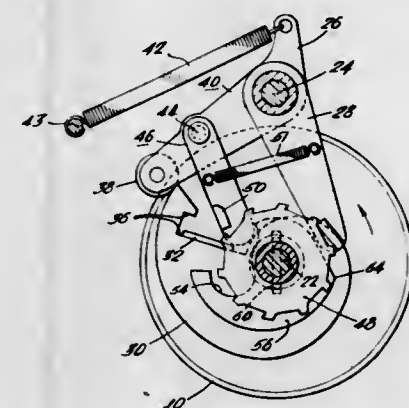
Einar T. Young, Largo, Fla., assignor to Suntech, Inc., St. Davids, Pa.

Filed Dec. 11, 1975, Ser. No. 640,104

Int. Cl.² G06M 1/30, 1/16

U.S. Cl. 235—92 FL

7 Claims



1. An approved register comprising:
a. a main shaft;
b. a less significant register wheel mounted on said main shaft;
c. means for driving said less significant register wheel, whereby it may be driven to register a measured quantity;
d. a more significant register wheel mounted on said main shaft;
e. a drive wheel coupled to said more significant register wheel for rotation therewith;
f. a snail cam coupled to said less significant register wheel for rotation therewith;
g. a cam follower positioned to follow the contour of said snail cam;
h. a spring coupled to said cam follower for accumulating a storing energy as said less significant register wheel is driven through substantially an entire revolution;
i. a driving pawl coupled to said drive wheel and said cam follower for driving said more significant register wheel

4,009,375

MONITORING SYSTEM FOR VEHICLES

Howard S. White, Toronto, and Leonard Casciato, Downsview, both of Canada, assignors to Peat, Marwick and Partners, Toronto, Canada

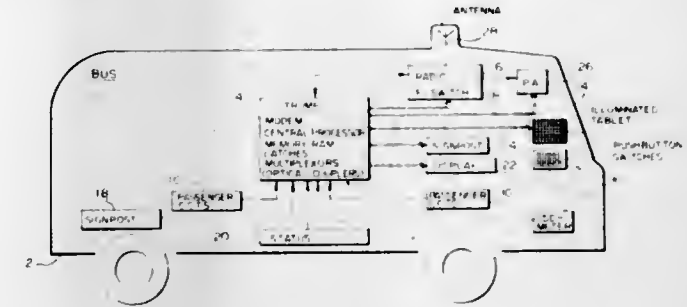
Filed May 5, 1975, Ser. No. 574,827

Claims priority, application Canada, May 13, 1974, 199661

Int. Cl.² G08G 1/09; G06F 15/50

U.S. Cl. 235—150.24

9 Claims



1. A closed loop vehicle monitoring and control system including a central control station and one or more vehicles to be monitored during movement along a path of travel, a transit universal micro processor unit and one or more peripheral devices mounted on each vehicle, each peripheral device being interchangeably connected with the microprocessor unit for the flow of information therebetween, a two-way radio communication data information link between each vehicle and the central control station whereby information as to the vehicle can be received at said central control station from said vehicle, said control station analysing said information and preparing correspondingly modified instructions for said vehicle, said control station then transmitting said modified instructions to said vehicle.

4,009,376

METHOD AND APPARATUS FOR MEASURING MATERIAL THICKNESS

Claude Faraguet, Summit, Pa., assignor to Sangamo Weston, Inc., Archbald, Pa.

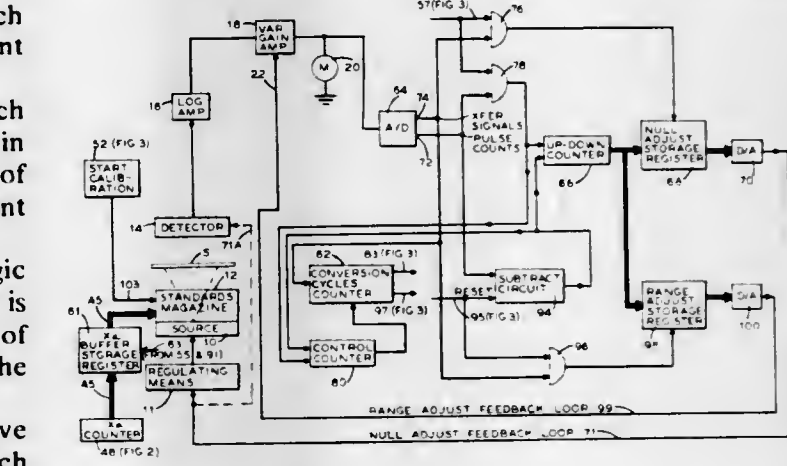
Continuation of Ser. No. 226,457, Feb. 15, 1972, abandoned.

This application Feb. 5, 1975, Ser. No. 547,160

Int. Cl.² G01N 23/16; G01T 1/16

U.S. Cl. 235—151.3

66 Claims



through a predetermined portion of a revolution after said less significant register wheel has substantially completed one revolution;
j. a restraining pawl, coupled to said drive wheel, for restraining rotational movement of said more significant wheel unless said driving pawl is driving said more significant register wheel;
k. a first reset cam, coupled to said main shaft for rotational movement therewith and also coupled to said driving and restraining pawls, for lifting said driving and restraining pawls upon rotation of said main shaft during a resetting operation; and
l. means for resetting the register to zero and including means for rotating said main shaft during a resetting operation, whereby said reset cam will lift said driving and restraining pawls from said drive wheel during the resetting operation.

4,009,374

PSEUDO-RANDOM BIDIRECTIONAL COUNTER

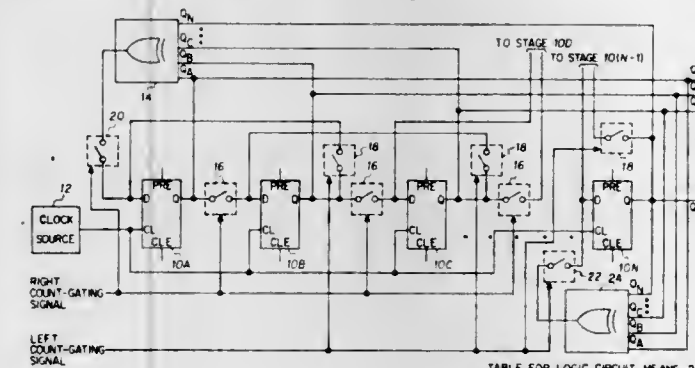
H. Scott Taylor, Newport Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 17, 1976, Ser. No. 687,416

Int. Cl.² H03K 23/30; H03B 29/00

U.S. Cl. 235—92 SH

9 Claims



1. A pseudo-random bi-directional counter, comprising:
a. a source of clock pulses;
a plurality of flip-flops for sequential interconnection to function as a shift register, the output signal of each flip-flop being transferred to the input of an adjacent flip-flop in response to each clock pulse;
switching circuit means for connecting the output of each flip-flop to the input of the next succeeding flip-flop in response to a right count gating signal or to the input of the next preceding flip-flop in response to a left count gating signal;
first logic circuit means for generating a first repetitive logic bit stream from the outputs of said flip-flops which is sequentially applied to the input of the first flip-flop of said register in synchronism with said clock pulses in the presence of said right count gating signal, and
second logic circuit means for generating a second repetitive logic bit stream from the outputs of said flip-flops which is sequentially applied to the input of the last flip-flop of said register in synchronism with said clock pulses in the presence of said left count gating signal, said bit streams being mirror images of each other and applied to the register such that the binary output of said register after advancing the count by any number of clock pulses in the presence of one of said gating signals is the same as the binary output which would have been obtained by regressing the count by the same number of clock pulses in the presence of the other one of said gating signals.

6. A thickness measuring gauge comprising, a source of radiation, a standards magazine mounting a plurality of radiation-attenuating standards of predetermined thickness values, each of said standards being movable into a path of said radiation in response to a signal representative of a selected standard thickness, detection means mounted in said path of radiation for providing an analog electrical signal output having a magnitude which is a function of the radiation absorption characteristic of the material in said path,

a plurality of individual, elongated, filamentary light-conducting fibers having major portions thereof arranged in a primarily planar array, said fibers having their converging inner ends embedded in said matrix and directed generally toward a central axis of said apertured matrix and their outer tips arranged to form a decorative pattern of dispersed small points of light and each of said fibers having a diameter in the range of 5 to 40 mils and being operable to minimize the loss of light conducted by the fibers through the sides of the fibers,

a lamp disposed at said axis of said matrix aperture generally adjacent the converging inner ends of said fibers to maximize the transmission of light from said lamp to the inner ends of said fibers,

a switch,

means for electrically connecting said battery means, said lamp and said switch,

means for supporting said article of jewelry on said person, and

a decorative shield overlying said lamp and said matrix.

4,009,382

FLEXIBLE LIGHT GUIDE, PARTICULARLY FOR MEDICAL/DENTAL USE

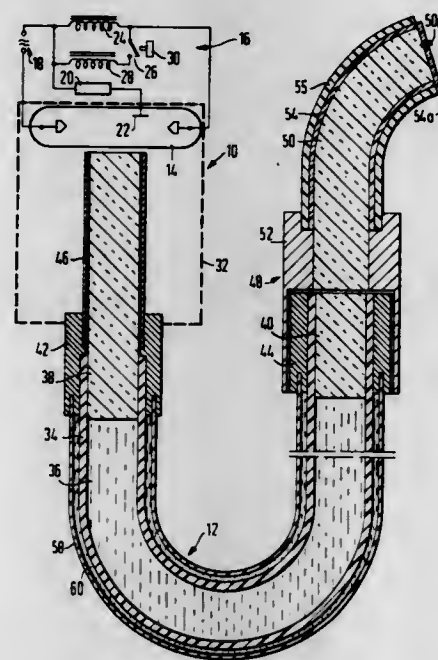
Günther Nath, 21 Speyrer St., Munich, Germany
Filed Feb. 3, 1975, Ser. No. 546,298

Claims priority, application Germany, Feb. 11, 1974, 2406424; May 21, 1974, 2424620; June 21, 1974, 2429859; July 11, 1974, 2433218

Int. Cl.² F21V 9/02

U.S. Cl. 240—1 LP

17 Claims



1. For combination with an illuminating device, a flexible light guide which comprises
a flexible hollow tube of plastic material;
light transmissive means closing the tube at its ends;
and a light conducting liquid which has a refractive index greater than the refractive index of the plastic material of the tube and which completely fills the flexible tube between the light transmissive closing means to form a closed liquid light guide system;
wherein the liquid filling the tube has the characteristic that the liquid does not wet the plastic material of the flexible tube; and
wherein the liquid filling the tube has the characteristic that the liquid is hygroscopic.

4,009,383

LIGHT CHUTE ARRANGEMENT

Siegfried Beier, Munich, Germany, assignor to AGFA-Gevaert A.G., Leverkusen, Germany

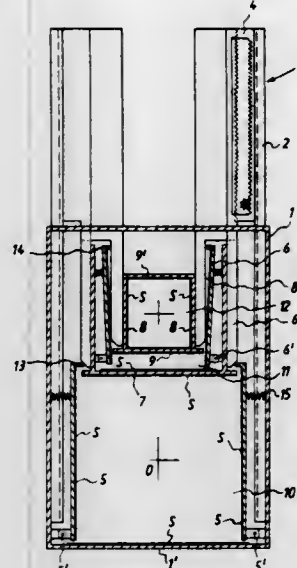
Filed Oct. 22, 1975, Ser. No. 624,977

Claims priority, application Germany, Oct. 31, 1974, 2451892

Int. Cl.² G03B 15/02, 27/54

U.S. Cl. 240—1.3

10 Claims



4. A light chute arrangement of the type having reflective inner surfaces for conveying light from a light source to an original, comprising, in combination, a first light chute component having an open side; at least one further light chute component having an open side and side walls laterally opposite said open side, said side walls having a lower region and being mounted at said lower region for pivotal movement about an axis substantially parallel to the light path, and an upper region having flange portions which extend towards each other; an additional light chute component, the cross-section of said additional light chute component being smaller than the cross-section of said further light chute component which, in turn, is smaller than the cross-section of said first light chute component, each of said light chute components having reflective inner surfaces; and mounting means mounting said further light chute component for movement into and out of the interior of said first light chute component, and said additional light chute component for movement into and out of said further light chute component to selectively form from said light chute components light chutes of different respective cross-sections adapted to convey light to originals of different respective sizes.

4,009,384

LAMP SCENT UNIT

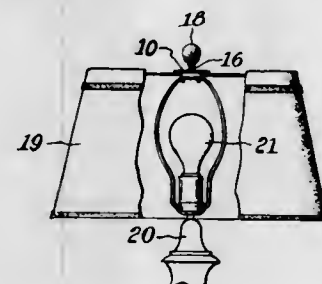
Ada R. Holland, Atlanta, Ga., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 10, 1975, Ser. No. 556,888

Int. Cl.² A61L 9/02

U.S. Cl. 240—108 R

1 Claim



1. A lamp shade holder mounted to a lamp assembly, with the lamp shade holder formed to fit about and over a lamp bulb mounted in said lamp assembly,

said lamp shade holder fitted with a post screw projecting from the said holder which screw projects from the holder away from a mounted lamp bulb, said screw adaptable for fitting into a finial hole of a lamp shade for attachment of the lamp shade to the said holder, together with

a container unit formed with a centrally located mounting hole of a size to fit about said post screw,

said container unit formed of a first sheet of porous material of high temperature-resistant and thermal insulation properties, which said first sheet is folded about an inner second sheet of porous material that is impregnated with a solution of scented material,

said central mounting hole passing through the said folded first sheet and the said folded second sheet.

4,009,385

LASER CONTROL CIRCUIT

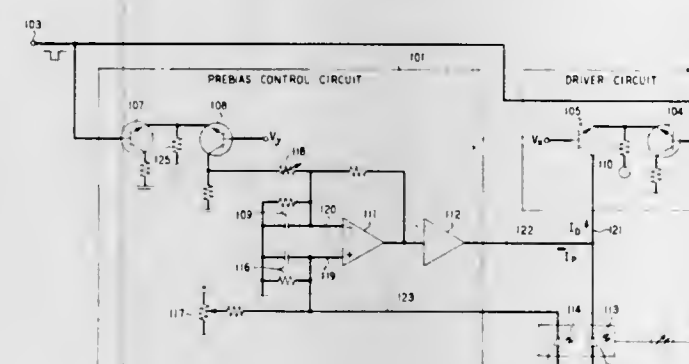
Darrell Dean Sell, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 22, 1976, Ser. No. 668,824

Int. Cl.² H01S 3/10; H04B 9/00

U.S. Cl. 250—199

6 Claims



1. A control circuit for an injection laser, the circuit comprising:
means for driving the laser in response to an electrical modulating signal, and
means for prebiasing the laser in response to the difference between a signal derived from the electrical modulating signal and a signal derived from the laser light output.

4,009,386

METHOD AND ARRANGEMENT FOR AUTOMATICALLY FOCUSING AN OBJECTIVE ONTO A SUBJECT, USING AUTOCOLLIMATION

Reinhold Deml, Munich, and Ulrich Greis, Weyarn, both of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Germany

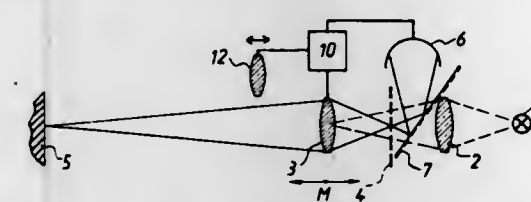
Filed Oct. 3, 1975, Ser. No. 619,396

Claims priority, application Germany, Oct. 5, 1974, 2447663

Int. Cl.² G01J 1/20

U.S. Cl. 250—201

18 Claims



1. A method for automatically focussing onto a subject the objective of an optical apparatus provided with autocollimation lens means having a position bearing a predetermined relationship to the position of the objective, comprising the steps of so positioning a grating relative to the autocollimation path of the autocollimation lens means as to cause the latter to project an image of the grating onto the subject and to cause

the image of the grating on the subject to be projected back onto the grating and into steady register with the grating structure to an extent dependent upon the degree of focus of the objective; using photoelectric means to derive from the light projected back onto the grating an electrical signal indicative of the extent to which the image of the grating projected back onto the grating is in steady register with the grating structure and accordingly indicative of the degree of focus of the objective; and controlling the operation of means for adjusting the setting of the objective by applying the electrical signal to such means.

4,009,387

AUTOMATIC ENERGY CONTROL LIGHTING SYSTEM WITH AUTOMATICALLY VARIABLE DC SOURCE

Eric L. H. Nuver, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.

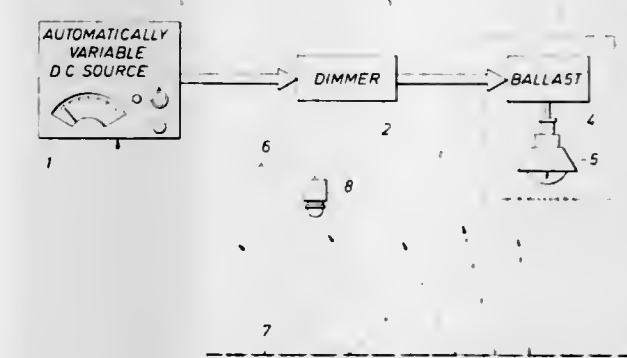
Continuation of Ser. No. 581,270, May 27, 1975, abandoned.

This application July 19, 1976, Ser. No. 706,567

Int. Cl.² G01J 1/32; H05B 41/36

U.S. Cl. 250—205

22 Claims



14. An automatically variable d.c. voltage source suitable for use with a lamp dimmer circuit that adjusts the light output of a lamp illuminating a work area in response to a variable d.c. bias, comprising:
a reference signal source producing a stable, continuous electrical signal level representative of a level of illumination desired over a work area;
photocell circuit means for detecting the level of illumination produced by a light source over a work area and producing a variable level signal representative of the level of illumination over the work area;
amplifier means connected to said reference signal source and said photocell circuit means for automatically producing a variable d.c. bias signal functionally related to the difference between the level of illumination over the work area and the desired illumination level for the work area; and
a buffer circuit to convert said variable d.c. bias signal to a higher signal level, said buffer comprising a controlled current source having a capacitor at its output to form an integrator that regulates the rate of change of the higher level d.c. bias signal to prevent rapid changes thereof in response to transient ambient stimuli.

4,009,388

ARRANGEMENT FOR EXTENDING PHOTSENSOR ARRAY RESOLUTION

Ned J. Seachman, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1975, Ser. No. 627,499

Int. Cl.² H01J 39/12

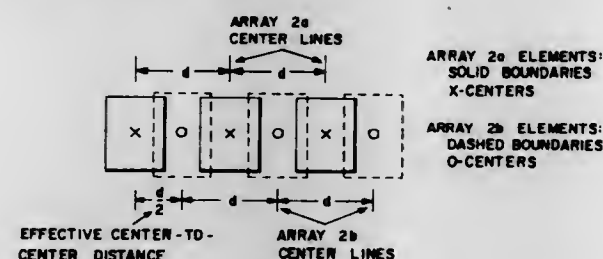
U.S. Cl. 250—208

3 Claims

1. An optical system for projecting twin images of an object from an object plane to an image plane and for sensing said image at said image plane, including:
a projection lens disposed on an optical axis between said object plane and said image plane to project an image of an object from said object plane to said image plane,

a beam splitter disposed on said optical axis between said projection lens and said image plane to partially transmit said image toward a first image plane and to partially reflect said image toward a second image plane, said first and second image planes thus being twin image planes in optical superposition.

a first linear array of photosensor elements disposed in said first image plane, said elements being separated by a center-to-center spacing d .



a second linear array of photosensor elements disposed in said second image plane, said elements being separated by a center-to-center spacing d .

said first and second arrays of photosensor elements being disposed in conjugate relationship to the same object line and being linearly offset relative to each other with respect to said object line by an amount $d/2$ so as to optically double the spatial density of said photosensor elements for increased resolution of image sensing by said elements.

4,009,389

APPARATUS FOR THE AUTOMATIC COUNTING OF PASSENGERS

Ulf Lindholm, Trangsund, Sweden, assignor to Aktiebolaget Almex, Stockholm, Sweden

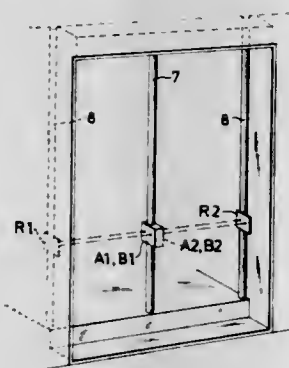
Filed Sept. 19, 1975, Ser. No. 614,865

Claims priority, application Sweden, Sept. 26, 1974, 7412121

Int. Cl.² G01D 21/04

U.S. Cl. 250-221

10 Claims



1. Apparatus for automatically counting persons entering and leaving a public transportation vehicle having at least two passenger doorways provided with doors, each doorway being adapted for entry and egress of passengers, comprising: per doorway, two emitters of invisible light adapted to emit a pair of pulsed parallel beams of said light in a horizontal plane across said doorway, the distance between said parallel beams being less than the thickness of an adult person, said plane being about the height of the hip of an adult in said doorway; two beam sensors of said light, each adapted to sense an interruption in said pulsed invisible light beam transmitted thereto; a reflector of invisible light positioned across said doorway opposite said emitters and adapted to reflect one of said beams to one of said sensors and to reflect the other beam to the other sensor, said sensors being visible from said reflector; electronic means cooperating with each of said sensors to emit a pulse of elec-

tric current for each interruption of the pulsed invisible light beam thereto; electronic pulse sensing means adapted to receive the pulses emitted from each of said sensors and to distinguish between and to separately register pulse pairs produced by interruption of the first beam of said pair of beams before interruption of the second beam of said pair and between pulse pairs produced by interruption of the second beam of a pair of beams before interruption of the first beam of said pair, thereby distinguishing between pulse pairs produced by persons passing inwardly through the doorway and pulse pairs produced by persons passing outwardly through said doorway; means for separately registering and storing said inward and said outward pulses separately for each doorway of said vehicle; and switch means cooperating with said doors to supply electric current to said apparatus only when said doors are open.

4,009,390

PROCESS FOR MEASURING TENDERNESS OF COOKED MEAT

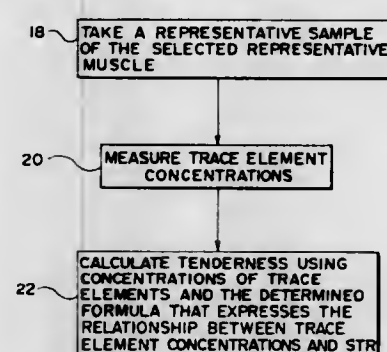
Lowell Duggan Satterlee; Roy Gary Arnold, both of Lincoln, and Philip C. Anderson, Crete, all of Nebr., assignors to The Regents of the University of Nebraska, Lincoln, Nebr.

Filed Oct. 23, 1975, Ser. No. 625,251

Int. Cl.² G01M 23/223

U.S. Cl. 250-273

22 Claims



1. A process for evaluating the tenderness of meat comprising the steps of measuring the concentration of at least two of several trace elements in the meat and correlating the concentrations of said trace elements as independent variables of a functional relationship having tenderness as the dependent variable.

4,009,391

SUPPRESSION OF UNWANTED LASING IN LASER ISOTOPE SEPARATION

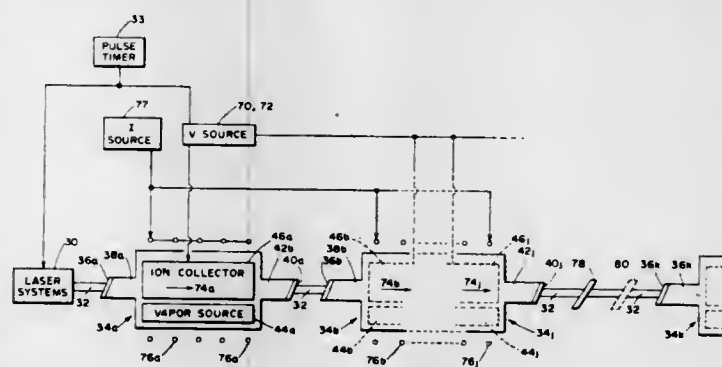
George Sargent Janes, Lincoln; Richard H. Levy, Boston, both of Mass., and Lawrence A. Levin, Beer Sheva, Israel, assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed June 25, 1974, Ser. No. 482,866

Int. Cl.² H01J 37/08, 39/34

U.S. Cl. 250-281

29 Claims



1. A system for limiting deexcitation losses by self lasing in a column of particles excited for subsequent further energization, said system comprising:

means for defining said column of particles;
means for applying radiation to said column of particles to produce excitation of particles in said column to at least one excited energy level;
the column of said particles having at least one population inversion between an excited and lower level with a gain sufficient to produce self lasing of said column of particles; and
means associated with said column of particles for reducing deexcitation thereof by self lasing.

4,009,392

RADIATION FOCUS METER

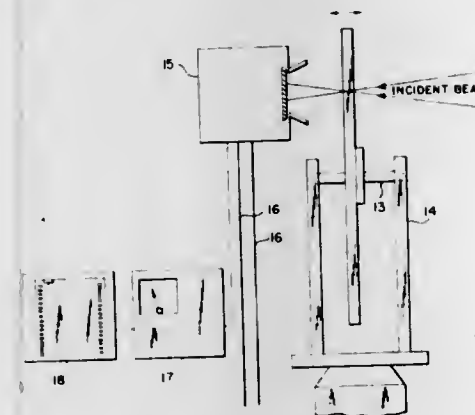
Stephen T. Hanley, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,251

Int. Cl.² G01J 1/00

U.S. Cl. 250-338

6 Claims



1. A method of determining the focal point of a convergent radiation beam which comprises, scanning said radiation beam with a scan means perpendicular to said radiation beam, permitting only a small percentage of said radiation to pass through said scan means, positioning a radiation detector means at a fixed distance from said scan means for detecting radiation that passes through said scan means, moving said radiation detector means in unison with said scan means to a position at which said radiation detector means has the greatest output, whereby the position for greatest output denotes the focal point of the incident radiation.

4,009,393

DUAL SPECTRAL RANGE TARGET TRACKING SEEKER
Glen W. Ashley, Jr., Walnut; Ernest O. Buening, Upland; Charles A. Leonard, Pomona, and Gerhard Lessman, Chino, all of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Sept. 14, 1967, Ser. No. 667,822

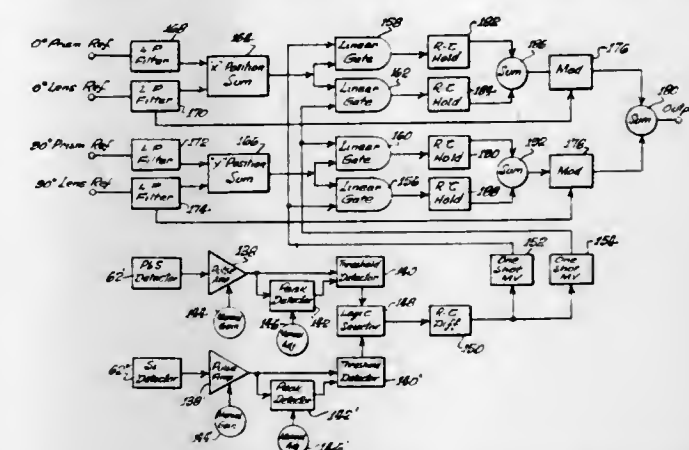
Int. Cl.² G01J 1/00; F41G 7/00

U.S. Cl. 250-339

17 Claims

1. A target tracking seeker for an air vehicle comprising:
a. optical means for receiving a first and a second spectral range of radiations emanating from a target, said optical means including two optically decentered elements;
b. means for individually rotating the two optically decentered elements of said optical means with respect to each other to produce a substantially point image for said first and said second spectral range radiations, said rotating means operably associated with said optical means;
c. means for detecting the substantially point image of said first and said second spectral range radiations to produce

a first signal indicative of the first spectral range image, and a second signal indicative of said second spectral



range image, said detecting means operably associated with said optical means.

4,009,394

REMOTE CONTROL LIGHT TRANSMITTER EMPLOYING A CYLINDRICAL LENS

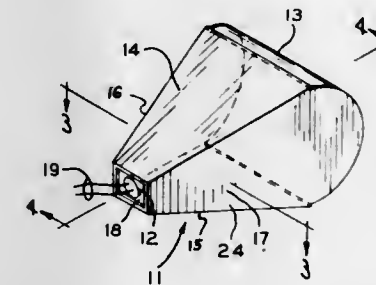
Eugene P. Mierzewski, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Oct. 28, 1975, Ser. No. 626,164

Int. Cl.² H01L 9/00

U.S. Cl. 250-552

16 Claims



12. A lens for transmitting light formed of optical material and having a front light receiving surface, planar side surfaces, a planar top surface, a planar bottom surface, and a rear surface, said front surface being cylindrical about an axis of curvature, said side surfaces subtending the length of said front surface and said top and bottom surfaces subtending the arc of said front surface, said side surfaces being convergent toward a first line located rearwardly of said front surface, and said top and bottom surfaces being convergent toward a second line located rearwardly of said rear surface, and said rear surface having a cavity therein for receiving a light emitting diode.

4,009,395

WAVE AND TIDE ACTUATED HYDRAULIC ELECTRICAL GENERATING APPARATUS

Charles S. Long, and Jamesina Long, both of Winesap Road, Rte. 8, Box 303, Jonesboro, Ark. 72401

Filed Nov. 4, 1974, Ser. No. 520,640

Int. Cl.² F03B 13/12

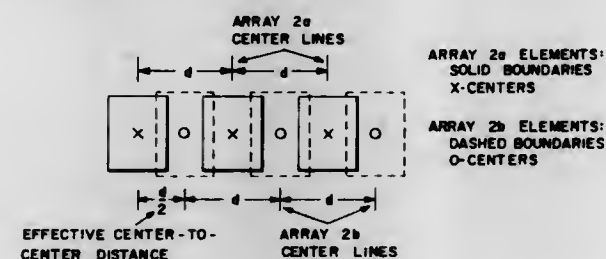
U.S. Cl. 290-53

1 Claim

1. A wave and tide actuated hydraulic electrical generating apparatus comprising, in combination:
a hollow basin area connected with a source of water having a fluctuating water level;
a gate interposed between said basin and said source of water and operable between an open and closed position for retaining and releasing water from said basin area;
a flotation chamber disposed in said basin and floatingly supported on said water level, said chamber movable upwardly and downwardly on said water level;
a multitude of substantially identical lever arm assemblies

a beam splitter disposed on said optical axis between said projection lens and said image plane to partially transmit said image toward a first image plane and to partially reflect said image toward a second image plane, said first and second image planes thus being twin image planes in optical superposition,

a first linear array of photosensor elements disposed in said first image plane, said elements being separated by a center-to-center spacing d ,



a second linear array of photosensor elements disposed in said second image plane, said elements being separated by a center-to-center spacing d ,

said first and second arrays of photosensor elements being disposed in conjugate relationship to the same object line and being linearly offset relative to each other with respect to said object line by an amount $d/2$ so as to optically double the spatial density of said photosensor elements for increased resolution of image sensing by said elements.

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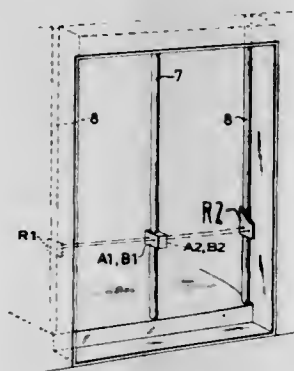
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Filed Sept. 19, 1975, Ser. No. 614,865

Claims priority, application Sweden, Sept. 26, 1974, 7412121

Int. Cl.² G01D 21/04

U.S. Cl. 250-221



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tronic current for each interruption of the pulsed invisible light beam thereto; electronic pulse sensing means adapted to receive the pulses emitted from each of said sensors and to distinguish between and to separately register pulse pairs produced by interruption of the first beam of said pair of beams before interruption of the second beam of said pair and between pulse pairs produced by interruption of the second beam of a pair of beams before interruption of the first beam of said pair, thereby distinguishing between pulse pairs produced by persons passing inwardly through the doorway and pulse pairs produced by persons passing outwardly through said doorway; means for separately registering and storing said inward and said outward pulses separately for each doorway of said vehicle; and switch means cooperating with said doors to supply electric current to said apparatus only when said doors are open.

4,009,390

PROCESS FOR MEASURING TENDERNESS OF COOKED MEAT

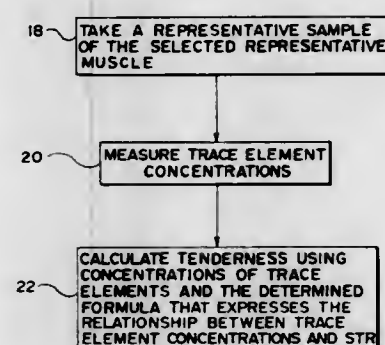
Lowell Duggan Satterlee; Roy Gary Arnold, both of Lincoln, and Philip C. Anderson, Crete, all of Nebr., assignors to The Regents of the University of Nebraska, Lincoln, Nebr.

Filed Oct. 23, 1975, Ser. No. 625,251

Int. Cl.² G01M 23/223

U.S. Cl. 250-273

22 Claims



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4,009,391

SUPPRESSION OF UNWANTED LASING IN LASER

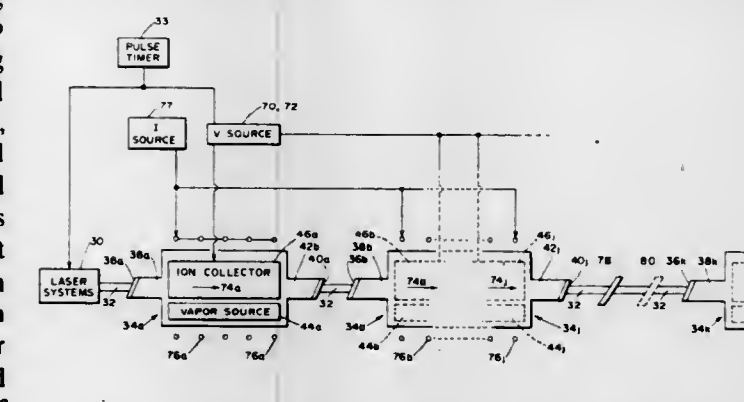
George Sargent Janes, Lincoln; Richard H. Levy, Boston, both of Mass., and Lawrence A. Levin, Beer Sheva, Israel, assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed June 25, 1974, Ser. No. 482,866

Int. Cl.² H01J 37/08, 39/34

U.S. Cl. 250-281

29 Claims



1. A system for limiting deexcitation losses by self lasing in a column of particles excited for subsequent further energization, said system comprising:

means for defining said column of particles;

means for applying radiation to said column of particles to produce excitation of particles in said column to at least one excited energy level;

the column of said particles having at least one population inversion between an excited and lower level with a gain sufficient to produce self lasing of said column of particles; and

means associated with said column of particles for reducing deexcitation thereof by self lasing.

4,009,392

RADIATION FOCUS METER

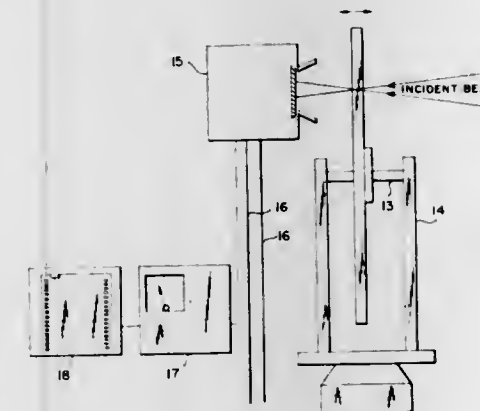
Stephen T. Hanley, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,251

Int. Cl.² G01J 1/00

U.S. Cl. 250-338

6 Claims



1. A method of determining the focal point of a convergent radiation beam which comprises, scanning said radiation beam with a scan means perpendicular to said radiation beam, permitting only a small percentage of said radiation to pass through said scan means, positioning a radiation detector means at a fixed distance from said scan means for detecting radiation that passes through said scan means, moving said radiation detector means in unison with said scan means to a position at which said radiation detector means has the greatest output, whereby the position for greatest output denotes the focal point of the incident radiation.

4,009,393

DUAL SPECTRAL RANGE TARGET TRACKING SEEKER
Glen W. Ashley, Jr., Walnut; Ernest O. Buenting, Upland; Charles A. Leonard, Pomona, and Gerhard Lessman, Chino, all of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Sept. 14, 1967, Ser. No. 667,822

Int. Cl.² G01J 1/00; F41G 7/00

U.S. Cl. 250-339

17 Claims

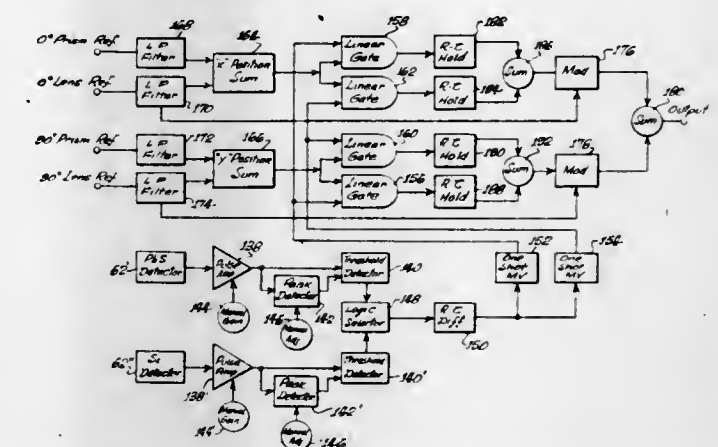
1. A target tracking seeker for an air vehicle comprising:

a. optical means for receiving a first and a second spectral range of radiations emanating from a target, said optical means including two optically decentered elements;

b. means for individually rotating the two optically decentered elements of said optical means with respect to each other to produce a substantially point image for said first and said second spectral range radiations, said rotating means operably associated with said optical means;

c. means for detecting the substantially point image of said first and said second spectral range radiations to produce

a first signal indicative of the first spectral range image, and a second signal indicative of said second spectral



range image, said detecting means operably associated with said optical means.

4,009,394

REMOTE CONTROL LIGHT TRANSMITTER EMPLOYING A CYLINDRICAL LENS

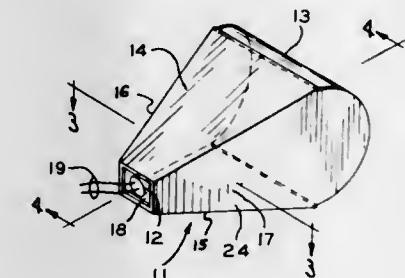
Eugene P. Mierzewski, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Oct. 28, 1975, Ser. No. 626,164

Int. Cl.² H01L 9/00

U.S. Cl. 250-552

16 Claims



12. A lens for transmitting light formed of optical material and having a front light receiving surface, planar side surfaces, a planar top surface, a planar bottom surface, and a rear surface, said front surface being cylindrical about an axis of curvature, said side surfaces subtending the length of said front surface and said top and bottom surfaces subtending the arc of said front surface, said side surfaces being convergent toward a first line located rearwardly of said front surface, and said top and bottom surfaces being convergent toward a second line located rearwardly of said rear surface, and said rear surface having a cavity therein for receiving a light emitting diode.

4,009,395

WAVE AND TIDE ACTUATED HYDRAULIC ELECTRICAL GENERATING APPARATUS

Charles S. Long, and Jamesina Long, both of Winesap Road, Rte. 8, Box 303, Jonesboro, Ark. 72401

Filed Nov. 4, 1974, Ser. No. 520,640

Int. Cl.² F03B 13/12

U.S. Cl. 290-53

1 Claim

1. A wave and tide actuated hydraulic electrical generating apparatus comprising, in combination:

a hollow basin area connected with a source of water having a fluctuating water level;

a gate interposed between said basin and said source of water and operable between an open and closed position for retaining and releasing water from said basin area;

a flotation chamber disposed in said basin and floatingly supported on said water level, said chamber movable upwardly and downwardly on said water level;

a multitude of substantially identical lever arm assemblies

disposed longitudinally spaced apart from each other completely along said flotation chamber and projecting outwardly over opposite portions of said flotation chamber to extend beyond said basin area, one end of each lever assembly movably connected to said flotation chamber, the opposite end of each of said lever assemblies projecting outwardly from said flotation chamber over said basin and terminating a distance spaced outwardly from said basin area in an outermost end;

a stationary pivot fulcrum associate with each outermost end of each lever arm assembly and spaced inwardly from said outermost end and pivotally connected to said lever arm assembly to provide pivotal rotation thereabout;

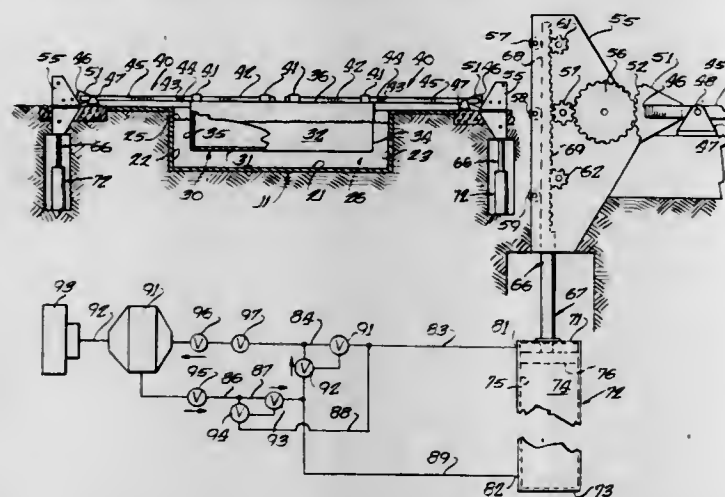
a multitude of hydraulic cylinders each having a piston rod associated therewith, each hydraulic cylinder being associated with the outermost end portion of an associated one of said lever arm assemblies;

a drive gear train disposed intermediate said outermost end of each lever arm assembly and said piston rod of each associated hydraulic cylinder for effecting reciprocal movement of said piston rod in said cylinder upon pivotal movement of said outermost end member about said stationary pivot fulcrum, and including means to increase the magnitude of the stroke of the piston rod with respect to the fluctuation of the water level;

hydraulic fluid disposed in said hydraulic cylinder chamber;

a hydraulically powered turbine;

suitable hosing connecting said multitude of hydraulic cylinders in parallel hydraulic relationship;



suitable hosing connecting said parallel connected cylinders to each hydraulic turbine for driving the same by transmitting hydraulic fluid therethrough from said cylinder through said turbine and back to said cylinders;

a pressure control valve disposed in said hosing for maintaining accurate flow of the fluid pressure therethrough to assure a constant pressure and volume of fluid to be delivered to said hydraulic turbine;

a first valve associated with an inlet to said turbine being of a one-way valve construction only permitting fluid to enter said inlet;

a second valve associated with an outlet of said turbine and being of a one-way structure to only permit fluid to exit from said outlet;

valve means associated with said hosing to provide for fluid direction from said hydraulic cylinders to said turbine in a manner such that fluid always enters said inlet and exits from said outlet during both the inward and outward stroke of said piston rod from said associated cylinders; and

an electrical generator mechanically connected to a shaft of said hydraulic turbine to be drivingly rotated thereby for generation of electrical energy;

wherein said flotation chamber is of a rectangular box-like configuration having a flat bottom surface, a flat top surface, opposed side wall surfaces, and opposed end wall surfaces; said flotation chamber being floatingly supported in said basin area; and

wherein said lever arm assemblies each comprise:

a pair of laterally spaced apart collar members affixed to said flotation chamber top surface;

a first lever arm slidingly received through said collar members for lateral sliding reciprocal movement relative thereto and having an inner end and an outer end, said inner end disposed inwardly of said flotation chamber with said outer end projecting laterally outwardly over a side edge of said flotation chamber and inwardly of said basin area;

a second lever arm of an elongated rigid structure having an inner end and an outer end;

pivot means connecting said second lever arm inner end to said first lever arm outer end;

said stationary pivot fulcrum mounted outwardly of said basin area in longitudinal alignment with said first and second lever arms and spaced inwardly of said outer end of said second lever arm and pivotally secured thereto for pivotal support thereof;

vertical upward and downward movement of said flotation chamber effecting lateral sliding movement of said first lever arm which, in turn, effects pivotal movement of said second lever arm about said stationary pivot fulcrum to effect the pivotal movement of said outer end in an upward and downward direction thereabout; and

wherein each of said piston rods and associated hydraulic cylinders comprises:

a hydraulic cylinder of an elongated cylindrical vertical configuration having a closed top end, a closed bottom end, and cylindrical side walls;

an elongated cylindrically spaced chamber defined interiorly of said cylinder;

a flat disc shaped piston disposed normal to the axis of the cylinder and positioned in said compartment for sliding guided movement therethrough;

an elongated rod shaped piston rod having a top end portion and a bottom end portion;

said bottom end portion being of a solid cylindrical configuration having its bottom end affixed concentrically to said piston and projecting outwardly of said cylinder top end and terminating at a juncture point with said top end portion;

said top end portion being of a flattened stock material having a flat back surface and a flat front surface diametrically opposed to said back surface;

said flat front surface provided with a continuous row of a rack of gear teeth completely therealong to the top end thereof;

a first valve disposed in said cylinder adjacent said top end thereof and in communication with said compartment;

a second valve disposed in said cylinder adjacent said bottom end thereof and in communication with said compartment;

said cylinder being of a double-acting cylinder type for pumping hydraulic fluid from said cylinder compartment on both a downstroke and upstroke of said piston;

and further characterized by a vertically disposed supporting bracket associated with each of said piston rods, each of said lever arm outer ends, and each of said drive gear trains;

a vertically aligned spaced apart series of roller guides rotatively affixed to said bracket with said rollers in guiding roller engagement with said back surface of said piston rod for guiding the vertical reciprocal movement of said piston and top end portion therealong;

a pair of tooth pinion gears rotatively affixed to said bracket in vertical alignment with each other and spaced horizontally from said roller guides, said teeth of said pinion gears engaging said rack teeth on said front surface of said top end of said piston rod to guide the same therealong and retain said piston rod captured for accurate vertical reciprocal movement between said pinion gears and said roller guides;

a first drive gear having gear teeth about its periphery in

meshing engagement with said rack of teeth on said piston rod and disposed intermediate said pinion gears;

a second drive gear having gear teeth about its periphery disposed in meshing engagement with said teeth of said first drive gear;

an arcuate segment gear affixed to said outer end of said second lever arm along a diametric axis thereof and having a row of gear teeth disposed along the arcuate outermost periphery thereof, said segment gear teeth being disposed in meshing engagement with said gear teeth of said second gear;

said first and second gears being of a size relative to each other to receive a small movement of said segment gear and increase the effectiveness of said movement when driving said top end portion of said piston rod in a manner to provide said increase of the magnitude of the stroke of said piston rod relative to the fluctuation of the water level.

4,009,396

WAVE OPERATED POWER PLANT

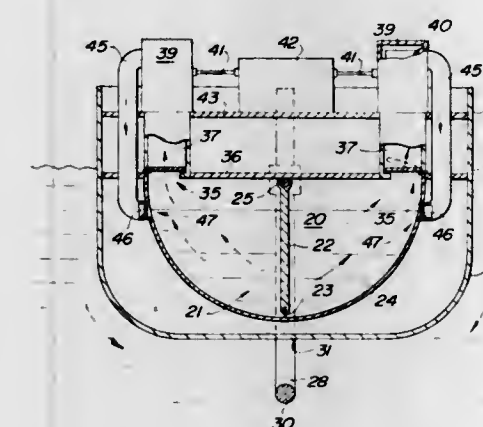
Henry A. Mattera, 736 Fern St., Yeadon, Pa. 19050; Paul F. Pitts, and Marlene M. Pitts, both of 245 Merion Ave., Aldan, Pa. 19018

Filed Nov. 19, 1975, Ser. No. 633,397

Int. Cl.² F03B 13/12

U.S. Cl. 290—53

4 Claims



1. A wave operated power plant which comprises a vessel having a hull

a chamber carried within said hull, and having a quantity of liquid therein,

a vertically extending pipe extending upwardly from the top of said chamber for liquid delivery,

liquid actuated motive power means to which said pipe is connected,

a return pipe connected to said motive power means for the return of the liquid to said chamber,

electric generator means driven by said motive power means,

a sweep rotatably mounted within said chamber by a shaft extending the length of said vessel, which sweep forces the water into said pipes by motion of said vessel, and weight means carried by said shaft under said vessel.

4,009,397

LOGIC CIRCUIT

Cornelis Mulder, Beekbergen, and Henricus Elisabeth Jozef Wulms, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,472

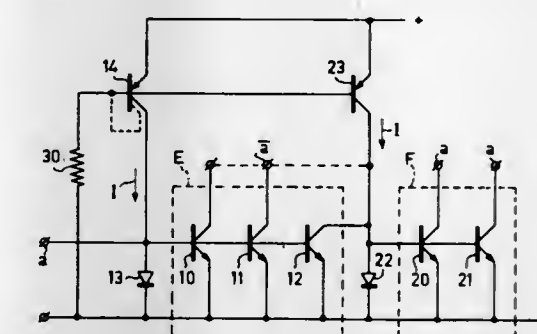
Claims priority, application Netherlands, Nov. 1, 1974, 7414273

Int. Cl.² H03K 19/08

U.S. Cl. 307—203

6 Claims

1. A logic gate circuit, comprising a first group of transistors each having emitter, base and collector, means connecting in



parallel one of the base-emitter and collector-emitter paths of the transistors in the first group, a second group of transistors each having emitter, base and collector, means connecting in parallel the base-emitter paths of the transistors in the second group to the collector-emitter path of at least one of the transistors of the first group, a current source for biasing the transistors of the first group and coupled to a common connection point of the emitters of the transistors of the first group, a current source for biasing the transistors of the second group and coupled to a common connection point of the emitters of the transistors of the second group, each of the bases of the transistors of the first and the second group being connected respectively to the current source for the transistors of the first and the second group, and means providing between the base and the emitter of each of the transistors of the first and second groups a current path for sinking a part of the current which is supplied by the current source which is connected to the base of each said transistor when each said transistor is in the conductive state.

4,009,398

SAWTOOTH WAVE FORM CIRCUIT

Kouichi Yamada, Higashiosaka; Tatsuo Mizota, Kadoma; Kiyoshi Takeda, Katano, and Kunio Aoki, Toyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 30, 1975, Ser. No. 582,192

Claims priority, application Japan, June 4, 1974, 49-63554

Int. Cl.² H03K 4/08, 4/48

U.S. Cl. 307—228

2 Claims

1. A sawtooth wave forming circuit which comprises a first and a second transistor connected as a differential amplifier, a bias source coupled to the bases of the first and the second transistors, which determines base current and voltage applied on the transistors, a switching circuit connected to the differential amplifier for alternately giving to the first and the second transistors the base current and voltage from the base source, a constant current circuit connected between a power source and the collectors of the differential amplifier for letting flow in the second transistor a current equal to or proportional to the current flowing in the collector of the first transistor, and a capacitor connected between ground and the connection between the constant current circuit and the second transistor of said differential amplifier, whereby the charge-discharge of the capacitor is controlled by means of the current and voltage from the bias source.

4,009,399

GATED RAMP GENERATOR

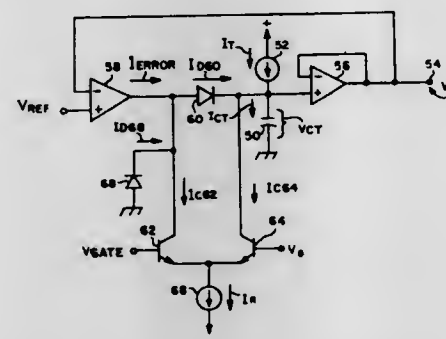
Bruce Edward Hofer, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 512,633, Oct. 7, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,584

Int. Cl.² H03K 4/08

U.S. Cl. 307-228

5 Claims



1. A gated ramp voltage generator, comprising: a current source for providing a first current; capacitor means connected to said current source for developing the ramp voltage thereacross in response to current applied thereto; comparator means having a first input coupled to receive the ramp voltage and a second input connected to a reference voltage source, said comparator means producing a second current at the output thereof which is proportional to the difference in amplitude between the ramp voltage and said reference voltage; and current steering means coupled to both said capacitor means and said comparator means for steering to said capacitor means said first and said second currents to produce the ramp voltage, said current steering means including means for gating said first and said second currents to cause the ramp voltage developed to be a gated ramp voltage.

4,009,400

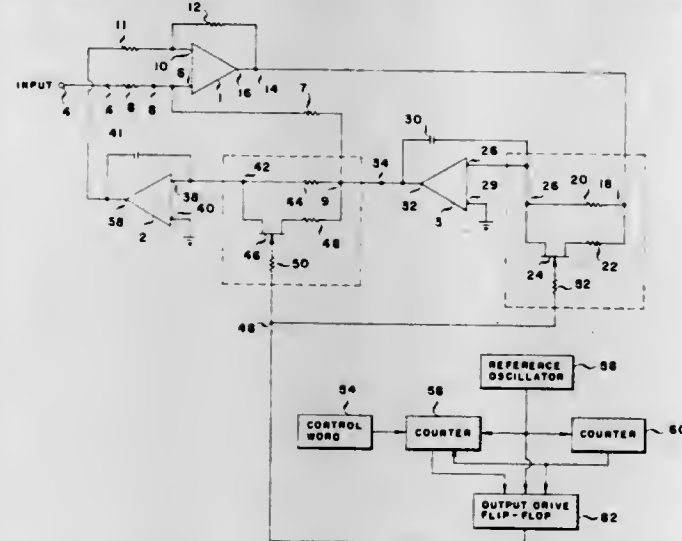
DIGITALLY CONTROLLED VARIABLE CONDUCTANCE
Richard Wayne Harris, Stockton, and Harry Thomas Lee, Sunnyvale, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Nov. 28, 1975, Ser. No. 636,106

Int. Cl.² H03K 9/06, 17/60

U.S. Cl. 307-233 A

5 Claims



1. The digitally controlled variable conductance comprising: a first resistance means connected between said first and second terminal; a second resistance means and a switching means, said

second resistance means and said switching means connected in series and connected between said first and second terminal; said switching means further defined as including a control terminal; digital means operatively connected to said control terminal to control the conductance of said variable conductance; said digital means includes a means for receiving a control word, a reference oscillator, a first counter, a second counter, and an output drive flip-flop; said reference oscillator connected to said first and second counters to provide a reference timing; said second counter generating an on signal that sets the said flip-flop to a conductive state and triggers said first counter to load the control word, whereby said switching means is turned on when said flip-flop is in the conductive state and is turned off when the first counter counts down to zero.

4,009,401

FADE-IN AND FADE-OUT SWITCHING CIRCUIT

Masanobu Sasaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,371

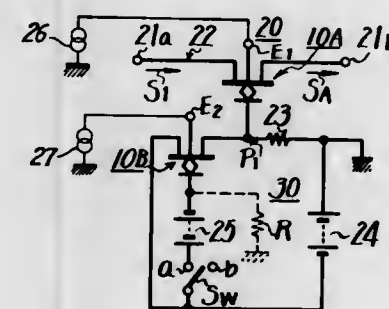
Claims priority, application Japan, Sept. 7, 1973, 48-100870

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² H03K 17/60

U.S. Cl. 307-251

8 Claims



1. A switching circuit comprising first and second semiconductor devices each including a semiconductor substrate having a current path portion, first and second semiconductor regions forming a PN-junction therebetween, said first region being capacitively coupled to said current path portion, a control electrode connected to said second region, first and second terminals electrically connected to both ends of said current path portion respectively, a signal input terminal electrically connected to said first terminal of said first semiconductor device, an output terminal electrically connected to said second terminal of said first semiconductor device, means for connecting said control electrode of said first semiconductor device to said first terminal of said second semiconductor device, means for applying a bias voltage to said second terminal of said second semiconductor device, switch means for selectively applying a bias voltage to said control electrode of said second semiconductor device and neutralization means operative on at least one of said first and second semiconductor devices for injecting carriers into said first region of said device to independently control a fade-in and fade-out time.

4,009,402

TIME EXPANDER CIRCUIT FOR A FREQUENCY-TO-DIGITAL CONVERTER

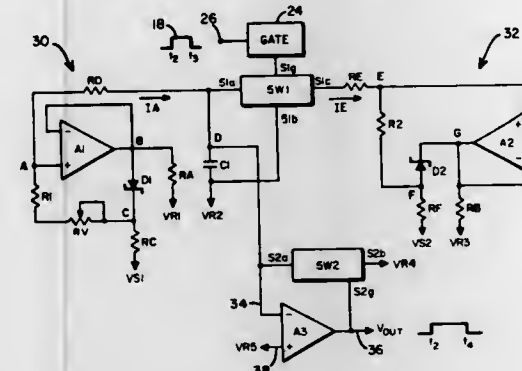
Floyd V. Miller, Richfield, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,143

Int. Cl.² H03K 1/18, 17/60

U.S. Cl. 307-267

3 Claims



1. A time expander circuit, comprising: a current source; a current sink; first switch means; second switch means; capacitor means; means for continuously coupling said current source to a first node; means for coupling a first terminal of said capacitor means to said first node; means for coupling a second terminal of said capacitor means to a first reference voltage; means for coupling a first terminal of said first switch means to said first reference voltage; means for coupling a second terminal of said first switch means to said first node; means for coupling a first terminal of said second switch means to said first node; means for coupling said current sink to a third terminal of said first switch means; comparator means coupling said first node to a second reference voltage for establishing the maximum voltage potential of said first node at said second reference voltage; means coupling a gating pulse, having a duration T, to a fourth terminal of said first switch means for selectively closing said first switch means only during said duration T and selectively switching said current sink from said first reference voltage to said first node only during said duration T; said gating pulse of duration T controlling said comparator means for generating, at an output terminal of said comparator means, an output signal V_{OUT} whose duration θ is a predetermined, time expanded multiple of said gating pulse duration T.

4,009,403

LOW GAIN PULSE GENERATING CIRCUIT

John O. G. Darrow, Murrsville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 16, 1975, Ser. No. 578,350

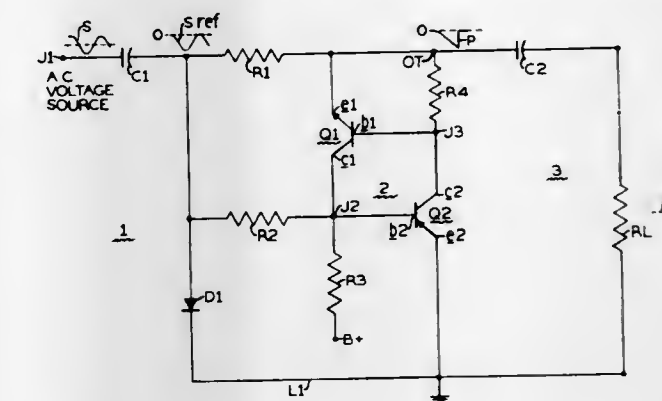
Int. Cl.² H03K 5/01, 6/06

U.S. Cl. 307-268

10 Claims

1. A low gain pulse generating circuit comprising, a source of alternating current voltage, a bistable semiconductive trigger circuit having an input and an output including means for biasing said trigger circuit for operating said pulse generating circuit at near unity gain, said input of said semiconductive trigger circuit coupled to said source of alternating current voltage, and a differentiating circuit coupled to the output of said semiconductive trigger circuit for producing a narrow

voltage pulse during one alternation of each cycle of said alternating current voltage, and said narrow voltage pulse



having an amplitude which is incapable of being larger than the magnitude of said alternating current voltage due to the low gain exhibited by said pulse generating circuit.

4,009,404

MONOSTABLE MULTIVIBRATOR HAVING MINIMAL RECOVERY TIME

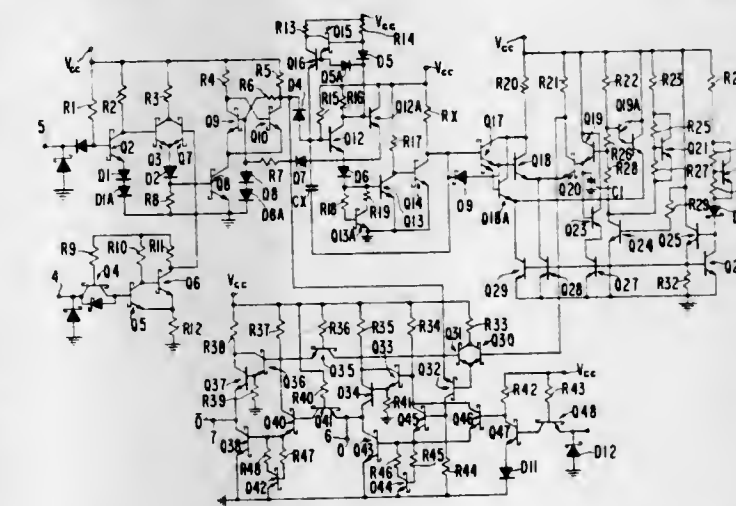
James Ren-Jke Kuo, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Oct. 6, 1975, Ser. No. 619,752

Int. Cl.² H03K 3/10

U.S. Cl. 307-273

6 Claims



1. A monostable multivibrator with improved timing control comprising: a. a pair of transistors interconnected whereby one transistor is conductive when the other transistor is nonconductive and wherein said transistors have a stable state and an unstable state, b. resistive-capacitive means interconnected with said pair of transistors for establishing the time period of said unstable state, c. means operably connected with said transistors for triggering said pair of transistors to said unstable state and effecting a discharge of said resistive-capacitive means, said pair of transistors reverting to said stable state when said resistive-capacitive means discharges to an established voltage level whereupon said resistive-capacitive means begins recharging, d. voltage comparator means operably connected to said resistive-capacitive means for comparing the voltage charge of said resistive-capacitive means with a reference voltage and developing an output signal responsive to said comparison, and e. means operably connected to said resistive-capacitive means for accelerating the discharge of said resistive-capacitive means whereby the recharge time period is much longer than the discharge time period, including a Darlington circuit interconnected with said means for

triggering and said resistive-capacitive means whereby said resistive-capacitive means discharges through said Darlington circuit.

4,009,405

VERTICALLY MOUNTABLE DYNAMOELECTRIC MACHINE HAVING AN IMPROVED VENTILATING COOLANT FLOW CONTROL STRUCTURES

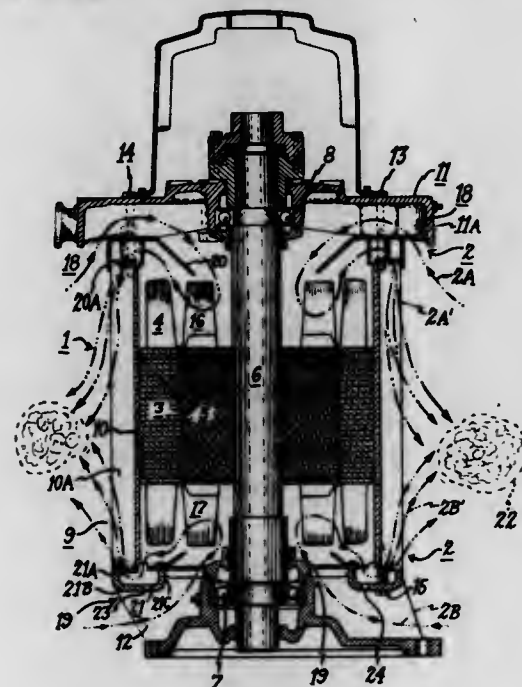
Robert F. Gleichman, San Jose, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,605

Int. Cl.² H02K 9/00

U.S. Cl. 310-58

9 Claims



1. A vertical electric motor having a ventilation means that controls the mixing of intake air and exhaust air used as a motor coolant, comprising:

a laminated stator, a stator winding mounted on the stator, a rotor mounted on an axial shaft journaled for rotation within the stator, and a housing including a central cylindrical element disposed about the stator and extending beyond both ends of the stator winding and further including first and second end caps mounted respectively on the top and bottom ends of said central element.

a pair of generally equivalent-volume fans mounted, respectively, on opposite ends of said rotor, said fans being effective when rotated to draw air into the housing through passageways formed at least partially by said end caps and being further effective to force air from the housing through exhaust ports,

a motor ventilation means comprising means defining first air inlet passageways between the top end cap and the central housing element, and means defining second air inlet passageways through the bottom end cap, said first air inlet passageways in combination being in the range of about 10 to about 60 percent larger in cross-sectional area than the combined cross-sectional area of said second air inlet passageways, said first air inlet passageways being arranged to receive air flowing axially upward along the top, outer end of said central housing element, and said second air inlet passageways being arranged to receive air flowing radially inward with respect to the bottom, outer end of the cylindrical surface of said central housing element, and first and second annular baffles mounted respectively adjacent the top and bottom ends of the central housing element to direct air forced from the housing to flow in generally axially directed streams along the exterior surface of said central housing element, said ventilation means being effective to cause streams of air exhausted from the top and bottom ends of said motor to become mixed at a region adjacent the central housing

element substantially closer to the bottom of the motor than to the top thereof, whereby a major portion of the turbulent hot exhaust air in said mixing region is prevented from undesirably pre-heating air entering the axially disposed inlet passageways adjacent the top of the motor.

4,009,406

SYNCHRONOUS MICROMOTOR WITH A PERMANENT MAGNET ROTOR

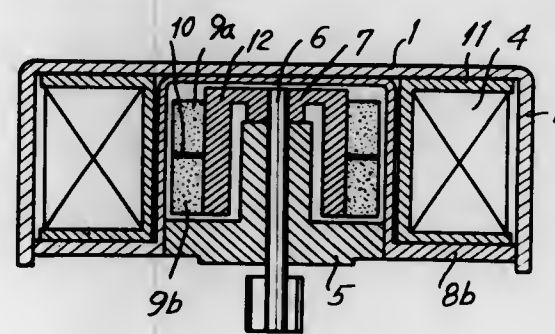
Tokuo Inariba, c/o Room No. 906, Kamiyama Mansion, No. 2-9, Kamiyama 4-chome, Setagaya, Tokyo, Japan

Filed Nov. 25, 1975, Ser. No. 635,232

Int. Cl.² H02K 21/14

U.S. Cl. 310-164

12 Claims



1. In a synchronous micromotor, an assembly forming an AC magnetic circuit having no gap, said assembly including annular coil means coaxially surrounding a predetermined axis, a casing of soft magnetic material having a transverse wall extending perpendicularly across said axis and a cylindrical wall extending from a peripheral edge of said transverse wall and surrounding said coil means, and an inner cylindrical stator component of soft magnetic material also coaxially surrounding said axis and situated within and surrounded by said coil means while being located closely adjacent thereto, said cylindrical component being connected at one end to an inner transverse wall of soft magnetic material extending along and engaging said transverse wall of said casing and at an opposite end to an outwardly directed flange projecting outwardly from said cylindrical stator component and having an outer peripheral edge fixed to an inner surface of said cylindrical wall of said casing with said coil means being situated between said flange and said transverse wall of said casing, said flange also being made of a soft magnetic material, so that said coil means, casing, cylindrical stator component, transverse wall fixed to said one end thereof and flange fixed to said other end thereof cooperate to form said AC magnetic circuit assembly which has no gap, and a rotor including an annular permanent magnet means coaxially surrounding said axis and situated coaxially within said cylindrical stator component while defining a small gap therewith, and support means connected with said permanent magnet means to support the latter for rotation about said axis, said cylindrical stator component being formed with a series of axially extending cutouts circumferentially distributed uniformly about said axis and being of a substantially elliptical configuration except for opposed ends of said cutouts, so that the latter define between themselves axially extending wall portions of said cylindrical stator component which are substantially of an hourglass configuration and have central regions where their circumferential width is smaller than at any other regions thereof.

4,009,407

SEGMENTED ELECTRODE TYPE GAS DISCHARGE DISPLAY PANEL WITH MERCURY GIVER MEANS

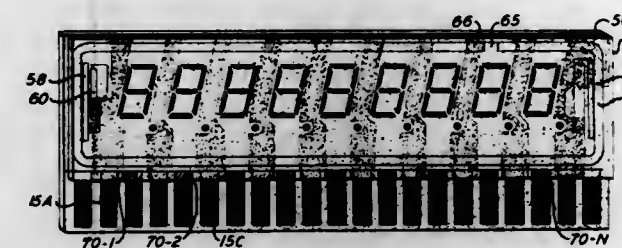
George A. Kupsky, State College, Pa., assignor to Panel Technology, Inc., Lewistown, Pa.

Filed July 30, 1974, Ser. No. 492,992

Int. Cl.² H01J 61/24, 61/30, 61/66

U.S. Cl. 313-177

1 Claim



1. In combination with a gas discharge information display panel device having a sealed envelope constituted by a pair of insulating plates, one of said insulating plates having a viewing window for viewing the information displayed in the panel, a gas in said envelope and electrodes carried on the surfaces of said pair of insulating plates for selectively activating said gas, a laser energy activatable mercury giver means, said giver means being a non-metallic mercury carrier which is physically positioned between said plates, a pair of spaced laser energy transparent windows in said plates of said sealed envelope, said laser energy activatable giver means being physically located between said pair of laser energy transparent windows, and dielectric means retaining said giver means in position between said pair of spaced insulating plates and spaced from said electrodes, said panel having a discharge gap of about twenty thousandths of an inch,

said giver means being constituted by a filamentary hollow glass tube element consisting of a laser energy transparent glass having an outside diameter under about twenty thousandths of an inch and of a selected length, said filamentary tube element being sealed at both ends and filled with elemental mercury, the length of said tube and the internal cross-sectional area of a hollow portion thereof being selected to contain a predetermined quantity of said mercury in a liquid state.

4,009,408

HIGH-PRESSURE SODIUM-VAPOR DISCHARGE LAMP

Nhiop Nguyen Dat, Chatenay Malabry; Maurice Bensoussan, Sevrès, and Bernard Doucet, Colombes, all of France, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,715

Claims priority, application France, Dec. 16, 1974, 74.41317

Int. Cl.² H01J 61/00

U.S. Cl. 313-198

4 Claims

1. An improved high-pressure sodium-vapor discharge lamp of the type having a pair of discharge electrodes defining a first discharge space within a refractory discharge envelope, and an auxiliary electrode defining a second discharge space relative to the discharge electrodes, wherein the improvement comprises:

forming the auxiliary electrode from a refractory metal spiral wound on an insulating rod supported within the lamp envelope having an electrical resistance value between 10 ohms and 10,000 ohms whereby the lamp starts between said auxiliary electrode and one of said discharge electrodes when the lamp is cold, and operates between the discharge electrodes when the lamp is hot.

4. A method for manufacturing an improved high-pressure sodium-vapor discharge lamp of the type having an auxiliary electrode in combination with two discharge electrodes within a lamp envelope including the steps of: providing a refractory metal spiral on an insulating rod, said spiral having a resistance value from 500-700 ohms;

mounting said insulated rod within said discharge envelope, said resistive spiral proximate one of said discharge electrodes for providing lamp starting therebetween said electrodes when the lamp is cold;



filling said lamp with a sodium compound and an inert gas; and sealing said lamp to atmosphere.

4,009,409

FAST WARMUP CATHODE AND METHOD OF MAKING SAME

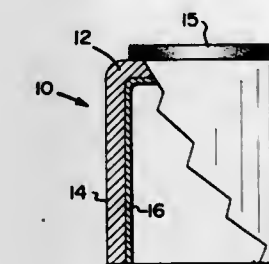
William E. Buescher, Seneca Falls, and Donald R. Kerstetter, Emporium, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 2, 1975, Ser. No. 609,447

Int. Cl.² H01J 1/20, 19/14

U.S. Cl. 313-337

6 Claims



1. An indirectly heated cathode for an electron discharge device comprising: a formed substrate of a material selected from the group of nickel and cathode nickel alloys, said formed substrate having an outer surface and an inner surface, at least an area of said outer surface being formed to receive an electron emissive material; and a coating of vacuum deposited magnesium on said inner surface, said vacuum deposited magnesium having a darker color than said outer surface after firing at a temperature above the melting point of said vacuum deposited metal.

4,009,410

CATHODE-RAY TUBES ELECTRON-GUNS

Claude Pommier, and Andre Albertin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sept. 20, 1973, Ser. No. 399,095

Claims priority, application France, Sept. 26, 1972, 72.34000

Int. Cl.² H01J 29/50

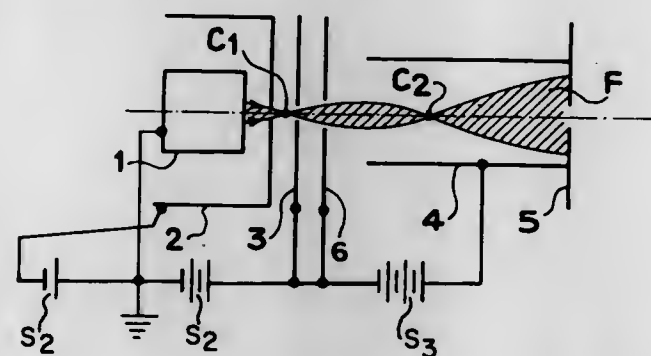
U.S. Cl. 313-411

4 Claims

1. An electron-gun for cathode ray tubes, comprising: a cathode for emitting an electron-beam; an apertured modulating electrode; means for connection to a biasing source for biasing said modulating electrode

negatively relative to said cathode; said modulating electrode controlling the intensity of said electron-beam; accelerator means comprising an apertured accelerator grid and at least one cylindrical anode; the central aperture of said accelerator grid having substantially the same dimensions as the central aperture of said modulating electrode; said cylindrical anode being terminated at its end opposite to said cathode in a diaphragm which is maintained at the same potential as said anode;

means for connecting said accelerator grid and said at least one cylindrical anode to a biasing source for positively biasing said grid and anode relative to said cathode, and with said cylindrical anode being more positive than said accelerator grid;



said modulating electrode constituting with said accelerator grid a first condenser lens producing a first cross-over (C1) in said electron-beam and

at least one supplementary electrode of the diaphragm type, arranged between said accelerator grid and said anode, the central aperture of said supplementary electrode having dimensions slightly greater than those of the central aperture of said modulating electrode, and said supplementary electrode being connected to connecting means for biasing said electrode at a potential positive relative to said cathode and lower than that of said anode; said supplementary electrode constituting with the adjacent opening in said anode, a second condenser lens forming a second cross-over (C2) in said electron beam.

4,009,411

ALIGNMENT MEANS FOR ELECTRON GUN STRUCTURES

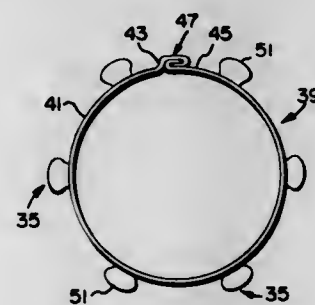
Peter George Puhak, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 20, 1976, Ser. No. 659,706

Int. Cl.² H01J 29/02, 29/82

U.S. Cl. 313-456

5 Claims



1. Means for aligning an electron gun assembly within a cathode ray tube having a longitudinal axis, said alignment means being formed for attachment to said gun assembly having a terminal electrode element including a substantially cylindrical sidewall portion oriented within the substantially cylindrical neck region of said tube, said electron gun alignment means comprising:

a one-piece band-like metallic base member having opposing ends discretely joined in an adjustable loose, lock seam jointure to form a closed and substantially circular

unit having limited end related movement and an internal circumferential dimension slightly greater than the related external dimensioning of said electrode to facilitate the telescopic placement and circumferential matching of said circular base member upon said terminal electrode and expedite bonding of said base member to the sidewall of said electrode at a plurality of spatially related points therearound thereby effecting circumferential adjustment and attachment of said encompassing base member thereupon; and

a plurality of spaced apart arm-like spacer contact projections extending from said band-like member in a manner substantially normal thereto to form a crown-like unit, each of said projections having a shank element contiguous to said base member and an opposed integral terminal portion, said terminal portions being configured to provide substantially non-abrasive contact with the surface of said neck, said contact projections being collectively related in a spaced apart manner and substantially parallelly related to the longitudinal axis of the tube whereof said terminal portions conjunctively define a crown-like array having an external circumferential dimension greater than that of said base member and interior of said neck to effect tensioned placement of the array of said terminal portions against the encompassing neck region to thereby provide alignment of said gun assembly therein.

4,009,412

FLUORESCENT LAMP BALLAST CIRCUIT WITH MAGNETIC SWITCH

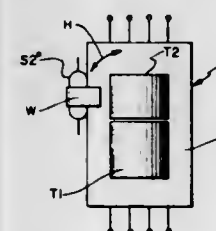
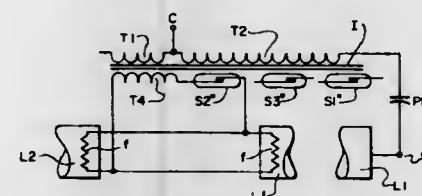
Frank M. Latassa, Magnolia, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 11, 1975, Ser. No. 640,023

Int. Cl.² H05B 41/23

U.S. Cl. 315-106

6 Claims



1. A rapid start ballast circuit for a fluorescent lamp comprising:

primary lamp terminals for carrying lamp current, secondary lamp terminals for supplying heating current to the lamp filaments,

a transformer including a primary winding for alternating line current, a secondary winding with connection for supplying lamp current to the primary lamp terminals, and a tertiary winding in a circuit to the secondary lamp terminals, and

magnetic field sensing means responsive to the magnetic field of lamp current in the secondary winding and connection, including switching means in the tertiary winding circuit for opening the tertiary circuit after the lamp starts and draws operating current from the secondary winding.

4,009,413

PLASMA JET DEVICE AND METHOD OF OPERATING SAME

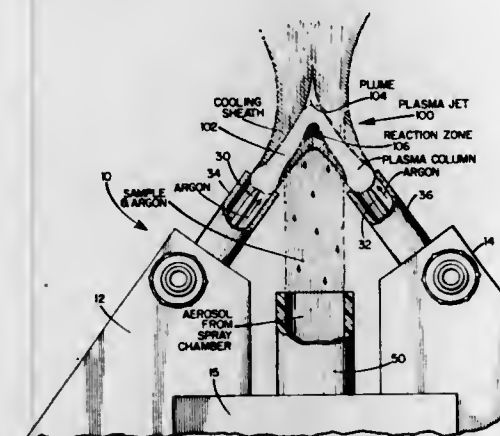
William G. Elliott, Lincoln, and Thomas J. Karlinski, Brookline, both of Mass., assignors to SpectraMetrics, Incorporated, Andover, Mass.

Filed Feb. 27, 1975, Ser. No. 553,572

Int. Cl.² G01J 3/30; H05H 1/00

U.S. Cl. 315-111.2

18 Claims



1. A plasma jet device which comprises in combination:
 - a. an anode electrode;
 - b. a cathode electrode;
 - c. the anode and cathode electrodes spaced apart and positioned such that their axes, if extended, would intersect at an angle;
 - d. first and second coaxial sleeve elements surrounding the anode and cathode electrodes, respectively;
 - e. means to flow an ionizable gas through the first and second sleeve elements and about the electrodes to form in operation a plasma jet comprising a continuous column of ionized gas between the anode and cathode electrodes, the plasma jet characterized by an inverted V-form shape and a reaction zone in the plasma jet at the lower region of the intersection of the extended axes of the electrodes; and
 - f. external and separate means to introduce a sample material directly into the reaction zone of the plasma jet.

4,009,414

BAR DISPLAY WITH SCALE MARKERS

Charles Paul Bockett-Pugh, Bracknell, England, assignor to Honeywell Inc., Minneapolis, Minn.

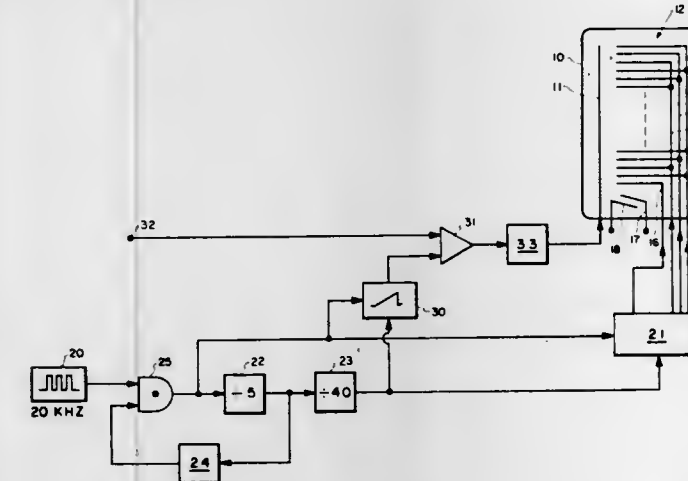
Filed Nov. 24, 1975, Ser. No. 634,761

Claims priority, application United Kingdom, Nov. 27, 1974, 51325/74

Int. Cl.² H05B 37/00

U.S. Cl. 315-169 R

4 Claims



1. A bar display system comprising:
 - a bar display device having a multiplicity of electrodes

arranged in a column and connected in at least three interdigitated sets;

a clock signal generator;

a display drive circuit driven by the clock signal generator for energizing each set of electrodes in sequence;

a ramp signal generator operated in synchronism with the energization of the bar display device;

a comparator for comparing an input signal with the ramp generated by the ramp signal generator;

display control means for changing the energization of the display when the output of the comparator changes; and

scale marker means comprising a divide-by-n circuit which is driven by the clock signal generator and the pulses from which modify the energization of the display.

4,009,415

PLASMA PANEL WITH DYNAMIC KEEP-ALIVE OPERATION UTILIZING A LAGGING SUSTAIN SIGNAL

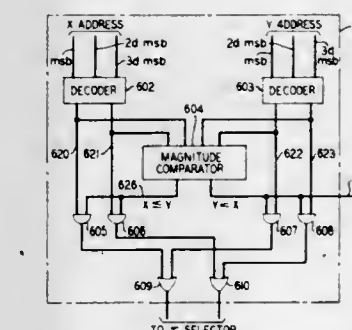
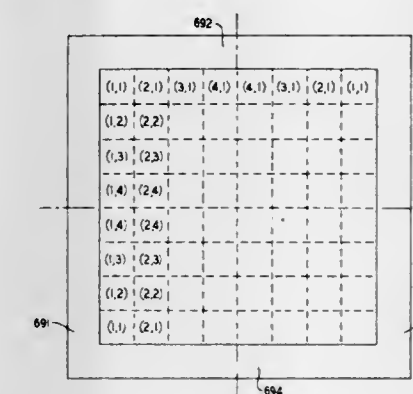
Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 24, 1975, Ser. No. 634,373

Int. Cl.² H05B 41/14

U.S. Cl. 315-169 TV

10 Claims



1. A display system comprising
 - a plurality of display sites, each capable of existing in at least two states,
 - circuit means for applying addressing signals to selected ones of said sites,
 - at least one selectable external priming source disposed in an operative relation to said display sites for enhancing the effect of said addressing signals on said selected sites, and
 - circuit means for selectively initiating the activation of at least said one priming source during a designated intermediate portion of an individual one of said addressing signals, said designated intermediate portion being determined by the position of a selected display site relative to the position of at least said one priming source.

4,009,416

METHOD FOR OPERATING A GASEOUS DISCHARGE LAMP WITH IMPROVED EFFICIENCY

Frank Eugene Lowther, Severna Park, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed July 10, 1975, Ser. No. 594,790

Int. Cl.² H05B 41/16, 41/30

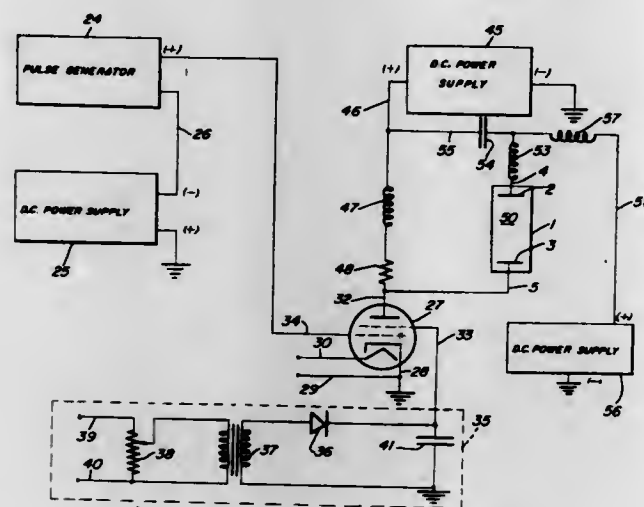
U.S. Cl. 315-176

8 Claims

1. In a method for producing light from a gas filled tube

wherein electrical energy is applied to the electrodes of said tube at a potential in excess of the ionization potential, the improvement which comprises:

- a. dissipating pulsed electrical energy between the electrodes of said tube, wherein the pulses have a potential in



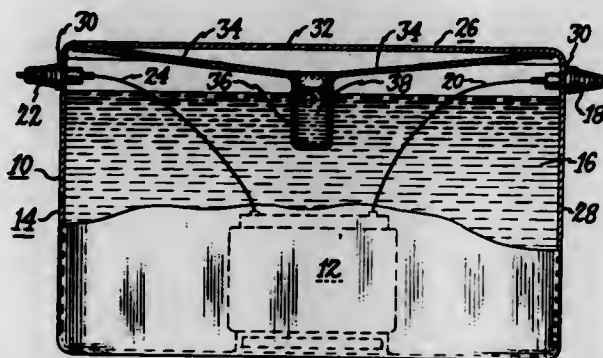
excess of the ionization potential, a duration of less than the gas ion transit time between the electrodes, and greater than the electron transit time; and
b. maintaining a low voltage bias potential across the electrodes less than said ionization potential to remove gas ions from between the electrodes.

4,009,417

ELECTRICAL APPARATUS WITH HEAT PIPE COOLING
Paul L. Waldon, and Ronald E. Bennett, both of Hickory, N.C.,
assignors to General Electric Company, New York, N.Y.
Filed Jan. 27, 1975, Ser. No. 544,037
Int. Cl.² H02H 7/04

U.S. Cl. 361-38

4 Claims



1. An electrical apparatus including an enclosure with a heat generating unit mounted therein and immersed in a dielectric fluid, a portion of said enclosure being hollow and forming a heat pipe, said hollow portion of said enclosure including an evaporator section which extends into said fluid dielectric and a condenser section forming an exterior wall of said enclosure, said hollow portion containing a working fluid.

4,009,418

ATTACHMENT OF HEAT PIPES TO ELECTRICAL APPARATUS

Ronald E. Bennett, Conover, N.C., assignor to General Electric Company

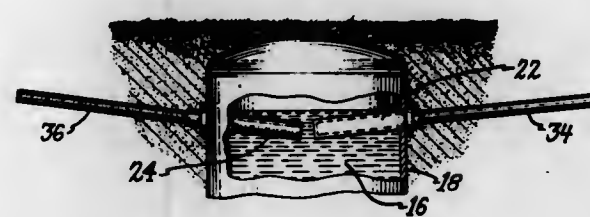
Filed Mar. 20, 1975, Ser. No. 560,127
Int. Cl.² H02H 7/04

U.S. Cl. 361-38

4 Claims

1. An electrical apparatus including an enclosure with a heat generating unit mounted therein and immersed in a dielectric fluid;
at least one attachment well secured to said enclosure, a

heat pipe mounted in said attachment well the evaporator section of said heat pipe extending into said attachment



well and a condenser section extending away from said enclosure.

4,009,419

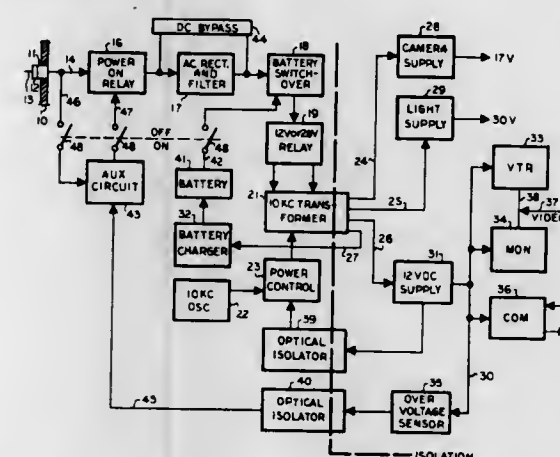
SAFETY CIRCUIT FOR VIDEO DIVER
James R. Ligman, Santa Barbara, Calif., assignor to General Aquadyne, Inc., Santa Barbara, Calif.

Filed July 16, 1975, Ser. No. 596,403

Int. Cl.² H02H 7/20

U.S. Cl. 361-91

6 Claims



1. A video circuit for divers that protects the diver from shipboard electrical malfunctions comprising:

- a. a video camera carried by the diver;
 - b. a shipboard video monitor electrically connected to the video camera for displaying video signals;
 - c. a shipboard source of electrical current;
 - d. a shipboard power supply transformer having a primary connected to said source and having a secondary connected to said video camera and said video monitor to supply power thereto;
 - e. means for varying the amount of current flow to the transformer primary;
 - f. and an optical feedback connection from the transformer secondary to the means for varying the current flow to the primary to thereby regulate the secondary output;
- whereby the diver's video camera is electrically isolated from the shipboard source of electrical current, thereby protecting the diver from accidental high voltages or currents at the source of electrical current.

4,009,420

SOLID STATE POWER CONTROLLER
Emilio Martinez-dePison, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1975, Ser. No. 574,129

Int. Cl.² H02H 3/24

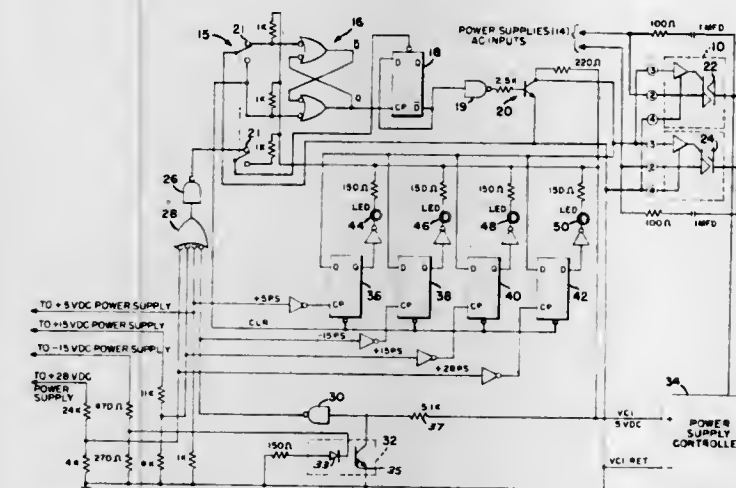
U.S. Cl. 361-88

5 Claims

1. A solid state control circuit for controlling the application of an AC source to a plurality of power supplies comprising:

- a. a source of AC voltage;
- b. a solid state relay means having a pair of load terminals and a control terminal;
- c. a plurality of load circuits connected in circuit with said load terminals to said AC source;

- d. bistable flip-flop circuit means for providing first and second output signals;
- e. first circuit means coupled to said bistable flip-flop circuit means and being responsive to said first output signal for generating a control signal for causing said relay to conduct and provide AC current to said loads;
- f. said first circuit means being responsive to said second output signal for turning off said relay;



- g. second circuit means coupled between each of said plurality of load circuits and said bistable flip-flop circuit means for providing an output pulse in response to a power supply failure in any one of said load circuits to cause said bistable flip-flop circuit to generate said second output signal.

4,009,421

STATION PROTECTOR WITH A THREE-ELECTRODE GAS TUBE ARRESTER

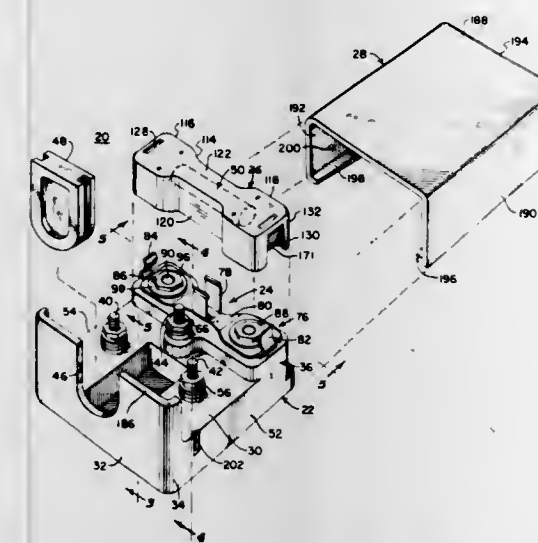
Frank G. Splitt, Arlington Heights, and Eric A. Scheithauer, Chicago, both of Ill., assignors to Cook Electric Company, Morton Grove, Ill.

Continuation of Ser. No. 516,286, Oct. 21, 1974, abandoned.
This application Dec. 1, 1975, Ser. No. 636,798

Int. Cl.² H02H 3/22

U.S. Cl. 361-119

26 Claims



1. A circuit protector for protecting telephone lines by means of an arrester having a pair of line electrodes and a ground electrode, and protector comprising
a substantially nonconductive base having line terminals to be coupled to said telephone lines, a ground terminal and an arrester mounting section,
line contact means in said base coupled to said line terminals and extending into said arrester mounting section,
grounding means in said base coupled to said ground terminal and extending into said arrester mounting section,
a ground clip assembly disposed in said arrester mounting section, said ground clip assembly having arrester holding

means coupled to said grounding means and contact assembly means which has movable contact means coupled to said line contact means and selectively movable to be coupled to said grounding means, and
an arrester module having a case into which is insertable said arrester and having arrester contact means fusibly linked to said line electrodes, said case being retained in said arrester mounting section such that said ground electrode is coupled to said grounding means by said arrester holding means and said arrester contact means is coupled to and controls the movement of said movable contact means.

4,009,422

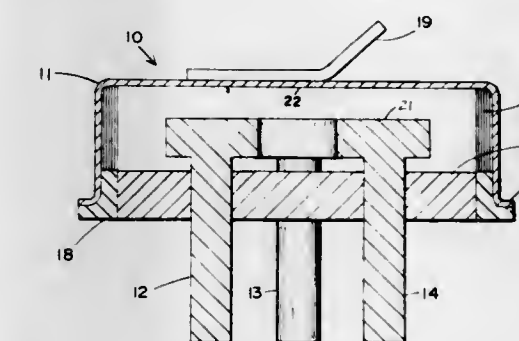
LIGHTNING ARRESTER CONSTRUCTION
Ernest L. Woodfill, Minneapolis, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed July 21, 1975, Ser. No. 597,594

Int. Cl.² H02H 3/22

U.S. Cl. 361-120

1 Claim

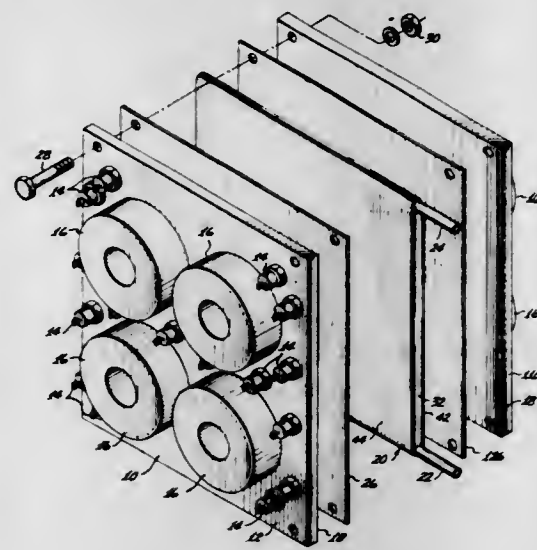


1. A lightning arrester for preventing electrical surges comprising:

a cylindrical conducting cup-shaped housing having a flat surface and a side wall extending from said flat surface, said side wall having an edge, said side wall further having an inner and outer surface, said cylindrical housing having an external lead for connecting to an external ground; an insulating member for mounting within said edge of said side wall; a sealing ring extending around said cylindrical housing and said insulating member so that said cylindrical housing and said insulating member coact to thereby provide a hermetically sealed chamber in said cylindrical housing; an inert gas located in said hermetically sealed chamber and operable for ionization upon application of an electrical surge; a plurality of at least four electrodes each having a flat surface, said plurality of electrodes extending through said insulating layer so that said flat surface of each of said electrodes is located in the sealed chamber of said cylindrical housing, said flat surface and said plurality of electrodes located in a parallel equally spaced relationship from said flat surface of said cylindrical conducting housing; each of said electrodes' flat surfaces being identical to the other surfaces of said electrodes; each of said flat surfaces being circular in diameter, said electrodes and said surfaces spaced on a circle which is concentric with said cylindrical housing and each of said electrodes spaced equal distance from one another so that an electrical surge from any of said electrodes will be discharged to the electrical ground due to ionization of the gas in the hermetically sealed chamber; a fusible material extending around the inner surface of said side wall, said fusible material operable for melting if a continuous current is sustained between any one of said flat surface of said electrodes and said flat surface of said cylindrical housing.

4,009,423
LIQUID COOLED HEAT EXCHANGER FOR ELECTRONIC POWER SUPPLIES
 Edward A. Wilson, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.
 Filed July 2, 1975, Ser. No. 592,579
 Int. Cl.² H01L 23/34
 U.S. Cl. 361—385

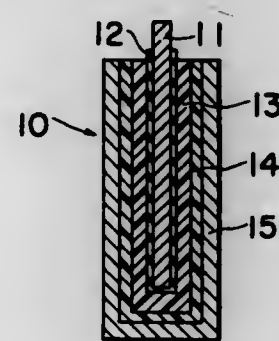
6 Claims



5. A heat exchanger comprising:
 a pair of end walls;
 a pair of tubes forming side walls;
 a pair of thin flexible walls made of a thermal conductor;
 said end walls, side walls and flexible walls forming a liquid tight chamber; and
 openings in said tubes within said chamber,
 one of said tubes adapted to be connected to a source of liquid under pressure and the other tube adapted to be connected to means through which liquid can be removed from said heat exchanger so that a liquid coolant under pressure can flow through the heat exchanger, said openings in said tubes being located so that the stream lines of fluid flowing between said tubes will have a predetermined pattern.

4,009,424
ELECTROLYTIC CAPACITOR HAVING A CONDUCTIVE GRAPHITE PARTICLES LAYER BETWEEN ORGANIC SOLID ELECTROLYTE AND CATHODE
 Yoshimasa Itoh, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
 Filed Mar. 26, 1975, Ser. No. 562,110
 Claims priority, application Japan, Mar. 26, 1974, 49-34298
 Int. Cl.² H01G 9/00; B01J 17/00
 U.S. Cl. 361—433

5 Claims

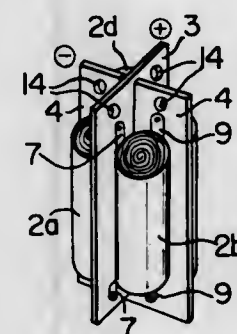


1. In an electrolytic capacitor having an anode of a valve metal covered with a dielectric film of an oxide of the valve metal, a solid electrolyte layer formed on the dielectric film, a cathode spaced from the anode and a conductive layer formed between and in intimate contact with the electrolyte layer and

the cathode, the electrolyte layer being made of a semiconductive salt of 7,7,8,8-tetracyanoquinodimethane and a polymer and formed on and in intimate contact with the dielectric film, the improvement comprising said conductive layer as a dispersion of finely powdered graphite in a thermoplastic resin amounting to from 1 to 10% by weight of said graphite, said graphite having a mean particle size ranging from 1 to 7 microns.

4,009,425
CAPACITOR WITH INTERSECTING LEAD PLATES
 Takayoshi Muranaka, Moriguchi; Hajime Yoneda, Uji, and Yoshio Miyazaki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
 Filed Feb. 12, 1976, Ser. No. 657,644
 Claims priority, application Japan, Feb. 14, 1975, 50-19248
 Int. Cl.² H01G 9/00
 U.S. Cl. 317—230

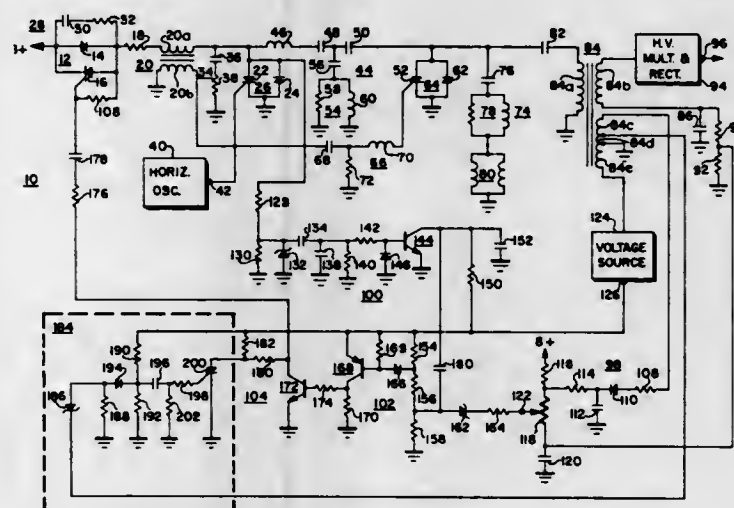
6 Claims



1. An electrolytic capacitor comprising a pair of lead plates made of conductive metal, one of said lead plates being formed with a slit extending from an intermediate portion to an upper end thereof while the other lead plate being formed with a slit extending from an intermediate portion to a lower end thereof, said pair of lead plates being assembled such that they intersect perpendicularly to each other and they are electrically isolated from each other, and a plurality of capacitor elements each comprising an anode foil and a cathode foil stacked on each other with a separator being interposed therebetween and the lamination being wound, the anodes and the cathodes of said capacitor elements being separately connected to said pair of lead plates, and an outer casing in which said capacitor elements are sealed with said capacitor elements being impregnated with electrolyte.

4,009,426
VOLTAGE REGULATOR FOR A DEFLECTION SYSTEM
 Walter Böhlinger, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.
 Filed July 10, 1975, Ser. No. 594,899
 Claims priority, application United Kingdom, May 16, 1975, 20868/75
 Int. Cl.² H01J 29/70, 29/76
 U.S. Cl. 315—408

12 Claims



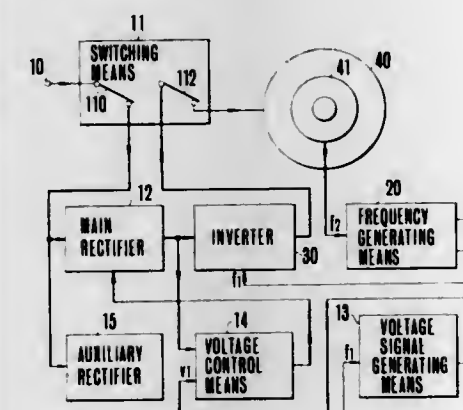
1. A voltage regulator for a deflection system including a

commutating network for storing energy during an energy storage interval of each deflection cycle and for supplying said stored energy to a deflection winding and a high voltage transformer during a commutating interval of each deflection cycle, said voltage regulator comprising:

a direct current voltage source;
 unidirectional current conducting means coupled to said direct current voltage source and said commutating network for providing a path for current flow in a first direction between said direct current voltage source and said commutating network during a first portion of said energy storage interval;
 gate controllable, unidirectional current conducting means coupled to said direct current voltage source and said commutating network for providing a path for current flow in a second direction between said direct current voltage source and said commutating network during a second portion of said energy storage interval after a predetermined level of current flows into a gate electrode of said gate controllable, unidirectional current conducting means;
 enabling means coupled to said gate electrode to provide said predetermined level of gate current during said second portion of said energy storage interval; and
 disabling means coupled to said deflection system and said gate electrode for diverting said predetermined level of gate current away from said gate electrode for an interval determined by the level of signals produced by said high voltage transformer thereby maintaining a substantially constant level of signals produced by said high voltage transformer from one deflection cycle to another.

4,009,427
ADAPTIVE CONTROL SYSTEM FOR AN ALTERNATING-CURRENT MOTOR
 Shuichi Takahashi, 1-16, Takaido-higashi 1-chome, Suminami, Tokyo, Japan
 Filed Jan. 22, 1975, Ser. No. 543,026
 Claims priority, application Japan, Feb. 25, 1974, 49-21403
 Int. Cl.² H02P 5/40
 U.S. Cl. 318—227

13 Claims

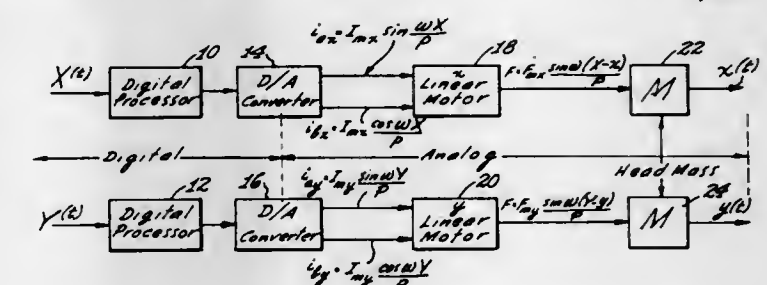


1. An adaptive control system for an alternating-current motor comprising:
 a poly-phase induction motor;
 power supply means for generating variable frequency and variable voltage poly-phase alternating-current power to be supplied to said motor;
 frequency control means for controlling said variable frequency of said power supply means;
 voltage control means for controlling said variable voltage of said power supply means in relation to said variable frequency;
 means for detecting the instantaneous velocity of said motor;
 detector means for detecting the position error of said motor in relation to a commanded position and generating a desired slip frequency signal which is proportional to said position error;

slip frequency limiter means for generating a slip frequency signal by limiting the magnitude of said desired slip frequency signal within the magnitude of the slip frequency at which the maximum torque of said motor is developed;
 means for generating a frequency signal by algebraically adding said slip frequency signal to said detected instantaneous velocity of said motor, the value of said velocity being represented by revolutions per second multiplied by the number of pole-pairs of said motor;
 frequency generating means for generating a pulse frequency determined by said frequency signal, said pulse frequency controlling said frequency control means, and said frequency generating means comprising a register means for storing a digital code representative of said frequency signal, an accumulator means for storing the integrated value of said frequency signal and delivering overflow pulses, digital adder logic circuits for periodically adding the contents of said register means to the contents of said accumulator means, and pulse counter means for dividing the frequency of said overflow pulses to generate said pulse frequency; and
 voltage signal generating means for generating a voltage signal in relation to said frequency signal as the reference signal for said voltage control means.

4,009,428
CONTROL SYSTEM FOR MAGNETIC POSITIONING DEVICE
 Bruce A. Sawyer, 20120 Allentown Drive, Woodland Hills, Calif. 91364
 Continuation of Ser. No. 36,177, May 11, 1970, abandoned.
 This application Jan. 15, 1973, Ser. No. 323,387
 Int. Cl.² G05B 19/40
 U.S. Cl. 318—571

25 Claims



1. In a system for providing a controlled relative movement between two members along a particular axis, the combination of:
 a first member,
 a second member disposed relative to the first member for displacement relative to the first member along the particular axis,
 first means for providing signals representing any desired displacements of the first member relative to the second member to any desired position along the particular axis,
 second means for providing signals having sinusoidal characteristics and having a particular phase displacement relative to each other,
 third means responsive to the signals from the first means and the signals from the second means for providing indications representing the positions at which the signals from the second means are to be shifted through a controllable angle, during the displacements of the first member relative to the second member along the particular axis, in accordance with the desired displacement represented by the first signals,
 fourth means responsive to the signals from the third means for instantaneously shifting the phase of the signals from the second means through the controllable and variable angles at the particular positions in accordance with the characteristics of the signals from the third means and for maintaining the phase shift of such signals through the controllable and variable angle for an extended distance after such particular positions to provide for controlled

variations in the magnitudes of accelerations and decelerations between the first and second members along the particular axis in accordance with the shifts in the phase of the polyphase recurrent analog signals through the controllable angles,

fifth means for varying the frequency of the signals from the second means, and

sixth means operatively coupled to a particular one of the first and second members and interacting with the other one of the first and second members and disposed in phase-displaced relationship in accordance with the phase displacement of the signals from the second means and responsive to the phase-shifted signals provided by the fourth means for imposing controlled magnitudes of acceleration and deceleration between the first and second members along the particular axis to produce continuous displacements between the first and second members along the particular axis to the desired position, the first and second members being constructed to provide a movement of the second member relative to the first member in synchronism with the recurrent characteristics of the signals from the fourth means.

4,009,429

CHARGER WITH MULTIPLE ATTACHABLE CELLHOLDER MODULES

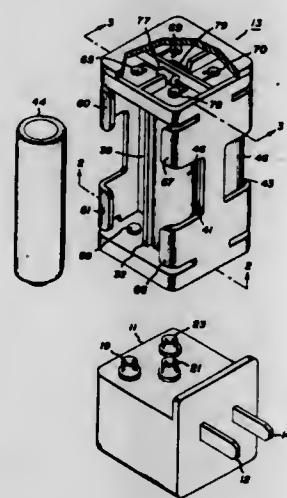
Ferdinand H. Mullersman, Gainesville, Fla., assignor to General Electric Company, Columbus, Ohio

Filed Dec. 31, 1975, Ser. No. 645,843

Int. Cl.² H02J 7/00

U.S. Cl. 320-2

12 Claims



1. A charging system comprising:

- a source of charge current comprising (1) a housing, (2) a transformer having a secondary winding disposed in said housing, and (3) first, second and third source terminals, said first and third source terminals connected to said winding, said second source terminal connected to said winding at a point intermediate of the connections of said first and third source terminals to said winding;
- a first cellholder module comprising (1) first, second and third module terminals for selective connection to said first, second and third source terminals, respectively; (2) compartment means for holding a plurality of cells for charging; (3) circuit means connecting at least one cell in series between said first and second module terminals and between said second and third module terminals, respectively; and
- a second module comprising (1) compartment means for holding at least one cell of a physical size different from said compartment means of said first module and (2) having only first and second module terminals for connection, respectively, to said first and third source terminals.

4,009,430

ANTIPARALLEL COMMUTATED INVERTER

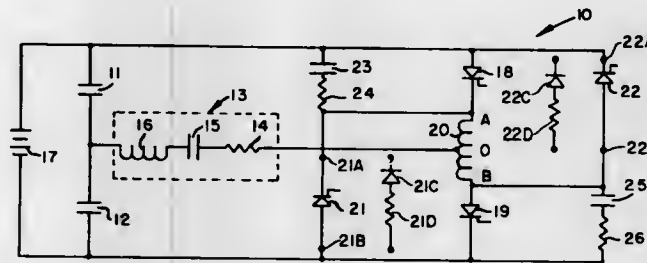
Donald F. Partridge, 436 Aldo Ave., Santa Clara, Calif. 95050

Filed Apr. 14, 1975, Ser. No. 568,040

Int. Cl.² H02M 7/515

U.S. Cl. 321-45 C

21 Claims



1. A control system for regulating power input to a resonant electrical load from a dc source having first and second terminals, the combination comprising:

- a magnetic means connected between said first and second terminals to receive power from said source;
- a first switching device between the magnetic means and said first terminal and a second switching device between said magnetic means and said second terminal operable to commutate the flow of power from the respective terminal to the magnetic means when the switching device is interrupted;
- a first anti-parallel means connected across said first switching device and a second anti-parallel means connected across said second switching device; and
- a series resonant load connected with said magnetic means to receive power through the magnetic means from said dc source whereby by the selective commutation of said switching devices the power input to the load from the source can be regulated while said first and second anti-parallel means serve to provide a path for reverse current from the load around the respective switching device as the associated switching device is commutated.

4,009,431

SERIES PARALLEL TRANSITION FOR POWER SUPPLY

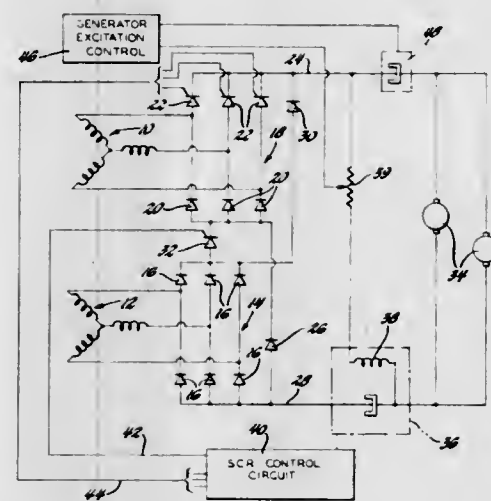
Lauren L. Johnson, Westchester, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 8, 1975, Ser. No. 611,073

Int. Cl.² H02P 9/00; H02M 7/04

U.S. Cl. 322-7

3 Claims



1. In a system for transmitting electrical power from an AC generator having two similar output sections to a load, a generator transition circuit for smoothly changing the generator output between a high current, low voltage mode and a low current, high voltage mode comprising first and second rectifier means connected respectively to

said output sections to provide DC power from each section,

first and second conductors connected to the load, switch means for connecting the rectifier means in series between the first and second conductors to provide a high voltage, low current mode when the switch means is conductive,

means for connecting the rectifier means in parallel to provide a low voltage high current mode including a pair of circuit paths, each circuit path including a diode allowing conduction only when the said switch means is non-conductive for connecting each rectifier means respectively between the first and second conductors,

voltage modulating controlled rectifier means in said first rectifier means for controllably varying the output voltage of the first rectifier means,

transition signal means for initiating a desired transition from one mode to another,

means responsive to the transition signal means for gating the voltage modulating controlled rectifier means to reduce the output voltage of the said first rectifier means to substantially zero, operating the switch means when the output voltage is so reduced and, after the switch means is operated, gating the modulating controlled rectifier means to increase the output voltage of the said first rectifier means, the voltage of the said first rectifier means being changed gradually when the output sections are connected in series,

and generator excitation control means for controlling the output voltage of said second rectifier means such that the combined output voltage of said first and second rectifier means is held substantially constant while the output voltage of said first rectifier means is being varied and the said rectifier means are connected in series.

4,009,432

CONSTANT CURRENT SUPPLY

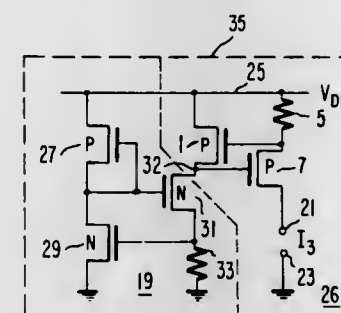
Andrew Gordon Francis Dingwall, Somerset, and Bruce David Rosenthal, Randolph, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,181

Int. Cl.² G05F 1/56

U.S. Cl. 323-4

17 Claims



13. A current supply comprising, in combination: first and second terminals between which an operating voltage may be applied;

first and second transistors of one conductivity type and a third transistor of opposite conductivity type, each having a conduction path and a control electrode;

first and second resistors;

two terminals for a load, one connected to said second terminal;

a first series circuit connected between said first terminal and the other terminal for said load, comprising said first resistor and the conduction path of said first transistor, in that order;

a second series circuit connected between said first and second terminals comprising the conduction path of said second transistor, the conduction path of said third transistor and said second resistor, in that order;

a direct connection from the control electrode of said second transistor to the connection between the conduction path of said first transistor and said first resistor;

a direct connection from the control electrode of the first transistor to the connection between the conduction paths of the second and third transistors; and

means coupled to the control electrode of said third transistor for applying a voltage thereto for regulating the flow of current through its conduction path.

4,009,433

METHOD AND APPARATUS FOR COMPENSATING REACTIVE POWER

Gottfried Moltgen, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

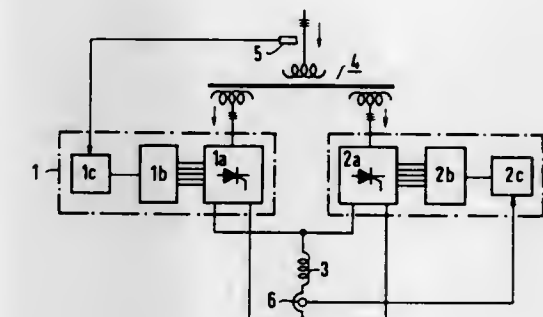
Filed Nov. 12, 1975, Ser. No. 630,948

Claims priority, application Germany, Nov. 18, 1974, 2454651

Int. Cl.² H02J 3/18; G05F 1/68

U.S. Cl. 323-102

5 Claims



3. A method of operating apparatus for compensating the reactive power in a three phase network, the apparatus including first and second reactive power converters having the same no load voltages and having their a-c inputs coupled to the line and their d-c outputs coupled in parallel and short-circuited through a common choke comprising the steps of:

- operating the first converter with the delayed firing time;
- operating the second converter with an advanced firing time; and
- maintaining the d-c current in the choke at a constant value.

4,009,434

DIELECTRIC INDUCTION LOGGING SYSTEM FOR OBTAINING WATER AND RESIDUAL OIL SATURATION OF EARTH FORMATIONS

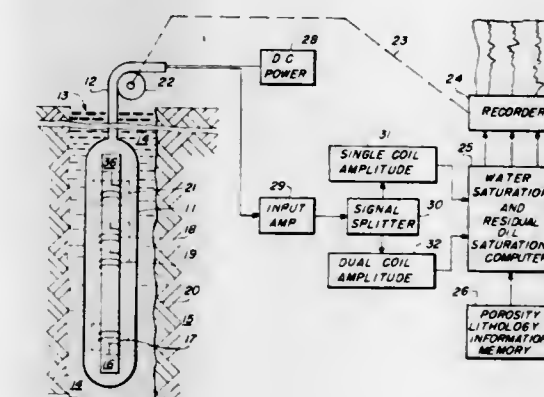
Philip F. McKinlay, and Richard A. Meador, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,798

Int. Cl.² G01V 3/10, 3/18

U.S. Cl. 324-6

17 Claims



1. A method for determining the characteristics of earth formations in the vicinity of a well borehole comprising the steps of:

generating, in a well borehole, a radio frequency electromagnetic field in the frequency range from 10 to 60 megahertz;
 detecting, at a first spaced distance in the borehole, the total field amplitude of the electromagnetic field at said generated frequency this amplitude being influenced by earth formation materials at a first effective depth of investigation;
 detecting, at a second spaced distance in the borehole, the total field amplitude at said generated frequency this amplitude being influenced by earth formation materials at a second, different, effective depth of investigation; and
 combining said total field amplitude measurements having different effective depths of investigation according to a predetermined relationship to derive an indication of the earth formation conductivity and permittivity at said generated frequency.

4,009,435

APPARATUS FOR PRESERVATION AND IDENTIFICATION OF PARTICLES ANALYZED BY FLOW-THROUGH APPARATUS

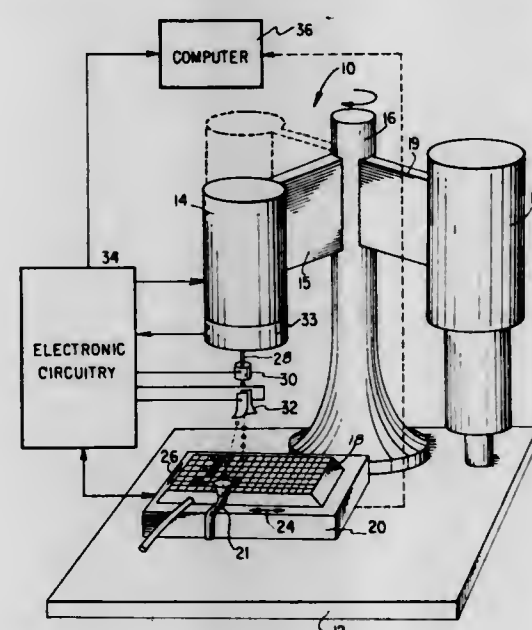
Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 496,178, Aug. 9, 1974, Pat. No. 3,924,947, which is a continuation-in-part of Ser. No. 407,811, Oct. 19, 1973, abandoned. This application Oct. 8, 1975, Ser. No. 620,658

Int. Cl.² G01N 33/16, 27/00, 51/00

U.S. Cl. 324—71 CP

30 Claims



1. An apparatus for identifying particles in a liquid suspension comprising:

a particle scanning device including, means for containing a quantity of suspension carrying particles, a sensing zone for producing at least one characteristic signal representing at least one physical characteristic of each particle passing therethrough, means for moving the suspension in a stream through the sensing zone and out of the particle scanning device such that particles separately pass there-through and out, a substrate;

sequencer means coupled to said scanning device and said substrate and operative in response to at least one characteristic signal for each particle to develop a particular sequence signal and to direct the stream and particle therein producing said characteristic signal to a particular location on said substrate corresponding to said particular sequence signal and;

memory means coupled to said sensing means and said sequencer means and operative in response to said at

least one characteristic signal to store said characteristic signal and one of said sequence signals and a memory location identifier corresponding to said substrate location, whereby each particle location and characteristic can be correlated.

4,009,436

LATCH STROBE GENERATOR CIRCUIT

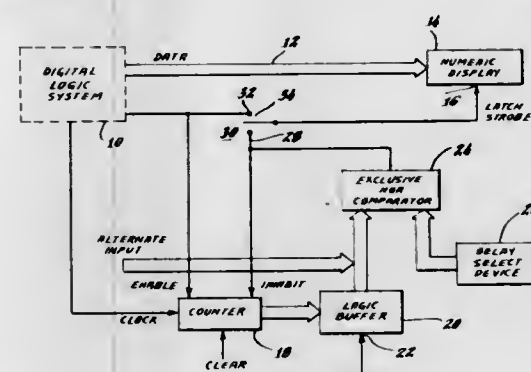
Daniel F. Dlugos, Huntingdon, and Flavio M. Manduley, Seymour, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 15, 1975, Ser. No. 640,488

Int. Cl.² G01R 15/12; G11C 11/02

U.S. Cl. 324—73 R

8 Claims



1. In a monitor having a data display means with a latch strobe input for freezing the display, said monitor being used for servicing digital logic systems which manipulate data in a time-controlled sequence, an improved latch strobe generator comprising:

- means for generating a set of signals representing the current time in the time-controlled sequence;
- an operator-controlled selection means for establishing a set of signals representing the time in the sequence at which the display is to be frozen, each said set of signals having a unique format representing a different time; and
- a comparator circuit connected to said selection means and said signal generating means to generate the latch strobe when the compared sets of signals are complementary

4,009,437

NET ANALYZER FOR ELECTRONIC CIRCUITS

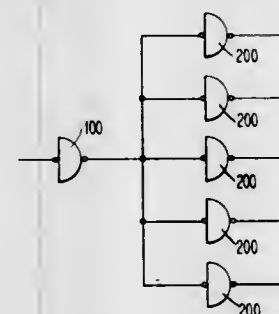
William Arthur Lacher, Lansdale, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 31, 1976, Ser. No. 672,426

Int. Cl.² G01R 15/12

U.S. Cl. 324—73 R

16 Claims



1. A net analyzer for testing a plurality of circuit nets which include at least two types distinguishable from each other by their controlled impedances comprising:

circuit means coupling said analyzer to the nets to be tested, current source means coupled to the net under test for causing a first current of predetermined amplitude to flow therethrough and to develop a first voltage thereacross, net type selection means including comparison means for comparing said first voltage to a reference potential and

to generate an output signal which is indicative of the type of net under test,

current source means coupled to said net under test for causing a second current of predetermined amplitude to flow therethrough and to develop a second voltage thereacross,

net measurement means including a plurality of pairs of comparison means, each pair being associated with one of said net types, a pair of reference voltages coupled respectively to one of two input terminals of each of said pair of comparison means, said reference voltages for each of said pairs establishing a tolerance range for said second voltage,

circuit means for coupling said second voltage in common to the other input terminals of all of said comparison means,

gating means coupled to the outputs of each pair of said comparison means,

means responsive to said net type selection means output signal for tending to enable only that particular gating means coupled to a comparison means associated with the type of net under test,

the application to said last mentioned comparison means of a second voltage lying outside said tolerance range causing it to generate an output signal capable of enabling the gating means coupled thereto, an output from said gating means signifying the presence of an out-of-tolerance net.

4,009,438

SUPERHETERODYNE RECEIVER WITH A DIGITALLY ADJUSTABLE TUNING ARRANGEMENT

Lothar Grohmann, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

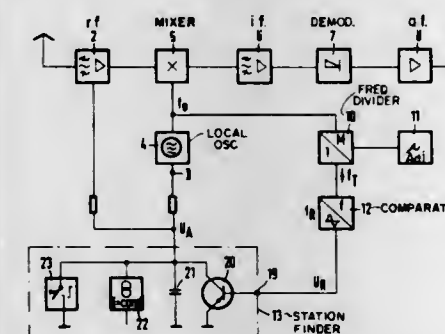
Filed June 20, 1974, Ser. No. 481,031

Claims priority, application Germany, July 3, 1973, 2333852

Int. Cl.² H04B 1/26

U.S. Cl. 325—421

3 Claims



1. An improved superheterodyne receiver wherein there is provided an information-transmission circuit, a local oscillator tunable with a dc voltage, a digitally adjustable tuning arrangement coupled to the output of said local oscillator and containing a frequency divider having a numerically adjustable division ratio, a device for digitally adjusting the frequency divider, and a frequency comparator having a dc voltage output which is dependent on the input frequency and approximates a fixed reference frequency, wherein the improvement comprises:

an automatic tuning control circuit within said tuning arrangement having an input coupled to the output of said frequency comparator and having an output which provides a tuning voltage coupled to the tuning input of said local oscillator, said automatic tuning circuit comprising:

a storage capacitor;
 a constant current source;
 a threshold switch; and
 a controllable resistance coupled in parallel with said storage capacitor and formed by a transistor having base emitter and collector electrodes, said emitter electrode coupled to ground, said collector electrode coupled to said storage capacitor, and said constant current source,

and said threshold switch, and said base electrode coupled to the output of said frequency comparator.

4,009,439

PROGRAMMING UNIT FOR A TELEVISION TUNING PHASE LOCKED LOOP

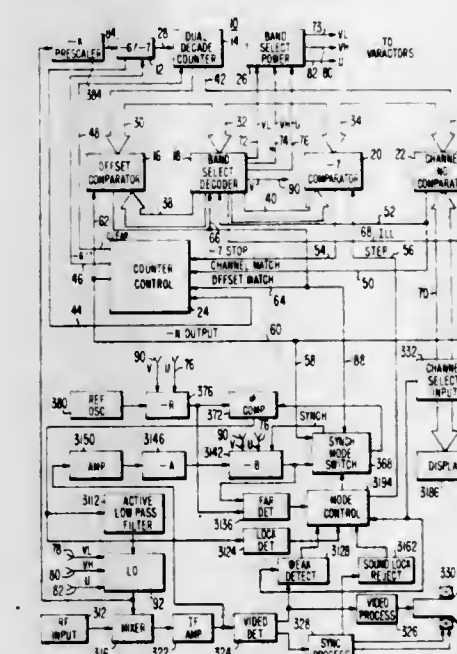
Robert Morgan Rast, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,097

Int. Cl.² H04B 1/16

U.S. Cl. 325—421

13 Claims



1. In a television tuning system for providing a plurality of local oscillator signals respectively corresponding to a plurality of channels a viewer may select, said plurality of said local oscillator signals being partitionable into a plurality of frequency bands in which there is predetermined frequency spacing between adjacent local oscillator signals, an apparatus for dividing the frequency of a local oscillator signal by a predetermined number corresponding to the selected channel to form an output signal, comprising:

counter means responsive to said local oscillator signal for counting periods of said local oscillator signal and for generating a count signal representing the number of periods counted;

channel selection means for generating a channel number signal representing the number of said selected channel; first means responsive to said count signal and said channel number signal for forming a first portion of said output signal having a duration equal to the duration of a first number of periods of said local oscillator signal, said first number being determined by said selected channel;

means responsive to said count signal for generating one of a plurality of band traversed signals whenever said number of counted periods corresponds to a channel defining a boundary of a respective one of said plurality of bands; means responsive to said band traversed signals for examining said band traversed signals at the end of said first portion to derive a band selected signal representing the band in which said selected channel resides; and

second means responsive to said count signal and said band selected signal for forming a second portion of said output signal having a duration equal to the duration of a second number of periods of said local oscillator signal, said second number being determined by the band in which the selected channel resides.

dividing circuit stages connected in series configuration to each other for receiving high frequency input signal pulses for counting and dividing them into lower frequency output signal pulses; means for changing the intermediate and final output pulse signals of said divider circuit to pulses which are not overlapped with each other; means for obtaining a preselected number of pulse signals which are smaller in number than the dividing number of said divider circuit against the final one output periodical term by adding said pulses; and means for selectively stopping the counting of only one input signal pulse to the first stage of said divider circuit.

4,009,446

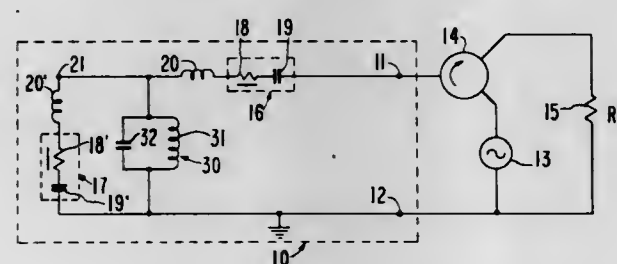
DUAL DIODE MICROWAVE AMPLIFIER

Joseph G. De Koning, Los Altos, Calif.; Robert E. Goldwasser, St. Peters, Mo., and Robert J. Hamilton, Jr., Los Altos, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Mar. 19, 1976, Ser. No. 668,560
Int. Cl.² H03F 3/10

U.S. Cl. 330-34

16 Claims



1. A microwave reflection amplifier adapted to operate over a selected frequency band comprising:
a pair of input-output terminals,
two negative-resistance elements connected in series across said terminals, each of said negative-resistance elements comprising a negative-resistance diode in series with a resonating inductor,
means for supplying dc bias to said diodes, and
a shunt-resonant circuit connected in shunt across one of said negative-resistance elements, said shunt-resonant circuit being shunt-resonant at a frequency in the vicinity of said band.

4,009,447

AMPLIFIER ARRANGEMENT WITH ZEROING DEVICE FOR PIEZOELECTRIC TRANSDUCERS

Hans-Joachim Wolf, Freienstein; Franz Meier, Hettlingen, and Hans Ulrich Baumgartner, Winterthur, all of Switzerland, assignors to Kistler Instrumente AG, Winterthur, Switzerland

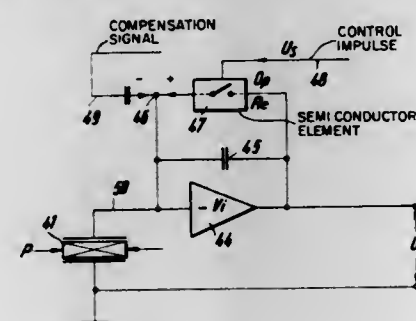
Filed July 20, 1973, Ser. No. 381,006
Claims priority, application Switzerland, July 28, 1972, 11465/72

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² H03F 1/36

U.S. Cl. 330-110

20 Claims



1. An amplifier measuring a circuit comprising:
a piezoelectric transducer for supplying output signals representative of an input quantity being measured;

an amplifier, having an input connected to said piezoelectric transducer, for providing an output representative of an operation effected on said output signals, said amplifier having an input impedance of at least 10^{10} ohm; and means, connected to the input of said amplifier, for resetting the input voltage to a prescribed value, said means including at least one semiconductor element which receives a remote-controllable signal for controlling the resetting of said input voltage, said amplifier input further including a compensation input to which error signals are applied, for compensating for zero jumps in said semiconductor element.

4,009,448

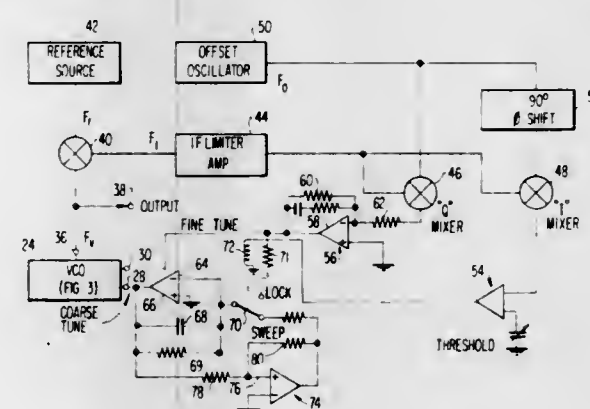
PHASE LOCK LOOP FOR A VOLTAGE CONTROLLED OSCILLATOR

Francis W. Hopwood, Severna Park, and Lester K. Staley, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1976, Ser. No. 646,800
Int. Cl.² H03B 3/04

U.S. Cl. 331-4

10 Claims



1. In a phase locked loop servo system adapted to phase lock a voltage controlled oscillator to a reference frequency signal wherein the system includes, a reference frequency source and a voltage controlled frequency source coupled to a signal mixer providing an IF signal therefrom, an offset frequency source providing an output frequency equal to the frequency of the IF signal at phase lock, phase detector means coupled to said IF signal and said offset frequency source providing an error signal output therefrom, and amplifier means coupled to said phase detector means providing a predetermined value of DC output voltage therefrom at phase lock, the improvement comprising:

a voltage controlled frequency source consisting of an oscillator having fine tuning means and coarse tuning means, said coarse tuning means being operable to tune the oscillator monotonically over a predetermined frequency band;

circuit means coupling the output of said amplifier means to said fine tuning means, said fine tuning means being responsive to said DC output voltage to fine tune the oscillator; and

integrator circuit means coupling the output of said amplifier means to said coarse tuning means and being responsive to a departure of said DC output voltage from said predetermined value to tune the frequency of said oscillator until said predetermined value of DC voltage is again applied to said fine tuning means, whereby the tuning sensitivity of the fine tuning means is substantially constant across said predetermined frequency band and the bandwidth of the phase lock loop remains substantially constant.

4,009,449

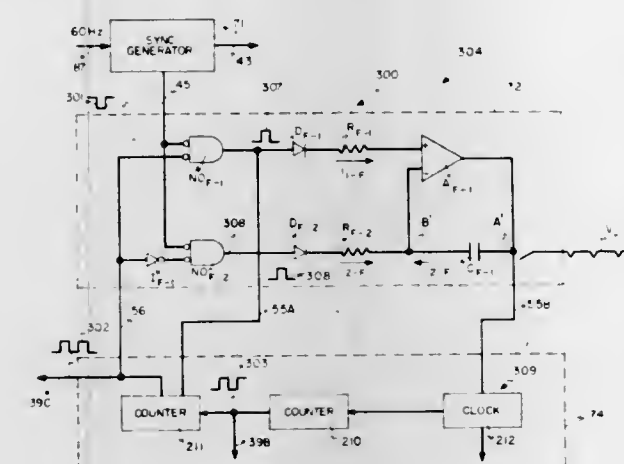
FREQUENCY LOCKED LOOP

David J. Agans, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 11, 1975, Ser. No. 640,106
Int. Cl.² H03B 3/04

U.S. Cl. 331-16

7 Claims



1. A frequency locked loop for use in a system wherein events are timed to occur on the basis of a periodic waveform whose frequency is f_0 , comprising, in combination: sync generator means that produces a sampling pulse at the frequency f_0 , counter means; voltage controlled clock means connected as clock input at a frequency f_1 to the counter means; control circuit means that generates a control voltage V_c to control the output frequency f_1 of the clock means; said counter means comprising a first counter and a second counter, the first counter being connected to divide the clock frequency by 2^m to produce an output frequency

$$f_2 = f_1 / 2^m$$

the second counter being resettable and being connected to receive said output frequency f_2 as input and to provide as output a frequency which always equals the frequency f_0 and, when locked,

$$f_2 = f_0 / (2^n + K),$$

wherein K is a circuit parameter and m and n are integers, the frequency f_1 being adjustable under the regulation of the control means to render the frequency f_2 locked to the frequency f_0 that serves as a standard for the electric system of which the frequency locked loop is a part in the relationship

$$f_2 = f_0 (2^n + K);$$

and sampling means that receives as input the sampling pulse as well as a feedback signal from the output of the second counter and provides a reset pulse that is connected to reset the second counter and a further pulse, the further pulse and the reset pulse being connected as input to the control circuit means to provide as output the voltage V_c .

4,009,450

PHASE LOCKED LOOP TRACKING FILTER HAVING ENHANCED ATTENUATION OF UNWANTED SIGNALS

Don R. Holcomb, Phoenix, and Arthur J. Kline, Jr., Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Apr. 14, 1975, Ser. No. 568,073
Int. Cl.² H03B 3/04

U.S. Cl. 331-17

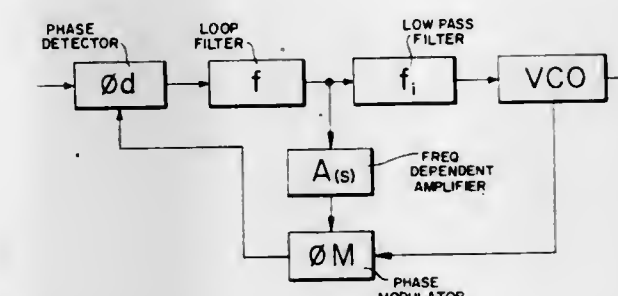
2 Claims

1. A tracking filter for tracking a signal of a certain characteristic embedded in a spectrum of unwanted signals and noise, comprising:

a phase locked loop having a phase detector, a loop filter and an oscillator configured for tracking the wanted

signal and attenuating the unwanted signals and noise, and enhancing means including a low pass filter interposed between the loop filter and said oscillator, a phase modulator interposed between said oscillator and said phase detector and a frequency dependent amplifier interposed between the output of the loop filter and said phase modulator, wherein said low pass filter, said modulator and said amplifier are scaled to cancel the effect of each other out in the loop while providing the additional filtering action to the loop output.

2. A tracking filter for tracking a signal of a certain characteristic embedded in a spectrum of unwanted signals and noise, comprising:



a phase locked loop having a phase detector, a loop filter and an oscillator configured for tracking the wanted signal and attenuating the unwanted signals and noise, and enhancing means including a low pass filter interposed between the loop filter and said oscillator, a phase modulator interposed between the oscillator and said phase detector and a frequency independent amplifier interposed between the output of said low pass filter and said phase modulator wherein, said low pass filter, said modulator and said amplifier are scaled to cancel the effect of each other out in the loop while providing the additional filtering action to the loop output.

4,009,451

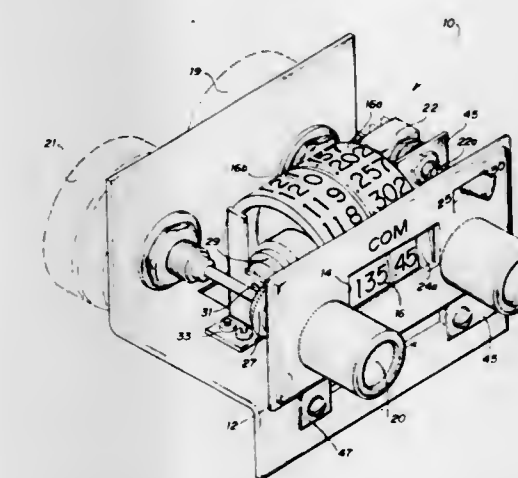
FREQUENCY RANGE SELECTABLE OSCILLATOR FOR MULTICHANNEL COMMUNICATION SYSTEM

Edward B. Moore, North Caldwell, and Donald P. Ryan, Pine Brook, both of N.J., assignors to Edo-Aire, a Division of Edo Corporation, Fairfield, N.J.

Filed June 12, 1975, Ser. No. 586,227
Int. Cl.² H03B 5/36; H03J 1/02

U.S. Cl. 331-64

5 Claims



1. In a multichannel communication system having means for selecting an operating frequency and a digital display of the selected frequency, comprising in combination:

a frequency generator coupled to the means for selecting and providing at an output terminal the operating frequency, said generator including a reference oscillator comprising:
a crystal selected to oscillate at a desired base reference frequency.

lower portion, one or more contact-units received in said slide systems and including an actuating member having an inner portion slidably mounted in said contact-unit and an outer portion adapted to be associated with a common coupling section which is placed between said parallel walls and is brought into movement by an electromagnet, the improvement that:

- at least the first wall includes a first longitudinal cylindrical recess obtained during extrusion of said wall
- at least one restoring system, acting upon said coupling section and an associated resilient member, is rotatably mounted in said recess
- at least one guiding system, swivelling mounted on a wall along an axis parallel to that of said recess, is provided at its free end with an articulation whose axis is determined by a centering recess obtained during extrusion of said coupling section.

4,009,458

PUFFER TYPE GAS CIRCUIT BREAKER

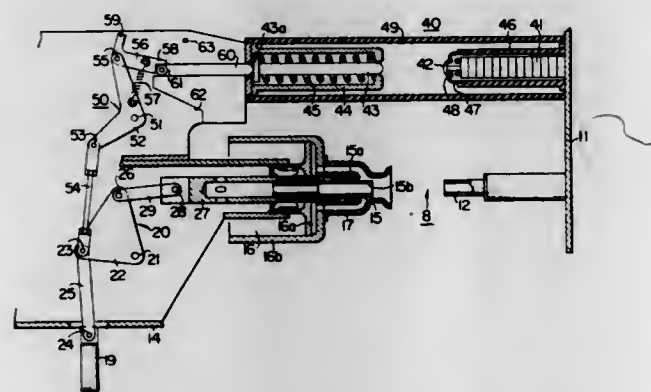
Tuneo Kishi; Hiroshi Itoh; Masaoki Tamura; Seizo Nakano, and Masao Hosokawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 15, 1975, Ser. No. 568,179

Int. Cl.² H01H 33/82

U.S. Cl. 200-148 A

6 Claims



1. A puffer type gas circuit breaker of the type comprising:
 - a. an interrupter unit comprising:
 - a main fixed contact, a main movable contact movably disposed in opposed relation with said main fixed contact between a position where it is in contact with and a position where it is separated from said main fixed contact, and a puffer device for compressing and blowing arc-affecting gases across the arc established between the main fixed and movable contacts when the same are separated from each other.
 - b. a preinsertion resistor contact unit electrically connected in parallel with the main fixed and movable contacts of the interrupter unit and comprising:
 - a fixed resistor contact, a preinsertion resistor assembly electrically connected in series with said fixed resistor contact, and a movable rod-shaped resistor contact having a contact end opposed to said fixed resistor contact and being movably disposed in opposed relation with said fixed resistor contact to be moved into contact therewith or separated therefrom and having means for biasing said movable resistor contact into a normally opened position,
 - c. first operating means for actuating said main movable contact and said puffer device, and
 - d. second operating means comprising a driving member positioned so as to be pressed at one end thereof against the end of the movable rod-shaped resistor contact opposite to the contact end thereof, a pushing member having one end thereof disposed in opposed relation with said driving member, means for biasing said one end of said pushing member to be pressed against the other end of said driving member, linkage means mechanically con-

nected between said first operating means and the other end of said pushing member for displacing said pushing member, said driving member, and said movable resistor contact from an original position where said movable and fixed resistor contacts are separated to a position where said movable and fixed resistor contacts are engaged, release means for disengaging the end of said pushing member from the end of said driving member, and means responsive to operation of said release means for returning only the movable resistor contact and driving member to their original positions immediately after said movable rod-shaped resistor contact engages with said fixed resistor contact and both the contacts of the interrupter unit are closed.

4,009,459

RESIN-EMPOTTED DRY-TYPE ELECTROMAGNET FOR DUSTY AND GASSEY LOCATIONS

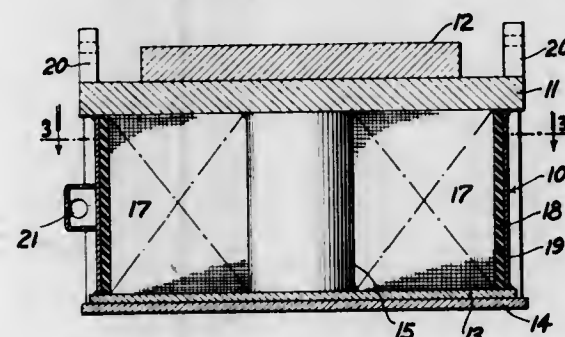
William H. Benson, 2421 Plum St., Erie, Pa. 16501, and Gerald D. Rose, 2676 Hazel St., Erie, Pa. 16508

Filed May 5, 1975, Ser. No. 574,803

Int. Cl.² H01F 5/00, 27/08

U.S. Cl. 335-300

3 Claims



1. An electromagnet comprising,
 - a back plate,
 - a circular bottom plate and a wear plate supporting said bottom plate,
 - a shell disposed between said back plate and said wear plate and fixed to said back plate,
 - heat dissipation fins disposed between said back plate and said wear plate and adjacent said shell and extending radially outwardly from said shell,
 - a winding disposed in said shell adjacent said back plate, said winding and said shell defining a space therebetween, said space being filled with an epoxy material that is filled with grains of material having a high coefficient of thermal conductivity.

4,009,460

INDUCTOR

Masahiko Fukui, Kumagaya, and Yasuji Kamata, Hitachi, both of Japan, assignors to Hitachi Metals, Ltd. and Hitachi, Ltd., both of Japan

Filed Sept. 19, 1975, Ser. No. 614,943

Claims priority, application Japan, Sept. 24, 1974, 49-108752; Sept. 24, 1974, 49-108753

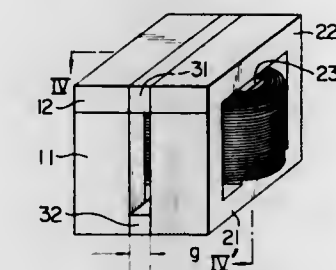
Int. Cl.² H01F 21/00

U.S. Cl. 336-110

13 Claims

1. An inductor comprising:
 - a first magnetic circuit which includes at least one magnetic core formed from a soft magnetic material, at least one airgap formed in a portion thereof, and a permanent magnetic member disposed in said one airgap to produce magnetic flux flowing through said first magnetic circuit;
 - a second magnetic circuit including at least one magnetic core formed from a soft magnetic material; the magnetic core of said second magnetic circuit being disposed face to face with the magnetic core of said first magnetic circuit; and

coil means wound around adjacent portions of said mag-



netic cores in common to produce a magnetic flux therein.

4,009,461

EXTERNALLY ACTUATED CLAMPING SYSTEM FOR TRANSFORMER WINDINGS INCORPORATING A MECHANICAL FOLLOW-UP DEVICE

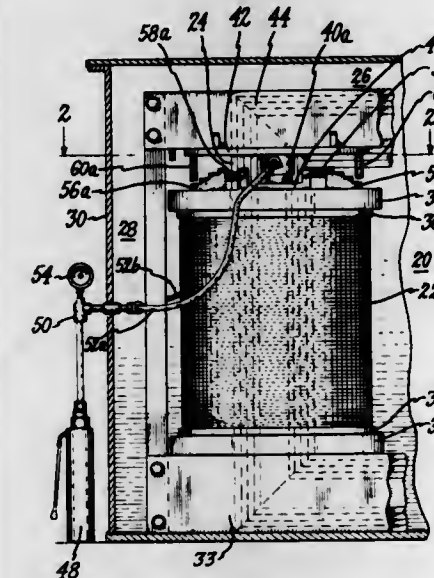
Gerald O. Usry, Rome, Ga., assignor to General Electric Company

Filed July 24, 1975, Ser. No. 598,702

Int. Cl.² H01F 27/30

U.S. Cl. 336-197

10 Claims



1. In electrical apparatus of the type that is completely enclosed and mounted in a fixed relation with respect to said enclosure, having,
 - a magnetic core, said core having at least one leg, winding structure, having a longitudinal axis, being disposed around said leg, said winding structure having first and second axial ends,
 - a rigid core-clamping frame mounted adjacent to and in a fixed relation with respect to said core,
 - a first force-distribution clamping plate positioned between one of said axial ends of said winding structure and said rigid core-clamping frame,
 - a second force-distributing clamping plate positioned between the remaining axial end of said winding structure and said rigid clamping frame, a hydraulic actuator, actuated externally of said electrical apparatus enclosure, capable of causing a compressive force to be applied to said first and second force-distributing clamping plates, the force generated by said hydraulic actuator being reacted against said rigid core-clamping frame,
- the improvement which comprises:
- means automatically maintaining said force-generated by said hydraulic actuator at some predetermined minimum value dependent upon the maximum force applied by said hydraulic actuator, once said hydraulic actuator relaxes said compressive force below a predetermined value.

4,009,462

EAST ACTUATING WATER RESISTOR

Felix Bernasconi, Zollikoberg, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

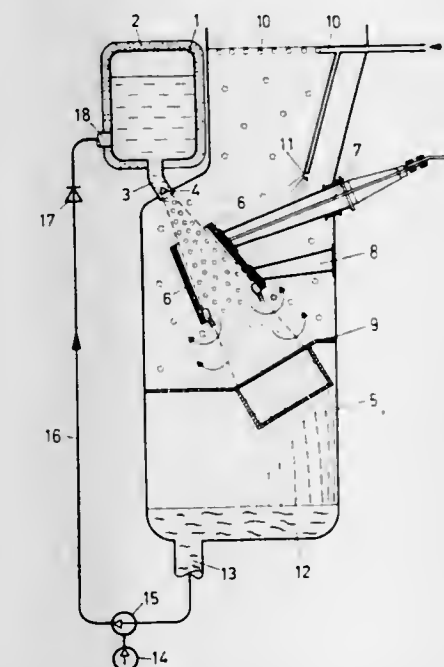
Filed Nov. 25, 1975, Ser. No. 635,109

Claims priority, application Switzerland, Dec. 12, 1974, 16519/74

Int. Cl.² H01C 10/02

U.S. Cl. 338-80

8 Claims



1. A fast actuating water resistor of high power, particularly useful in thermal power plants operated with fossil or nuclear fuels for transient assumption of loads in the event of a sudden reduction in load or faults with the mains which comprises, a low-pressure steam boiler containing a pressurized hot highly electrically conductive aqueous solution, a tank, a jet nozzle connected with an outlet from said boiler for spraying the hot pressurized solution into said tank, a tubular electrode, means insulatively supporting said electrode within said tank in spaced relation to said nozzle and in axial alignment with said nozzle, a bus bar lead extending from said electrode outwardly through said tank, means insulatively supporting said bus bar lead within said tank, a collecting grid located at the discharge end of said electrode and in spaced relation therefrom, said hot pressurized solution being vaporized upon passage through said electrode and to said collecting grid thereby to establish a resistive electrical connection from said bus bar lead through said electrode and vaporized solution to said collecting grid, and a supplementary water distributor located in said tank above the respective supporting means for said bus bar lead and electrode and to which washing water is delivered.

4,009,463

ACOUSTIC EMISSION MONITORING SYSTEM

Leonard C. Vercellotti, Verona, and Perry J. Hite, Sr., Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1975, Ser. No. 558,107

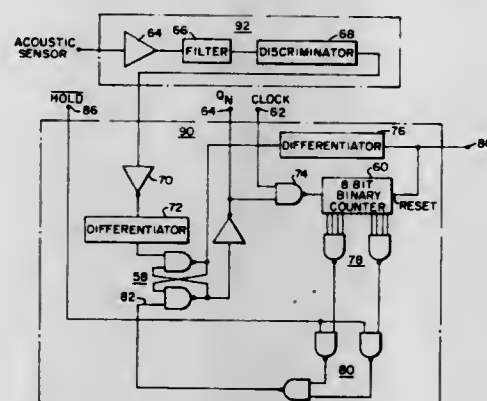
Int. Cl.² G01S 5/18

U.S. Cl. 340-16 R

19 Claims

11. A method of monitoring the presence and source location of acoustic emissions generated within or on an acoustically conductive medium comprising the steps of:
 - segregating a surface of the medium into a plurality of quadrilateral monitoring zones;
 - monitoring acoustic emissions communicated to the respective corners of the respective zones;
 - generating corresponding electrical signals representative of the acoustic emissions monitored;
 - employing the electrical signals to enable corresponding

counters to sequence through the counters respective counting states; identifying the zone first encountering an acoustic reception at all its corresponding monitoring locations; and



reading the states of the counters corresponding to the identified zone.

4,009,464

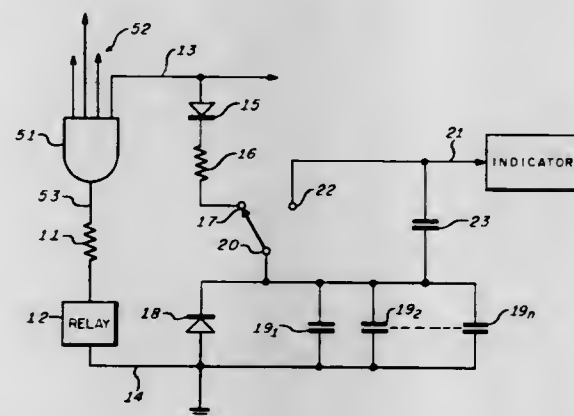
APPARATUS FOR INDICATING ATTITUDE FAILURE
Terrence L. Grimes, and Thomas W. Neis, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 541,299, Jan. 15, 1975, abandoned.
This application Jan. 16, 1976, Ser. No. 649,886

Int. Cl.² G08B 21/00

U.S. Cl. 340-27 AT

5 Claims



1. In an aircraft indicator system operable from an electrical energy source and having a panel mounted indicator display for indicating to the pilot the attitude of the craft relative to the horizon and a remote vertical gyroscope for providing a horizon reference, electrical control apparatus for positioning said indicator display comprising:

- motor means responsive to said vertical gyroscope and coupled through gears to said indicator display for normally positioning said indicator display in accordance with the position of said vertical gyroscope,
- storage means coupled to said electrical energy source for storing electrical energy,
- isolation means for isolating said storage means from said motor means during normal operation of said attitude indicator system,
- sensing means responsive to a failure in said attitude indicator system, and
- transfer means responsive to said sensing means for transferring the stored energy within said storage means to said motor means after a failure, the magnitude of the stored energy being sufficient to drive said indicator display to a position corresponding to an attitude indicating position greatly exaggerated from a normal aircraft attitude and wherein the motor means and the gears maintain said indicator display in said exaggerated position after dissipation of the stored energy thereby indicating a failure

and warning the pilot not to rely on said attitude indicator system.

4,009,465

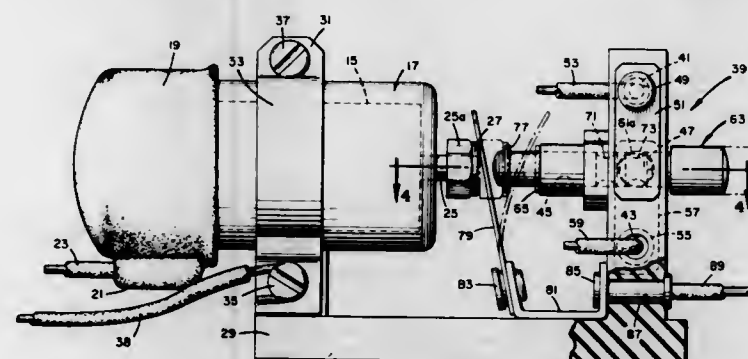
BRAKE LINING WEAR DETECTOR
Gonzalo Rigalt, 8a. Avenida No. 3-69, Zona 10 Guatemala City, Guatemala

Filed Jan. 28, 1974, Ser. No. 436,926

Int. Cl.² B60T 17/22

U.S. Cl. 340-52 A

11 Claims



1. In a vehicle having a brake and brake activator, apparatus for indicating the wear condition of brake linings when the linings have worn a predetermined amount, comprising:

- a. first means energized when the brake linings have worn the predetermined amount;
- b. second means, connected to said first means, for generating a first alarm signal when said first means is first energized, said second means generating said first alarm signal when said first means is subsequently de-energized, said second means including a first switch that is closed when said first means is energized and remains closed when said first means is subsequently de-energized; and
- c. third means, connected to said first means, for generating a second alarm signal when said first means is first energized, wherein said third means does not generate said second alarm signal when said first means is subsequently de-energized.

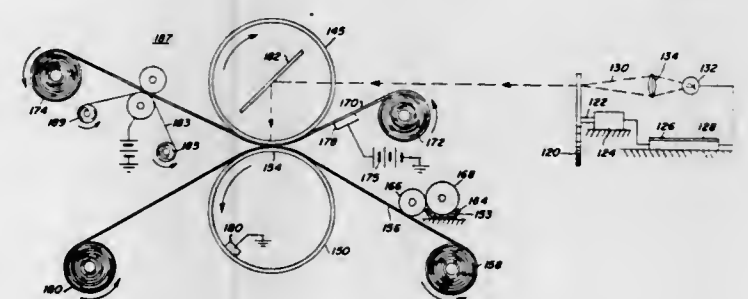
4,009,466

CHARACTER CODING AND RECOGNITION SYSTEM
Harold E. Clark, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 214,282, Dec. 30, 1971, Pat. No. 3,938,088. This application June 27, 1975, Ser. No. 591,242
Int. Cl.² G06K 7/12

U.S. Cl. 340-146.3 B

2 Claims



1. A method for forming coded characters which are recognizable both by an individual and a machine comprising: directing into a polychromatic imaging suspension between two electrodes

- light in color coded image character configuration, said light in color coded character configuration being coded by placing a multi-colored transparency in the path of light, said transparency comprising two or more parallel colored strips, no two adjacent strips being of the same color; and
- exposing said imaging suspension to said color coded light

image character while applying an electrical field across said suspension until an image is formed corresponding to said color coded light image character.

4,009,468

LOGIC NETWORK FOR PROGRAMMABLE DATA CONCENTRATOR

Piero Calcagno; Enzo Garetti, and Günter Lobisch, all of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

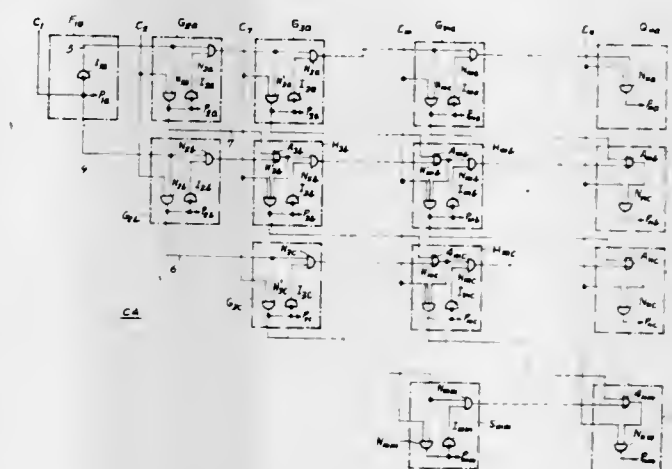
Filed Apr. 4, 1975, Ser. No. 565,114

Claims priority, application Italy, Apr. 5, 1974, 68089/74

Int. Cl.² H04Q 3/00; H04J 3/00

U.S. Cl. 340-147 C

10 Claims



4,009,467

CHARACTER READER

Tsuguo Koda, Tokyo, and Kiyokazu Hanatani, Kawasaki, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

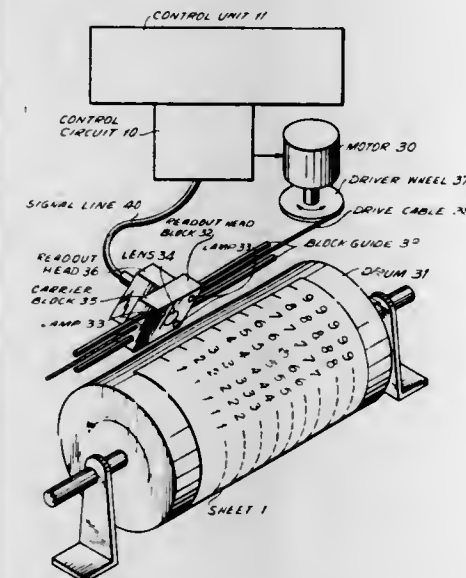
Filed Sept. 18, 1975, Ser. No. 614,418

Claims priority, application Japan, Sept. 28, 1974, 49-112203

Int. Cl.² G06K 9/08

U.S. Cl. 340-146.3 H

2 Claims



1. A character reader for recognizing characters recorded in equidistantly spaced lines on a sheet, each of the lines having a line mark recorded thereat, said character reader having scanning means positioned for scanning the lines of the sheet having characters recorded therein, said scanning means producing a scanning output signal, and recognition means for recognizing the recorded line mark in the scanning output signal produced by the scanning means for each line having characters recorded therein, said recognition means detecting the line marks and recognizing the characters in the lines corresponding to the line marks via the scanning output signal, said character reader comprising

- positioning means for positioning the scanning means at a distance above a line being scanned sufficient to provide a scanning range between the upper and lower scanning limits of a line of characters relative to a center line through such line, said scanning range being greater than the distance between next-adjacent lines;
- position detecting means for detecting where the line mark is located in the scanning range via the recognition means; and
- extraction means for extracting the scanning output signal of the scanning means only when said scanning means scans within specified areas including the reference positions provided by the line marks detected by the position detecting means, said recognition means recognizing characters by recognizing the scanning output signal of the extraction means.

4,009,469

LOOP COMMUNICATIONS SYSTEM WITH METHOD AND APPARATUS FOR SWITCH TO SECONDARY LOOP

Paul Emile Boudreau, Ridgefield, Conn., and Brian Barry Moore, Wappingers Falls, N.Y., assignors to IBM Corporation, Armonk, N.Y.

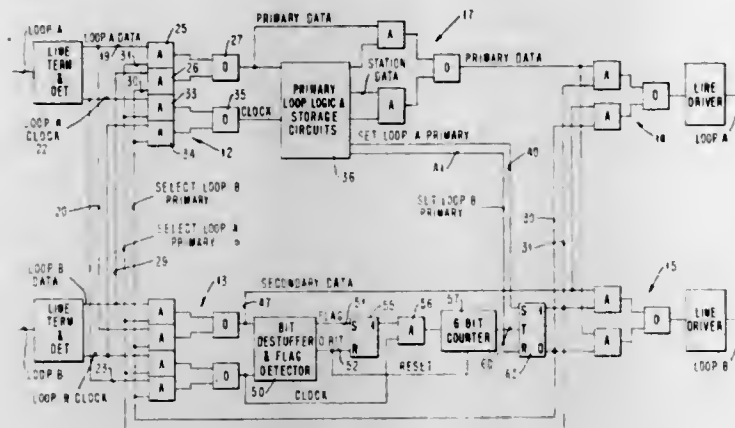
Filed Dec. 19, 1975, Ser. No. 642,278

Int. Cl.² H04Q 9/00; G06F 11/00; G05B 23/02; H04J 3/14
U.S. Cl. 340-147 SC

6 Claims

1. In a loop communication system wherein a remote station has switching means for making a primary connection to a selected one of two loops and a secondary connection to the other of said two loops and wherein a central station has means for transmitting command frames having a beginning flag, 32 bits, and an ending flag, the improvement comprising: means at a remote station for detecting the occurrence on said other loop of a flag followed by 32 consecutive 1 bits of a command frame Secondary Switch, means responsive to said detecting means for operating said

switching means to switch said remote station of a primary connection to said other loop when said control



station transmits the command frame Secondary Switch on said other loop.

4,009,470

PRE-EMPTIVE, ROTATIONAL PRIORITY SYSTEM

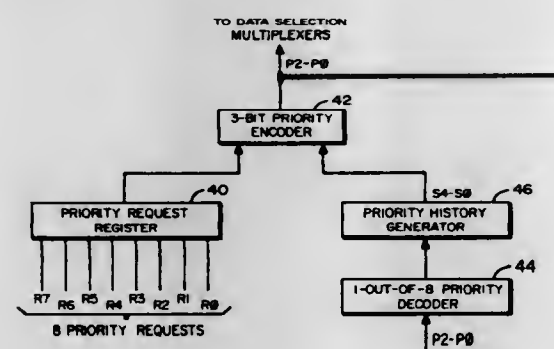
Michael Danilenko, West St. Paul; James Robert Davis, Jr., New Brighton, and Arthur Flets Boehm, St. Paul, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,800

Int. Cl.² G06F 3/04, 9/18

U.S. Cl. 340—172.5

9 Claims



1. A priority system, comprising: priority encoder means adapted to receive selected ones of R priority request signals during successive memory cycles, where R is a positive integer of 4 or greater having a descending ordered pre-emptive priority, said R priority request signals being arranged in at least first and second groups of priority request signals of at least first and second priority request signals per group, for generating output signals that identify the one priority request signal that is to be granted priority during each one of said successive memory cycles; priority history generator means responsively coupled to said priority encoder means output signals for accumulating and storing the priority history of the priority request signals that have been granted priority over said successive memory cycles and generating output signals that define the stored priority history of said priority request signals; and means coupling said priority history generator means output signals to said priority encoder means and conditioning said priority encoder means to encode said R priority request signals during each of said successive memory cycles for rotating priority between the priority request signals within each of said first and second groups of priority request signals and between said first and second groups of priority request signals during each of said successive memory cycles.

4,009,471

INFORMATION TRANSFER SYSTEM

Atsuo Tanaka, Kanagawa; Koichi Tokura, Chiba, and Hiroki Kawahara, Kawasaki, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

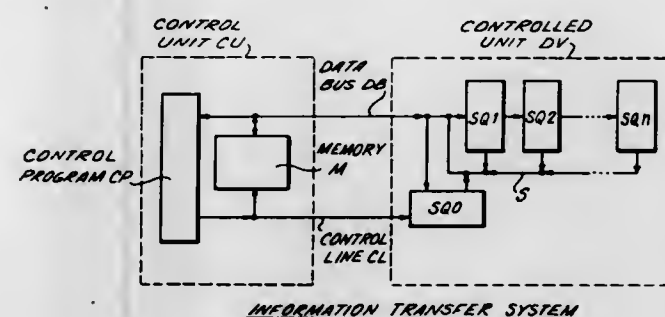
Filed June 20, 1975, Ser. No. 588,701

Claims priority, application Japan, June 24, 1974, 49-72061

Int. Cl.² G06F 13/00; G11C 19/00

U.S. Cl. 340—172.5

4 Claims



1. A data transfer system having a control unit, a controlled unit having a plurality of n data setting means and data bus and control leads, said control unit being connected to said controlled unit via said data bus and control leads, the contents of selected data setting means of a plurality of n data setting means of said control unit being modified from said control unit, said data transfer system comprising control means for the controlled unit, said control means being included in the control unit and including memory means, said control means controlling the handling of data of the memory means, data transfer between the memory means and the data bus and the transmission of the commands to the controlled unit, the plurality of data setting means having configurations providing parallel shifts of data, and the controlled unit having a configuration which is such that the contents of selected data setting means are transferred to the data bus, only data from the data bus to the first data setting means is written, and the plurality of data setting means are parallel shifted from the first data setting means to the selected data setting means on the basis of a command from the control means for the controlled unit to the control leads and data bus, whereby when the contents of the ith data setting means of the controlled unit, wherein $i \leq n$, are to be modified from the control unit, the contents of the first to (i-1)th data setting means are transferred to the bus bar in accordance with commands sequentially issued from the control means for the controlled unit for the contents of said data setting means, and data on the data bus is sequentially stored in the memory means, the control means for the controlled unit thereafter transferring data to be modified to the data bus and issuing write commands thereby setting modification data in the first data setting means, and the control means for the controlled unit thereafter sequentially reads out data stored in the memory means, transfers the read out data to the data bus and issues parallel shift and write commands for the first to ith data setting means whenever data is transferred whereby the contents of the ith data setting means are modified.

4,009,472

DYNAMIC ASSOCIATIVE CELL

John Wyn Jones, Winchester, England, assignor to IBM Corporation, Armonk, N.Y.

Filed May 16, 1975, Ser. No. 578,300

Int. Cl.² G11C 15/00

U.S. Cl. 340—173 R

6 Claims

1. In an array for performing logic functions a new storage cell comprising: two, three terminal semi-conductive devices,

an output line coupled through a load device to a source of potential and to a first terminal of both the transistors, input lines for carrying the true and complement of at least two input variables and two different reference levels, one of the reference levels representing an up logic level of the input variables and the other reference level representing a down logic level of the input variables, and

tions of the charge-coupled device memory for producing charge signals for storage in the charge coupled device memory.

4,009,474

ALARM SYSTEM FOR ELECTRICAL RECEPTACLES

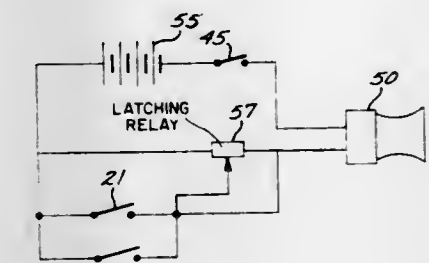
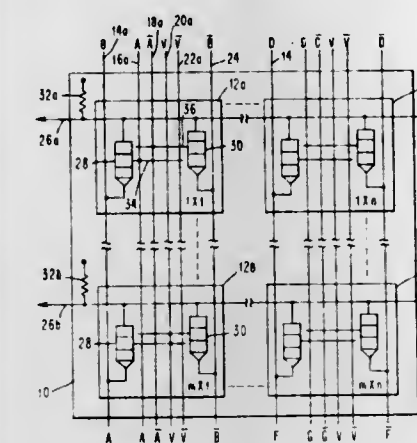
Chauncey B. Eller, 23100 Vista Grande Way, Colton, Calif. 92324

Filed Feb. 26, 1976, Ser. No. 661,744

Int. Cl.² G08B 13/02

U.S. Cl. 340—280

7 Claims



connection means for coupling a second terminal of one of the semi-conductive devices to an input level carrying the true of one input variable and the second terminal of the other transistor to the input line carrying the complement of the same input variable and selective connection means for selectively connecting the third terminal of the semi-conductive device to at least one of the other input lines whereby one of sixteen logic functions of two variables can be performed by the storage cell.

1. In an electrical receptacle including two female terminals for electrical excitation and a female grounding terminal formed in a housing the improvement comprising: a transverse slot formed partly across said grounding terminal; a spring biased arm connected at one end thereof to said housing and arranged to align within said slot for intersecting said grounding terminal; a switch connected to said housing and aligned to be closed by the free end of said arm when said arm is intersecting said grounding terminal and to be opened upon the displacement of said arm by an electrical connector insertable in said grounding terminal; and alarm means connected in circuit with said switch.

4,009,473

CHARGE COUPLED MEMORY SYSTEM

Joseph R. Burns, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

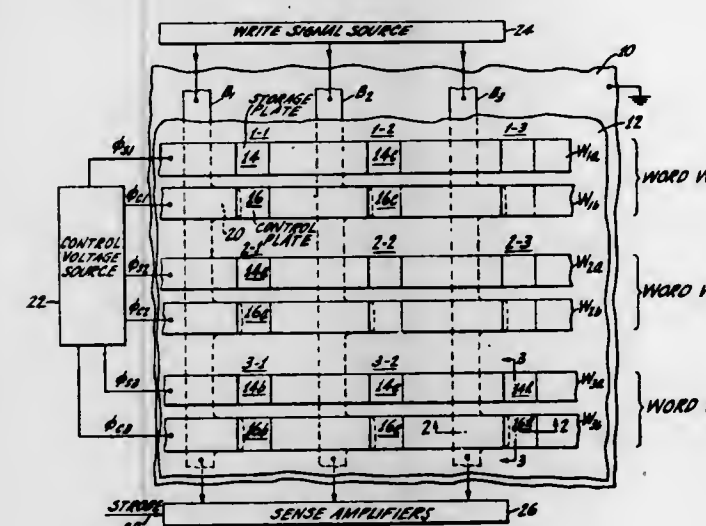
Continuation of Ser. No. 106,357, Jan. 14, 1971, abandoned.

This application June 9, 1975, Ser. No. 585,409

Int. Cl.² G11C 11/40

U.S. Cl. 340—173 R

4 Claims



1. The combination of: a charge-coupled device memory including a plurality of memory locations, each such location including means for storing charge signals, an optical memory having a plurality of storage locations for producing, when read out, a light pattern output indicative of the information stored in said locations; means for producing a charge pattern in said charge coupled device memory corresponding to the information stored in said optical memory comprising means for reading out said optical memory and for applying the light pattern thereby obtained indicative of the information stored in said locations of said optical memory onto loca-

4,009,475

DELTA-SIGMA CONVERTER AND DECODER

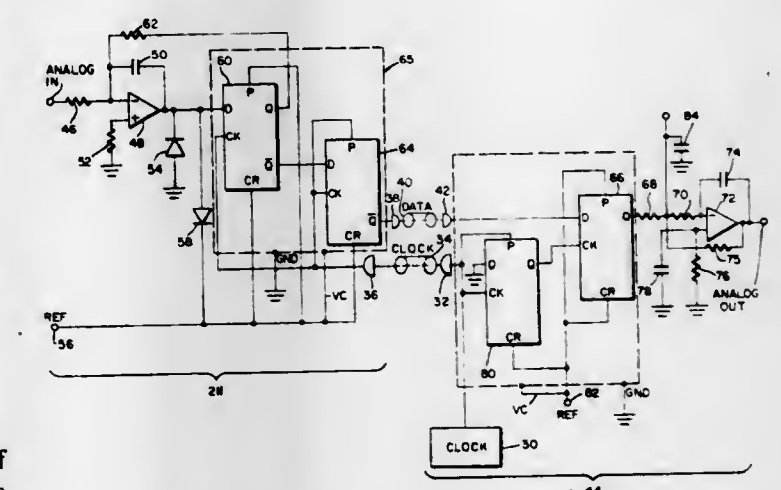
Richard E. DeFreitas, Westford, Mass., assignor to Hybrid Systems Corporation, Burlington, Mass.

Filed Dec. 5, 1974, Ser. No. 529,639

Int. Cl.² H03K 13/20

U.S. Cl. 340—347 AD

7 Claims



2. A converter for transforming an input analog signal level into a pulse rate comprising: means for integrating said analog signal level in combination with a feedback signal to provide an integrator output signal; means for providing a clock signal; a first bistable storage means including an input characterized by a threshold level, an output, and a clock signal input, the output signal therefrom having two levels and

being representative of the magnitude of a signal applied to the input relative to the threshold level at the last occurrence of said clock signal;
said integrator output signal being applied to the storage means input;
said output signal from said first storage means providing the feedback signal of a polarity to cause said integrator to integrate on opposite signs slope upon the occurrence of one of the output levels from said bistable storage means; and
a second bistable storage means operative in association with said first storage means and responsive to said clock signal for providing an output pulse coincident with each clock signal and corresponding to the output level from said first storage means at the time of each clock signal.

4,009,476

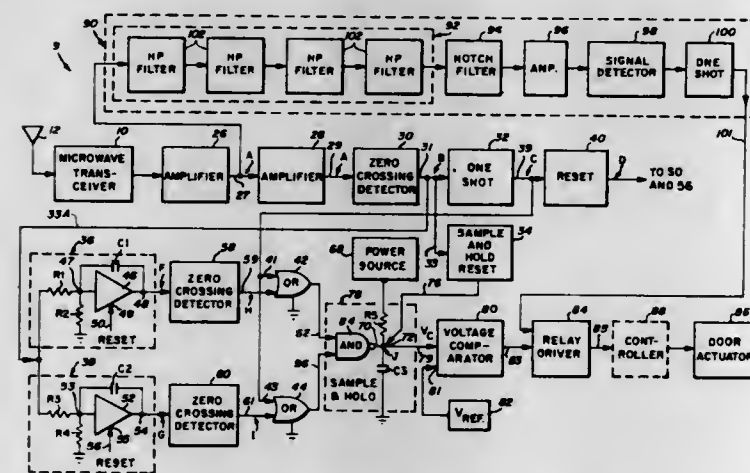
APPARATUS FOR AUTOMATICALLY CONTROLLING DOOR OPERATION

Erno B. Lutz, Sunnyvale, Calif., assignor to Solfan Security Systems, Palo Alto, Calif.

Filed June 27, 1975, Ser. No. 590,811
Int. Cl.² G01S 9/02; E05F 15/20

U.S. Cl. 343-7 ED

11 Claims



1. An apparatus for automatically controlling the operation of a door comprising:
first means responsive to detect the movement of a randomly moving object and operative to develop a Doppler signal representative of such movement, said Doppler signal being generally sinusoidal with a zero crossing in each cycle;
second means responsive to said Doppler signal and operative to develop a timing pulse upon the occurrence of each said zero crossing;
third means responsive to said Doppler signal and operative to develop first and second signals of unlike polarity relative to a predetermined reference level in the absence of said movement and of like polarity relative to said reference level in the presence of said movement;
fourth means for detecting the respective polarities of said first and second signals, said fourth means being responsive to said timing pulse and operative to develop a control signal when said first and said second signals are of like polarity; and
fifth means responsive to said control signal and operative to open the door.

4,009,477

WATTMETER HOUSING FOR A POWER CARRYING LINE

Edward Francis Rozyłowicz, Villa Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

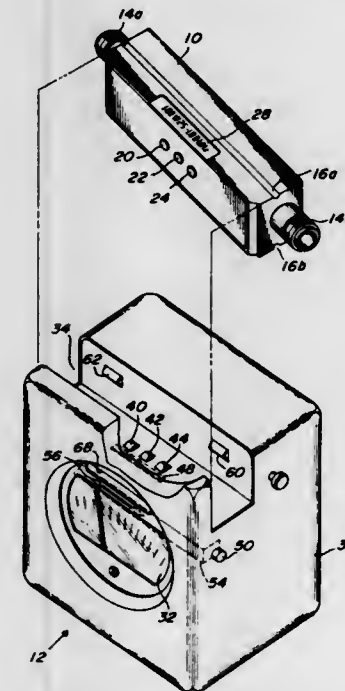
Filed Jan. 5, 1976, Ser. No. 646,452
Int. Cl.² G01R 1/04

U.S. Cl. 324-156

14 Claims

1. Apparatus for measuring electrical flow on a line comprising:
coupler means including

- a coupler body means adapted for permanent coupling to the line;
 - sense means for sensing the electrical flow on the line and producing a sense signal representative of the magnitude thereof;
 - first electrical contacting means affixed in a predetermined position with respect to said coupler body such that said contacting means does not project therefrom; and
 - means coupling the sense signal to the first contacting means; and
- meter means including
- a. an electrical flow readout device,



- a housing means adapted for housing said readout device, said housing provided with a cavity adapted to receive said coupler body means;
- second contacting means located to electrically contact said first contacting means upon entrance of said coupler means into said housing cavity said second contacting means also being located within said cavity such that said second contacting means does not project therefrom; and
- coupling means, having an input connected to said second contacting means and an output connected to said readout device, for producing at its output a drive signal suitable for activating said readout device in response to sense signals at its input.

4,009,478

FILM ADVANCE AND METERING MECHANISM FOR CAMERAS

Maki Yamashita, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 4, 1975, Ser. No. 610,348

Claims priority, application Japan, Sept. 6, 1974, 49-101956

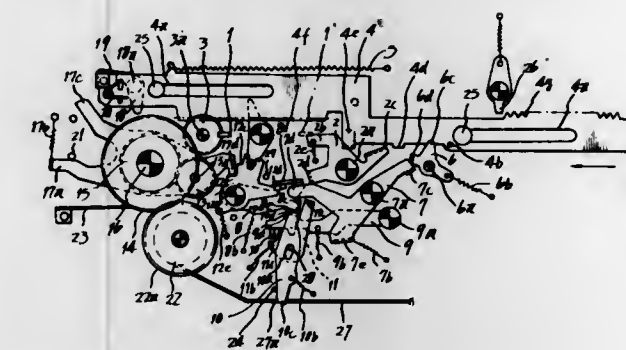
Int. Cl.² G03B 1/22

U.S. Cl. 354-206

10 Claims

1. In a camera loaded with a film having a row of longitudinally spaced perforations, one for each frame, a film transport and metering mechanism comprising:
an operating member operable for transporting said film;
a sensing member for sensing a perforation of said film;
film wind-up means for winding-up said film;
intermediate means releasably connected with said operating member for transmitting the operation of said operating member to said film wind-up means;
means for retaining the connection of said intermediate means with said operating member; and

means for releasing the retention of said intermediate



means by said retaining means upon the detection of a perforation of said film by said sensing member.

4,009,479

JOSEPHSON JUNCTION

Philippe Cardinne, Grenoble; Francois Colomb, Echirolles; Bernard Manhes, Grenoble, all of France; James Emery Nordman, Madison, Wis., and Raymond Serve, Eybens, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude, Paris, France

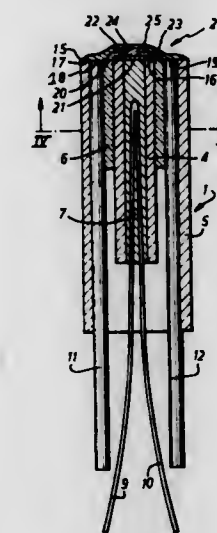
Filed Dec. 21, 1973, Ser. No. 427,262

Claims priority, application France, Mar. 30, 1973, 73.11541

Int. Cl.² H01L 39/22, 23/02

U.S. Cl. 357-5

6 Claims



1. A Josephson junction comprising a cylindrical supporting substrate that has a flat end face disposed in a plane perpendicular to the axis of the cylindrical substrate, said cylindrical substrate comprising a body of insulating material elongated in a direction parallel to the axis of said cylindrical substrate and first and second electrical conductor means extending longitudinally along and spaced from each other by said insulating material, said body of insulating material and said electrical conductor means terminating respectively in a transverse insulating zone and first and second conductive zones, all said zones forming said flat end face, a first blade of superconductive material extending face-on-face exclusively on said first conductive zone, an electrical barrier film on said first blade of superconductive material, and a second blade of superconductive material disposed face-on-face on said electrical barrier film and extending transversely along said flat end to said second conductive zone.

4,009,480

ROLL FILM CAMERA FOR USE WITH VARIOUS SIZED MAGAZINES

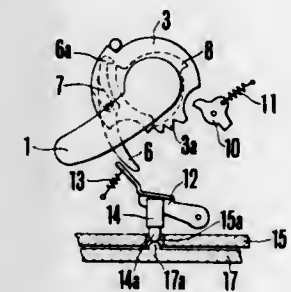
Tomonori Iwashita, Chofu; Hiroshi Aizawa, Machida; Susumu Kozuki, Yokohama, and Masanori Uchidoi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 13, 1975, Ser. No. 549,681

Claims priority, application Japan, Feb. 16, 1974, 49-18817; Feb. 16, 1974, 49-18818

Int. Cl.² G03B 1/00

U.S. Cl. 354-210

5 Claims



1. A roll film camera comprising a camera body, a large capacity film magazine adapted for attachment to the rear of said camera body, magazine supply and take-up spools rotatably mounted within said magazine, a film transport mechanism included in said camera body, said film transport mechanism having a camera body take-up spool and driving means operatively associated therewith, clutch means operatively arranged between said camera body take-up spool and said driving means, and actuating means for said clutch means to operatively disconnect said camera body take-up spool from said driving means in automatic response to attachment of said magazine to the rear of said camera body.

4,009,481

METAL SEMICONDUCTOR DIODE

Klaus Reindl, Sherman, Tex., assignor to Siemens Aktiengesellschaft, Munich and Berlin, Germany

Continuation of Ser. No. 95,048, Dec. 4, 1970, abandoned.

This application Aug. 16, 1972, Ser. No. 281,162

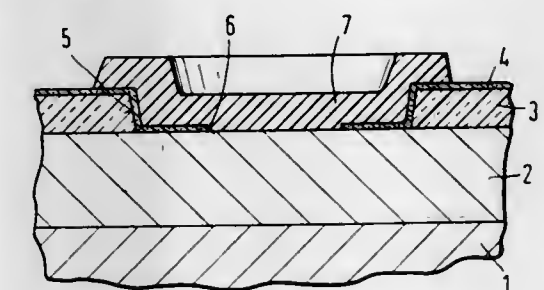
Claims priority, application Germany, Dec. 15, 1969, 1962814

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H01L 29/48

U.S. Cl. 357-15

2 Claims



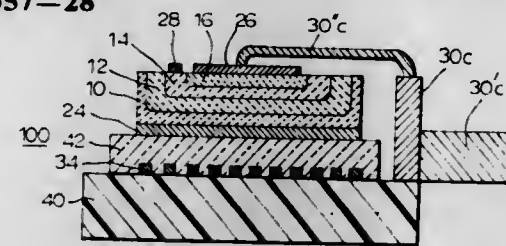
1. A metal semiconductor diode with a silicon dioxide insulating layer, arranged on a semiconductor body and provided with a first contact window, a silicon nitride insulating layer which is thinner than the silicon dioxide insulating layer on said silicon dioxide insulating layer, said silicon nitride insulating layer having therein a second contact window which is 10 to 30 μm smaller than the first contact window, so that said silicon nitride insulating layer covers the edge of the surface of the semiconductor body which emerges through the first contact window and contact metal is provided in the first and in the second contact windows, said silicon dioxide layer being 0.4 to 0.8 μm thick and said silicon nitride layer being 100 - 500 Å thick.

4,009,482

SEMICONDUCTOR THERMALLY SENSITIVE SWITCH STRUCTURE

Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 506,772, Sept. 17, 1974, abandoned.
This application Aug. 12, 1976, Ser. No. 713,872
Claims priority, application Japan, Sept. 26, 1973, 48-108107

Int. Cl.² H01L 23/56, 29/66, 29/74; B22D 1/00
U.S. Cl. 357-28 7 Claims



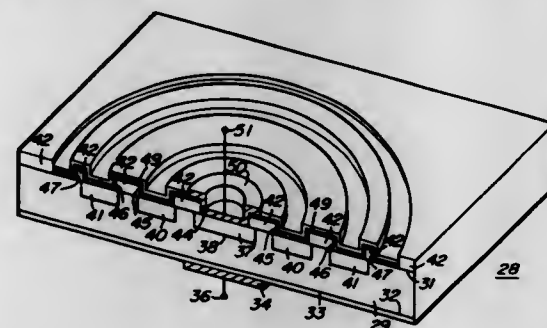
1. A semiconductor thermally sensitive switch structure comprising a thermally sensitive semiconductor switch element including at least four semiconductor layers of alternate conductivity and having p-n junctions between said layers and which element can change between stable conducting and nonconducting states at a switching temperature and which is self-held in the nonconducting state, electrode means on said switch element for connecting said switch element in an electrical circuit for switching the current flow in the circuit, and heater means on said switch element for heating said semiconductor switch element to switch the latter from its nonconducting state to its conducting state, said heater means being electrically insulated from said semiconductor switch element.

4,009,483

IMPLEMENTATION OF SURFACE SENSITIVE SEMICONDUCTOR DEVICES

Lowell E. Clark, Paradise Valley, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Continuation of Ser. No. 457,949, April 4, 1974, abandoned, which is a continuation of Ser. No. 240,634, April 3, 1972, abandoned. This application Sept. 2, 1975, Ser. No. 609,886
Int. Cl.² H01L 29/34, 29/40, 29/72

U.S. Cl. 357-52 2 Claims



1. A high voltage semiconductor device including a first region of semiconductor material of a first conductivity type, having an upper surface, a second region of semiconductor material of a second conductivity type adjoining said first region and forming therewith a first PN junction terminating at said upper surface, first passivating means on said upper surface covering said termination of said first PN junction, a high resistivity film on said first passivating means and making electrical contact to said first region of semiconductor material and said second region of semiconductor material comprising:

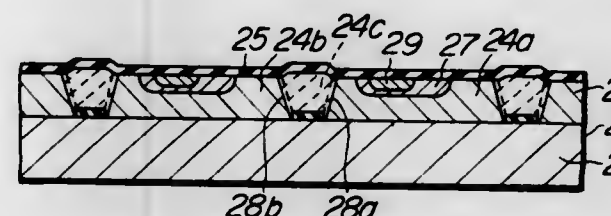
high integrity second passivating means on said high resistivity film for protecting said high resistivity film from resistivity degradation;
a guard ring of semiconductor material of said second conductivity type in said first region and forming therewith a

second PN junction terminating at said upper surface, said guard ring surrounding and spaced from said second region; and
an opening in said first passivating means exposing said guard ring, said high resistivity film contacting said guard ring through said opening for establishing the potential of said guard ring to a value between the potential of said first region and the potential of said second region.

4,009,484

INTEGRATED CIRCUIT ISOLATION USING GOLD-DOPED POLYSILICON

Katami Ogiue, Kodaira; Masaya Ohta, and Shotaro Shibata, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Dec. 3, 1969, Ser. No. 881,822
Claims priority, application Japan, Dec. 11, 1968, 43-90252
Int. Cl.² H01L 27/04, 29/04, 29/167, 21/20
U.S. Cl. 357-59 11 Claims



1. A semiconductor device comprising:
a monocrystalline semiconductor region; and
a polycrystalline semiconductor region being directly contiguous to said monocrystalline region and doped with an impurity forming a deep level therein;
in which said monocrystalline region is doped with a first conductivity-type-determining impurity and gold, and said polycrystalline region is doped with gold and a second conductivity-type determining impurity.

4,009,485

SEMICONDUCTOR PELLET ASSEMBLY MOUNTED ON CERAMIC SUBSTRATE

Paul W. Koenig, Clyde, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Continuation-in-part of Ser. No. 535,670, Dec. 23, 1974. This application Sept. 8, 1975, Ser. No. 611,239
Int. Cl.² H01L 23/48, 29/44, 29/52, 29/60
U.S. Cl. 357-68 22 Claims



1. A semiconductor apparatus comprising:
a semiconductor body defining first and second substantially parallel faces, said body containing a preselected distribution of conductivity altering impurities such that a semiconductive device pellet is formed, and wherein each of said faces has at least one metallic contact thereon in an electrically conductive relationship with said pellet;
a metallic mounting plate defining first and second substantially parallel major surfaces, each of said major surfaces defining a central planar region and wherein at least said first major surface defines a peripheral transition region such that the peripheral corner of said first major surface is without the plane of the central planar region thereof, said peripheral corner of said first major surface having a burr projecting in the direction of the plane of said first

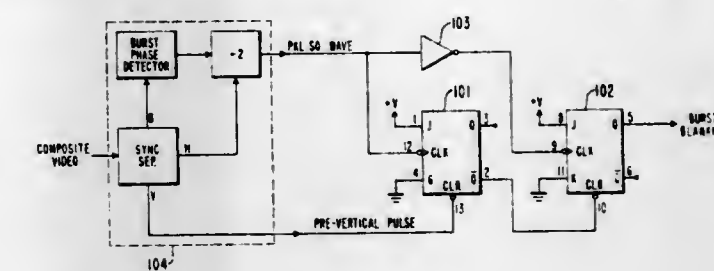
4,009,487

BLANKING GENERATOR FOR PAL SYNC SIGNALS

William Joseph Derenbecher, Jr., Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 29, 1975, Ser. No. 645,184
Claims priority, application United Kingdom, Apr. 4, 1975, 13965/75

Int. Cl.² H04N 9/46

U.S. Cl. 358-19 6 Claims



1. A blanking generator for PAL television signals, comprising:
a first source of periodic signals at one-half the horizontal line rate having first and second polarity transitions;
a source of periodic enabling signals related to the vertical field rate having a duration equal to a multiple of said horizontal line rate;
first logic means responsive to said first signal source, said first logic means being enabled by said enabling signal for providing a first output signal at the first polarity transition of said first signal to occur after application of said enabling signal;
second logic means responsive to said first signal and said first output signal for providing a second output signal from said second logic means at the second polarity transition of said first signal occurring after said enabling signal duration;
said second output signal being equal in time to the duration of said enabling signal, but displaced in time to be coincident with the first polarity transition of said first signal to occur after application of said enabling signal.

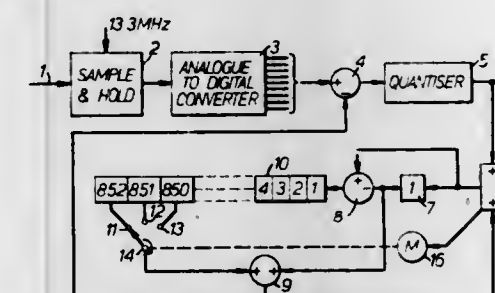
4,009,486

DIGITAL ENCODING SYSTEM

John Edward Thompson, Watford, England, assignor to The Post Office, London, England
Filed Aug. 20, 1975, Ser. No. 605,994
Claims priority, application United Kingdom, Aug. 23, 1974, 37280/74

Int. Cl.² H04N 9/02

U.S. Cl. 358-13 12 Claims

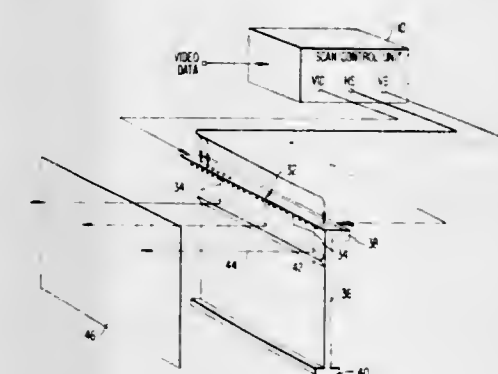


1. A method of digitally encoding a PAL colour television signal having a base band luminance component and a phase and amplitude modulated sub-carrier wave representing chrominance, the sense of the phase modulation being switched about a datum phase so as to alternate in successive lines, in which at each of a regular succession of sampling instants an instantaneous value of the signal has subtracted from it a combination of previously sampled values of the signal, the difference being encoded in digital form; wherein the sampling frequency is three times the frequency of the sub-carrier, with sampling instants synchronised with the datum phase of the sub-carrier or a phase in quadrature with the datum phase, and the value of the signal at a present sampling instant has subtracted from it both the value at a preceding sampling instant and the difference between the values at first and second sampling instants approximately one line period earlier, the value at the first sampling instant being subtracted from the value of the second sampling instant to produce the last-mentioned difference, the first and second sampling instants being chosen so that they are spaced the same number of sampling intervals as the present and preceding sampling instants, and that the sub-carrier components, if unmodulated, would cancel each other.

4,009,488

VIDEO DISPLAY SYSTEM AND METHOD EMPLOYING PROPAGATING STRESS WAVES

Ronald S. Smith, CMR Box 2509 USASAFS Augsburg, A.P.O. New York, N.Y. 09458
Filed May 1, 1975, Ser. No. 573,611
Int. Cl.² H04N 9/31; G02F 1/11
U.S. Cl. 358-62 19 Claims



1. A video display system comprising:
a stress wave propagating means defining a viewing plane and including means for initiating the propagation of stress waves along said propagating means in a first scanning direction in said viewing plane; and
means for emitting light selectively modulated in intensity by a video signal along a scan line in a second scanning direction generally perpendicular to said first scanning direction, said light emitting means being disposed in

DESIGN PATENTS
GRANTED FEBRUARY 22, 1977

ERRATA

For	See
CLASS	PATENT NO.
015-144	243,459
014-045	243,460
011-158	243,462
011-006	243,463
024-052	243,477
028-065	243,478
028-049	243,480

DESIGNS

FEBRUARY 22, 1977

243,421 SPORT SHOE

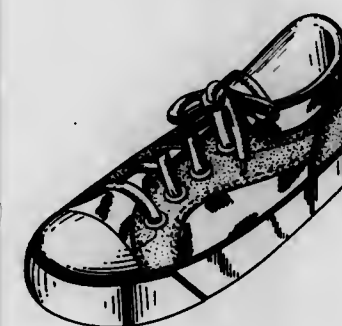
William J. Cohen, Hingham, Mass., assignor to CITC Industries, Inc., New York, N.Y.

Filed July 31, 1975, Ser. No. 600,711

Term of patent 14 years

Int. Cl. C2-04

U.S. Cl. D2-310



243,424 UPHOLSTERED SEAT

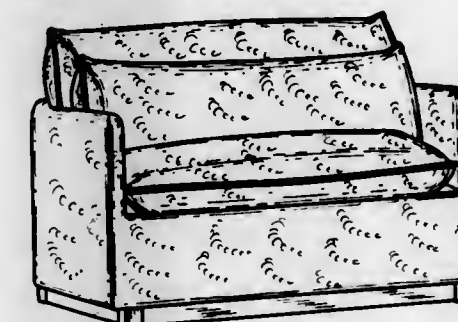
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy

Filed July 14, 1975, Ser. No. 595,408

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-71



243,425 CHAIR

Sidney Gibson, 229 Deloraine Ave., Toronto, Ontario, Canada

Filed Oct. 21, 1975, Ser. No. 624,450

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-75



243,422 TONGUE BRUSH

Ilona D. Varga, 14 Beverly Road, Torrington, Conn. 06790

Filed Nov. 4, 1974, Ser. No. 520,726

Term of patent 14 years

Int. Cl. D4-02

U.S. Cl. D4-25



243,423 UPHOLSTERED SEAT

Alberto Rosselli, Milan, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy

Filed July 14, 1975, Ser. No. 595,407

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-71



243,426 HOT COMB HOLDER

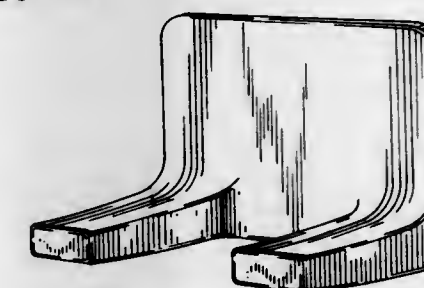
John A. Joslyn, 2441 N. 111th St., Wauwatosa, Wis. 53213

Filed Feb. 26, 1976, Ser. No. 661,474

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-125

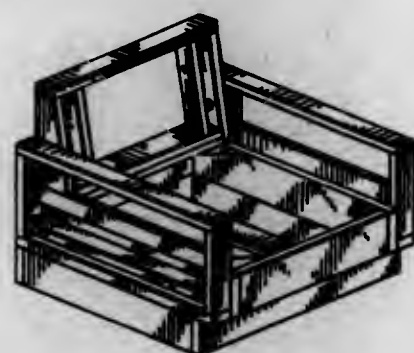


243,427

FRAME FOR A SEAT

William R. Watts, Rte. No. 1, P.O. Box 320-1, Millsboro, Del.
 Filed Aug. 27, 1975, Ser. No. 608,027
 Term of patent 14 years
 Int. Cl. D6-06

U.S. Cl. D6-191

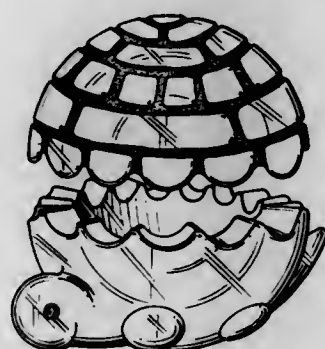


243,428

COVERED FOOD BOWL OR SIMILAR ARTICLE

James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor
 Hocking Corporation, Lancaster, Ohio
 Filed July 28, 1975, Ser. No. 599,835
 Term of patent 14 years
 Int. Cl. D7-05

U.S. Cl. D7-5



243,429

COVERED FOOD BOWL OR SIMILAR ARTICLE

James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor
 Hocking Corporation, Lancaster, Ohio
 Filed Aug. 13, 1975, Ser. No. 604,444
 Term of patent 14 years
 Int. Cl. D7-01

U.S. Cl. D7-5

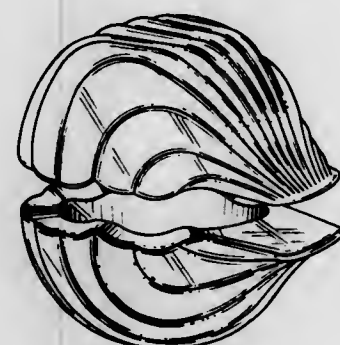


243,430

COVERED FOOD BOWL OR SIMILAR ARTICLE

James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor
 Hocking Corporation, Lancaster, Ohio
 Filed Oct. 23, 1975, Ser. No. 625,203
 Term of patent 14 years
 Int. Cl. D7-01

U.S. Cl. D7-5

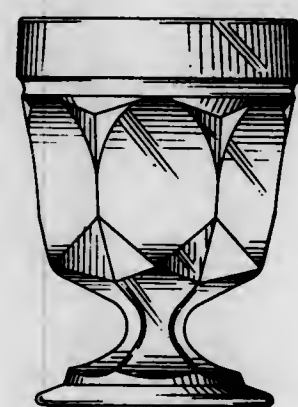


243,431

GOBLET OR SIMILAR ARTICLE

Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking
 Corporation, Lancaster, Ohio
 Division of Ser. No. 397,069, Dec. 13, 1973, Pat. No.
 D238,541. This application Jan. 29, 1975, Ser. No. 544,913
 Term of patent 14 years
 Int. Cl. D7-01

U.S. Cl. D7-11



243,432

PLATE OR THE LIKE

Ottorino N. Mercadante, Corning, N.Y., assignor to Corning
 Glass Works, Corning, N.Y.
 Filed July 18, 1975, Ser. No. 597,218
 Term of patent 14 years
 Int. Cl. D7-01

U.S. Cl. D7-36



243,433

PITCHER OR SIMILAR ARTICLE

Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking
 Corporation, Lancaster, Ohio
 Division of Ser. No. 380,272, July 18, 1973, Pat. No.
 D237,031. This application Dec. 5, 1974, Ser. No. 529,746
 Term of patent 14 years
 Int. Cl. D7-01

U.S. Cl. D7-64



243,434

PITCHER

Richard E. R. Cone, Dallas, Tex., assignor to Plastics Manufac-
 turing Company, Dallas, Tex.
 Filed Apr. 9, 1975, Ser. No. 566,540
 Term of patent 14 years
 Int. Cl. D7-01

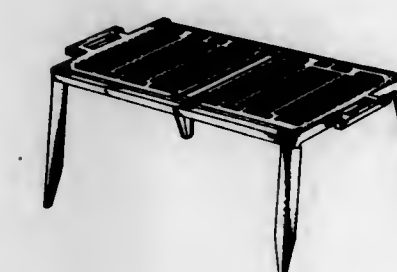
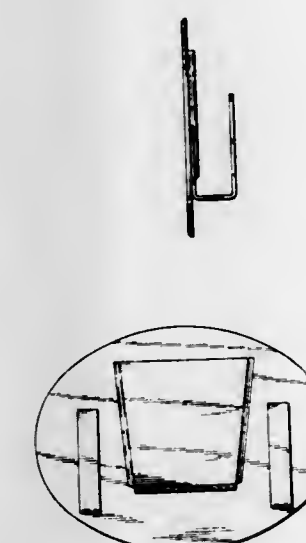
U.S. Cl. D7-64

243,435

COMBINED TABLE PLACE MAT AND NAPKIN HOLDER

Beulah J. Hoffman, 160 S. Monaco Blvd., Denver, Colo. 80222
 Filed Feb. 25, 1976, Ser. No. 661,315
 Term of patent 14 years
 Int. Cl. D6-04; D7-06

U.S. Cl. D7-72



243,436

BARBECUE GRILL

Kenneth J. Vida, 6200 Canterbury Drive, Apt. 309, Culver
 City, Calif. 90230
 Filed Apr. 26, 1976, Ser. No. 679,987
 Term of patent 14 years
 Int. Cl. D7-04

U.S. Cl. D7-107

243,437

ARTICLE OF FLATWARE

William J. Knope, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.

Filed May 21, 1975, Ser. No. 579,450

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D7-137



243,438

RAKE FOR SPREADING INSULATION IN BUILDING STRUCTURES

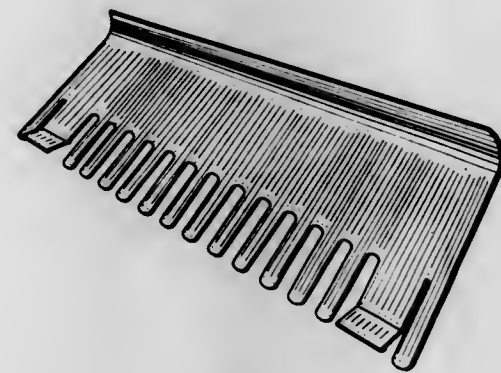
Ray E. Batley, 7325 Old Mill Road, Birmingham, Mich. 48010

Filed July 7, 1975, Ser. No. 593,364

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-16



243,439

HANDLE FOR A PERCUSSION TOOL OR THE LIKE

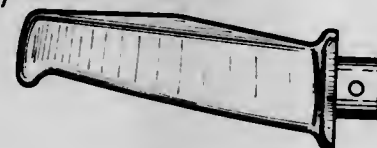
Stig Rune Zernell, Johanneshov, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed July 29, 1975, Ser. No. 600,005

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-107



243,440

SUPPORT HOOK FOR SHELVES OR THE LIKE

Nils Erik Strinning, St. Sulpice, Switzerland, assignor to String-Seffe Mobelfabrik AB, Saffle, Sweden

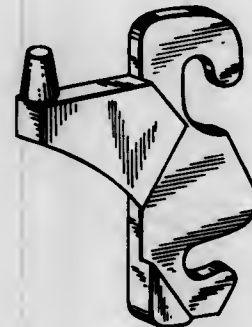
Filed Aug. 1, 1975, Ser. No. 600,966

Claims priority, application Germany, Feb. 3, 1975, 7503156[U]

Term of patent 14 years

Int. Cl. D8-08

U.S. Cl. D8-381



243,441

HOOK

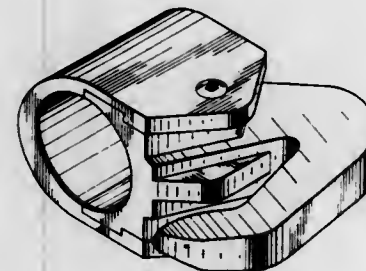
Alexander L. Podd, 306 University Ave., Apt. 21, Fredericton, New Brunswick, Canada

Filed May 28, 1975, Ser. No. 581,585

Term of patent 14 years

Int. Cl. D8-08

U.S. Cl. D8-367



243,442

BOTTLE

Robin M. Montgomery, Sherman Oaks, Calif., assignor to Max Factor & Co., Hollywood, Calif.

Filed Mar. 10, 1975, Ser. No. 556,869

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-73



243,443

COMBINED DISPLAY CARD AND HOLDER FOR A CYLINDRICAL ARTICLE

Tadaaki Hayashi, 15-13, Midori, 5-chome, Koganei, Tokyo, Japan

Filed Oct. 6, 1975, Ser. No. 620,095

Term of patent 14 years

Int. Cl. D9-03

U.S. Cl. D9-191



243,444

CLOCK FACE

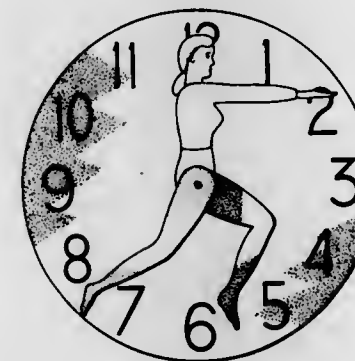
Daniel L. Miller, 3757 S.W. 27th Lane, Miami, Fla. 33134

Filed June 5, 1975, Ser. No. 583,861

Term of patent 14 years

Int. Cl. D10-01

U.S. Cl. D10-8



243,445

BOAT

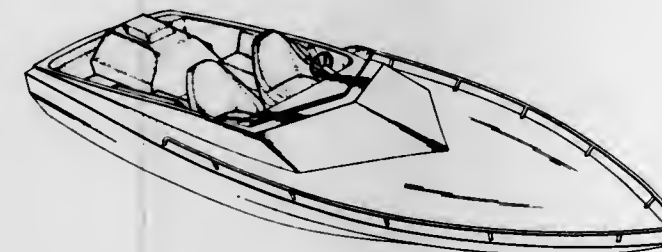
Nasim Khoury, San Marino, Calif., assignor to Bell Industries, Los Angeles, Calif.

Filed Dec. 3, 1975, Ser. No. 637,165

Term of patent 14 years

Int. Cl. D12-06

U.S. Cl. D12-62



243,446

SAILBOAT

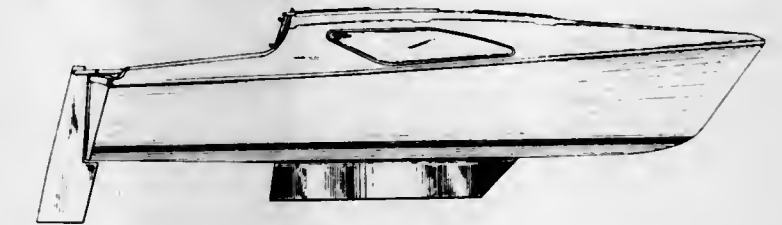
David T. Livingston, Seattle, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.

Filed July 17, 1975, Ser. No. 596,762

Term of patent 14 years

Int. Cl. D12-06

U.S. Cl. D12-64



243,447

FOOT LEVER FOR MOTORCYCLES

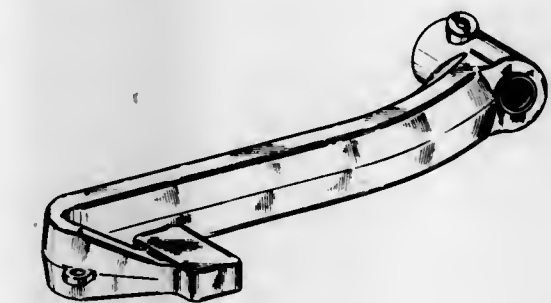
Grover C. Smith, III, and Thomas M. Smith, both of Houston, Tex., assignors to Interstate Sports, Inc., Fulshear, Tex.

Filed Dec. 17, 1974, Ser. No. 533,701

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-114



243,448

PNEUMATIC TIRE TREAD AND BUTTRESS

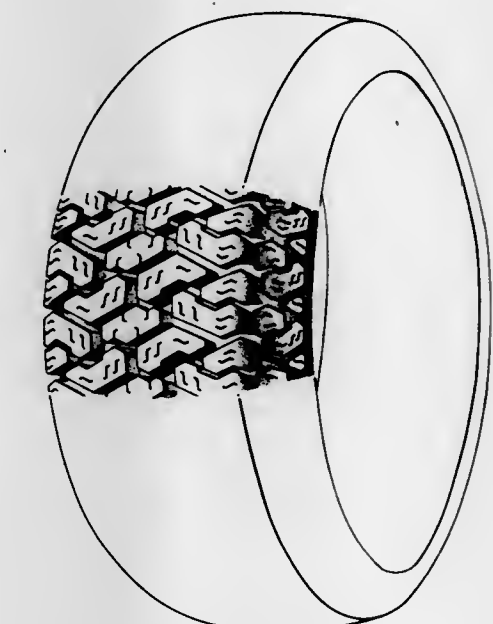
Gerhard Franz-Josef Senger, Aachen, Germany, assignor to Uniroyal A.G.

Filed Mar. 4, 1976, Ser. No. 663,883

Term of patent 14 years

Int. Cl. D12-15

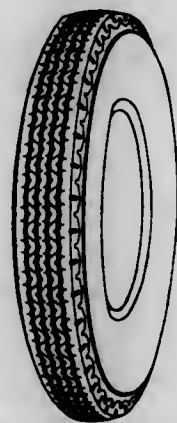
U.S. Cl. D12-136



243,449
VEHICLE TIRE

Toshio Hayakawa, Kodaira, and Masao Nakamura, Higashi-Murayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed May 14, 1976, Ser. No. 687,403
Claims priority, application Japan, Dec. 26, 1975, 50-50903
Term of patent 14 years
Int. Cl. D12-15

U.S. Cl. D12-142

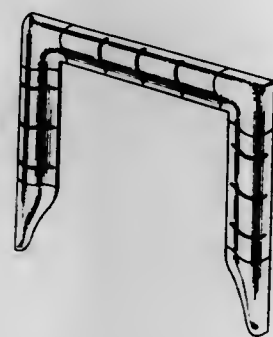


243,450
AERODYNAMIC DRAG REDUCTION DEVICE FOR VEHICLES

Paul B. MacCready, Jr., and Peter B. S. Lissaman, both of Pasadena, Calif., assignors to Aerovironment Inc., Pasadena, Calif.

Filed July 17, 1975, Ser. No. 596,658
Term of patent 14 years
Int. Cl. D12-16

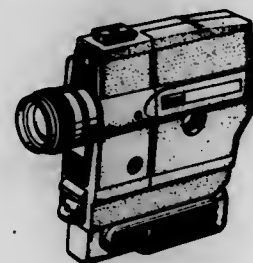
U.S. Cl. D12-181



243,451
MOVIE CAMERA

Shigeo Mizukawa, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Dec. 17, 1975, Ser. No. 641,475
Claims priority, application Japan, Aug. 13, 1975, 50-33246
Term of patent 14 years
Int. Cl. D16-01

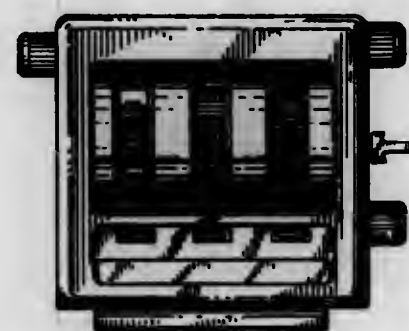
U.S. Cl. D16-04



243,452
COLOR MIXING HEAD FOR A PHOTOGRAPHIC ENLARGING APPARATUS

Mario Gandini, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy
Filed Oct. 8, 1975, Ser. No. 620,580
Claims priority, application Italy, Apr. 29, 1975, 6709/75
Term of patent 14 years
Int. Cl. D16-04

U.S. Cl. D16-34



243,453
ILLUMINABLE CALENDAR HOLDER OR SIMILAR ARTICLE

Samuel J. Friedland, Flushing, N.Y., assignor to Collection Corporation, Flushing, N.Y.
Filed June 9, 1975, Ser. No. 584,906
Term of patent 14 years
Int. Cl. D19-02

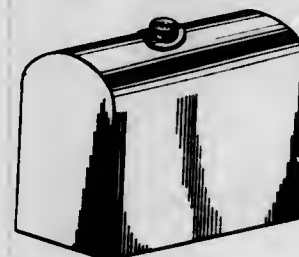
U.S. Cl. D19-20



243,454
STORAGE TANK

Marvin D. Kerr, and Donald R. Kerr, both of 220 Burlington St., Hastings, Nebr. 68901
Filed Nov. 10, 1975, Ser. No. 630,140
Term of patent 14 years
Int. Cl. D23-01

U.S. Cl. D23-2

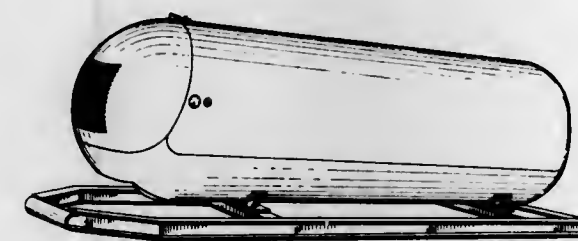


243,455
CRYOGENIC LIQUID STORAGE VESSEL

Nicholas A. Verini, North Plainfield, N.J., assignor to Airco, Inc.

Filed Nov. 17, 1975, Ser. No. 632,430
Term of patent 14 years
Int. Cl. D23-01

U.S. Cl. D23-2

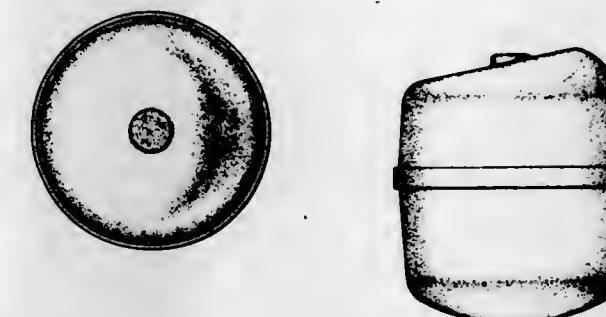


243,458
FILTER

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,153
Term of patent 14 years
Int. Cl. D23-01

U.S. Cl. D23-4

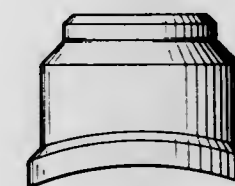


243,456
WELDING OUTLET

Bobby W. Ryan, Houston, Tex., assignor to WFI International, Inc.

Filed Feb. 20, 1976, Ser. No. 659,921
Term of patent 14 years
Int. Cl. D23-01

U.S. Cl. D23-40

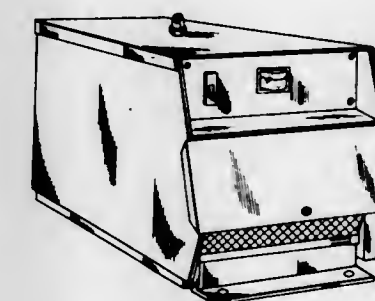


243,459
WELDING MACHINE

Theodore J. Bliss, Warner, N.H., assignor to Saban Electric Corporation, Warner, N.H.

Filed Apr. 10, 1975, Ser. No. 566,937
Term of patent 14 years
Int. Cl. D15-09

U.S. Cl. D15-144

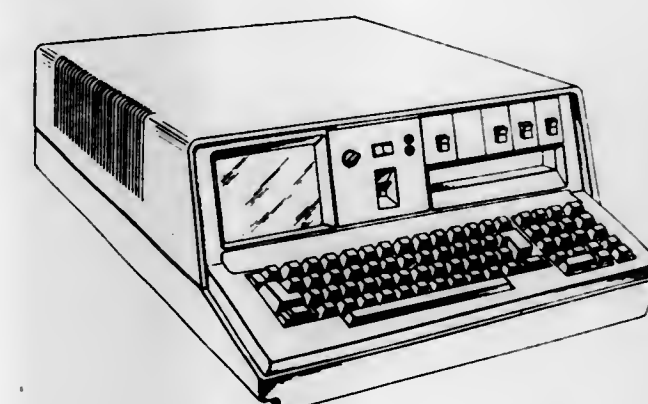


243,460
PORTABLE PERSONAL COMPUTER

John Greenfield; Collan B. Kneale, and Frank Wilkey, Jr., all of Rochester, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,845
Term of patent 14 years
Int. Cl. D14-02

U.S. Cl. D14-45

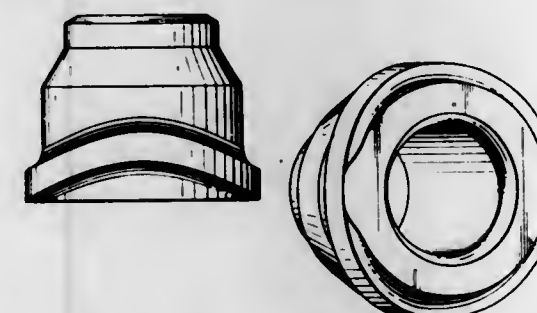


243,457
WELDING OUTLET

Bobby W. Ryan, Houston, Tex., assignor to WFI International, Inc.

Filed Feb. 20, 1976, Ser. No. 659,923
Term of patent 14 years
Int. Cl. D23-01

U.S. Cl. D23-40



243,461

DESK TOP ACCOUNTING MACHINE

Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

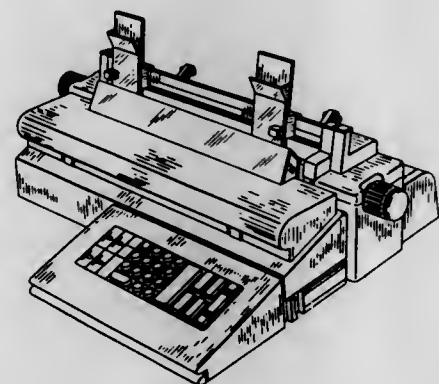
Filed Sept. 24, 1975, Ser. No. 616,376

Claims priority, application Italy, Mar. 27, 1975, 52989/75

Term of patent 14 years

Int. Cl. D18-01

U.S. Cl. D64-11 B



243,463

VASE OR SIMILAR ARTICLE

Frank J. Benes, and James Lloyd Thrush, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed July 11, 1974, Ser. No. 487,456

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-146



243,462

STRING FISH SCULPTURE

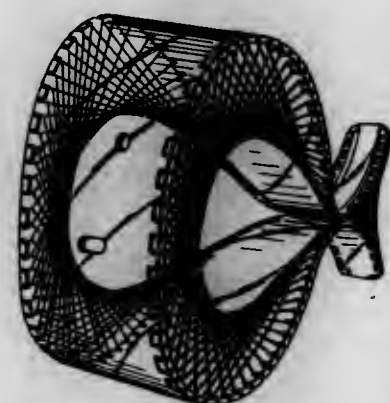
Margaret D. Sud, 2063 Golf Course Drive, Reston, Va. 22091

Filed June 9, 1975, Ser. No. 585,384

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-158



243,464

BIRD HOUSE

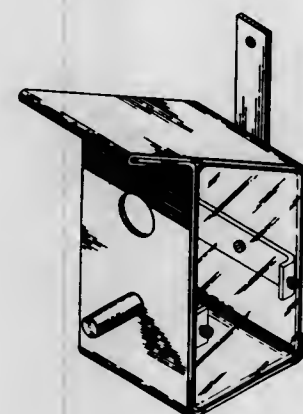
Michael L. Greene, 13103 Venango Road, Oxon Hill, Md. 20022

Filed July 9, 1975, Ser. No. 592,712

Term of patent 14 years

Int. Cl. D30-02

U.S. Cl. D30-03



243,465

BIRD FEEDER

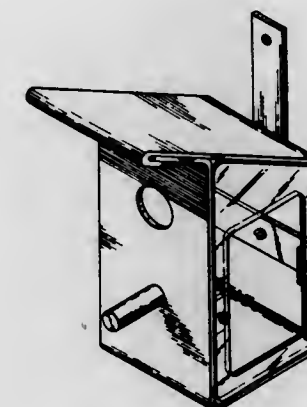
Michael L. Greene, 13103 Venango Road, Oxon Hill, Md. 20022

Filed July 9, 1975, Ser. No. 592,711

Term of patent 14 years

Int. Cl. D30-03

U.S. Cl. D30-14



243,467

TENNIS RACQUET FRAME

George Kouvelas, 181 Madison Ave., Englewood, N.J. 07631

Filed May 19, 1975, Ser. No. 578,621

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 ST



243,466

CEMETERY MEMORIAL MONUMENT

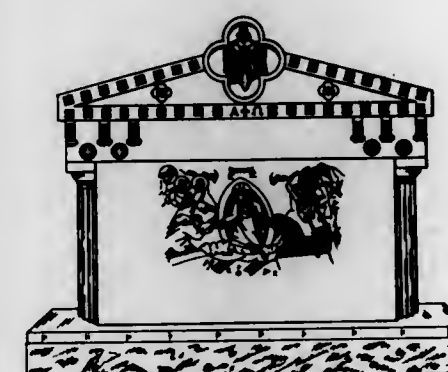
Christos J. Bantas, 129 Eleventh St., Lowell, Mass. 01850

Filed June 25, 1975, Ser. No. 590,070

Term of patent 14 years

Int. Cl. D31-00

U.S. Cl. D31-17



243,468

GAME BOARD

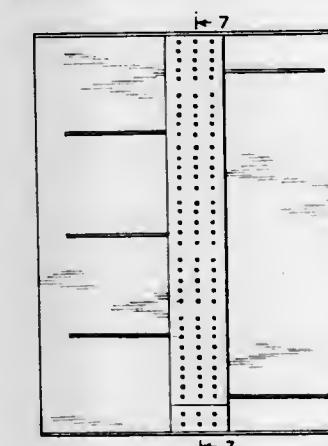
Irving N. Levey, 4342 Britt Place, Columbus, Ohio 43227

Filed July 16, 1975, Ser. No. 596,450

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 TT

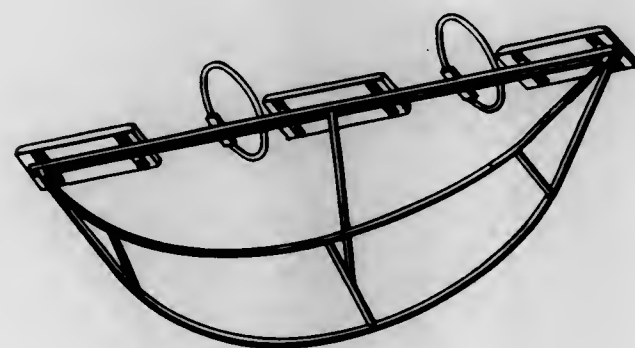


243,469
ROCKING TOY

William U. Nipper, Jr., Swainsboro, Ga., assignor to Randolph C. Karrh, Swainsboro, Ga.

Filed Mar. 15, 1976, Ser. No. 667,194
Term of patent 14 years
Int. Cl. D21-03

U.S. Cl. D34-5 D



243,471
CURTAIN MATERIAL

Peter E. Schroeder, Am Faltler 8, CH866 Lucerne, Switzerland
Filed Aug. 25, 1975, Ser. No. 607,838

Claims priority, application Germany, May 26, 1975, 360/75

Term of patent 14 years
Int. Cl. D5-05

U.S. Cl. D47-6 E



243,470
PENDANT

Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed June 16, 1975, Ser. No. 586,995

Term of patent 14 years
Int. Cl. D11-01

U.S. Cl. D11-6



243,472
LAMP SHADE

Jhi Hung Leung, Kowloon, Hong Kong, assignor to Star Industrial Co., Ltd., Kowloon, Hong Kong

Filed Sept. 18, 1975, Ser. No. 614,601

Claims priority, application United Kingdom, Aug. 5, 1975, 972079/75

Term of patent 7 years
Int. Cl. D26-05

U.S. Cl. D48-16 D

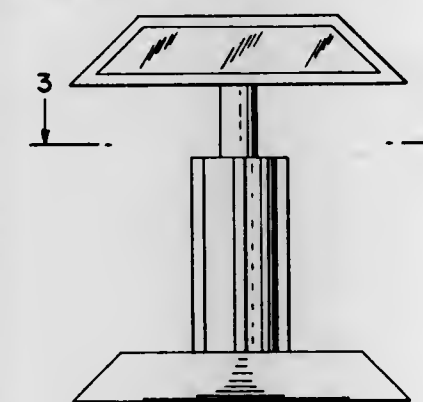


243,473
FLUORESCENT TABLE LAMP

Delores S. Freeman, 134-40 231st St., Laurelton, N.Y. 11413
Filed Feb. 18, 1976, Ser. No. 658,872

Term of patent 14 years
Int. Cl. D26-05

U.S. Cl. D48-20 R



243,474
PORTABLE FLUORESCENT LANTERN

Chung Sum Leung, Kowloon, Hong Kong, assignor to Foster Industries Co., Ltd., Kowloon, Hong Kong

Filed July 8, 1975, Ser. No. 594,080

Claims priority, application United Kingdom, Feb. 13, 1975, 969865/75

Term of patent 7 years
Int. Cl. D26-02

U.S. Cl. D48-24 R

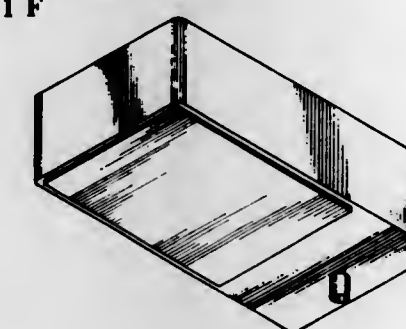


243,475
PHYSIOLOGICAL SENSOR FOR PLACEMENT ON THE SKIN ON HUMANS OR ANIMALS TO DETECT ELECTRICAL ACTIVITY IN THE LOCALIZED REGION THEREOF

Lawrence M. Frazier, 3432 Gauntlet, West Covina, Calif. 91792

Filed Nov. 20, 1974, Ser. No. 525,493
Term of patent 14 years
Int. Cl. D24-99

U.S. Cl. D83-1 F



243,476
THERAPEUTIC ELECTRODE PAD

Roger E. Avery, 145 Rome St., Farmingdale, N.Y. 11735
Filed Apr. 24, 1975, Ser. No. 571,376

Term of patent 14 years
Int. Cl. D24-04

U.S. Cl. D83-1 F

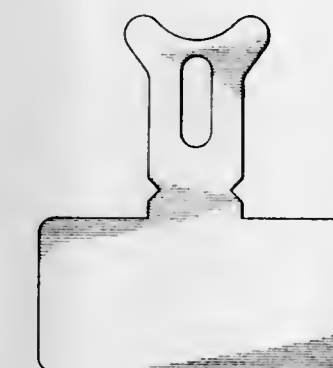


243,477
INTRAVENOUS TUBE ANCHOR

Jeffrey F. Cutruzzola, Pittsburgh, Pa., and Robert L. Schattner, Baltimore, Md., assignors to Omnimed, Inc., Burlington, N.J.

Filed Mar. 24, 1976, Ser. No. 670,206
Term of patent 14 years
Int. Cl. D24-04

U.S. Cl. D24-52

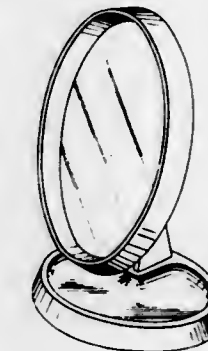


243,478
COMBINED MIRROR AND STAND THEREFOR

Ralph Godfrey Jones, Newtown Linford, England, assignor to Preci-Spark Limited, Syston, England

Filed Aug. 25, 1975, Ser. No. 607,573

Term of patent 14 years
Int. Cl. D28-03



243,479

TEXTILE PILE FABRIC

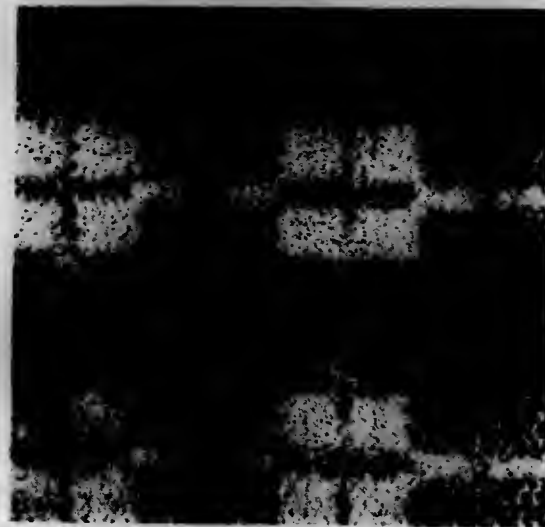
Peter R. Spierer, Coral Gables, Fla., assignor to Horizon Industries, Inc.

Filed Aug. 1, 1974, Ser. No. 493,832

Term of patent 14 years

Int. Cl. D5-05

U.S. Cl. D92-1 AA



243,480

COMBINED ELECTRIC SHAVER AND COVER THEREFOR

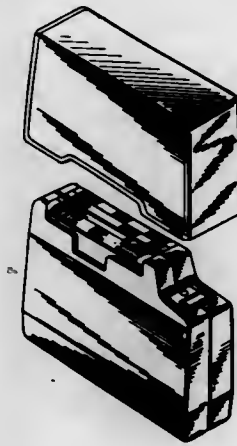
Jacob A. Krapowicz, Ridgefield, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed Feb. 24, 1975, Ser. No. 552,633

Term of patent 14 years

Int. Cl. C28-03

U.S. Cl. D28-49



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF FEBRUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- AB Carbox: See—
Trolle, Sten, 4,008,659.
- Abel, Edward P., to Eastman Kodak Company. Timing layer for color transfer assemblages comprising a mixture of cellulose acetate and maleic anhydride copolymer. 4,009,030, Cl. 96-29.00D.
- Abel, Martin. Lubricating self-aligning bearing. 4,008,928, Cl. 308-72.000.
- Abel, Paul: See—
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.
- Abitibi Paper Company Ltd.: See—
Pozzo, James A.; and Yan, Maxwell M., 4,009,073.
- Acura-Med: See—
Freitag, Samuel L., 4,008,802.
- Adachi, Kiyoshi: See—
Numasaki, Kouichi; Ninomiya, Nobutaka; Matsumoto, Zenji; Adachi, Kiyoshi; and Fujimoto, Toyohisa, 4,008,994.
- Adams, Jean M. Detachable gun sight mounts. 4,008,536, Cl. 42-1.00S.
- Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, to American Cyanamid Company. Methods for controlling insects and acarina. 4,009,279, Cl. 424-277.000.
- Agans, David J., to Massachusetts Institute of Technology. Frequency locked loop. 4,009,449, Cl. 331-16.000.
- Agawa, Hiroshi: See—
Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, 4,009,111.
- AGFA-Gevaert A.G.: See—
Becker, Manfred; and Ullrich, Roswitha, 4,009,036.
- Beier, Siegfried, 4,009,383.
- Deml, Reinhold; and Greis, Ulrich, 4,009,386.
- Ainoya, Koh; Arai, Kiichi; Kato, Akira; and Tanaka, Michio, to Japan Tobacco & Salt Public Corporation, The; Neo Filter Co., Ltd.; and Sanjo Machine Works Ltd. Apparatus for piling rod-shaped articles in a container. 4,008,555, Cl. 53-148.000.
- Air Products and Chemicals, Inc.: See—
Dixon, Dale D.; and Smith, William Mayo, Jr., 4,009,304.
- Jensen, Bruce E.; and Tolar, Jimmie G., 4,009,048.
- Aisin Seiki Kabushiki Kaisha: See—
Murakami, Noboru; and Hirose, Koichi, 4,008,630.
- Aizawa, Hiroshi: See—
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; and Uchidoi, Masanori, 4,009,480.
- Akao, Masatake: See—
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; and Shibano, Takashi, 4,009,306.
- Akashi, Goro: See—
Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, 4,009,111.
- Akiba, Keiichi: See—
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichi; Oishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.
- Akita, Isao: See—
Okada, Hisao; Oyahe, Hideo; and Akita, Isao, 4,009,440.
- Aktiebolaget Almex: See—
Lindholm, Ulf, 4,009,389.
- Aktiengesellschaft "Weser": See—
Nitzki, Leopold; and Alsen, Jurgen, 4,008,674.
- Aktieselskabet Grindstedværk: See—
Eliasson, Rune; and Nedenskov, Poul, 4,009,187.
- Albers, Teo. Waste collection and conversion system. 4,008,689, Cl. 119-28.000.
- Albertin, Andre: See—
Pommier, Claude; and Albertin, Andre, 4,009,410.
- Albertson, Noel F., to Sterling Drug Inc. N-acylated-11-oxygenated-2,6-methano-3-benzazocine intermediates. 4,009,171, Cl. 260-293.540.
- Alcaide, H. David; and Ewing, James H., to MKS Instruments, Inc. Vacuum monitoring. 4,008,619, Cl. 73-398.00C.
- Alcan Research and Development Limited: See—
Fitzpatrick, Nigel Patrick; Byrne, James Neville; and MacDonald, Angus James, 4,008,884.
- Sivilotti, Olivo Giuseppe, 4,008,750.
- Alcolac Inc.: See—
Steckler, Robert; and Linder, Seymour Martin, 4,009,201.
- Alexander, Charles F., Jr., to Brunswick Corporation. Pivotal mount assembly for trolling motors. 4,008,680, Cl. 115-18.00E.
- Allen, Cloy L. Growth measuring scale. 4,008,524, Cl. 33-169.00R.
- Allen, Joseph C., to Texaco Inc. Carrier gas vaporized solvent oil recovery method. 4,008,764, Cl. 166-266.000.
- Allenspach, Walter. Method and apparatus for arcuately bending and rolling an elongated metallic workpiece. 4,008,595, Cl. 72-170.000.
- Allwolt, Arthur L., to Rohm and Haas Company. Colored glass fiber articles and process. 4,009,314, Cl. 428-290.000.
- Allgood, Tommy L. Fireplace heating system. 4,008,703, Cl. 126-121.000.
- Allied Chemical Corporation: See—
Barrett, Joseph J.; and Buff, Ernest D., 4,008,961.
- Allis-Chalmers Corporation: See—
Hanaway, Roger D., 4,008,819.
- Hoeftl, Joseph R.; and Ballendux, Gerardus M., 4,008,629.
- Alps Electric Co., Ltd.: See—
Kumagai, Tadashi; and Ogasawara, Shoji, 4,009,441.
- Alsen, Jurgen: See—
Nitzki, Leopold; and Alsen, Jurgen, 4,008,674.
- Alter, Seymour B.; and Turkenkopf, Eugene. Method and apparatus for forming expansible envelope. 4,008,650, Cl. 93-62.000.
- Altermatt, Ruedi, to Sandoz Ltd. Mixtures of azo compounds having a 2-nitro-4-phenylsulfamoyldiphenyl amine nucleus. 4,009,158, Cl. 260-205.000.
- Alza Corporation: See—
Theeuwes, Felix; and Ayer, Atul D., 4,008,719.
- Amthem Products, Inc.: See—
Binns, Robert Eric, 4,009,115.
- Starke, George Robert; and Cooke, Anson Richard, 4,009,020.
- Ament, Roland W.; and Fender, Daniel C., to Wildlife Vaccines, Inc. Immersion method for treating aquatic animals. 4,009,259, Cl. 424-89.000.
- American Cyanamid Company: See—
Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, 4,009,279.
- Hoffman, Joseph Adrian, 4,009,207.
- Walworth, Bryant Leonidas, 4,009,277.
- American Gage & Manufacturing Co.: See—
Ross, Karl J., 4,008,881.
- American Gas Association, Inc.: See—
Baker, Bernard S.; and Marianowski, Leonard G., 4,009,321.
- American Standard, Inc.: See—
Fichter, Barry S.; and Duncan, Lane Scot, 4,008,732.
- Amity Leather Products Company: See—
Lemler, Paul L., 4,008,742.
- Amlong, William R., to Safety Laboratories, Inc. Gas dispensing assembly. 4,008,716, Cl. 128-203.000.
- AMP Incorporated: See—
Gilissen, Hermanus Petrus Johannes; and van Dijk, Petrus Richardus Martinus, 4,008,519.
- Kinkaid, Robert John; and Asick, John Carl, 4,008,939.
- Redmond, John Peter; Andrews, Daniel Marshall; and Guyler, Karl Edward, 4,009,297.
- Smith, Donald Lee, 4,008,941.
- Anaconda Company, The: See—
Sauer, Philip D.; and Payne, Thomas F., 4,009,010.
- Anderson-Cook, Incorporated: See—
Anderson, Marvin R.; and Jungesjo, Harald N., 4,008,702.
- Anderson, Donald J.; Pisio, Peter; and Kirkvold, Charles F., to Chevron Research Company. Method of recovering viscous petroleum from thick tar sand. 4,008,765, Cl. 166-272.000.
- Anderson, Gordon W. Chalkboard line tool. 4,008,522, Cl. 33-44.000.
- Anderson, Marvin R.; and Jungesjo, Harald N., to Anderson-Cook, Incorporated. Grinding machine and dresser therefor. 4,008,702, Cl. 125-11.00H.
- Anderson, Michael Denny, to Versapak (UK) Ltd. Sealing devices. 4,008,914, Cl. 292-307.00R.
- Anderson, Olof Verner, to Anson Incorporated. Writing instrument top. 4,008,535, Cl. 40-334.000.
- Anderson, Olof Verner, to Anson Incorporated. Writing instrument top. 4,008,969, Cl. 401-292.000.
- Anderson, Philip C.: See—
Satterlee, Lowell Duggan; Arnold, Roy Gary; and Anderson, Philip C., 4,009,390.
- Anderson, Richard C.; and Mathers, Marc G., to Varian Associates. Device providing sensible output indicating receipt of data by computer. 4,009,339, Cl. 178-18.000.
- Andrews, Daniel Marshall: See—
Redmond, John Peter; Andrews, Daniel Marshall; and Guyler, Karl Edward, 4,009,297.
- Andrews, Wendell C., to Corning Glass Works. Method of forming laminated curvilinear glass sheet. 4,009,064, Cl. 156-102.000.
- Angelbauer, Ewald: See—
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.
- Anhalt, John W.; Goodman, David S.; and Oliver, Leland W., to International Telephone and Telegraph Corporation. Electrical connector. 4,008,938, Cl. 339-17.00F.
- Anschutz & Co. GmbH: See—
Ehrich, Hans; Emshoff, Heiko; and Otto, Hans-Peter, 4,008,623.

Anson Incorporated: *See—*
Anderson, Olof Verner, 4,008,535.
Anderson, Olof Verner, 4,008,969.

Aoki, Kunio: *See—*
Yamada, Kouichi; Mizota, Tatsuo; Takeda, Kiyoshi; and Aoki, Kunio, 4,009,398.

Aonuma, Masashi: *See—*
Tama, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, 4,009,111.

Appelbaum, Paul; and Rhodes, Cecil J., to Cartridge Vending Systems, Inc. Container for vending machines. 4,008,827, Cl. 221-197,000.

Applied Materials, Inc.: *See—*
Fisk, Robert Walter, 4,008,815.

Arai, Atsuki; Ohi, Reiichi; Yamada, Minoru; Yokoo, Kenji; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials. 4,009,038, Cl. 96-100,000.

Arai, Kiichi: *See—*
Ainoya, Koh; Arai, Kiichi; Kato, Akira; and Tanaka, Michio, 4,008,555.

Arai, Tohru: *See—*
Komatsu, Noboru; Arai, Tohru; and Sugimoto, Yoshihiko, 4,009,086.

Arcilesi, Donald A.: *See—*
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,009,087.

Ardis, Alan E.; and Wojtowicz, John A., to Olin Corporation. Process for preparing 3-hydroxyoxetane. 4,009,182, Cl. 260-333,000.

Arizona Feeds: *See—*
Cardon, Bartley P.; and Frederick, Howard M., 4,009,268.

Armco Steel Corporation: *See—*
Maxel, John M., 4,009,225.

Armer Construction Company: *See—*
Hufford, Jerrold L., 4,008,756.

Arnold, O. Harold, to UOP Inc. Seat back adjuster. 4,008,920, Cl. 297-361,000.

Arney, William Charles; Williams, Clarence Alfred; and Glass, Joseph Edward, Jr., to Union Carbide Corporation. Bioresistant cellulose ethers. 4,009,329, Cl. 536-84,000.

Arnold, Roy Gary: *See—*
Satterlee, Lowell Duggan; Arnold, Roy Gary; and Anderson, Philip C., 4,009,390.

Arpe, Hans-Jurgen: *See—*
Leupold, Ernst Ingo; and Arpe, Hans-Jurgen, 4,009,209.

Asahi Glass Co., Ltd.: *See—*
Nagano, Kentaro; Henmi, Ichiro; and Kiyota, Masahiro, 4,008,843.

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Nobusawa, Tsukumo, 4,008,965.

Asano, Kiro: *See—*
Fujimaki, Hiroto; Kodama, Fumio; Takabe, Reiho; Asano, Kiro; and Seguchi, Koji, 4,009,305.

Ashley, Glen W., Jr.; Bunting, Ernest O.; Leonard, Charles A.; and Lessman, Gerhard, to General Dynamics Corporation. Dual spectral range target tracking seeker. 4,009,393, Cl. 250-339,000.

Ashton, Harold P.: *See—*
Swett, James B.; and Ashton, Harold P., 4,008,526.

Asick, John Carl: *See—*
Kinkaid, Robert John; and Asick, John Carl, 4,008,939.

Asko, Inc.: *See—*
Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,598.

Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,970.

Athens Stove Works, Inc.: *See—*
Biddle, William P.; and Tacker, John J., 4,009,302.

Atlantic Richfield Company: *See—*
Lowe, Clovis Carroll, Jr., 4,008,763.

Moskovich, Peter P., 4,008,738.

Atlas Copco Aktiebolag: *See—*
Kallin, Karl Ake; Larsson, Jan August; and Meyer, Waldemar, 4,008,922.

Atlas Powder Company: *See—*
Bloom, Harold F., 4,009,060.

Atsukawa, Masumi; Shinoda, Naoharu; and Inoue, Kenji, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for removing oxides of nitrogen and sulfur from exhaust gases. 4,009,244, Cl. 423-235,000.

Austin, Thomas H.: *See—*
Zimmerman, Robert L.; Austin, Thomas H.; and Schulze, Heinz, 4,009,130.

Automotive Products Company Limited: *See—*
Young, Alastair John, 4,008,925.

Ayalow, Liyew. Method of treatment of nematode parasite infections in domestic animals. 4,009,266, Cl. 424-177,000.

Ayer, Atul D.: *See—*
Theeuwes, Felix; and Ayer, Atul D., 4,008,719.

Aylon, Norman N., to General Concrete of Canada Limited. Control method for feeding items on a conveyor. 4,008,796, Cl. 198-460,000.

Ayres, Walter D., to Redco, Inc. Vacuum feed mechanism. 4,008,889, Cl. 271-99,000.

Babcock & Wilcox Company, The: *See—*
Kreider, Edward Wells; and Hoosie, Thomas Paul, 4,008,691.

Shimono, Nobuo; and Marubayashi, Hidcki, 4,008,734.

Weatherford, Larry Green, Jr., 4,008,757.

Baber, Donald D., to Boise Cascade Corporation. Bidirectional tear strip means for cartons and the like. 4,008,849, Cl. 229-51,075.

Bach, John W.: *See—*
Hooper, Clinton; Miciukiewicz, Joseph F.; Pollak, Philip, Jr.; and Bach, John W., 4,008,660.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Paust, Joachim; and Schumacher, Horst, 4,009,202.

Poschmann, Franz; and Bergold, Wolfram, 4,009,119.

Badon, Kenneth E. Swimming pool play pen. 4,008,497, Cl. 4-171,000.

Baggiolini, Enrico; Confalone, Pasquale Nicholas; Pizzolato, Giacomo; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. 2,3,3a,6,7,7a-Hexahydro-thieno[3,2-b]pyridin-(4H)-5-ones. 4,009,172, Cl. 260-293,550.

Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebe, Reinhard; Meyer, Alfred; and Naumann, Gunter, to Bayer Aktiengesellschaft. Process of preparing substantially organic waste liquids containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage. 4,009,116, Cl. 252-301,10W.

Bailey, Morris W., to Overhead Door Corporation. Pancled door construction. 4,008,745, Cl. 160-229,00R.

Bajer, Francis J.: *See—*
Pawlak, Joseph A.; and Bajer, Francis J., 4,009,198.

Baker, Bernard S.; and Marianowski, Leonard G., to American Gas Association, Inc. High temperature fuel cell electrolyte. 4,009,321, Cl. 429-46,000.

Baker, Don R., to Stauffer Chemical Company. Bromoalkyl alkane sulfonate. 4,009,190, Cl. 260-456,00R.

Baker, Don R., to Stauffer Chemical Company. Bromoethyl diester of sulfacetic acid. 4,009,191, Cl. 260-456,00R.

Bakos, Peter; and Rasile, John, to International Business Machines Corporation. High speed positive photoresist composition. 4,009,033, Cl. 96-33,000.

Balashova, Nadezhda Nikolaevna: *See—*
Sverchkov, Jury Sergeevich; Balashova, Nadezhda Nikolaevna; Popel, Viktor Mikhailovich; and Shmatok, Viktor Petrovich, 4,008,673.

Baldini, Giovanni, to Carrar & Matta S.p.A. Trolley with folding shelves. 4,008,671, Cl. 108-113,000.

Baldwin-Gegenheimer Corporation: *See—*
Stad, Andrew N., 4,008,516.

Ball Brothers Service Corporation: *See—*
Zappia, Anthony T., 4,008,525.

Ballendux, Gerardus M.: *See—*
Hocpf, Joseph R.; and Ballendux, Gerardus M., 4,008,629.

Banas, Edmund Odon; and Schindel, Wesley Gerald. Preparation of CCl₄ and CCl₂F₂ from fluorspar and CCl₄. 4,009,215, Cl. 260-653,800.

Banks, Stewart: *See—*
Cooper, Howard Lee; and Banks, Stewart, 4,008,918.

Bar-on, Ari, to Xerox Corporation. Fuser assembly for an electro-photographic copying machine. 4,008,955, Cl. 355-3,00R.

Bardenheier, Josef: *See—*
Schrawar, Rolf; Bardenheier, Josef; and Koch, Jurgen, 4,009,013.

Barker, James Albert: *See—*
Mann, David Roderick; and Barker, James Albert, 4,009,037.

Barrett, Joseph J.; and Buff, Ernest D., to Allied Chemical Corporation. Monochromatic detection of plural rotational Raman spectra generated by multiple frequency excitation. 4,008,961, Cl. 356-75,000.

Barrett, William T., to Wehr Corporation. Conveyor belt wear protection. 4,008,799, Cl. 198-698,000.

Bartlett, Robert N. Removable fireplace heater. 4,008,707, Cl. 126-131,000.

Bartram, Ronald D.; and Runkle, Charles J., to Monsanto Company. Method for shaping a slit product. 4,008,597, Cl. 72-199,000.

Baserga, Emilio, to Sandoz Ltd. Basic anthraquinone dyes, their production and use. 4,009,189, Cl. 260-381,000.

BASF Aktiengesellschaft: *See—*
Fischer, Adolf, deceased; Hansen, Hanspeter; and Rohr, Wolfgang, 4,009,192.

Geierhaas, Herbert; Ripperger, Willi; and Herrmann, Walter, 4,009,125.

Hess, Klaus; Stickel, Richard; Nagel, Otto; Sinn, Richard; and Daucher, Hans, 4,009,100.

Laurer, Peter Rudolf; Schroeder, Wolfgang; Hoffmann, Herwig; and Lingk, Heinz, 4,009,124.

Schefczik, Ernst, 4,009,165.

Scheuermann, Horst; and Stitz, Walter, 4,009,193.

Widder, Rudi; Diessel, Paul; and Distler, Dieter, 4,009,139.

Bastie, Clifford F., to Singer Company, The. Solenoid valve. 4,008,876, Cl. 251-129,000.

Bauer, Lieselotte: *See—*
Krueger, Friedrich; and Bauer, Lieselotte, 4,009,204.

Baues, Peter; Mahlein, Hans; Reichelt, Achim; and Winzer, Gerhard, to Siemens Aktiengesellschaft. Electro-optical switch and modulator. 4,008,947, Cl. 350-96,00C.

Baumayr, Hans E.: *See—*
Epstein, Arthur M.; and Baumayr, Hans E., 4,008,521.

Baumayr Instrument Co., Inc.: *See—*
Epstein, Arthur M.; and Baumayr, Hans E., 4,008,521.

Baumgartner, Hans Ulrich: *See—*
Wolf, Hans-Joachim; Melzer, Franz; and Baumgartner, Hans Ulrich, 4,009,447.

Baus, Heinz Georg. Ventilating device. 4,008,652, Cl. 98-39,000.

Baxter Laboratories, Inc.: *See—*
Miller, Jimmy L.; Salkin, Burton; Schnell, William J.; and Wolf, Ludwig, Jr., 4,009,107.

Miller, Jimmy L.; Salkin, Burton; and Schnell, William J., 4,009,108.

Bayan, Aris P.: *See—*
Ilavsky, Jan; Bayan, Aris P.; Charney, William; and Reimann, Hans, 4,009,269.

Bayer Aktiengesellschaft: *See—*
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebe, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,009,116.

Groß, Johann; Martin, Manfred; and Scharf, Gerhard, 4,009,216.

König, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, 4,009,272.

Kramb, Hans, 4,009,156.

Mormann, Werner; and Wagner, Kuno, 4,009,152.

Nuray, Dieter; Tresper, Erhard; and Freitag, Dieter, 4,009,148.

Ott, Karl-Heinz; Humme, Gert; Kranz, Dietmar; and Rohr, Harry, 4,009,226.

Ott, Karl-Heinz; Rohr, Harry; Humme, Gert; and Morbitzer, Leo, 4,009,227.

Preis, Lothar, 4,009,043.

Bays, Marvin G., to Seiscom Delta Inc. Seismic signal source. 4,008,784, Cl. 181-114,000.

BBC Brown Boveri & Company Limited: *See—*
Bernasconi, Felix, 4,009,462.

Beard, Colin C., to Syntex (U.S.A.) Inc. Novel 2-substituted-1,2,4-thiadiazole-2,3-di-benzimidazoles and process for their preparation. 4,009,164, Cl. 260-250,0BN.

Bearce, Allen George: *See—*
Lessig, William Ralph, III; and Bearce, Allen George, 4,008,559.

Becker, Helmut: *See—*
Meyer, Frank; Becker, Helmut; and Goretz, Heinz, 4,008,576.

Becker, Manfred; and Ullrich, Roswitha, to AGFA-Gevaert A.G. Photographic developer. 4,009,036, Cl. 96-66,300.

Becker, Otto Alfred. Process and apparatus for welding sheet metal coated with layers. 4,009,362, Cl. 219-92,000.

Becker, Phillip D., to Buell Industries, Inc. Fastening device. 4,008,642, Cl. 85-35,000.

Becton, Dickinson and Company: *See—*
Johnson, Lavell R., 4,009,005.

Beermann, Paul; and Grosse-Benne, Wilhelm, to Hagenuk & Co. GmbH. Percussion igniter. 4,008,666, Cl. 102-70,00R.

Beetham, Stanley, to Clarke Chapman Limited. Orbital welding apparatus. 4,009,360, Cl. 219-60,00A.

Behrendt, George H.; and Potter, Jesse L., to Filteron Systems Inc. Marine sanitation method and device. 4,009,104, Cl. 210-62,000.

Beier, Siegfried, to AGFA-Gevaert A.G. Light chute arrangement. 4,009,383, Cl. 240-1,300.

Belforte, Piero; and Perucca, Giovanni, to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA. Switching station for PCM telecommunication system. 4,009,349, Cl. 179-15,0AT.

Bell & Howell Company: *See—*
Hertel, Heinz E., 4,008,861.

Bell Telephone Laboratories, Incorporated: *See—*
Cutler, Cassius Chapin; and Limb, John Ormond, 4,009,330.

Ngo, Peter Dinh-Tuan, 4,009,415.

Sell, Darrell Dean, 4,009,385.

Bellocci, Rio; and Degois, Michel, to Pont-A-Mousson S.A. Method for low-pressure casting in a sand mould. 4,008,749, Cl. 164-66,000.

Belperin, Gerard, to Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T. Device for fixing a bearing on a concrete mass. 4,008,926, Cl. 308-3,00R.

Bendix Corporation, The: *See—*
Kluczynski, Matthew L.; and Orme, Myrl E., 4,008,737.

Bendler, Hellmut; Gawlick, Heinz; and Flach, Egon, to Dynamit Nobel Aktiengesellschaft. Device for tensioning safety belts in vehicles. 4,008,780, Cl. 180-82,00C.

Bennett, Harry Wrighton, to Rolls-Royce (1971) Limited. Gas turbine engine. 4,008,569, Cl. 60-39,51H.

Bennett, Ronald E., to General Electric Company. Attachment of heat pipes to electrical apparatus. 4,009,418, Cl. 361-38,000.

Bennett, Ronald E.: *See—*
Waldon, Paul L.; and Bennett, Ronald E., 4,009,417.

Bennion, Douglas N.; Hebbard, Ranna K.; and Deshpande, Sanjay L., to United States of America, Navy. Storage battery comprising positive electrode of a graphite and lithium fluoride compound. 4,009,323, Cl. 429-194,000.

Benson, William H.; and Rose, Gerald D. Resin-impregnated dry-type electromagnet for dusty and gassy locations. 4,009,459, Cl. 335-300,000.

Bensoussan, Maurice: *See—*
Nguyen Dat, Nhiep; Bensoussan, Maurice; and Doucet, Bernard, 4,009,408.

Bentler Werke AG: *See—*
Lachenmayer, Wilhelm, 4,009,066.

Berg, Alan, to United States of America, Navy. Aircraft steering and braking system. 4,008,868, Cl. 244-111,000.

Berg, David H.: *See—*
Bock, LaVerne D.; and Berg, David H., 4,009,262.

Berger, Jean-Luc; and Woehrn, Daniel, to Thomson-CSF. Charge transfer image device. 4,009,333, Cl. 358-213,000.

Berger, Leo; and Corraze, Alfred John, to Hoffmann-La Roche Inc. Cyclopenta[b]indole-2-carboxylic acids and derivatives thereof. 4,009,181, Cl. 260-326,270.

Bergold, Wolfram: *See—*
Poschmann, Franz; and Bergold, Wolfram, 4,009,119.

Bergwerksverband GmbH: *See—*
Meyer, Frank; Becker, Helmut; and Goretz, Heinz, 4,008,576.

Berkowitz, Joseph; and Berkowitz, Minerva. Auto steering wheel lock protector. 4,008,590, Cl. 70-424,000.

Berkowitz, Minerva: *See—*
Berkowitz, Joseph; and Berkowitz, Minerva, 4,008,590.

Bernasconi, Felix, to BBC Brown Boveri & Company Limited. Fast actuating water resistor. 4,009,462, Cl. 338-80,000.

Bertino, Lorenzo: *See—*
Garberi, Sergio; and Bertino, Lorenzo, 4,008,795.

Bertram, Leo: *See—*
Schemmann, Hugo; and Bertram, Leo, 4,008,985.

Besancenot, Serge. Projector control mechanism. 4,008,953, Cl. 353-103,000.

Bettridge, David Frederick: *See—*
Cork, Frank; Bettridge, David Frederick; and Clarke, Philip Charles, 4,009,146.

Beyer, Arnold D.; and Tjon, Harry X., to Kaiser Aluminum & Chemical Corporation. Transfer mechanism. 4,009,050, Cl. 134-66,000.

Biddle, William P.; and Tacker, John J., to Athens Stove Works, Inc. Method of coating a gas range top burner. 4,009,302, Cl. 427-238,000.

Biebuyck, Lawrence F., to Howmet Corporation. Wall structure and elements therefor. 4,008,552, Cl. 52-397,000.

Binegar, Ernest W. Vehicle switch attachment. 4,009,363, Cl. 260-336,000.

Bingham, Sidney H.; and Eberhardt, William H. Cut and cover construction of subway with utility chamber and air conditioning with minimum street traffic disturbance. 4,008,577, Cl. 61-44,000.

Binns, Robert Eric, to Amchem Products, Inc. Composition and method for cleaning aluminum at low temperatures. 4,009,115, Cl. 252-142,000.

Bio-Industries, Inc.: *See—*
Hoge, William H., 4,009,075.

Birk, Silvia C., to Mobil Oil Corporation. Oil recovery by waterflooding employing multicomponent surfactant systems. 4,008,768, Cl. 166-274,000.

Blachere, Henri: *See—*
Moll, Manfred; Durand, Gilbert; and Blachere, Henri, 4,009,286.

Black Body Corporation: *See—*
Wells, Harold D., 4,008,996.

Black and Decker Manufacturing Company, The: *See—*
Lessig, William Ralph, III; and Bearce, Allen George, 4,008,559.

Black, Philip William; and Irven, John, to International Standard Electric Corporation. Optical fiber manufacture. 4,009,014, Cl. 65-3,00A.

Blackwell, Henry Wayne, to Dresser Industries, Inc. Oil well tool with packing means. 4,008,759, Cl. 166-120,000.

Blanco, Francisco. Smoker's pipe construction. 4,008,725, Cl. 131-184,00A.

Bleckmann, Richard. Method of positive and non-positive cold-joining. 4,008,845, Cl. 228-136,000.

Bliss, Charles H.: *See—*
Nichols, Frank S.; Bliss, Charles H.; and Londergan, Robert J., 4,009,141.

Bloom, Harold F., to Atlas Powder Company. Primer composition for use with explosive charges. 4,009,060, Cl. 149-93,000.

Blumenthal, Gunter; and Marr, Peter, to Bochumer Eisenhütte Heintzmann & Company. Pit prop assembly. 4,008,578, Cl. 61-45,00D.

Bober, Thomas W., to Eastman Kodak Company. Method for reclaiming extruded plastic resins. 4,009,235, Cl. 264-40,200.

Bochumer Eisenhütte Heintzmann & Company: *See—*
Blumenthal, Gunter; and Marr, Peter, 4,008,578.

Bocker, Richard P.; Bromley, Keith; Monahan, Michael A.; and Stotts, Larry B., to United States of America, Navy. Electro-optical system for performing matrix-vector multiplication. 4,009,380, Cl. 235-181,000.

Bockett-Pugh, Charles Paul, to Honeywell Inc. Bar display with scale markers. 4,009,414, Cl. 315-169,00R.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See—*
Huber, Bernhard Werner; and Tamm, Rolf Gunther Arnold, 4,008,963.

Bodor, Nicolae S.; and Kaminski, James J., to Interx Research Corporation. Brominating and oxidizing agent and method of using same. 4,009,178, Cl. 260-307,00C.

Boeck, LaVerne D.; and Berg, David H., to Eli Lilly and Company. Antibiotic A-28086 recovery process. 4,009,262, Cl. 424-123,000.

Boehm, Arthur Flets: *See—*
Danilenko, Michael; Davis, James Robert, Jr.; and Boehm, Arthur Flets, 4,009,470.

Bohringer, Walter, to RCA Corporation. Voltage regulator for a deflection system. 4,009,426, Cl. 315-408,000.

Boise Cascade Corporation: *See—*
Baber, Donald D., 4,008,849.

Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,008,854.

Boney, William G.: *See—*
Mikulicz, Michael Z.; Boney, William G.; and Vora, Bipin V., 4,009,222.

Bonisch, Horst: *See—*
Mollenkopf, Hans; Angelbauer, Ewald; Wurr, Jurgen; Abel, Paul; Bonisch, Horst; and Vering, Antonius, 4,008,995.

Boone, James A.; Lewallen, Dennis L.; and Walker, Harold G., to Walker, Harold G., a part interest. Scraper assembly for ground tillage implement discs. 4,008,770, Cl. 172-566,000.

Boots Company Limited, The: *See—*
Cluzan, Robert; and Katz, Lazare, 4,009,174.

Borthwick, James; and Morman, James Forrester, to Imperial Chemical Industries Limited. Smoking mixture. 4,008,723, Cl. 131-2,000.

Borysiewicz, Richard; and Roedel, Charles W., to Milgo Electronic Corporation. Data modems having data drop-out and data echo protection. 4,009,356, Cl. 179-170.200.

Boscak, Vladimir G.: See—
Ostojic, Nedeljko; and Boscak, Vladimir G., 4,008,621.

Botsis, Nicolaos George; Korobilis, Panayotis Nicolas; Miras, Ioannis Constantin; and Eriparelis, George Michael, to Lamir Ltd. Tire failure indicator. 4,008,744, Cl. 152-427.000.

Boudreau, Paul Emile; and Moore, Brian Barry, to International Business Machines Corporation. Loop communications system with method and apparatus for switch to secondary loop. 4,009,469, Cl. 340-147.05C.

Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Cooled integral valve chest for an internal combustion engine and method for making same. 4,008,695, Cl. 123-41.760.

Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Device for locating the position of the control rack of a pump and for locking the latter in disassembling position. 4,008,981, Cl. 417-63.000.

Bourboulis, Panagiotis. Building construction. 4,008,546, Cl. 52-65.000.

Boussageon, Pierre, to Societe Generale pour l'Emballage. High-frequency bonding apparatus. 4,009,068, Cl. 156-380.000.

Bowen, Max E. Method of forming tablets with separators of sheet material. 4,009,239, Cl. 264-112.000.

Boys, John T., to Standard Pressed Steel Co. Tightening system. 4,008,772, Cl. 173-12.000.

Boys, John T.: See—
Wallace, Paul W.; and Boys, John T., 4,008,773.

Bozzano, Stefano. Motorboat provided with power operated retractable wheels for landing on beaches. 4,008,679, Cl. 115-1.00A.

BP Chemicals International Limited: See—
Hunt, Thomas, 4,009,145.

Bradshaw, Kenneth; and Buckingham, James Ernest, to Cam Gears Limited. Rack and pinion units. 4,008,627, Cl. 74-498.000.

Braeger, Horst; and Groth, Gerhard, to Nordischer Maschinenbau Rud. Baader. Machine for filleting fish. 4,008,509, Cl. 17-56.000.

Branchaud, Jean-Marie. Newspaper vending machine. 4,008,828, Cl. 221-241.000.

Brandstatter, Hans G.: See—
Smellie, Allan M.; and Brandstatter, Hans G., 4,009,247.

Braun, Paul E.; and Serner, Melvin F., to Ford Motor Company. Extended throttle bore multi-stage carburetor. 4,008,699, Cl. 123-122.0AB.

Breen, Barry C., to Tel-Tone Corporation. Multiple link circuit for a port multiplexer. 4,009,352, Cl. 179-18.0FF.

Brefka, Paul E.: See—
Turner, Robert Bruce; and Brefka, Paul E., 4,008,614.

Bremer, Robert Charles, Jr.; and Haupt, Hans Otto, to Wallace-Murray Corporation. Torsional vibration damper measuring. 4,008,600, Cl. 73-11.000.

Brinckmann, Paul; Krenz, Joachim-Ulrich; and Ruck, Werner. Blade with irrigation tubes. 4,008,720, Cl. 128-317.000.

Brix, Joachim Emil, to O & K Orenstein & Koppel Aktiengesellschaft. Water craft having sea opening with connecting conduit. 4,008,676, Cl. 114-151.000.

Brodbeck, Brunhilde. Massaging and relaxing device. 4,008,715, Cl. 128-57.000.

Bromley, Keith: See—
Bocker, Richard P.; Bromley, Keith; Monahan, Michael A.; and Stotts, Larry B., 4,009,380.

Brower, Jerrold J. Insulated fishing creel. 4,008,540, Cl. 43-55.000.

Brown, Boveri & Cie. A.G.: See—
Lob, Georg; and Pfohler, Clemens, 4,009,296.

Brown, Wayne Myron; and Manente, Joseph Carmen, Jr., to United Technologies Corporation. Compressor bleed system. 4,008,977, Cl. 415-1.000.

Brunkhorst, Robert: See—
Kilbourn, Lawrence Layton; and Brunkhorst, Robert, 4,008,532.

Brunswick Corporation: See—
Alexander, Charles F., Jr., 4,008,680.

Buanno, John M. Fireplace furnace. 4,008,706, Cl. 126-121.000.

Buckbee-Mears Company: See—
Woodfill, Ernest L., 4,009,422.

Buckingham, James Ernest: See—
Bradshaw, Kenneth; and Buckingham, James Ernest, 4,008,627.

Buckley, David A., to Xerox Corporation. Preparation of red amorphous selenium. 4,009,249, Cl. 423-510.000.

Budzik, Daniel A. Antitheft locking strap for clothing. 4,008,835, Cl. 223-85.000.

Buehl, Russell C.: See—
Cloran, Thomas S.; Thompson, Vernon R.; and Buehl, Russell C., 4,009,233.

Buell Industries, Inc.: See—
Becker, Phillip D., 4,008,642.

Buelow, Carol Ruth: See—
Megahed, El Sayed; Buelow, Carol Ruth; and Spellman, Patrick Joseph, 4,009,056.

Buening, Ernest O.: See—
Ashley, Glen W., Jr.; Buening, Ernest O.; Leonard, Charles A.; and Lessman, Gerhard, 4,009,393.

Buesscher, William E.; and Kerstetter, Donald R., to GTE Sylvania Incorporated. Fast warmup cathode and method of making same. 4,009,409, Cl. 313-337.000.

Buff, Ernest D.: See—
Barrett, Joseph J.; and Buff, Ernest D., 4,008,961.

Bugaut, Andre: See—
Kalopissis, Gregoire; Bugaut, Andre; and Estradier, Francoise, 4,008,999.

Buhler, Hermann, to Ciba-Geigy Corporation. Process for the dyeing or printing and simultaneous finishing of cellulose materials. 4,009,000, Cl. 8-17.000.

Burke, Noel I., to Tee-Pak, Inc. Method for improving the filterability of aluminum salts precipitated from aqueous solutions. 4,009,103, Cl. 210-51.000.

Burlington Industries, Inc.: See—
Reid, James P., Jr.; and McConnell, Bobby L., 4,009,001.

Burns, Joseph R., to RCA Corporation. Charge coupled memory system. 4,009,473, Cl. 340-173.00R.

Burrell Industrial Supply Company: See—
Zeloye, Daniel J., 4,008,935.

Burroughs Corporation: See—
Lacher, William Arthur, 4,009,437.

Simon, Paul W., 4,009,061.

Burroughs Wellcome, Inc.: See—
Thomas, Derek; and Zola, Heddy, 4,009,257.

Burton, Charles V., to Medtronic, Inc. Tape electrode for transmitting electrical signals through the skin. 4,008,721, Cl. 128-418.000.

Buy, Henri, to Transac-Compagnie pour le Developpement des Transactions. Distributor of sheets in wads. 4,008,891, Cl. 271-263.000.

Byrne, James Neville: See—
Fitzpatrick, Nigel Patrick; Byrne, James Neville; and MacDonald, Angus James, 4,008,884.

Cabet, Alain; Pinier, Gaston; Semur, Pierre; and Roy, Marie-Annick, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Level regulator of the digital type. 4,009,350, Cl. 179-15.0BP.

Cade, Richard Lukens: See—
Sigwarth, Herbert Francis; and Cade, Richard Lukens, 4,008,917.

Cahoy, Roger P., to Gulf Oil Corporation. Process for manufacturing 3,5-ditert-butyl-4-hydroxybenzaldehyde by formylation of 2,6-ditert-butylphenol. 4,009,210, Cl. 260-600.00R.

Calcagno, Piero; Garetti, Enzo; and Lobisch, Gunter, to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA. Logic network for programmable data concentrator. 4,009,468, Cl. 340-147.00C.

Cam Gears Limited: See—
Bradshaw, Kenneth; and Buckingham, James Ernest, 4,008,627.

Cameron Iron Works, Inc.: See—
Weldon, James M., 4,008,898.

Campbell, Stephen: See—
Coulter, Wallace H.; Hogg, Walter R.; Longman, Millard D., Jr.; Campbell, Stephen; and Doty, Edward Neal, 4,009,443.

Canadian Patents and Development Limited: See—
Warkentin, John; Ramakrishnan, Kottith; Jain, Rup C.; and Wandelmaier, Frank W., 4,009,276.

Canavan, Joseph M., to Raymond Lee Organization, Inc., The, a part interest. Support for elongated wooden planks and the like. 4,008,786, Cl. 182-186.000.

Canon Kabushiki Kaisha: See—
Iwashita, Tomonori; Aizawa, Hiroshi; Kozuki, Susumu; and Uchidoi, Masanori, 4,009,480.

Nagaoka, Tateki; Kimura, Yoshimasa; and Komiya, Yutaka, 4,008,612.

Caprara, Giuseppe: See—
Fumagalli, Carlo; Caprara, Giuseppe; and Roffia, Paolo, 4,009,183.

Cardinne, Philippe; Colomb, Francois; Manhes, Bernard; Nordman, James Emery; and Serve, Raymond, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude. Josephson junction. 4,009,479, Cl. 357-5.000.

Cardon, Bartley P.; and Frederick, Howard M., to Arizona Feeds. Composition and method for reducing the incidence of scours in neo-natal ruminants. 4,009,268, Cl. 424-180.000.

Carl Still, Firma: See—
Weber, Heinrich; Choulut, Gustav; and Laufhutte, Dieter, 4,009,243.

Carlson, David P.; Keenan, Thomas R.; and Marks, Douglas L., to Polaroid Corporation. Diffusion transfer image-receiving element having polyvinylpyridine layer treated with hydrophilic colloid/ammonia solution. 4,009,031, Cl. 96-29.00D.

Carmack, Larry G.: See—
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Carroll, William Michael, to Koller Die & Tool Company. Non-rotatable flame guard assembly. 4,008,822, Cl. 220-94.00R.

Carson, Don B., to UOP Inc. Mixed-phase fluid distribution for packed chambers. 4,009,095, Cl. 208-108.000.

Carter, Cecil O., to Phillips Petroleum Company. HF recovery with alkyl fluoride formation and utility in alkylation. 4,009,221, Cl. 260-683.480.

Carter, H. Kennon; and Mlekodaj, Ronald L., to United States of America, Energy Research and Development Administration. Seal for permitting transfer of tape from one pressure region to a region of substantially different pressure. 4,008,899, Cl. 277-35.000.

Carter, William, to United Merchants and Manufacturers, Inc. Process for treating textile fabric to retard inflammability. 4,009,002, Cl. 8-116.00P.

Cartridge Vending Systems, Inc.: See—
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Caulfield, Richard A. Drawing apparatus. 4,008,528, Cl. 35-26.000.

Cavanagh, Joseph C., to Midland Glass Company, Inc. Method of curing plastic coatings on bottles. 4,009,298, Cl. 427-55.000.

Cavendish, Michael Edward; and Elloy, Martin Arthur, to National Research Development Corporation. Prosthetic bone joint devices. 4,008,495, Cl. 3-1.910.

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Center, Warren A. Gun, 4,008,538, Cl. 42-78.000.

Chaffin, John H., III, to Honeywell Inc. Preparation of graded composition protective coatings. 4,009,300, Cl. 427-162.000.

Champan, Louis W., to Melco. Signalling device for key telephone systems. 4,009,354, Cl. 179-99.000.

Chanal, Roger, to Etat Francais represente par le Delege Ministeriel pour l'Armement. Return device for steering mechanism. 4,008,782, Cl. 180-132.000.

Chandra, Rangasami Sarat; and Stone, Kirby Lee, to Cincinnati Milacron, Inc. Ratio controlled mixing of liquids. 4,008,829, Cl. 222-63.000.

Chang, Harry L., to Mobil Oil Corporation. Oil recovery by micro-emulsion injection. 4,008,769, Cl. 166-274.000.

Chapman, Richard A.; Jasinski, Raymond J.; and Manns, William G., to Texas Instruments Incorporated. Electrochromic display cell structure. 4,008,950, Cl. 350-160.00R.

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Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., to Owens-Corning Fiberglass Corporation. Glass fiber coated with a size comprising emulsified clad particles of poly(methyl methacrylate). 4,009,317, Cl. 428-378.000.

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Chien, James C. W.; and Schappell, Frederick George, to Hercules Incorporated. Process of preparing fire-retardant natural and synthetic fibers. 4,009,294, Cl. 427-35.000.

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Clarke, John Michael; and Gilchrist, David Stuart, to Caterpillar Tractor Co. Bolt seal for rotary piston machine. 4,008,989, Cl. 418-120.000.

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Cline, Warren K., to Olin Corporation. Regenerated cellulose film, aluminum foil laminates and method for producing same. 4,009,319, Cl. 428-424.000.

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Clowers, Earl R., to Singer Company. The Above-the-floor adaptor for upright vacuum cleaners. 4,008,505, Cl. 15-338.000.

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Purcupile, John Charles; Dempsey, Martin J.; and Rackoff, Selwyn Raymond, 4,008,970.
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Gerry, Martin E. Distortionless modulation head. 4,009,491, Cl. 360-125.000.
Gibson, Joseph Paul, Jr.: See—
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Glass, Joseph Edward, Jr.: See—
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Gleichman, Robert F., to General Electric Company. Vertically mountable dynamoelectric machine having an improved ventilating coolant flow control structures. 4,009,405, Cl. 310-58.000.
Goehrmann, Hans; and Rusch, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Terrestrial solar cell generator. 4,009,054, Cl. 136-89.00P.
Godchaux-Henderson Sugar Co., Inc.: See—
Petri, Peter H., 4,009,045.
Goerke, Paul; and Dyhringer, Waldemar S. Apparatus and method for sorting objects according to length. 4,008,805, Cl. 209-73.000.
Goffe, William L., to Xerox Corporation. Reversal migration imaging system. 4,009,028, Cl. 96-1.0PS.
Gogarty, William B.; and Merrill, LaVaun S., Jr., to Marathon Oil Company. Process for reducing the settling rate of comminuted porous solids in a water-solids slurry. 4,008,924, Cl. 302-66.000.
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Goodman, David S.: See—
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Goodrich, John J., to St. Regis Paper Company. Gusseted pinch bottom bag. 4,008,850, Cl. 229-55.000.
Goodyear Aerospace Corporation: See—
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Green, Robin John; and Johnson, Richard Shaw, to Lever Brothers Company. Protection of materials. 4,009,113, Cl. 252-95.000.
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Greenwald, Richard B., to Polaroid Corporation. N-(lower alkyl sulfonyl-methyl sulfonyl)-piperazines. 4,009,167, Cl. 260-268.00S.
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Harrell, Washington. Ignition switch security shield protection against car theft. 4,008,589, Cl. 70-424.000.
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Corporation. Sun gear retainer in planetary gearset. 4,008,629. Cl. 74-781.00R.

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Howaldtwerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel: See—
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Howard, Alan Norman. Methods and formulations for the treatment of obesity. 4,009,265. Cl. 424-177.000.

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Hreha, Frank. Water to fuel converter. 4,009,006. Cl. 23-281.000.

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analysis of samples by means of flameless atomic absorption spectroscopy. 4,008,963. Cl. 356-85.000.

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Hudson, John W.; and Pendergrast, Robert A., to United States Steel Corporation. Process for the manufacture of monoammonium phosphate. 4,009,245. Cl. 423-313.000.

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Hufford, Jerrold L., to Armer Construction Company. Apparatus for air conditioning employing variable terminal box. 4,008,756. Cl. 165-26.000.

Hugelin, Bernard: See—
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Hunt, Thomas, to BP Chemicals International Limited. Filling compounds. 4,009,145. Cl. 260-40.00R.

Hurst, Doug; and Mowatt-Larsen, Erling, to General American Transportation Corporation. Drop center tank. 4,008,739. Cl. 141-35.000.

Hutchinson, Marvin E., Jr. Reagent and method for determination of phosphorous. 4,009,004. Cl. 23-230.00B.

Hybrid Systems Corporation: See—
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I-T-E Imperial Corporation: See—
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Ishigaki, Yukinobu; and Fukui, Kiyotake, to Matsushita Electric Industrial Co., Ltd.; and Victor Company of Japan, Limited. Phase locked loop angle modulation system with large modulation index. 4,009,455. Cl. 332-18.000.

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Itoh, Yoshimasa, to Matsushita Electric Industrial Co., Ltd. Electrolytic capacitor having a conductive graphite particles layer between organic solid electrolyte and cathode. 4,009,424. Cl. 361-433.000.

ITT Industries, Inc.: See—
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Izumi, Yusuke; Miyazaki, Hidetaka; and Kawahara, Shin-ichi, to Tokuyama Soda Kabushiki Kaisha. Process for preparing hydrogen peroxide. 4,009,252. Cl. 423-584.000.

J. M. Richards Laboratories: See—
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Jackson, Calvin E. Glow plug connector. 4,008,944. Cl. 339-253.00R.

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James B. Carter Limited: See—
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James, Randall Leland; and Padden, James Thomas, to International Business Machines Corporation. Analog signal detection. 4,009,353. Cl. 179-84.0VF.

James, George Sargent; Levy, Richard H.; and Levin, Lawrence A., to Jersey Nuclear-Avco Isotopes, Inc. Suppression of unwanted lasing in laser isotope separation. 4,009,391. Cl. 250-281.000.

Japan Exlan Company Limited: See—
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Japan Tobacco & Salt Public Corporation, The: See—
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Jardine, Douglas M. Underground storage system for heating and cooling systems. 4,008,709. Cl. 126-271.000.

Jasinski, Raymond J.: See—
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Jensen, Bruce E.; and Tolar, Jimmie G., to Air Products and Chemicals, Inc. Solvent cleaning and recovery process. 4,009,048. Cl. 134-12.000.

Jensen, Ernst: See—
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Jensen, Harald: See—
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Jeris, John S., to Ecolotrol, Inc. Waste treatment process. 4,009,098. Cl. 210-3.000.

Jeris, John S., to Ecolotrol, Inc. Apparatus and process for removing ammonia nitrogen from waste water. 4,009,099. Cl. 210-3.000.

Jeris, John S., to Ecolotrol, Inc. Waste treatment apparatus. 4,009,105. Cl. 210-107.000.

Jersey Nuclear-Avco Isotopes, Inc.: See—
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Joh, A. Benckiser GmbH: See—
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Johansson, Anders, to Salen & Wicander Terminalsystem AB. Ship of the type facilitating vehicle transport. 4,008,675. Cl. 114-70.000.

Johansson, Hans Arne Valentin. Automated bathing plant. 4,008,496. Cl. 4-145.000.

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John Wyeth & Brother Limited: See—
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Johnson & Johnson: See—
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Johnson, Lauren L., to General Motors Corporation. Series parallel transition for power supply. 4,009,431. Cl. 322-7.000.

Johnson, Lavell R., to Becton, Dickinson and Company. Apparatus for radioimmunoassay with regeneration of immunadsorbent. 4,009,005. Cl. 23-253.00R.

Johnson, Patrick Steven. Butter dispenser. 4,008,681. Cl. 118-5.000.

Johnson, Richard Shaw: See—
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Johnson, Robert L., to United States Steel Corporation. Saw blade handling device. 4,008,817. Cl. 214-147.00R.

Johnson, Roy A.: See—
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Johnsson, Lars Bertil, to Societe anonyme dite Etablissement GENOU & Cie. Valve system, particularly for cigarette lighter. 4,008,992. Cl. 431-344.000.

Jones, James E., to PPG Industries, Inc. Electrodepositionable epoxy resins having quaternary groups carrying blocked NCO, and aqueous dispersions. 4,009,133. Cl. 260-29.2TN.

Jones, John Wyn, to International Business Machines Corporation. Dynamic associative cell. 4,009,472. Cl. 340-173.00R.

Jones, Stanley Peter, to Emhart (U.K.) Limited. Systems for transferring heat through a glassware forming mold. 4,009,017. Cl. 65-162.000.

Jorgensen, Povl Jorgen, to Rotostat I/S. Mixing unit for mixing and/or treating fluid materials. 4,008,882. Cl. 259-2.000.

Jos. Schneider & Co. Optische Werke Kreuznach: See—
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Jungesjo, Harald N.: See—
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Juto, Yasuro; and Suzuki, Keisuke, to Yamaha, Hatsudoki Kabushiki Kaisha. Compact snowmobile. 4,008,777. Cl. 180-5.00R.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: See—
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Kabushiki Kaisha Toyota Jidoshokki Seisakusho: See—
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Kaiser Aluminum & Chemical Corporation: See—
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Kalev, Lyubomir Tzonev; Zikov, Kostadin Zikov; and Marvakov, Ivan Kirilov, to Institut po Metaloznanic i Technologia na Metalite. Pulsed-DC arc welding. 4,009,365. Cl. 219-135.000.

Kali-Chemie Aktiengesellschaft: See—
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Kallin, Karl Ake; Larzen, Jan August; and Meyer, Waldemar, to Atlas Copco Aktiebolag. Method and a machine for advancing an underground face of a geological formation. 4,008,922. Cl. 299-13.000.

Kalopissis, Gregoire; Bugaut, Andre; and Estradier, Francois, to Societe Anonyme dite L'Oreal. N,N-dialkylamino diphenylamines for dyeing keratinic fibers. 4,008,999. Cl. 8-10.200.

Kalopissis, Gregoire; and Vanlerberghe, Guy, to Societe Anonyme dite L'Oreal. Hair treating compositions containing cationic surface active agents. 4,009,255. Cl. 424-70.000.

Kam, Ting Yuet: See—
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Kamata, Yasuji: See—
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- Kandler, Joachim: See—
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- Kaneko, Ginji: See—
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- Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M&T Chemicals Inc. Electrodeposition of copper, 4,009,087, Cl. 204-52,00R.
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- Karpov, Oleg Stepanovich: See—
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- Karpov, Vladimir Alexeevich: See—
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- Katz, Sherwin D., to I-T-E Imperial Corporation. Counterbalance valve, 4,008,731, Cl. 137-106,000.
- Katzman, Frederick. In-ground swimming pool, 4,008,547, Cl. 52-169,700.
- Kaufman, Samuel. Device for setting sockets for swimming pool ladders, 4,008,550, Cl. 52-298,000.
- Kaupmann, Wilhelm; von Eickstedt, Klaus-Wolf; and Rahman, Salah-Eldin, to Kali-Chemik Aktiengesellschaft. Amino carbonyl derivatives of benzofurans, processes for their production, and pharmaceutical compositions containing the same 2-phenyl-3-[3-dialkylamino-propenyl]benzofuran compounds, 4,009,184, Cl. 260-346,20R.
- Kawabata, Hidetoshi: See—
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- Kawase, Buntaro; Kojima, Iwao; Kasai, Juichi; and Kawasaki, Keiji, to Showa Denko Kabushiki Kaisha. Method of removing mercury vapor from gases contaminated therewith, 4,009,241, Cl. 423-210,000.
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- Kazis, Earle W.; Mark, Robert; and Wetherell, Thomas J., to General Solar Power Corporation. Solar power pack apparatus, 4,009,051, Cl. 320-15,000.
- Keenan, Thomas R.: See—
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- Kennedy, Robert J., Jr.; and Smith, Kendall S., II, to Lincoln Manufacturing Company, Inc. End panel construction for modular units and modular unit embodying the end panel construction, 4,008,931, Cl. 312-111,000.
- Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung: See—
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- Keys, Francis Jackson. Sleeping nook for house pet, 4,008,687, Cl. 119-1,000.
- Khoshaba, Mushie, to Freedom, John, a part interest. Indexing chuck, 4,008,900, Cl. 279-5,000.
- Khouri, Nick S., to Continental Group, Inc.. The Abuse resistant pull tab, 4,008,825, Cl. 220-273,000.
- Kida, Junnosuke: See—
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- Kiemle, Horst, to Siemens Aktiengesellschaft. Device for testing masks for semiconductor components, 4,008,967, Cl. 356-239,000.
- Kihara, Nobutoshi; and Shimada, Osamu, to Sony Corporation. Video recording and/or reproducing medium, 4,009,492, Cl. 360-131,000.
- Kilbourn, Lawrence Layton; and Brunkhorst, Robert, to Olin Corporation. Ski boot, 4,008,532, Cl. 36-120,000.
- Kilbourne, Edwin D., to Mount Sinai School of Medicine of the City University of New York. The Influenza vaccine containing a recombinant, antigenically hybridized virus and method of using the same, 4,009,258, Cl. 424-89,000.
- Kimura, Shiro; Nagasawa, Hideo; Kato, Yasuo; Nakamura, Yasuyoshi; Miki, Shoji; and Ishikawa, Yumiko, to Sanko Chemical Company Ltd. Process for preparing 4-amino-3-methyl-N-substituted or unsubstituted alkylanilines, 4,009,205, Cl. 260-556,00A.
- Kimura, Takashi; Kawashima, Giichi; Nagami, Minoru; and Hanada, Minoru, to Sumitomo Bakelite Company, Limited. Process for producing shaped synthetic resin articles varying in shape of longitudinal section, 4,009,237, Cl. 264-46,300.
- Kimura, Yoshimasa: See—
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- King, Terence; and Rose, John Brewster, to Imperial Chemical Industries Limited. Amorphous thermoplastic aromatic polysulphone, 4,009,149, Cl. 260-49,000.
- Kingsland, David O., to Xerox Corporation. Optical system effecting image rotation, 4,008,958, Cl. 355-51,000.
- Kinkaid, Robert John; and Asick, John Carl, to AMP Incorporated. Axially cammed housing for low insertion force connector, 4,008,939, Cl. 339-75,00M.
- Kirkvold, Charles F.: See—
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- Kishi, Tuncu; Itoh, Hiroshi; Tamura, Masaaki; Nakano, Seizo; and Hosokawa, Masao, to Hitachi, Ltd. Puffer type gas circuit breaker, 4,009,458, Cl. 200-148,00A.
- Kishimoto, Soichiro; and Okazaki, Saburo, to Japan Exlan Company Limited. Process for producing carbon fibers, 4,009,248, Cl. 423-447,400.
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 Mullersman, Ferdinand H., to General Electric Company. Charger with multiple attachable cellholder modules. 4,009,429, Cl. 320-2.000.
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 Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohei; Saito, Katsuhide; Mori, Tamiki; and Yasutomi, Yasuo. N-(substituted phenyl and benzyl)abietamides. 4,009,206, Cl. 260-557.00B.
 Muraishi, Masakazu, to Nissan Motor Co., Ltd. Tilttable seat latch devices. 4,008,919, Cl. 297-331.000.
 Murakami, Noboru; and Hirotsawa, Koichiro, to Aisin Seiki Kabushiki Kaisha. Fluid pressure control system for automatic transmissions. 4,008,630, Cl. 74-865.000.
 Murakami, Shigeo: *See—*
 Shinohara, Hiroshi; Masunaga, Kunihiko; Murakami, Shigeo; and Ishiguro, Kazuhiko, 4,008,692.
 Muranaka, Takayoshi; Yoneda, Hajime; and Miyazaki, Yoshio, to Matsushita Electric Industrial Co., Ltd. Capacitor with intersecting lead plates. 4,009,425, Cl. 317-230.000.
 Murasaki, Hiroshi: *See—*
 Ogawa, Masaya; Enoguchi, Yuji; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 4,008,954.
 Murata, Masahiro, to Hope Kabushiki Kaisha. Heel pieces of ski bindings. 4,008,907, Cl. 280-614.000.
 Murayama, Masao: *See—*
 Tanabe, Osamu; Obayashi, Akira; Nakamura, Teruya; Suzuki, Osamu; Murayama, Masao; and Matsumura, Shingo, 4,009,077.
 Murdoch, Peter. Machine tools. 4,008,886, Cl. 269-266.000.
 Murray, Keith William: *See—*
 Green, Robin John; Key, Michael David; and Murray, Keith William, 4,009,076.
 Murray, Thomas P., to United States Steel Corporation. Scanning pyrometer. 4,008,616, Cl. 73-355.00R.
 Musch, Bernard E., to Hewlett-Packard Company. Portable programmable calculator displaying absolute line number addresses and key codes and automatically altering display formats. 4,009,379, Cl. 235-156.000.
 Musc, Joel: *See—*
 Tazuma, James J.; and Musc, Joel, 4,009,228.
 Myers, Donald M., to Ludlow Industries, Inc. Vibratory bin level indicators. 4,008,613, Cl. 73-290.00V.
 Naarden International, N.V.: *See—*
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- Nagami, Minoru: *See—*
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- Nagano, Kentaro; Henmi, Ichiro; and Kiyota, Masahiro, to Asahi Glass Co., Ltd. Apparatus for sealing tubes. 4,008,843, Cl. 228-33.000.
- Nagaoka, Tateki; Kimura, Yoshimasa; and Komiya, Yutaka, to Canon Kabushiki Kaisha. Liquid quantity detecting device. 4,008,612, Cl. 73-290.00R.
- Nagasawa, Hideo: *See—*
Kimura, Shiro; Nagasawa, Hideo; Kato, Yasuo; Nakamura, Yasuyoshi; Miki, Shoji; and Ishikawa, Yumiko, 4,009,205.
- Nagel, Otto: *See—*
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- Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Feldgun, Leon Izrailevich; Drui, Mark Simonovich; Kostjuk, Boris Dmitrievich; Zjukin, Nikolai Stepanovich; Lysanov, Vladislav Sergeevich; and Lavrinovich, Alla Alexandrovna. Alloy for metallization and brazing of abrasive materials. 4,009,027, Cl. 75-154.000.
- Nakagawa, Akira: *See—*
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Miyata, Satoru; and Ide, Hiroyuki, 4,009,166.
- Nakagawa, Jihei, to Olympus Optical Co., Ltd. Retrofocus-type lens system. 4,008,952, Cl. 350-215.000.
- Nakaguti, Osamu: *See—*
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- Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; Katayama, Shigenari; Inaba, Shigehiro; and Yamamoto, Hisao, 4,009,173.
- Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Reverse conducting thyristor and process for producing the same. 4,009,059, Cl. 148-187.000.
- Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor thermally sensitive switch structure. 4,009,482, Cl. 357-28.000.
- Narato, Kiyoshi; Ootsuka, Keizo; and Sawahata, Syoichi, to Hitachi, Ltd. Sampler for analyzers. 4,008,620, Cl. 73-421.50A.
- Narrace, John M.: *See—*
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- Nath, Gunther. Flexible light guide, particularly for medical/dental use. 4,009,382, Cl. 240-1.0LP.
- National Research Development Corporation: *See—*
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- National Starch and Chemical Corporation: *See—*
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- Naumann, Gunter: *See—*
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- NCR Corporation: *See—*
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- Nebe, William John, to Du Pont de Nemours, E. I., and Company. Hexaarylbiimidazole polymers. 4,009,040, Cl. 96-115.00R.
- Nebelung, Hermann; and Christopher, Edward Charles, to Emhart Industries, Inc. Glassware forming machine of the I. S. type with in-line mold motion. 4,009,018, Cl. 65-229.000.
- Nedelec, Lucien; and Frechet, Daniel, to Roussel-UCLAF. Substituted 10,11-dihydro-5,10-imino-[5H] dibenzo (a,d)-cycloheptene. 4,009,273, Cl. 424-258.000.
- Nedenskov, Poul: *See—*
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- Neely, Allan B., Jr. Haystacking and reloading tailgate apparatus. 4,008,818, Cl. 214-505.000.
- Neis, Thomas W.: *See—*
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- Nekrasov, Boris Vladimirovich: *See—*
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- Nell, Kuno, to Knorr-Bremse GmbH. Uncoupling device for central buffer couplings on railroad vehicles. 4,008,811, Cl. 213-211.000.
- Nelson, Robert C., to West Virginia Armature Co., Inc. Mining machine conveyor with deflectible boom. 4,008,797, Cl. 198-318.000.
- Neo Filter Co., Ltd.: *See—*
Ainoya, Koh; Arai, Kiichi; Kato, Akira; and Tanaka, Michio, 4,008,555.
- Nepper, Robert F., to Minnesota Mining and Manufacturing Company. Color printing method. 4,008,962, Cl. 355-77.000.
- Neuray, Dieter; Tresper, Erhard; and Freitag, Dieter, to Bayer Aktiengesellschaft. High molecular weight polycarbonates of $\alpha,\alpha,\alpha',\alpha'$ - α' -hexakisaryl-1,3-and/or -1,4-dimethyl benzenes. 4,009,148, Cl. 260-47.0XA.
- Newingham, Thomas D.; and Recchuit, Alexander D., to Sun Oil Company of Pennsylvania. Method of making invert water-in-oil emulsion. 4,009,117, Cl. 252-309.000.
- Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Plasma panel with dynamic keep-alive operation utilizing a lagging sustain signal. 4,009,415, Cl. 315-169.0TV.
- Nguyen Dat, Nhiep; Bensoussan, Maurice; and Doucet, Bernard, to ITT Industries, Inc. High-pressure sodium-vapor discharge lamp. 4,009,408, Cl. 313-198.000.
- Nicholas, Dimitri P. Pet bed. 4,008,688, Cl. 119-1.000.
- Nichols, Frank S.; Bliss, Charles H.; and Londergan, Robert J., to General Electric Company. Electrical insulating compositions of epoxy resins, zirconium silicate and alumina. 4,009,141, Cl. 260-37.0EP.
- Nickel, Hubertus: *See—*
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- Niedermeier, Karl; and Wintzer, Manfred, to Siemens Aktiengesellschaft. Process for the production of ceramic substrates for thin layer circuits. 4,009,238, Cl. 264-61.000.
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- Nippon Shinyaku Co., Ltd.: *See—*
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- Nissen Corporation: *See—*
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- Nissen, George P., to Nissen Corporation. Apparatus for rebound running. 4,008,892, Cl. 272-100.000.
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- Nitzki, Leopold; and Alsen, Jurgen, to Aktiengesellschaft "Weser". Catamaran vessel. 4,008,674, Cl. 114-61.000.
- Nobusawa, Tsukumo, to Asahi Optical Co., Ltd. Method and device for use in detecting a precise focusing point. 4,008,965, Cl. 356-125.000.
- Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Miyata, Satoru; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. Pyrido(2,3-d) pyrimidinones. 4,009,166, Cl. 260-256.40F.
- Nodera, Katsuji: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Ooba, Shigehiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Akiba, Keiichi; Oishi, Tadashi; and Kameda, Nobuyuki, 4,009,278.
- Noehren, William Lawrence; and Hiban, Edward Stanley, to United Technologies Corporation. Composite helicopter spar and means to alleviate stress concentration. 4,008,980, Cl. 416-134.00A.
- Nolan, John T., Jr.: *See—*
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- Noma, Takashi; Fujie, Hiroshi; and Ozawa, Shuji, to Teijin Limited. Process for preparing aromatic polyamides with sodium carbonate hydrate as acid acceptor. 4,009,154, Cl. 260-78.0SC.
- Noonan, Charles M., to Westinghouse Electric Corporation. Thin film electrostatic epoxy coating powder. 4,009,223, Cl. 260-830.0TW.
- Norco, Inc.: *See—*
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- Nordischer Maschinenbau Rud. Baader: *See—*
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- Nordman, James Emery: *See—*
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- Norfin, Inc.: *See—*
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- Norling, Parry McWhinnick, to Du Pont de Nemours, E. I., and Company. Time-lapse free-radical polymerizable composition. 4,009,150, Cl. 260-63.0UY.
- Northern Electric Company Limited: *See—*
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- Northern Telecom Limited: *See—*
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- Novozhilov, Vasily Nikolavich; Nekrasov, Boris Vladimirovich; Semenov, Pavel Alexeevich, deceased; Semanova, Vera Vasilievna, administratrix; Semanova, Irina Pavlovna, administratrix; and Semenov, Sergei Pavlovich, administrator. Contact method of producing sulphuric acid. 4,009,250, Cl. 423-522.000.
- Nowak, Frank A., Jr.; Micchelli, Albert L.; and Legato, Gerard J., to National Starch and Chemical Corporation. Novel shampoo composition containing a water-soluble cationic polymer. 4,009,256, Cl. 424-70.000.
- Noyce, George, to Hartwell Corporation. Wire coiling machine. 4,008,594, Cl. 72-142.000.
- NSC International Corporation: *See—*
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- Nudenberg, Walter: *See—*
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- Numasaki, Kouichi; Ninomiya, Nobutaka; Matsumoto, Zenji; Adachi, Kiyoshi; and Fujimoto, Toyohisa, to Japan Gasoline Co., Ltd.; and Takeda Chemical Industries, Ltd. Apparatus and method for regeneration of spent wet active carbon. 4,008,994, Cl. 432-14.000.
- Nuovo Pignone, S.p.A.: *See—*
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- Nuver, Eric L. H., to Esquire, Inc. Automatic energy control lighting system with automatically variable dc source. 4,009,387, Cl. 250-205.000.
- Nyboer, Jan, to J. M. Richards Laboratories. Method for monitoring body characteristics. 4,008,712, Cl. 128-2.10Z.
- O & K Orenstein & Koppel Aktiengesellschaft: *See—*
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- Oak Industries Inc.: *See—*
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- Obayashi, Akira: *See—*
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- Oberg, Karl Erik; and Sjoberg, Bengt Olof, to Uddeholms Aktiebolag. Method for the refining of molten metal. 4,009,023, Cl. 75-12.000.
- Ochiai, Tsurunosuke. Automatic vehicle-speed adjusting device. 4,008,781, Cl. 180-104.000.
- Oda, Shingo, to Kabushiki Kaisha Toyota Jidoshokki Seisakusho. Device for adjusting position of taker-in under casing in card. 4,008,511, Cl. 19-105.000.
- Offerman, Sidney, to Grow Chemical Corporation. Sprayable decorative coating composition. 4,009,144, Cl. 260-40.00R.
- Offermanns, Heribert: *See—*
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- Ogawa, Masaya; Enoguchi, Yuji; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, to Minolta Camera Kabushiki Kaisha. Device for extinguishing unnecessary electrostatic charge in electrophotographic copier. 4,008,954, Cl. 355-1.000.
- Ogishima, Akira: *See—*
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- Ogiue, Katumi; Ohta, Masaya; and Shibata, Shotaro, to Hitachi, Ltd. Integrated circuit isolation using gold-doped polysilicon. 4,009,484, Cl. 357-59.000.
- Ohata, Katsuya: *See—*
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- Ohloff, Gunther; and Giersch, Wolfgang K., to Firmenich S.A. Oxatricyclo compounds useful as perfuming agents. 4,009,127, Cl. 252-522.000.
- Ohta, Masaya: *See—*
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- Okada, Yoshitsugu: *See—*
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- Okawa, Tadayuki: *See—*
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- Okumori, Toshio; Tadokoro, Yozo; Takagi, Yoshiyuki; and Yoshida, Nobuo, to Nishin Seiyu Kabushiki Kaisha. Method for preparing edible oil. 4,009,290, Cl. 426-489.000.
- Okuno, Yoshitoshi, to Sumitomo Chemical Company, Limited. Fumigant composition containing d-allethronyl d-trans-chrysanthemate. 4,009,281, Cl. 424-306.000.
- Olin Corporation: *See—*
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- Cline, Warren K., 4,009,319.
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- Lincs, Ellwood L.; Herbst, John A.; and Fairbrother, Robert J., 4,009,122.
- Olinger, Charles P.; and Wasserman, Jacob F., to Olinger, Charles P. Method and apparatus for non-invasive detection of intracranial aneurysms. 4,008,711, Cl. 128-2.00K.
- Olinkraft, Inc.: *See—*
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- Oliver, Leland W.: *See—*
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- Oliver, Wayne H. Wall panel structure and connecting means therefor. 4,008,553, Cl. 52-584.000.
- Olrik, Henrik Gerner. Friction drive device. 4,008,929, Cl. 308-176.000.
- Olson, John E.; and Seaberg, Richard D., to Cascade Corporation. Sequence valve for clamping apparatus. 4,008,875, Cl. 251-63.400.
- Olympus Optical Co., Ltd.: *See—*
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- Ooiwa, Katsuhiko; Ito, Shigehiko; and Maeda, Shinichi, to Nippondenso Co., Ltd. Fuel consumption rate detecting apparatus. 4,008,607, Cl. 73-114.000.
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- Orclup, Richard B., to Morton-Norwich Products, Inc. Colored water immiscible organic liquid. 4,009,008, Cl. 44-59.000.
- Orme, Myrl E.: *See—*
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- Orozovich, George E.: *See—*
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- Orshansky, Elias, Jr., to Orshansky Transmission Corporation. Hydro-mechanical transmission. 4,008,628, Cl. 74-687.000.
- Orshansky Transmission Corporation: *See—*
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- Osaka Gas Company, Ltd.: *See—*
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- Ostojic, Nedeljko; and Boscak, Vladimir G., to Geo. A. Hormel & Co. Method and apparatus for sampling gas. 4,008,621, Cl. 73-421.50R.
- Otani, Syuichi; and Matsuoka, Hideoki, to Nissan Motor Co., Ltd. Actuator for safety seat belt system. 4,008,909, Cl. 280-746.000.
- Otani, Tatsuo: *See—*
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- Otsuka, Kouichi, to Kabushiki Kaisha Daini Seikosha. Counting or indicating ring device. 4,009,370, Cl. 235-64.000.
- Ott, Karl-Heinz; Humme, Gert; Kranz, Dietmar; and Rohr, Harry, to Bayer Aktiengesellschaft. ABS moulding compositions. 4,009,226, Cl. 260-876.00R.
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- Otto, Hans-Peter: *See—*
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Ou, Jan-Chou. Portable shoe shine apparatus. 4,008,504, Cl. 15-258.000.
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- Saito, Yoshihisa: See—
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- Sakamoto, Shinichi, to Hitachi, Ltd. Ignition timing control system for an internal combustion engine. 4,009,378, Cl. 235-152.000.
- Salen & Wicander Terminalsystem AB: See—
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- Saliga, Thomas V., to Paradyn Corporation. Digital signaling device. 4,009,336, Cl. 179-15.0BY.
- Salkin, Burton: See—
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- Salyer, Greg: See—
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- Sangamo Weston, Inc.: See—
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- Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; Katayama, Shigenari; Inaba, Shigeo; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Butyrophene derivatives. 4,009,173, Cl. 260-293.640.
- Sasajima, Kikuo: See—
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- Sasaki, Masanobu, to Sony Corporation. Fade-in and fade-out switching circuit. 4,009,401, Cl. 307-251.000.
- Sato, Mitsuhiro, to Ricoh Co., Ltd. Printer ribbon drive apparatus. 4,008,662, Cl. 101-336.000.
- Sato, Shui: See—
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- Satterlee, Lowell Duggan; Arnold, Roy Gary; and Anderson, Philip C., to University of Nebraska, The Regents of the. Process for measuring tenderness of cooked meat. 4,009,390, Cl. 250-273.000.
- Sauer, Philip D.; and Payne, Thomas F., to Anaconda Company, The. Method and apparatus for foam scrubber level detector. 4,009,010, Cl. 55-87.000.
- Saunders, Arthur G.: See—
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- Sawahata, Syoichi: See—
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- Scharfc, Gerhard: See—
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- Scheithauer, Eric A.: See—
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- Schenk, Gerd; and Haake, Heinz, to Varta Batterie Aktiengesellschaft. Wrapped-electrode battery. 4,009,053, Cl. 429-94.000.
- Scherer, Jeremy D., to Isotronics, Inc. Ultraviolet-transmitting window for a PROM. 4,008,945, Cl. 350-1.000.
- Schering Aktiengesellschaft: See—
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- Schleppnik, Alfred A.; and Vanata, Steve G., to Monsanto Company. 4-Cyclohexyl-4-methyl-2-pentanone useful as a malodor counteractant. 4,009,253, Cl. 424-45.000.
- Schmerling, Louis, to Universal Oil Products Company. Conversion of olefins to esters. 4,009,203, Cl. 260-497.00R.
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- Schneider, Chris J., to Raymond Lee Organization, Inc., The, a part interest. Sounding trundle and hoop. 4,008,542, Cl. 46-220.000.
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- Miller, Jimmy L.; Salkin, Burton; and Schnell, William J., 4,009,108.
- Schneider, Max; and Merimaki, Risto, to Heberlein Maschinenfabrik AG. Threading device for a false-twist texturing machine without upper structure. 4,008,560, Cl. 57-34.0HS.
- Schnitzer, Edmund, to Renwick of Canada Inc. Key attachment device for key case. 4,008,586, Cl. 70-456.00B.
- Schoenberg, Jules E., to National Starch and Chemical Corporation. Starch-based alkaline curing corrugating adhesives containing, as crosslinking agent, the reaction product of a ketone, formaldehyde and a secondary amine. 4,009,311, Cl. 428-182.000.
- Schoenjahn, Ann E.: See—
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- Scholle, William R. Pump apparatus. 4,008,984, Cl. 417-393.000.
- Schonbrun, Tibor; and Tremblay, Victorien, to Genesport Industries Limited. Protective footwear. 4,008,531, Cl. 36-106.000.
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- Schrader, Carl N.; and Fisher, Frank H., to Rockwell International Corporation. Brake drum and method of manufacture. 4,008,517, Cl. 29-527.600.
- Schrawar, Rolf; Bardenheier, Josef; and Koch, Jürgen, to Messer Griesheim GmbH. Process for the production of slush of low-boiling gases. 4,009,013, Cl. 62-10.000.
- Schreiber, Sally Ann; and Williams, Thomas Walley, III. Illuminated fiber optic jewelry. 4,009,381, Cl. 240-1.0EL.
- Schreiner, Horst: See—
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- Schultz, Gerhart: See—
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- Schultz, Thomas E.; and Schuchardt, Peter W., to Minnesota Mining and Manufacturing Company. Strip applying device. 4,009,072, Cl. 156-584.000.
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- Schwan, Thomas J.; Davis, Charles S.; and Honkomp, LeRoy J., to Morton-Norwich Products, Inc. Compound 2-(2-thiazolyl)-5,6-dimethoxyindazoles. 4,009,177, Cl. 260-306.80R.
- Scobbo, James Joseph, to General Tire & Rubber Company, The. Method of improving adhesion of secondary backings on carpets. 4,009,310, Cl. 428-95.000.
- Seaberg, Richard D.: See—
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- Seachman, Ned J., to Xerox Corporation. Arrangement for extending photosensor array resolution. 4,009,388, Cl. 250-208.000.
- Sears, Edward A. Reclaiming system for foundry sand. 4,008,856, Cl. 241-46.00R.
- Seer, Harold George, Jr., to RCA Corporation. Negative color film mask correction. 4,009,489, Cl. 358-80.000.
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- Severin, Norman W., to Hotwork, Inc. Method of preheating the wall of a furnace channel and article for generating circulation of heated air for preheating the wall of a furnace channel. 4,008,993, Cl. 432-4,000.
- Shafer, LaVern. Energized cobalt-containing animal feed. 4,009,263, Cl. 424-131,000.
- Shafii-Kahany, Hooshang; and McCart, Larry D., to Cascade Corporation. Takeup reel for combined hose and cable. 4,008,791, Cl. 191-12,20R.
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- Shimono, Nobuo; and Marubayashi, Hideki, to Babcock & Wilcox Company. The Pressure relief system. 4,008,734, Cl. 137-314,000.
- Shin, Hyunkook, to Du Pont de Nemours, E. I., and Company. Vapor-phase preparation of aromatic polyamides. 4,009,153, Cl. 260-78,00R.
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- Shinoda, Akibumi; and Yoshino, Hiroyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Power steering control system for industrial trucks. 4,008,779, Cl. 180-79,100.
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- Silva, Jose R.; and Narrace, John M. Brain wave correlation system and method of delivering a recorded program of material educational in content. 4,008,714, Cl. 128-2,10B.
- Simon, Paul W., to Burroughs Corporation. Etchant and method of etching tin oxide film. 4,009,061, Cl. 156-635,000.
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- Smith, Calvin Schwartz, Jr. Production of energy by direct contact of water immiscible working fluid with hot or warm water to vaporize liquid working fluid, utilization of vapor to produce mechanical energy and direct contact of spent vapor with cold or cool water to condense same. 4,009,082, Cl. 203-11,000.
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- Smith, F. Charles. Package for two reactive ingredients of a desired mix in a single pack. 4,008,803, Cl. 206-220,000.
- Smith, George W., to Envirox Inc. Clarifier with overflow scum removal. 4,009,106, Cl. 210-195,00S.
- Smith, Joseph. Axle mountings. 4,008,507, Cl. 16-34,000.
- Smith, Kendall S., II: *See—*
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- Smith, Ronald S. Video display system and method employing propagating stress waves. 4,009,488, Cl. 358-62,000.
- Smith, Stuart D. Portable docks and bridges. 4,008,506, Cl. 14-71,100.
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- Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., to Norfin, Inc. Sheet binding apparatus. 4,009,071, Cl. 156-563,000.
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- Societe Anonyme dite L'Oreal: *See—*
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- Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
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- Stanton, Anthony Howard; and Taylor, Peter Laurence, to Sparcatron Limited. Electrical discharge machining apparatus with monitoring circuit and means to check the operability of the monitoring circuit. 4,009,361, Cl. 219-69,00C.
- Stark Amsterdam NV: *See—*
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- Steckler, Robert; and Linder, Seymour Martin, to Alcolac Inc. Polymerizable cationic monomers. 4,009,201, Cl. 260-486,00R.
- Steidl, Dieter: *See—*
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- Stein, Werner; and Hartmann, Helmut, to Henkel & Cie G.m.b.H. Continuous process for the separation of mixtures of fatty substances of different melting points. 4,009,213, Cl. 260-643,00D.
- Stemmler, Denis L., to Xerox Corporation. Document handling system for pre-collation copying. 4,008,956, Cl. 355-8,000.
- Sterling Drug Inc.: *See—*
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- Stuart, Meredith, to Forster Mfg. Co., Inc. Stick storage apparatus with automatic reject system for misaligned sticks. 4,008,812, Cl. 214-6,0BA.
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- Sumrell, Robert Earl. Resiliently biased tie-down anchor. 4,008,669, Cl. 105-484,000.
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- Swainson, Ralph V., to Texas Bryre Industries. Humidor. 4,008,930, Cl. 312-31,100.
- Swartz, Gordon P. Rotating display with black light illumination. 4,008,534, Cl. 40-106,520.
- Swett, James B.; and Ashton, Harold P., to Dart Industries Inc. Openable curvilinear openings of different geometrical shapes. 4,008,526, Cl. 35-22,00A.
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- Szucs, Laszlo; Tasnadi, Csaba; and Lindner, Istvan, to Patentbureau Danubia. Apparatus for heat- and mass transfer between liquids and gases. 4,009,229, Cl. 261-72,00R.
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- Tallmadge, Gene E.; and Gerling, John E., to Chemetron Corporation. Method and apparatus for controlling microwave ovens. 4,009,359, Cl. 219-10,55B.
- Tamai, Yasuo; Aonuma, Masashi; Nakamura, Matsuaki; Agawa, Hiroshi; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,009,111, Cl. 252-62,550.
- Tamers, Murry A. Total synthesis of benzene from non-hydrocarbon materials. 4,009,219, Cl. 260-673,000.
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- Vandenberg, Edwin J., to Hercules Incorporated. Polymerization of epoxides. 4,009,128, Cl. 260-2.00A.
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Whitt, James A., to General Electric Company. Lubrication system including lubricant-storing discrete foam particles. 4,008,788, Cl. 184-12.000.
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Yoneda, Hajime: See—
Muranaka, Takayoshi; Yoneda, Hajime; and Miyazaki, Yoshio, 4,009,425.
Yorkston, Neil. Teaching apparatus and method. 4,008,529, Cl. 35-35.00E.
Yoseloff, Mark. Simulated bowling game. 4,008,893, Cl. 273-85.00R.

- Yoshida, Nobuo: See—
Okumori, Toshio; Tadokoro, Yozo; Takagi, Yoshiyuki; and Yoshida, Nobuo, 4,009,290.
- Yoshikuni, Yoshiaki: See—
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Sempuku, Kenji; Kitaguchi, Koji; Fujita, Yukio; Yoshikuni, Yoshiaki; Kura, Kohci; Saito, Katsuhide; Mori, Tamiki; and Yasutomi, Yasuo, 4,009,206.
- Yoshino, Hiroyuki: See—
Shinoda, Akibumi; and Yoshino, Hiroyuki, 4,008,779.
- Youdes, David H.: See—
Hahn, Robert S.; Holmstrom, Bruno A.; St. Andre, Arthur F.; and Youdes, David H., 4,008,631.
- Young, Alastair John, to Automotive Products Company Limited. Valve devices for use in liquid pressure braking systems of vehicles. 4,008,925, Cl. 303-6.00C.
- Young, Dora M. Knotless tatting. 4,008,643, Cl. 87-10.000.
- Young, Einar T., to Suntech, Inc. Electro-mechanical counting register. 4,009,373, Cl. 235-92.0FL.
- Young, Eugene R.: See—
Spears, Esten W., Jr.; and Young, Eugene R., 4,008,568.
- Young, John E.: See—
Massoth, Franklin E.; and Young, John E., Jr., 4,009,009.
- Youngman, David R. Carpet stretcher. 4,008,879, Cl. 254-57.000.
- Younkin, James R., to Edo-Airc Mitchell Industries, Inc. Flight instrument. 4,008,618, Cl. 73-387.000.
- Youssef, Hassan, to La Metallurgie Francaise des Poudres Metafram. Method of testing the qualities of a material. 4,008,622, Cl. 73-432.00R.
- Yu, Pyung K.: See—
Yih, Roy Y.; and Yu, Pyung K., 4,009,021.
- Yurko, Joseph A., to Colgate-Palmolive Company. Non-phosphate detergent composition. 4,009,114, Cl. 252-109.000.
- Zahariev, Stefan Elenkov: See—
Petrov, Radoslav Stanev; Zahariev, Stefan Elenkov; Markov, Ivan Kirilov; and Peychev, Georgi Vassilev, 4,008,596.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: See—
Umezawa, Hamao; Takuchi, Tomio; Inuma, Hironobu; and Tanabe, Osamu, 4,009,155.
- Zanoni, Louis A.: See—
Luce, Nunzio A.; and Zanoni, Louis A., 4,008,564.
- Zappia, Anthony T., to Ball Brothers Service Corporation. Apparatus for processing ware. 4,008,525, Cl. 33-174.00L.
- Zegel, Snyder M. Educational accounting device. 4,008,527, Cl. 35-24.00R.
- Zeloylc, Daniel J., to Burrell Industrial Supply Company. Stand for a projected image viewing apparatus. 4,008,935, Cl. 312-252.000.
- Zenith Aviation: See—
Courant, Jacques; Gonnet, Robert; and Thore, Marc, 4,008,733.
- Zielinski, Stanley A.: See—
Payne, Robert A.; Slobodzin, Gregory E.; Zielinski, Stanley A.; and Ravanese, Ralph M., 4,009,335.
- Zikov, Kostadin Zikov: See—
Kalev, Lyubomir Tzonev; Zikov, Kostadin Zikov; and Marvakov, Ivan Kirilov, 4,009,365.
- Ziman, Stephen David, to Du Pont de Nemours, E. I., and Company. Di- and tri-substituted oxazolidin-2-one oximes. 4,009,179, Cl. 260-307.0FA.
- Zimmerman, Robert L.; Austin, Thomas H.; and Schulze, Heinz, to Texaco Development Corporation. Preparation of isocyanurate foams using alkali metal tertiaryamino dithiocarbamate salt catalysts. 4,009,130, Cl. 260-2.5AB.
- Zinser Textilmaschinen GmbH: See—
Grau, Gerhard, 4,008,561.
- Zjukin, Nikolai Stepanovich: See—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Feldgun, Leon Izrailevich; Druj, Mark Simonovich; Kostjuk, Boris Dmitrievich; Zjukin, Nikolai Stepanovich; Lysanov, Vladislav Sergeevich; and Lavrinovich, Alla Alexandrovna, 4,009,027.
- Zola, Heddy: See—
Thomas, Derek; and Zola, Heddy, 4,009,257.
- Zubieta, Robert Frutos. Blender. 4,008,883, Cl. 259-108.000.

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 381,006	4,009,447	Apr. 6, 1976	Sep. 22, 1977	B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977	B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976	B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976	B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976	B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977	B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976	B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976	B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976	B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977	B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976	B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976	B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976	B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977	B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976	B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976	B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976	B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976	B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976	B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976	B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976	B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976	B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977	B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977	B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977	B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976

**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 508,878	3,994,117	Feb. 3, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 509,061	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976	B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976	B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,296	3,984,404	Feb. 3, 1976	Nov. 2, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976	B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976	B 528,803	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976	B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976	B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976	B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976	B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976	B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976	B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976	B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976	B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976	B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976	B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977	B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977	B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976	B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976	B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976	B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976	B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976	B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976	B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977	B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976	B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976	B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976	B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976	B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 520,928	3,983,617	Jan. 23, 1976	Oct. 5, 1976	B 531,686	4,000,017	Mar. 23, 1976	Nov. 2, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976	B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976	B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976	B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976	B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976	B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976	B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976	B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 535,391	3,981,368	Jan. 27, 1976	Sep. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976	B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976	B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976	B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976	B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976	B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977	B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976	B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976	B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976	B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976	B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976	B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977	B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976	B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976	B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976	B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976	B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976	B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976	B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976	B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976	B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976	B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 545,299	4,001,259	Feb. 24, 1976	Nov. 16, 1976	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976	B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,435	3,995,724	Feb. 3, 1976	Oct. 12, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976				

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF FEBRUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Bianchini, Gianni, to Societa Italiana Elettronica S.p.A. Fail-safe apparatus for checking the presence of flame in a burner. Re. 29,143, Cl. 361-175,000.
Consiglio Nazionale delle Ricerche: See—
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., Re. 29,142.
Coulter Electronics, Inc.: See—
Hogg, Walter R., Re. 29,141.
Eggers, Edward T.: See—
Mast, Aquila D.; and Eggers, Edward T., Re. 29,140.
Hogg, Walter R., to Coulter Electronics, Inc. Apparatus for orienting generally flat particles for sensing. Re. 29,141, Cl. 356-36,000.
Mast, Aquila D.; and Eggers, Edward T., to Sperry Rand Corporation. Hay roll forming machine. Re. 29,140, Cl. 56-341,000.
Messner, Carlton E. Lawn maintenance equipment. Re. 29,139, Cl. 56-13,100.
Montefinale, Alberto C.: See—
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., Re. 29,142.
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., to Consiglio Nazionale delle Ricerche. Combustible compositions for generating aerosols, particularly suitable for cloud modification and weather control and aerosolization process. Re. 29,142, Cl. 252-305,000.
Petriconi, Gianna L.: See—
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., Re. 29,142.
Societa Italiana Elettronica S.p.A.: See—
Bianchini, Gianni, Re. 29,143.
Sperry Rand Corporation: See—
Mast, Aquila D.; and Eggers, Edward T., Re. 29,140.
Zawidzky, Tadeusz W.: See—
Papee, Henry M.; Montefinale, Alberto C.; Petriconi, Gianna L.; and Zawidzky, Tadeusz W., Re. 29,142.

LIST OF PLANT PATENTEEES

- de Ruiter, Gijsbert, to Jackson & Perkins Co. Rose plant. 4,018, 2-22-77, Cl. 27,000.
Jackson & Perkins Co.: See—
de Ruiter, Gijsbert, 4,018.
Royon, Rene, to Universal Plants S. A. R. L. Rose plant-pitica variety. 4,017, 2-22-77, Cl. 18,000.
Universal Plants S. A. R. L.: See—
Royon, Rene, 4,017.

LIST OF DESIGN PATENTEEES

- Aerovironment Inc.: See—
MacCready, Paul B., Jr.; and Lissaman, Peter B. S., 243,450.
Aircro, Inc.: See—
Verini, Nicholas A., 243,455.
Anchor Hocking Corporation: See—
Benes, Frank J., 243,431.
Benes, Frank J., 243,433.
Benes, Frank J.; and Thrush, James Lloyd, 243,463.
Thrush, James Lloyd, 243,428.
Thrush, James Lloyd, 243,429.
Thrush, James Lloyd, 243,430.
Atlas Copco Aktiebolag: See—
Zernell, Stig Rune, 243,439.
Avery, Roger E. Therapeutic electrode pad. 243,476, 2-22-77, Cl. D83-1,00F.
Batley, Ray E. Rake for spreading insulation in building structures. 243,438, 2-22-77, Cl. D8-16,000.
Bell Industries: See—
Khoury, Nasim, 243,445.
Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Desk top accounting machine. 243,461, 2-22-77, Cl. D64-11,00B.
Benes, Frank J., to Anchor Hocking Corporation. Goblet or similar article. 243,431, 2-22-77, Cl. D7-11,000.
Benes, Frank J., to Anchor Hocking Corporation. Pitcher or similar article. 243,433, 2-22-77, Cl. D7-64,000.
Benes, Frank J.; and Thrush, James Lloyd, to Anchor Hocking Corporation. Vase or similar article. 243,463, 2-22-77, Cl. D11-146,000.
Bentas, Christos J. Cemetery memorial monument. 243,466, 2-22-77, Cl. D31-17,000.
Bliss, Theodore J., to Saban Electric Corporation. Welding machine. 243,459, 2-22-77, Cl. D15-144,000.
Bridgestone Tire Company Limited: See—
Hayakawa, Toshio; and Nakamura, Masao, 243,449.
CITC Industries, Inc.: See—
Cohen, William J., 243,421.
Cohen, William J., to CITC Industries, Inc. Sport shoe. 243,421, 2-22-77, Cl. D2-310,000.
Collection Corporation: See—
Friedland, Samuel J., 243,453.
Cone, Richard E. R., to Plastics Manufacturing Company. Pitcher. 243,434, 2-22-77, Cl. D7-64,000.
Corning Glass Works: See—
Mercadante, Ottorino N., 243,432.
Cutruzzula, Jeffrey F.; and Schattner, Robert L., to Omnimed, Inc. Intravenous tube anchor. 243,477, 2-22-77, Cl. D24-52,000.
Durst AG Fabrik Fototechnischer Apparate: See—
Gandini, Mario, 243,452.
Foster Industries Co., Ltd.: See—
Leung, Chung Sum, 243,474.
Fratelli Saporiti: See—
Offredi, Giovanni, 243,424.
Rosselli, Alberto, 243,423.
Frazier, Lawrence M. Physiological sensor for placement on the skin of humans or animals to detect electrical activity in the localized region thereof. 243,475, 2-22-77, Cl. D83-1,00F.
Freeman, Delores S. Fluorescent table lamp. 243,473, 2-22-77, Cl. D48-20,00R.
Friedland, Samuel J., to Collection Corporation. Illuminable calendar holder or similar article. 243,453, 2-22-77, Cl. D19-20,000.
Fuji Photo Film Co., Ltd.: See—
Mizukawa, Shigeo, 243,451.
Gandini, Mario, to Durst AG Fabrik Fototechnischer Apparate. Color mixing head for a photographic enlarging apparatus. 243,452, 2-22-77, Cl. D16-34,000.
Gibson, Sidney. Chair. 243,425, 2-22-77, Cl. D6-75,000.
Greene, Michael L. Bird house. 243,464, 2-22-77, Cl. D30-03,000.
Greene, Michael L. Bird feeder. 243,465, 2-22-77, Cl. D30-14,000.
Greenfield, John; Kneale, Collan B.; and Wilkey, Frank, Jr., to International Business Machines Corporation. Portable personal computer. 243,460, 2-22-77, Cl. D14-45,000.
Hayakawa, Toshio; and Nakamura, Masao, to Bridgestone Tire Company Limited. Vehicle tire. 243,449, 2-22-77, Cl. D12-142,000.
Hayashi, Tadaaki. Combined display card and holder for a cylindrical article. 243,443, 2-22-77, Cl. D9-191,000.
Hoffman, Beulah J. Combined table place mat and napkin holder. 243,435, 2-22-77, Cl. D7-72,000.
Horizon Industries, Inc.: See—
Spirer, Peter R., 243,479.

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- Ing. C. Olivetti & C., S.p.A.: See—
Bellini, Mario, 243,461.
International Business Machines Corporation: See—
Greenfield, John; Kneale, Collan B.; and Wilkey, Frank, Jr., 243,460.
International Silver Company: See—
Knope, William J., 243,437.
Interstate Sports, Inc.: See—
Smith, Grover C., III; and Smith, Thomas M., 243,447.
Jones, Ralph Godfrey, to Preci-Spark Limited. Combined mirror and stand therefor. 243,478, 2-22-77, Cl. D28-65,000.
Joslyn, John A. Hot comb holder. 243,426, 2-22-77, Cl. D6-125,000.
Karrh, Randolph C.: See—
Nipper, William U., Jr., 243,469.
Kerr, Donald R.: See—
Kerr, Marvin D.; and Kerr, Donald R., 243,454.
Kerr, Marvin D.; and Kerr, Donald R. Storage tank. 243,454, 2-22-77, Cl. D23-2,000.
Khoury, Nasim, to Bell Industries. Boat. 243,445, 2-22-77, Cl. D12-62,000.
Kleiner, Carl J. Pendant. 243,470, 2-22-77, Cl. D11-6,000.
Kneale, Collan B.: See—
Greenfield, John; Kneale, Collan B.; and Wilkey, Frank, Jr., 243,460.
Knope, William J., to International Silver Company. Article of flatware. 243,437, 2-22-77, Cl. D7-137,000.
Kouvelas, George. Tennis racquet frame. 243,467, 2-22-77, Cl. D34-5,0ST.
Krapowicz, Jacob A., to Sperry Rand Corporation. Combined electric shaver and cover therefor. 243,480, 2-22-77, Cl. D28-49,000.
Leung, Chung Sum, to Foster Industries Co., Ltd. Portable fluorescent lantern. 243,474, 2-22-77, Cl. D48-24,00R.
Leung, Jhi Hung, to Star Industrial Co., Ltd. Lamp shade. 243,472, 2-22-77, Cl. D48-16,00D.
Levey, Irving N. Game board. 243,468, 2-22-77, Cl. D34-5,0TT.
Lissaman, Peter B. S.: See—
MacCready, Paul B., Jr.; and Lissaman, Peter B. S., 243,450.
Livingston, David T., to Reinell Boats, Inc. Sailboat. 243,446, 2-22-77, Cl. D12-64,000.
MacCready, Paul B., Jr.; and Lissaman, Peter B. S., to Aerovironment Inc. Aerodynamic drag reduction device for vehicles. 243,450, 2-22-77, Cl. D12-181,000.
Max Factor & Co.: See—
Montgomery, Robin M., 243,442.
Mercadante, Ottorino N., to Corning Glass Works. Plate or the like. 243,432, 2-22-77, Cl. D7-36,000.
Miller, Daniel L. Clock face. 243,444, 2-22-77, Cl. D10-8,000.
Mizukawa, Shigeo, to Fuji Photo Film Co., Ltd. Movie camera. 243,451, 2-22-77, Cl. D16-04,000.
Montgomery, Robin M., to Max Factor & Co. Bottle. 243,442, 2-22-77, Cl. D9-73,000.
Nakamura, Masao: See—
Hayakawa, Toshio; and Nakamura, Masao, 243,449.
Nipper, William U., Jr., to Karrh, Randolph C. Rocking toy. 243,469, 2-22-77, Cl. D34-5,00D.
Offredi, Giovanni, to Fratelli Saporiti. Upholstered seat. 243,424, 2-22-77, Cl. D6-71,000.
Omnimed, Inc.: See—
Cutruzzula, Jeffrey F.; and Schattner, Robert L., 243,477.
Pall Corporation: See—
Pall, David B., 243,458.
Pall, David B., to Pall Corporation. Filter. 243,458, 2-22-77, Cl. D23-4,000.
Plastics Manufacturing Company: See—
Cone, Richard E. R., 243,434.
Podd, Alexander L. Hook. 243,441, 2-22-77, Cl. D8-367,000.
Preci-Spark Limited: See—
Jones, Ralph Godfrey, 243,478.
Reinell Boats, Inc.: See—
Livingston, David T., 243,446.
Rosselli, Alberto, to Fratelli Saporiti. Upholstered seat. 243,423, 2-22-77, Cl. D6-71,000.
Ryan, Bobby W., to WFI International, Inc. Welding outlet. 243,456, 2-22-77, Cl. D23-40,000.
Ryan, Bobby W., to WFI International, Inc. Welding outlet. 243,457, 2-22-77, Cl. D23-40,000.
Saban Electric Corporation: See—
Bliss, Theodore J., 243,459.
Schattner, Robert L.: See—
Cutruzzula, Jeffrey F.; and Schattner, Robert L., 243,477.
Schroeder, Peter E. Curtain material. 243,471, 2-22-77, Cl. D47-6,00E.
Senger, Gerhard Franz-Josef, to Uniroyal A.G. Pneumatic tire tread and buttress. 243,448, 2-22-77, Cl. D12-136,000.
Smith, Grover C., III; and Smith, Thomas M., to Interstate Sports, Inc. Foot lever for motorcycles. 243,447, 2-22-77, Cl. D12-114,000.
Smith, Thomas M.: See—
Smith, Grover C., III; and Smith, Thomas M., 243,447.
Sperry Rand Corporation: See—
Krapowicz, Jacob A., 243,480.
Spirer, Peter R., to Horizon Industries, Inc. Textile pile fabric. 243,479, 2-22-77, Cl. D92-1,0AA.
Star Industrial Co., Ltd.: See—
Leung, Jhi Hung, 243,472.
String-Seffle Mobelfabrik AB: See—
Strinning, Nils Erik, 243,440.
Strinning, Nils Erik, to String-Seffle Mobelfabrik AB. Support hook for shelves or the like. 243,440, 2-22-77, Cl. D8-381,000.
Sud, Margaret D. String fish sculpture. 243,462, 2-22-77, Cl. D11-158,000.
Thrush, James Lloyd, to Anchor Hocking Corporation. Covered food bowl or similar article. 243,428, 2-22-77, Cl. D7-5,000.
Thrush, James Lloyd, to Anchor Hocking Corporation. Covered food bowl or similar article. 243,429, 2-22-77, Cl. D7-5,000.
Thrush, James Lloyd, to Anchor Hocking Corporation. Covered food bowl or similar article. 243,430, 2-22-77, Cl. D7-5,000.
Thrush, James Lloyd: See—
Benes, Frank J.; and Thrush, James Lloyd, 243,463.
Uniroyal A.G.: See—
Senger, Gerhard Franz-Josef, 243,448.
Varga, Iona D. Tongue brush. 243,422, 2-22-77, Cl. D4-25,000.
Verini, Nicholas A., to Aircro, Inc. Cryogenic liquid storage vessel. 243,455, 2-22-77, Cl. D23-2,000.
Vida, Kenneth J. Barbecue grill. 243,436, 2-22-77, Cl. D7-107,000.
Watts, William R. Frame for a seat. 243,427, 2-22-77, Cl. D6-191,000.
WFI International, Inc.: See—
Ryan, Bobby W., 243,456.
Ryan, Bobby W., 243,457.
Wilkey, Frank, Jr.: See—
Greenfield, John; Kneale, Collan B.; and Wilkey, Frank, Jr., 243,460.
Zernell, Stig Rune, to Atlas Copco Aktiebolag. Handle for a percussion tool or the like. 243,439, 2-22-77, Cl. D8-107,000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 22, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	78	4,008,538	164	4,008,585	11 R	4,008,647	82	4,008,690	CLASS 149								
60	4,008,494	CLASS 43	235	4,008,587	CLASS 91	4,008,648	494	4,008,691	93	4,009,060							
CLASS 3	42.31	4,008,539	366	4,008,588	168	4,008,648	CLASS 122	35	4,008,742								
1.91	4,008,495	55	4,008,540	424	4,008,589	CLASS 93	CLASS 123	158	4,008,743								
CLASS 4	59	4,009,008	456 B	4,008,586	36.2	4,008,649	3	4,008,692	427	4,008,744							
145	4,008,496	CLASS 46	76	4,009,020	62	4,008,650	8.25	4,008,693	39	4,009,062							
171	4,008,497	86 R	92	4,009,021	81 R	4,008,651	41.4	4,008,694	71	4,009,063							
180	4,008,498	220	93	4,009,022	CLASS 96	1 PS	4,009,028	41.76	4,008,695	102	4,009,064						
CLASS 5	99 C	4,008,499	CLASS 72	38	4,008,591	3	4,009,029	97 B	4,008,696	159	4,009,065						
CLASS 8	2.5 A	4,008,998	1 A	4,008,543	70	4,008,592	29 D	4,009,030	117 A	4,008,697	221	4,009,066					
10.2	4,008,999	77	4,008,544	75	4,008,593	29 D	4,009,031	117 R	4,008,698	245	4,009,067						
15	4,009,001	CLASS 51	142	4,008,594	33	4,009,032	4,009,031	122 AB	4,008,699	380	4,009,068						
17	4,009,000	5 C	170	4,008,595	48 HD	4,009,034	4,009,033	139 AW	4,008,700	466	4,009,069						
116 P	4,009,002	CLASS 52	176	4,008,596	55	4,009,035	4,009,036	148 E	4,008,701	559	4,009,070						
CLASS 9	7	4,008,500	199	4,008,597	66.3	4,009,036	87 R	CLASS 125	11 PH	563	4,009,071						
CLASS 11	1 AC	4,008,501	354	4,008,599	100	4,009,038	100	4,008,703	4,008,702	584	4,009,072						
CLASS 14	71.1	4,008,506	CLASS 73	11	4,008,600	114.1	4,009,039	4,008,704	4,008,708	635	4,009,061						
CLASS 15	3.17	4,008,502	17 R	4,008,604	115 R	4,009,040	120	4,008,705	4,008,709	229 R	4,008,745						
21 D	4,008,503	258	23	4,008,601	120	4,009,041	CLASS 98	4,008,706	328	4,008,746							
338	4,008,505	CLASS 16	67.8 R	4,008,602	39	4,008,652	39	4,008,707	CLASS 162	132	4,009,073						
CLASS 17	34	4,008,507	67.8 S	4,008,603	40 D	4,008,653	40 DL	4,008,709	CLASS 164	9	4,008,747						
52	4,008,508	CLASS 19	101	4,008,605	46	4,008,655	46	4,009,045	30	4,008,748							
56	4,008,509	CLASS 23	104	4,008,606	298	4,008,656	47	4,009,046	66	4,008,749							
64	4,008,510	230 B	114	4,008,607	483	4,008,657	CLASS 99	1 D	4,008,710	87	4,008,750						
CLASS 24	16 PB	4,008,512	154	4,008,608	CLASS 100	53	4,008,658	2.05 Z	4,008,713	153	4,008,751						
201 A	4,008,513	253 R	194 EM	4,008,609	214	4,008,659	53	4,008,714	2.1 Z	4,008,715	252	4,008,752					
CLASS 29	25.42	4,008,514	204	4,008,610	132	4,008,660	214	4,008,716	57	4,008,715	278	4,008,753					
182.5	4,009,007	426	205 R	4,008,611	181	4,008,661	214 R	4,008,717	203	4,008,716	2	4,008,754					
428	4,008,516	527.6	290 R	4,008,612	336	4,008,662	218 R	4,008,718	218 R	4,008,718	11	4,008,755					
568	4,008,518	625	290 V	4,008,613	349	4,008,663	260	4,008,719	260	4,008,719	26	4,008,756					
630 C	4,008,520	CLASS 32	343 R	4,008,614	365	4,008,664	317	4,008,720	317	4,008,720	67	4,008,757					
CLASS 33	27	4,008,521	355 R	4,008,615	41	4,008,665	418	4,008,721	418	4,008,721	94	4,008,758					
44	4,008,522	CLASS 35	362 R	4,008,617	70 R	4,008,666	26	4,008,722	26	4,008,722	120	4,008,759					
143 L	4,008,523	169 R	387	4,008,618	88	4,008,667	133 A	4,008,724	133 A	4,008,724	248	4,008,761					
174 L	4,008,525	CLASS 36	398 C	4,008,619	CLASS 104	2	4,008,723	184 A	4,008,725	2	4,008,723	253	4,008,763				
22 A	4,008,526	26	421.5 A	4,008,620	184 A	4,008,668	184 A	4,008,725	2	4,008,723	266	4,008,764					
24 R	4,008,527	35 E	421.5 R	4,008,621	CLASS 105	484	4,008,669	CLASS 132	9	4,008,726	272	4,008,765					
26	4,008,528	CLASS 37	432 R	4,008,622	484	4,008,669	9	4,008,726	9	4,008,726	273	4,008,766					
35 E	4,008,529	CLASS 38	CLASS 74	5 R	4,008,623	CLASS 106	39.7	4,009,042	89	4,008,727	274	4,008,767					
CLASS 39	28	4,008,530	339	4,008,624	339	4,008,624	39.7	4,009,042	92 R	4,008,728	321	4,008,768					
106	4,008,531	120	441	4,008,625	441	4,008,625	204	4,009,043	92 R	4,008,728	566	4,008,770					
70 R	4,008,533	CLASS 40	491	4,008,626	491	4,008,626	287 R	4,009,044	9	4,009,047	806	4,008,771					
106.52	4,008,534	CLASS 42	498	4,008,627	498	4,008,627	CLASS 108	28	4,008,670	12	4,009,048	12	4,008,772				
334	4,008,535	CLASS 43	687	4,008,628	687	4,008,628	113	4,008,671	21	4,009,049	66	4,009,050	153	4,008,773			
1 S	4,008,536	CLASS 44	781 R	4,008,629	781 R	4,008,629	CLASS 112	121.12	4,008,672	21	4,009,049	107	4,008,729	64	4,008,775		
16	4,008,537	CLASS 45	865	4,008,630	865	4,008,630	CLASS 114	16 E	4,008,673	66	4,009,050	107	4,008,729	210 R	4,008,776		
		CLASS 46	CLASS 75	12	4,009,023	12	4,009,023	CLASS 115	61	4,008,674	66	4,009,050	107	4,008,729	18	4,009,338	
		CLASS 47	30	4,009,024	30	4,009,024	CLASS 116	61	4,008,674	61	4,008,674	107	4,008,729	46	4,009,340		
		CLASS 48	123 B	4,009,025	123 B	4,009,025	CLASS 117	70	4,008,675	70	4,008,675	107	4,008,729	69 A	4,009,341		
		CLASS 49	148	4,009,026	148	4,009,026	CLASS 118	151	4,008,676	151	4,008,676	107	4,008,729	2 DP	4,009,342		
		CLASS 50	154	4,009,027	154	4,009,027	CLASS 119	162	4,008,677	162	4,008,677	107	4,008,729	15 AQ	4,009,346		
		CLASS 51	CLASS 81	3 R	4,008,632	3 R	4,008,632	CLASS 120	230	4,008,678	230	4,008,678	15 AT	4,009,349			
		CLASS 52	68	4,008,636	68	4,008,636	CLASS 121	1 A	4,008,679	1 A	4,008,679	107	4,008,729	15 BA	4,009,345		
		CLASS 53	CLASS 82	1 C	4,008,631	1 C	4,008,631	CLASS 122	18 E	4,008,680	18 E	4,008,680	15 BF	4,009,348			
		CLASS 54	1 C	4,008,633	1 C	4,008,633	CLASS 123	16 E	4,008,673	16 E	4,008,673	107	4,008,729	15 BP	4,009,350		
		CLASS 55	30	4,008,634	30	4,008,634	CLASS 124	61	4,008,674	61	4,008,674	107	4,008,729	15 BS	4,009,343		
		CLASS 56	CLASS 83	155	4,008,637	155	4,008,637	CLASS 125	151	4,008,676	151	4,008,676	107	4,008,729	4,009,344		
		CLASS 57	185	4,008,638	185	4,008,638	CLASS 126	162	4,008,677	162	4,008,677	107	4,008,729	4,009,345			
		CLASS 58	371	4,008,639	371	4,008,639	CLASS 127	230	4,008,678	230	4,008,678	107	4,008,729	4,009,346			
		CLASS 59	833	4,008,640	833	4,008,640	CLASS 128	1 A	4,008,679	1 A	4,008,679	107	4,008,729	4,009,347			
		CLASS 60	CLASS 84	1.24	4,008,641	1.24	4,008,641	CLASS 129	18 E	4,008,680	18 E	4,008,680	107	4,008,729	4,009,348		
		CLASS 61	CLASS 85	5	4,008,681	5	4,008,681	CLASS 130	5	4,008,681	5	4,008,681	107	4,008,729	4,009,349		
		CLASS 62	CLASS 86	41	4,008,682	41	4,008,682	CLASS 131	35	4,008,739	35	4,008,739	107	4,008,729	4,009,350		
		CLASS 63	CLASS 87	49.1	4,008,683	49.1	4,008,683	CLASS 132	100	4,008,740	100	4,008,740	107	4,008,729	4,009,351		
		CLASS 64	CLASS 88	123	4,008,684	123	4,008,684	CLASS 133	46	4,008,741	46	4,008,741	107	4,008,729	4,009,352		
		CLASS 65	CLASS 89	629	4,008,685	629	4,008,685	CLASS 134	187	4,009,059	187	4,009,059	107	4,008,729	4,009,353		
		CLASS 66	CLASS 90	651	4,008,686	651	4,008,686	CLASS 135	187	4,009,059	187	4,009,059	107	4,008,729	4,009,354		
		CLASS 67	CLASS 91	CLASS 119	1	4,008,687	1	4,008,687	CLASS 136	187	4,009,059	187	4,009,059	107	4,008,729	4,009,355	
		CLASS 68	CLASS 92	1	4,008,688	1	4,008,688	CLASS 137	187	4,009,059	187	4,009,059	107	4,008,729	4,009,356		
		CLASS 69	CLASS 93	28	4,008,689	28	4,008,689	CLASS 138	187	4,009,059	187	4,009,059	107	4,008,729	4,009,357		
		CLASS 70	CLASS 94	1	4,008,690	1	4,008,690	CLASS 139	187	4,009,059	187	4,009,059	107	4,008,729	4,009,358		
		CLASS 71	CLASS 95	1	4,008,691	1	4,008,691	CLASS 140	187	4,009,059	187	4,009,059	107	4,008,729	4,009,359		
		CLASS 72	CLASS 96	1	4,008,692	1	4,008,692	CLASS 141	187	4,009,059	187	4,009,059	107	4,008,729	4,009,360		
		CLASS 73	CLASS 97	1	4,008,693	1	4,008,693	CLASS 142	187	4,009,059	187	4,009,059	107	4,008,729	4,009,361		
		CLASS 74	CLASS 98	1	4,008,694	1	4,008,694	CLASS 143	187	4,009,059	187	4,009,059	107	4,008,729	4,009,362		
		CLASS 75	CLASS 99	1	4,008,695	1	4,008,695	CLASS 144	187	4,009,059	187	4,009,059	107	4,008,729	4,009,363		
		CLASS 76	CLASS 100	1	4,008,696	1	4,008,696	CLASS 145	187	4,009,059	187	4,009,059	107	4,008,729	4,009,364		
		CLASS 77	CLASS 101	1	4,008,697	1	4,008,697	CLASS 146	187	4,009,059	187	4,009,059	107	4,008,729	4,009,365		
		CLASS 78	CLASS 102	1	4,008,698	1	4,008,698	CLASS 147	187	4,009,059	187	4,009,059	107	4,008,729	4,009,366		
		CLASS 79	CLASS 103	1	4,008,699	1	4,008,699	CLASS 148	187	4,009,059	187	4,009,059	107	4,008,729	4,009,367		
		CLASS 80	CLASS 104	1	4,008,700	1	4,008,700	CLASS 149	187	4,009,059	187	4,009,059	107	4,008,729	4,009,368		
		CLASS 81	CLASS 105	1	4,008,701	1	4,008,701	CLASS 150	187	4,009,059	187	4,009,059	107	4,008,729	4,009,369		
		CLASS 82	CLASS 106	1	4,008,702	1	4,008,702	CLASS 151	187	4,009,059	187	4,009,059	107	4,008,729	4,009,370		

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18 GE	4,009,351	107	4,009,105	CLASS 240	63 K	4,009,151	99	4,008,889	456	4,009,411
84 VF	4,009,353	195 S	4,009,106	1 EL	63 UY	4,009,150	151	4,008,890	CLASS 315	
99	4,009,354	321 B	4,009,107	1 LP	77.5 AT	4,009,152	263	4,008,891	106	4,009,412
121 D	4,009,355		4,009,108	1.3	78 R	4,009,153			111.2	4,009,413
170.2	4,009,356	447	4,009,109	108 R	78 SC	4,009,154	100	4,008,892	169 R	4,009,414
CLASS 180		CLASS 211		CLASS 241	141	4,009,155	CLASS 272		176	4,009,415
5 R	4,008,777	34	4,008,807	46 R	169	4,009,156	CLASS 273		408	4,009,426
6.5	4,008,778	65	4,008,808	89.2	192	4,009,157	85 R	4,008,893	CLASS 317	
79.1	4,008,779	71	4,008,809	101.2	205	4,009,158	110	4,008,894	CLASS 318	
82 C	4,008,780		4,008,810		239.1	4,009,159	113	4,008,895	CLASS 320	
104	4,008,781	CLASS 213		CLASS 242	244 R	4,009,160	171	4,008,896	CLASS 321	
132	4,008,782	211	4,008,811	18 A	245	4,009,161	CLASS 322		CLASS 322	
140	4,008,783	CLASS 214		46.21	247.2 A	4,009,162	CLASS 323		CLASS 323	
CLASS 181		6 BA	4,008,812	68	250 BN	4,009,163	CLASS 324		CLASS 324	
CLASS 182		11 R	4,008,813	86.5 R	256.4 C	4,009,164	CLASS 325		CLASS 325	
133	4,008,785	16 B	4,008,814	107.4 B	256.4 F	4,009,165	CLASS 326		CLASS 326	
186	4,008,786	17 C	4,008,815	107.4 R	268 S	4,009,166	CLASS 327		CLASS 327	
CLASS 184		17 DA	4,008,816	CLASS 243	270 K	4,009,167	CLASS 328		CLASS 328	
12	4,008,787	147 R	4,008,817	6	287 T	4,009,168	CLASS 329		CLASS 329	
CLASS 188		505	4,008,818	CLASS 244	289 R	4,009,169	CLASS 330		CLASS 330	
70 R	4,008,788	522	4,008,819	1 N	293.54	4,009,170	CLASS 331		CLASS 331	
CLASS 190		CLASS 215		3.13	293.55	4,009,171	CLASS 332		CLASS 332	
44	4,008,790	256	4,008,820	87	293.64	4,009,172	CLASS 333		CLASS 333	
CLASS 191		CLASS 219		111	293.69	4,009,173	CLASS 334		CLASS 334	
12.2 R	4,008,791	10.55 B	4,009,359	CLASS 246	296 T	4,009,174	CLASS 335		CLASS 335	
CLASS 194		60 A	4,009,360	120	306.8 R	4,009,175	CLASS 336		CLASS 336	
1 N	4,008,792	69 C	4,009,361	CLASS 248	307 C	4,009,176	CLASS 337		CLASS 337	
CLASS 195		92	4,009,362	205 A	307 FA	4,009,177	CLASS 338		CLASS 338	
31 F	4,009,074	121 L	4,009,364	224.2	314.5	4,009,178	CLASS 339		CLASS 339	
33	4,009,075	135	4,009,365	242	314.5	4,009,179	CLASS 340		CLASS 340	
63	4,009,076	208	4,009,366	534	346.2 R	4,009,180	CLASS 341		CLASS 341	
81	4,009,077	222	4,009,367	CLASS 250	346.8 M	4,009,181	CLASS 342		CLASS 342	
103.5 R	4,009,078	430	4,009,368	199	347.3	4,009,182	CLASS 343		CLASS 343	
CLASS 197		CLASS 220		201	347.3	4,009,183	CLASS 344		CLASS 344	
1 A	4,008,793	67	4,008,821	205	348.5 L	4,009,184	CLASS 345		CLASS 345	
55	4,008,794	94 R	4,008,822	208	381	4,009,185	CLASS 346		CLASS 346	
161	4,008,795	269	4,008,823	221	456 A	4,009,186	CLASS 347		CLASS 347	
CLASS 198		270	4,008,824	273	456 R	4,009,187	CLASS 348		CLASS 348	
318	4,008,797	273	4,008,825	281	459 A	4,009,188	CLASS 349		CLASS 349	
411	4,008,798	CLASS 221		338	465.3	4,009,189	CLASS 350		CLASS 350	
460	4,008,799	13	4,008,826	339	465.4	4,009,190	CLASS 351		CLASS 351	
698	4,008,799	197	4,008,827	552	468 D	4,009,191	CLASS 352		CLASS 352	
782	4,008,800	241	4,008,828	CLASS 251	473 F	4,009,192	CLASS 353		CLASS 353	
841	4,008,801	CLASS 222		63.4	475 R	4,009,193	CLASS 354		CLASS 354	
CLASS 200		63	4,008,829	129	479 C	4,009,194	CLASS 355		CLASS 355	
42 R	4,009,357	95	4,008,830	249.5	486 R	4,009,195	CLASS 356		CLASS 356	
148 A	4,009,358	CLASS 223		257	488 CD	4,009,196	CLASS 357		CLASS 357	
150 B	4,009,358	85	4,008,831	CLASS 252	497 R	4,009,197	CLASS 358		CLASS 358	
336	4,009,363	99	4,008,832	8.9	502.5	4,009,198	CLASS 359		CLASS 359	
CLASS 201		102	4,008,833	62.55	556 A	4,009,199	CLASS 360		CLASS 360	
29	4,009,080	CLASS 224		71	557 B	4,009,200	CLASS 361		CLASS 361	
CLASS 202		42.1 F	4,008,838	109	558 A	4,009,201	CLASS 362		CLASS 362	
227	4,009,081	CLASS 226		142	559 R	4,009,202	CLASS 363		CLASS 363	
CLASS 203		32	4,008,839	301.1 W	563 P	4,009,203	CLASS 364		CLASS 364	
11	4,009,082	173	4,008,840	305	600 R	4,009,204	CLASS 365		CLASS 365	
49	4,009,083	194	4,008,841	309	609 R	4,009,205	CLASS 366		CLASS 366	
53	4,009,084	CLASS 227		321	628	4,009,206	CLASS 367		CLASS 367	
CLASS 204		117	4,008,842	358	643 D	4,009,207	CLASS 368		CLASS 368	
27	4,009,085	CLASS 228		413	653.7	4,009,208	CLASS 369		CLASS 369	
39	4,009,086	CLASS 229		417	653.8	4,009,209	CLASS 370		CLASS 370	
52 R	4,009,087	33	4,008,843	431 N	663	4,009,210	CLASS 371		CLASS 371	
180 P	4,009,088	119	4,008,844	441	669 R	4,009,211	CLASS 372		CLASS 372	
188	4,009,089	136	4,008,845	463	673	4,009,212	CLASS 373		CLASS 373	
192	4,009,090	CLASS 229		465	673.5	4,009,213	CLASS 374		CLASS 374	
228	4,009,091	4.5	4,008,846	473	683.48	4,009,214	CLASS 375		CLASS 375	
242	4,009,092	14 C	4,008,847	522	830 TW	4,009,215	CLASS 376		CLASS 376	
291	4,009,093	31 R	4,008,848	CLASS 254	837 R	4,009,216	CLASS 377		CLASS 377	
CLASS 206		51 TS	4,008,849	57	862	4,009,217	CLASS 378		CLASS 378	
63.3	4,008,802	55	4,008,850	161	876 R	4,009,218	CLASS 379		CLASS 379	
220	4,008,803	62	4,008,851	164	878 R	4,009,219	CLASS 380		CLASS 380	
320	4,008,804	92.3	4,008,852	CLASS 259	72 R	4,009,220	CLASS 381		CLASS 381	
CLASS 208		CLASS 235		2 A	148	4,009,221	CLASS 382		CLASS 382	
48 AA	4,009,094	61.11 E	4,009,369	2.5 AB	CLASS 260	4,009,222	CLASS 383		CLASS 383	
108	4,009,095	64	4,009,370	2.5 F	3 R	4,009,223	CLASS 384		CLASS 384	
111	4,009,096	92 CC	4,009,372	23 R	9	4,009,224	CLASS 385		CLASS 385	
342	4,009,097	92 FL	4,009,373	29.2 TN	10	4,009,225	CLASS 386		CLASS 386	
CLASS 209		92 LG	4,009,374	29.2 UA	24	4,009,226	CLASS 387		CLASS 387	
73	4,008,805	92 SH	4,009,375	29.4 UA	40.2	4,009,227	CLASS 388		CLASS 388	
122	4,008,806	150.24	4,009,376	29.6 MP	45.3	4,009,228	CLASS 389		CLASS 389	
CLASS 210		151.32	4,009,377	29.6 RB	46.3	4,009,229	CLASS 390		CLASS 390	
3	4,009,098	152	4,009,378	29.6 RW	61	4,009,230	CLASS 391		CLASS 391	
14	4,009,100	156	4,009,379	37 EP	112	4,009,231	CLASS 392		CLASS 392	
28	4,009,101	181	4,009,380	38	233	4,009,232	CLASS 393		CLASS 393	
33	4,009,102	CLASS 239		42.22	CLASS 266	4,009,233	CLASS 394		CLASS 394	
51	4,009,103	542	4,008,853	45.95 B	162	4,008,885	CLASS 395		CLASS 395	
62	4,009,104	655	4,008,854	47 XA	266	4,008,886	CLASS 396		CLASS 396	
		682	4,008,855	49	CLASS 270		CLASS 397		CLASS 397	

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	CLASS 350	28	4,009,482	237	4,008,971	440	4,009,247		4,009,283	290	4,009,313
I	4,008,945	52	4,009,483	341	4,008,972	447.4	4,009,248	322	4,009,284		4,009,314
10	4,008,946	59	4,009,484		CLASS 404	510	4,009,249		CLASS 425	310	4,009,315
96 C	4,008,947	68	4,009,485	16	4,008,973	522	4,009,250	454	4,008,990	364	4,009,316
	4,008,948			48	4,008,974	573 G	4,009,251		CLASS 426	378	4,009,317
98	4,008,949	13	4,009,486	101	4,008,975	584	4,009,252			420	4,009,318
160 R	4,008,950	19	4,009,487		CLASS 408		CLASS 424	8	4,009,285	424	4,009,319
187	4,008,951	62	4,009,488	144	4,008,976	45	4,009,253	13	4,009,286		CLASS 429
215	4,008,952	80	4,009,489		CLASS 415	59	4,009,254	106	4,009,287	27	4,009,320
	CLASS 353	83	4,009,490		CLASS 416	70	4,009,255	297	4,009,288	46	4,009,321
103	4,008,953	127	4,009,491	1	4,008,977		4,009,256	330.3	4,009,289	94	4,009,322
	CLASS 354	213	4,009,492	134	4,008,978	85	4,009,257		4,009,290	112	4,009,323
206	4,009,478	240	4,009,493		CLASS 417	89	4,009,258		4,009,291	126	4,009,324
210	4,009,480	280	4,009,494	40	4,008,979	105	4,009,259	659	4,009,292	175	4,009,325
	CLASS 355	45	4,009,490	134 A	4,008,980	121	4,009,260		4,009,293	191	4,009,326
I	4,008,954	125	4,009,491		CLASS 418	123	4,009,261		CLASS 427	194	4,009,327
3 R	4,008,955	131	4,009,492	63	4,008,981	131	4,009,262	35	4,009,294		CLASS 431
8	4,008,956	137	4,009,493	204	4,008,982	177	4,009,263	40	4,009,295	1	4,008,991
14	4,008,957			348	4,008,983		4,009,264	54	4,009,296	344	4,008,992
51	4,008,958		CLASS 361	393	4,008,984		4,009,265		4,009,297		CLASS 432
77	4,008,962	38	4,009,417	423 R	4,008,985		4,009,266	55	4,009,298		
84	4,008,959		4,009,418		CLASS 419	180	4,009,267	82	4,009,299	4	4,008,993
	CLASS 356	88	4,009,419	51	4,008,986	181	4,009,268	162	4,009,300	14	4,008,994
33	4,008,960	91	4,009,420	53	4,008,987	195	4,009,269	195	4,009,301	80	4,008,995
36	Re.29,141	119	4,009,421	54	4,008,988	248.57	4,009,270	238	4,009,302	14	4,008,996
75	4,008,961	120	4,009,422	120	4,008,989	251	4,009,271	287	4,009,303	128	4,008,997
85	4,008,963	175	4,009,423			258	4,009,272	322	4,009,304	258	
109	4,008,964	385	4,009,424		CLASS 423	263	4,009,273	374 C	4,009,306		CLASS 526
125	4,008,965	433	4,009,424	210	4,009,240	267	4,009,274	377	4,009,307	6	4,009,324
218	4,008,966		CLASS 401	213.2	4,009,241	272	4,009,275	399	4,009,308		4,009,325
239	4,008,967	207	4,008,968	234	4,009,242	273	4,009,276	443		47	4,009,326
		292	4,008,969	235	4,009,243	274	4,009,277		CLASS 428	96	4,009,327
	CLASS 357			236	4,009,244	277	4,009,278	38	4,009,309		CLASS 536
5	4,009,479		CLASS 403	237	4,009,245	283	4,009,279	95	4,009,310	17	4,009,328
15	4,009,481	31	4,008,970	313	4,009,246	306	4,009,280		4,009,311	84	4,009,329
				385	4,009,247	317	4,009,281	182	4,009,312	17	
							4,009,282	213		17	

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4 : 4,008,653	4,009,147	4,008,942	4,008,912	20 : 4,009,263	26 : Re.29,139
4,008,756	4,009,164	4,008,979	4,008,960	4,008,632	4,008,494
4,008,893	4,009,179	4,008,980	4,008,986	4,008,770	4,008,506
4,009,064	4,009,190	4,009,122	4,009,007	4,008,816	4,008,508
4,009,268	4,009,191	4,009,160	4,009,062	4,008,975	4,008,517
4,009,299	4,009,197	4,009,182	4,009,091	4,009,178	4,008,544
4,009,423	4,009,231	4,009,331	4,009,095	4,009,210	4,008,613
4,009,450	4,009,260	4,009,436	4,009,096	4,008,579	4,008,638
4,009,464	4,009,267	4,009,469	4,009,097	4,008,724	4,008,667
4,009,483	4,009,323	06 : 4,009,393	4,009,103	4,008,732	4,008,690
4,008,618	4,009,324	10 : 4,009,040	4,009,107	4,008,800	4,008,699
4,008,812	4,009,325	4,009,092	4,009,108	4,008,801	4,008,701
4,009,395	4,009,339	4,009,128	4,009,120	4,008,497	4,008,702
6 : 4,008,501	4,009,359	4,009,153	4,009,123	4,008,763	4,008,712
4,008,534	4,009,374	4,009,215	4,009,203	4,008,972	4,008,747
4,008,541	4,009,379	4,009,242	4,009,217	4,009,045	4,008,804
4,008,567	4,009,380	12 : Re.29,141	4,009,218	4,008,643	4,008,842
4,008,592	4,009,400	4,008,574	4,009,220	4,008,729	4,008,928
4,008,594	4,009,404	4,008,716	4,009,222	4,008,550	4,008,997
4,008,606	4,009,405	4,008,725	4,009,225	4,008,559	4,009,073
4,008,617	4,009,419	4,008,968	4,009,234	4,008,575	4,009,083
4,008,628	4,009,420	4,008,982	4,009,321	4,008,705	4,009,085
4,008,645	4,009,428	4,009,048	4,009,335	4,008,713	4,009,087
4,008,656	4,009,430	4,009,219	4,009,357	4,008,717	4,009,090
4,008,687	4,009,444	4,009,283	4,009,421	4,008,874	4,009,112
4,008,689	4,009,446	4,009,336	4,009,431	4,008,966	4,009,175
4,008,707	4,009,452	4,009,356	4,009,477	4,009,201	4,009,239
4,008,718	4,009,457	4,009,363	4,009,477	4,009,392	4,009,282
4,008,719	4,009,474	4,009,373	18 : 4,008,525	4,009,416	4,009,303
4,008,737	4,009,476	4,009,429	4,008,539	4,009,448	4,009,369
4,008,765	4,009,490	4,009,435	4,008,568	4,008,514	4,008,553
4,008,778	4,009,491	4,009,443	4,008,572	4,008,538	4,008,621
4,008,802	8 : 4,008,610	13 : 4,009,245	4,008,600	4,008,548	4,008,721
4,008,806	4,008,670	4,009,384	4,008,735	4,008,551	4,008,740
4,008,815	4,008,677	4,009,461	4,008,738	4,008,605	4,008,808
4,008,836	4,008,774	16 : 4,008,540	4,008,757	4,008,614	4,008,833
4,008,837	4,008,818	4,008,849	4,008,787	4,008,619	4,008,933
4,008,838	4,008,937	17 : 4,008,498	4,008,788	4,008,631	4,008,959
4,008,852	4,008,949	4,008,503	4,008,931	4,008,683	4,008,962
4,008,866	4,009,259	4,008,543	4,008,978	4,008,894	4,009,011
4,008,869	4,009,332	4,008,556	4,008,991	4,008,910	4,009,047
4,008,883	9 : 4,008,516	4,008,556	4,009,262	4,008,945	4,009,072
4,008,896	4,008,532	4,008,661	4,009,394	4,008,977	4,009,224
4,008,913	4,008,566	4,008,698	4,008,537	4,009,031	4,009,300
4,008,915	4,008,625	4,008,731	19 : 4,008,558	4,009,041	4,009,313
4,008,916	4,008,636	4,008,776	4,008,583	4,009,141	4,009,322
4,008,938	4,008,642	4,008,817	4,008,604	4,009,167	4,009,402
4,008,973	4,008,660	4,008,825	4,008,626	4,009,294	4,009,422
4,008,976	4,008,677	4,008,835	4,008,829	4,009,381	4,009,470
4,008,984	4,008,727	4,008,841	4,008,892	4,009,391	4,008,500
4,009,004	4,008,730	4,008,847	4,008,902	4,009,412	4,008,654
4,009,049	4,008,830	4,008,861	4,008,905	4,009,413	4,008,703
4,009,050	4,008,832	4,008,873	4,008,906	4,009,449	4,008,775
4,009,082	4,008,844	4,008,889	4,008,917	4,009,475	

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,008,792	4,009,311	4,009,163	4,009,131	4,009,212	4,008,898
4,008,819	4,009,326	4,009,170	4,009,134	4,009,223	4,008,930
4,008,862	4,009,328	4,009,171	4,009,228	4,009,246	4,008,950
4,008,996	4,009,330	4,009,177	4,009,233	4,009,284	4,009,003
4,009,185	4,009,385	4,009,198	4,009,301	4,009,297	4,009,067
4,009,253	4,009,415	4,009,208	4,009,310	4,009,304	4,009,104
4,009,285	4,009,432	4,009,235	4,009,317	4,009,307	4,009,109
4,009,371	4,009,439	4,009,249	4,009,377	4,009,314	4,009,126
4,009,010	4,009,440	4,009,292	40 : 4,008,944	4,009,316	4,009,130
4,009,390	4,009,451	4,009,298	4,009,221	4,009,372	4,009,140
4,008,522	4,009,473	4,009,318	4,009,240	4,009,376	4,009,353
4,008,499	4,009,487	4,009,334	4,009,295	4,009,396	4,009,387
4,008,515	4,009,489	4,009,338	4,009,327	4,009,403	4,009,434
4,008,518	35 : 4,008,827	4,009,344	41 : 4,008,648	4,009,407	4,009,481
4,008,523	36 : 4,008,513	4,009,345	4,008,786	4,009,437	4,009,005
4,008,530	4,008,521	4,009,346	4,008,791	4,009,454	4,009,009
4,008,547	4,008,527	4,009,347	4,008,875	4,009,459	51 : 4,008,685
4,008,564	4,008,533	4,009,355	4,008,908	4,009,463	4,008,704
4,008,584	4,008,577	4,009,367	4,009,399	44 : 4,008,526	4,008,758
4,008,585	4,008,588	4,009,388	4,009,388	4,008,528	4,008,821
4,008,590	4,009,409	4,009,409	4,008,573	4,008,535	4,009,078
4,008,640	4,008,593	4,009,411	4,008,598	4,008,823	53 : 4,008,580
4,008,646	4,008,637	4,009,456	4,008,611	4,008,850	4,008,783
4,008,647	4,008,650	4,009,466	4,008,615	4,008,969	4,008,856
4,008,655	4,008,706	4,009,485	4,008,616	45 : 4,008,505	4,008,872
4,008,663	4,008,726	4,009,488	4,008,672	4,008,602	4,009,071
4,008,678	4,008,807	4,009,497	4,008,773	4,008,901	4,009,352
4,008,834	4,008,846	4,009,001	4,008,789	4,009,002	4,009,354
4,008,878	4,008,857	4,009,319	4,008,790	4,009,315	54 : 4,008,797
4,008,890	4,008,895	4,009,343	4,008,810	4,008,810	4,009,129
4,008,961	4,008,934	4,009,417	4,008,859	47 : 4,008,681	4,009,270
4,008,993	4,009,418	4,009,418	4,008,865	4,008,715	4,009,329
4,009,008	4,008,955	39 : 4,008,502	4,008,868	4,008,899	55 : 4,008,510
4,009,052	4,008,957	4,008,549	4,008,935	4,009,150	4,008,536
4,009,061	4,008,958	4,008,571	4,008,939	4,009,302	4,008,587
4,009,075	4,009,006	4,008,581	4,008,941	4,008,524	4,008,629
4,009,114	4,009,028	4,008,658	4,008,970	4,008,542	4,008,680
4,009,121	4,009,029	4,008,669	4,009,012	4,008,552	4,008,682
4,009,172	4,009,030	4,008,688	4,009,020	4,008,601	4,008,741
4,009,181	4,009,032	4,008,691	4,009,021	4,008,603	4,008,742
4,009,200	4,009,033	4,008,711	4,009,022	4,008,608	4,008,798
4,009,207	4,009,034	4,008,743	4,009,024	4,008,714	4,008,799
4,009,214	4,009,042	4,008,853	4,009,025	4,008,745	4,008,822
4,009,251	4,009,051	4,008,879	4,009,026	4,008,746	4,008,851
4,009,254	4,009,093	4,008,880	4,009,060	4,008,759	4,008,871
4,009,256	4,009,094	4,008,881	4,009,089	4,008,760	4,008,876
4,009,258	4,009,098	4,008,923	4,009,115	4,008,764	4,008,920
4,009,269	4,009,099	4,008,924	4,009,117	4,008,766	4,008,943
4,009,277	4,009,105	4,008,936	4,009,133	4,008,767	4,008,988
4,009,279	4,009,144	4,008,983	4,009,136	4,008,768	4,009,056
4,009,291	4,009,151	4,009,015	4,009,195	4,008,769	4,009,106
	4,009,157	4,009,102	4,009,211	4,008,784	

DESIGN PATENTS

6 : 243,436	10 : 243,480	26 : 243,466	36 : 243,432	243,430	243,447
243,442	243,427	243,438	243,453	243,431	243,456
243,445	12 : 243,444	27 : 243,460	243,458	243,433	243,457
243,450	13 : 243,479	31 : 243,454	243,473	243,463	243,470
243,475	24 : 243,469	33 : 243,459	243,476	243,468	51 : 243,462
243,435	24 : 243,464	34 : 243,455	39 : 243,428	42 : 243,477	53 : 243,446
243,422	25 : 243,465	243,467	243,429	48 : 243,434	55 : 243,426
243,437					

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